AN EXPLORATORY STUDY ON MOBILE-BASED PSYCHOLOGICAL INTERVENTIONS FOR IMPROVING MENTAL HEALTH IN STUDENTS.

Student: Tondani Mudau

Student number: 1490037

A thesis submitted for the degree of Doctor of Philosophy

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

University of the Witwatersrand

Department of Psychology

School of Human and Community Development

March 2023

Supervisor: Prof. Janan Dietrich

Co-Supervisor: Dr Vinitha Jithoo

DECLARATION

I, Tondani Mudau, Student Number 1490037, am a student registered for a Doctor of Philosophy degree with the University of the Witwatersrand's Department of Psychology. I hereby declare the following:

- I am aware that plagiarism is wrong.
- I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is evidence that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

Tondani Mudau

Date: 12 October 2023

ABSTRACT

Background: Despite high levels of psychological distress, university students are reluctant to seek counselling on campus. University students have easy access to data and regularly use their phones for academic and personal purposes. A mental health application (app) designed specifically for university students has the potential to address mental health challenges and promote help-seeking amongst university students. This study aimed to explore the prevalence of psychological distress amongst university students, the sources of their distress and common coping strategies. The study then investigated students' and counsellors' perceptions of using a mental health app as a coping mechanism for psychological distress. Finally, the study developed, tested, and evaluated a mental health app specifically designed for university students.

Methods: A multiphase mixed methods research design comprising three phases was used to collect quantitative and qualitative data through surveys, in-depth interviews, and focus group discussions. Data were collected, analysed and interpreted within the technology acceptance model (TAM) and cognitive behavioural theoretical frameworks. Phase 1 collected data to determine the prevalence of psychological distress, common coping strategies and mobile phone use amongst university students. Phase 2 integrated quantitative and qualitative data from Phase 1 to determine the feasibility of a mental health app, and thereafter developed the mental health app. Phase 3 tested and evaluated the usability of a mental health app with students and counsellors. All quantitative data were collected using the web-based application, Research Electronic Data Capture, and analysed using Statistical Analytics Software Enterprise Guide 7.1. All qualitative data were analysed through thematic analysis and by using NVivo version 12 Pro.

Results: Overall, 1 221 students and nine counsellors were enrolled in the study. Phase 1 enrolled 1 100 students in an exploratory survey, 62 in focus group discussions, and six counsellors for in-depth interviews.

Socio-demographic data Phase 1: A majority of participants (72.72%) were female, within the 18–20 age group (64.6%), and in their first-year level of study (46.2%). A vast majority (94.1%) were enrolled at the University of the Witwatersrand, with many enrolled in the faculty of humanities (36.1%). Most participants were South African citizens (95.6%) and from an urban location (61%), and 20.09% had been previously diagnosed with a mental health challenge.

Prevalence of psychological distress: The Kessler-10 and student stress inventory were used to determine the prevalence of psychological distress. The results show that most participants (60.5%) reported very high levels of psychological distress, while 53% reported moderate levels of stress. Male students were more likely than female students to have very high levels of psychological distress (71.4%) and mild stress (63.3%). Third-year students were more likely than first- and second-year students to have high levels of psychological distress (65%) and moderate stress (59%).

Coping strategies: The Brief-COPE-28 was used to determine common coping strategies amongst students. The results show that students with moderate or severe stress used emotion-focused (mean: 30.6 [SD = 5.71] vs 28.8 [SD = 6.21]; $p < .0001$) and avoidance coping styles (mean: 16.3 [SD = 3.82] vs 13.2 [SD = 3.51]; $p < .0001$) more than those with mild stress. A larger proportion of female than male students used denial (mean: 3.50 [SD = 1.77] vs 1.54 [SD = 3.13]; $p = 0.001$), emotional support (mean: 5.03 [SD = 1.96] vs 4.50 [SD = 1.82]; $p = 0.0001$), informational support (mean: 2.00 vs 1.88, $p = 0.0001$), behavioural disengagement, (mean: 3.63 [SD = 1.63] vs 3.82 [SD = 1.52]; $p = 0.001$), and religion (mean: 5.53 [2.24] vs 4.63 [2.17]; $p = 0.001$) as coping strategies. Students within the 18–20 age group had higher scores for religion as a coping strategy (mean: 5.53 [SD =2.2 2] vs 4.93 [SD = 2.23]; $p = 0.0003$). First-years were more likely to use problem-solving coping styles than postgraduate students (mean: 22.5 [SD = 5.86] vs 22.5 [SD = 5.29] $p = 0.0165$).

Mobile phone use: Results from a sociodemographic questionnaire show that a majority of participants (98.7%) owned a smartphone and 66.9% owned a phone with Android software. Most (81%) reported having easy access to data and only a few (26.6%) had used an online health app for their health needs.

Students' and counsellors' perceptions of psychological distress and using a mental health app to address mental health challenges: A semi-structured interview guide was used to collect qualitative data. Thematic analysis based on the TAM and cognitive behavioural theory frameworks categorised qualitative data under six main themes: (1) students' conceptualisation of distress, (2) common mental health challenges, (3) perceptions of factors leading to distress, (4) facilitators of using a mental health app intervention, (5) barriers to using a mental health app intervention, and (6) perceived usefulness of the app.

Sociodemographic data Phase 3: Three counsellors and 59 students were enrolled in the survey. Most students (64%) were female, within the 21–24 age group (63%), and in their

third year of study (37%). More than half the student participants were enrolled at the University of the Witwatersrand (54%) and 29% within the humanities faculty.

App testing: The app had eight categories for participants to test (information, coping strategies, take a test, seek help, journal, podcasts, videos, and settings). A majority of participants assessed coping strategies (73%) and information (69%), followed by the seek help (47%) and take a test (45%) category. Podcasts (23%) and settings (15%) were the least assessed categories.

Perceived ease of use: The belief that users will require minimal effort using the technology was assessed using the Mobile Application Rating Scale (MARS). The overall MARS score showed excellent internal consistency (Cronbach alpha = 0.93) and was highly correlated to the app's overall star rating ($r = 0.72$, $p < 0.0001$). The overall mean for the total MARS scale was 88.1. The MARS subscales were high quality and exceeded the (3.0) mean threshold: engagement (3.84), functionality (3.52), aesthetics (4.25), information (4.36), and subjective quality (3.45).

Conclusion: The findings reveal that psychological distress is prevalent amongst university students, suggesting a need for student-friendly mental health interventions. A mental health app has the potential to address this need.

This study found that most students own smart mobile phones and have easy access to data, indicating that a mental health app is a viable intervention. The qualitative findings demonstrate students' willingness to use a mental health app for psychological distress.

Barriers to using the app included a lack of face-to-face therapy, over-reliance on the app, fear of misdiagnosis, and lack of accessibility and affordability. Facilitators to using the app included previous experience with apps, convenience, accessibility, and confidentiality. These aspects were considered when designing the app, for it to be student friendly.

Students and counsellors suggested that, for the app to be useful, it should provide information and coping strategies, offer support, engagement, and security. Therefore, the mental health app intervention in this study was developed based on these characteristics.

The designed mental health app was evaluated by students and counsellors, who rated the app to be of high quality and easy to use. This outcome is positive and should be explored further. Future studies can longitudinally test for the app's effectiveness with students experiencing psychological distress.

ACKNOWLEDGEMENTS

I would like to thank my Lord and Saviour Jesus Christ for giving me the Holy Spirit, who has been my guide and light throughout this journey. Apart from Him, I can do nothing; in Him I live, move and have my being.

Prof Dietrich and Dr Jithoo, thank you for supervising this study with extreme patience, tact and intelligence. Your guidance and support throughout this journey gave me the confidence I needed to persevere.

Dad, thank you for your encouragement and motivation when I decided to pursue my studies full time. Your support gave me courage and means the world to me. Mum, thank you so much for always being available to listen and pray for my studies. Above all, thank you for believing in me.

My Pastor, Dr T.S. Muligwe and my friend, Rev. M.P. Muligwe, thank you for spurring me on and praying for me throughout this degree. Your love and support are a huge blessing in my life.

Khuthadzo Hlongwane and Prof. Otwombe, thank you for providing all the statistical support.

Sonto Madonsela, thank you for your dedication in co-facilitating the focus group discussions. I am also very grateful for your camaraderie throughout this study. Lerato and Gizelle, thank you for your assistance with qualitative data analysis. Stefanie Vermaak, thank you for offering your insights on the qualitative data.

Presley Mudau and Elton Oliver, thank you for your patience and the sacrifices you made to develop the app. Above all, thank you for bringing the participants' vision to life. It was not easy, but you were resilient and never backed down. Thank you!

Dr Mamakiri Mulaudzi, thank you for your friendship and mentorship. Your enthusiasm and dedication were invaluable in helping me navigate my PhD journey. You are awesome!

To my friends and church community who started calling me "Dr Tee" before I was halfway through the degree, I thank you. You inspired me and kept me accountable. You are all amazing!!

To my siblings Presley, Pinky and Fhumulani, thank you for your words of encouragement and for being present throughout this journey. Presley and Pinky, you made your home available when I needed to work without ever once complaining—finally, the sleepless nights have paid off.

Finally, a huge thank you to myself, for never giving up and for showing up in all the seasons of my life, no matter how tough! This PhD journey has shown me a different version of myself, and I will forever be grateful for the opportunity.

FUNDING

This research study was funded and supported by the following organisations:

- The National Research Fund (NRF) PhD funding.
- iThemba Foundation non-profit organisation
- The South African Medical Research Council (SAMRC) through the Health Systems Unit.
- The researcher also received support in the initial stages of the PhD from Prof. Dietrich's Post-PhD NRF Thuthuka research.

The conclusions drawn and recommendations presented in this study are solely those of the researcher. The NRF, iThemba Foundation, and SAMRC do not take responsibility for any opinions or findings presented in the study.

DEDICATION

To my brilliant niblings Lutendo, Nidvho and Vhutali.

To all the students who participated in this study.

To all university students.

"I hope you never fear those mountains in the distance,
Never settle for the path of least resistance.
And when you get the choice to sit it out or dance,
I hope you dance."

(Lee Ann Womack and Sons of the Desert, 2000)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of variance App Application
CBT	Cognitive behavioural therapy
CCDU	Counselling and Careers Development Unit (Wits University)
COVID-19	Coronavirus disease 2019
DSM-5	Diagnostic Statistical Manual of Mental Disorders – 5th edition
FGD	Focus group discussion
IDI	In-depth interview
IQR	Interquartile range
K-10	Kessler 10 psychological distress scale
LMICs	Low- and middle-income countries
MARS	Mobile Application Rating Scale
MMR	Mixed methods research
mHealth	Mobile health
PU	Perceived usefulness
PEOU	Perceived ease of use
REDCap	Research Electronic Data Capture
SADAG	The South African Depression and Anxiety Group
SAS	Statistical Analytics Software
SD	Standard deviation
SSI	Student stress inventory
TAM	Technology acceptance model
USAf	Universities of South Africa
UTUAT	Unified theory of acceptance and use of technology
WHO	World Health Organization
Wits	University of the Witwatersrand

KEY CONCEPTS

Anxiety disorders (anxiety): A spectrum of mental health disorder marked by extreme and uncontrollable feelings of worry, anxiousness or fear, which could interrupt one's daily activities (World Health Organization [WHO], 2017).

Campus counsellor: Therapists from different specialisations—including psychologists, counsellors and social workers—who offer mental health counselling services to university students (Wits University, 2023a/b).

Cognitive behavioural theory: A psycho-social theory, which states that our thoughts are connected to our emotions and behaviours. What we think impacts what we feel and, eventually, our behaviours (Beck, 1964).

Cognitive Behavioural Therapy (CBT): A psychotherapeutic technique that helps identify and remedy negative thoughts and behaviours (Beck, 1964).

Coping mechanism: Behavioural and cognitive patterns used to manage or decrease external or internal stress (Lazarus & Folkman, 1984).

Depressive disorder (depression): A mental disorder that causes sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration (WHO, 2017).

Diagnostic and statistical manual of mental disorders—5th edition (DSM-5): A taxonomic and diagnostic tool for mental disorders published by the American Psychiatric Association (2013).

Emerging adulthood: A psycho-social developmental period occurring between ages 18–25. This developmental period is marked by exploring identity, instability, self-focus, feeling in-between, and possibilities (Arnett, 2018).

Kessler-10 psychological distress scale: A self-report scale measuring psychological distress, comprising 10 questions on symptoms of depression and anxiety (Kessler et al., 2003).

Mental disorders: A group of mental illnesses or conditions that affect a person’s behaviour, emotions, and thought processes (WHO, 2017).

Mental health challenges: Any mental condition affecting the brain, feelings, thoughts and behaviours. They include a range of mental conditions and may or may not be diagnosable using the DSM-5 (American Psychological Association, 2022).

Mental health literacy: The ability to recognise, prevent or treat mental health challenges based on personal beliefs and attitudes held about these challenges (Jorm et al., 1997).

Mobile application (app): A software application designed for smaller devices such as a phone or tablet (Technopedia, 2018).

Mobile Application Rating Scale (MARS): A standardised tool developed by the Queensland University of Technology, used to assesses health apps (Stoyanov et al., 2015).

Psychological distress: An emotional state marked by symptoms of stress, anxiety and depression (Drapeau et al., 2012).

Stress: External or internal feelings of emotional or physical tension, stemming from events or thoughts that make individuals feel frustrated, angry, or nervous (WHO, 2017).

Student Stress Inventory (SSI): A self-report scale measuring levels of stress among university students (Mohamed Arip et al., 2015).

Technology Acceptance Model (TAM): An information systems theory that models how users come to accept and use a technology (Davis, 1989).

CHAPTER 1: INTRODUCTION

This chapter introduces the core topics of the study by discussing the prevalence of mental health challenges and the potential use of mobile applications (apps) to address mental health challenges amongst university students. Starting with a definition of mental health, the chapter then presents the significance of the study, including mental health challenges among university students and mobile health interventions. This is followed by a discussion of the rationale for the study, the research questions, the research aims and objectives, and research questions. The chapter concludes by offering an outline of the thesis with a synopsis of each chapter.

1.1 SIGNIFICANCE OF STUDY

Mental health is a multifaceted health concept which is understood and defined in various ways. The World Health Organization (WHO, 2022) defines mental health as the ability to "cope with stresses of life, learn well, work well and contribute to one's community". Mental health includes the "ability to make personal or collective decisions, build relationships and shape the world we live in" (WHO, 2022). Ultimately, mental health is not just the absence of mental disorders but the ability to thrive at an emotional, social and mental level.

Mental health, therefore, should be understood as existing on a continuum with varying presentations and at different intensities (Galderisi et al., 2015). Globally, research has been conducted to explain the mental health continuum, which Whitlock (2021) described as comprising four stages—thriving, surviving, struggling, and in crisis. Westerhof and Keyes (2010) asserted that the continuum constitutes four dimensions—optimal functioning, absence of mental disorders, poor mental health, and mental disorder. According to WHO (2022), individuals experience the mental health continuum differently in terms of difficulty, distress, social and clinical outcomes. Therefore, the presence of any mental health challenges can hinder an individual's ability to engage in everyday activities or may eventually lead to impaired functioning, making mental health a critical topic to explore and understand (Galderisi et al., 2015).

Mental health is rapidly becoming a major concern in South Africa. The prevalence of mental health challenges amongst the general South African population increased by 7.5%, from 28.5% in 2020 to 36% in 2022 (Msomi, 2022). According to the South African Depression and Anxiety Group (SADAG), at least one in three South Africans will experience a mental health challenge in their lifetime (SADAG, 2022). Depression and anxiety account for 20%–60% of mental health challenges in South Africa and are the third greatest contributors to the

country's burden of disease, respectively (Cuadros et al., 2019). Anxiety and depression are also prevalent mental health challenges amongst South African university students (Bantjes et al., 2016; Rousseau et al., 2020).

1.1.1 Mental health challenges among university students

Over 968 000 young people are enrolled at South African universities across the country, and it is estimated that one in five will experience a mental health challenge during their university tenure (SADAG, 2022; Statista, 2022). A study by Bantjes et al. (2016) conducted at a South African university in the Western Cape showed that 20.8% and 13.6% of first-year students reported symptoms of anxiety and depression, respectively (Bantjes et al., 2016). In 2022, SADAG reported that 15% of South African university students were diagnosed with moderate to severe depression, which often led to academic failure (SADAG, 2022). A longitudinal study conducted from 2016 to 2019 amongst undergraduate university students based at a Western Cape university in South Africa reported levels of severe depression increasing from 3.81% to 12.63% within the three-year period (Rousseau et al., 2020).

A mental health national survey conducted by Bantjes et al. (2023a) at 17 South African universities estimates a 37% prevalence of anxiety disorders, with at least 24% of students reporting symptoms related to post-traumatic stress disorder and social anxiety disorder. These high levels of mental health challenges, particularly depression and anxiety, are concerning and highlight the importance of recognising and addressing symptoms in the early stages. However, several studies reveal that most South African university students with mental health challenges avoid seeking mental health assistance on campus despite the availability of free counselling services (Bowman & Payne, 2011; Kaminer & Shabalala, 2019; Sanyaolu, 2017).

In 2010, it was estimated that less than 20% of students enrolled at South African universities sought counselling in an academic year (Cilliers et al., 2010). Currently, it is estimated that only one in five students with a mental health challenge seeks and receives professional help (Bantjes et al., 2020). Despite the 10-year gap between the studies, mental health help-seeking does not appear to have significantly improved.

A UNICEF (2021) study on the mental health of South African youth under the age of 24 showed that of the 65% reported mental health challenges, 16% believed their symptoms were not serious enough to seek help, 20% did not know where to seek help, and 18% were afraid to be exposed as having a mental health challenge. The outcomes of this study reveal that help-seeking behaviours for mental health remain a challenge for young people within the 18–24 age group.

For university students, factors such as low mental health literacy, stigma associated with receiving treatment, fear of diagnosis, reliance on friends, lack of trust in therapists, having classes during the day, and cultural beliefs are major barriers to help-seeking. (Czyz et al., 2013; Mitchell et al., 2017). Other factors, such as the environmental setup of mental health care structures on campus and procedures, such as making an appointment beforehand, can discourage students from seeking counselling (Mistler et al., 2017). Some campus counselling services are staffed by student therapists, which can be challenging for some students—being identified by their peers as having a mental health challenge or illness can create fear of stigmatisation and feelings of shame (Wong et al., 2018). A mental health application (app) developed particularly for university students can be a valuable and feasible intervention in addressing help-seeking barriers. An app has the potential to help students to identify and address mental health challenges in their own private space and time. A mental health app could help to address psychological distress, which may reduce the eventual development of anxiety and depressive disorders. Psychological distress is a non-clinical mental health challenge that has symptoms of anxiety, depression, stress; it is identified as a precursor to depressive and anxiety disorders (Drapeau et al., 2012).

1.1.2 Mobile health interventions for mental health challenges

Mobile health (mHealth) refers to the use of wireless technology such as mobile phones to achieve health objectives (WHO, 2018). mHealth apps deliver health information, track progress and assist with behaviour change (Ben-Zeev et al., 2015; Cafazzo et al., 2012). In the past few years, over 10 000 mental health mobile apps have become available for various purposes, including raising awareness, detecting symptoms, monitoring progress, and treating various mental health challenges (Chandrashekar, 2018). However, most of these apps are not evidence-based or tested by users for usability and effectiveness (Chandrashekar, 2018).

Research on the use of mHealth interventions for mental health challenges among South African students is limited (Borghouts et al., 2021; Van Belle et al., 2017). However, extensive global research confirms the potential for mHealth to address mental health challenges amongst young people, including students (Berrouiguet et al., 2016; Grist et al., 2017; Yilmaz & Bohara, 2021).

Global literature suggests that mental health mobile apps guided by therapeutic theories, such as cognitive behavioural therapy (CBT), interpersonal therapy, and mindfulness, may improve mental health challenges requiring behaviour modification, such as depression, anxiety, stress, and mood disorders (Lui et al., 2017; Sharry et al., 2013). Systematic reviews based on global

studies show that mental health apps guided by psychological theories are as effective as face-to-face therapy, suggesting that they can be used individually or as an adjunct to face-to-face therapy (Kobak et al., 2015; Wozney et al., 2017).

Although apps such as Panda and Pacifica have been developed for the general population, there appear to be no evidence-based mental health apps designed specifically for South African students. Therefore, developing an app targeted at South African students could help to address mental health challenges and improve mental well-being.

1.2 RATIONALE FOR THE STUDY

Mental health challenges amongst students are well researched globally and locally (Asif et al., 2020; Bantjes et al., 2023b; Sahu et al., 2020). However, a gap remains in the provision of mental health app-based interventions that address psychological distress among the South African student population (Borghouts et al., 2021; Van Belle et al., 2017). A few studies conducted globally test the efficacy of mental health apps in students, such as the study by Lee and Jung (2018), which shows that mental health apps provide an effective alternative support for university students' mental health. To date, no similar studies have been published within the South African context. A brief literature search on multiple academic databases (EBSCOhost, Google Scholar, PsycINFO and PubMed) revealed a gap in the literature for mental health mobile apps developed for university students in South Africa.

During the coronavirus disease (COVID-19) pandemic, several universities in South Africa, including Wits University and the University of Johannesburg, introduced apps to offer support to students for various challenges, including mental health (Wits, 2023b; University of Johannesburg, 2023). However, no reports are available on testing the usability of these apps. Compared to other mental health apps developed and launched during the pandemic, this study is critical and unique in that it introduces a distinct element by involving students in the development and evaluation processes. Therefore, this study has the potential to guide scholars and inform policy makers at university and government level regarding mental health and mHealth.

The literature shows that university counselling centres are short-staffed, have long waiting lists, and often cannot offer immediate counselling services (Abrams, 2020; Mistler et al., 2017). Usually, mental health challenges are categorised according to risk—students whose mental health challenges are considered low risk are not attended to immediately or as often by counsellors but are instead put on a waiting list or referred to stress management courses

(Cornish et al., 2017; Mitchell et al., 2017). These challenges highlight a gap that can be addressed through an mHealth intervention. In the absence of counsellors, a mental health app could offer students privacy, accessibility, and assurance as they address their mental health challenges (Chandrashekar, 2018; Lipschitz et al., 2019).

Research has also presented poor mental health literacy as a major barrier to help-seeking amongst university students (Mahfouz et al., 2016; Miles et al., 2020). Findings from a study by Seboka et al. (2022) conducted amongst university students in Ethiopia show that mental health literacy is closely associated with digital health literacy. Therefore, an app that provides information on mental health and the support available on campus presents a potential solution to increasing help-seeking behaviours and mental health literacy amongst university students.

In a developing country such as South Africa, where mHealth preventive and promotive approaches to mental health care are still expanding, a mental health app intervention may prove beneficial to university students. Therefore, this study contributes to the body of literature by adding new knowledge on how to develop and assess mental health interventions designed specifically for university students.

1.3 RESEARCH AIMS

The overall aim of this study was to explore the prevalence of psychological distress experienced by university students, and to understand the sources of this distress. The study also aimed to design, test and evaluate the usability of a mobile phone app in offering support and information on mental health, based on the principles of cognitive behavioural theory. To achieve this aim, it was necessary to understand how counsellors working with students corroborated the sources of distress experienced by students, their perceptions of using a mental health app for psychological distress and the usability of the app-based intervention.

As depicted in Figure 1.1 below, the following objectives were identified to realise the aims of the study:

Objective 1: To assess the prevalence of psychological distress in students by using the student stress inventory (SSI) and the Kessler-10 (K-10) psychological distress scale. To further assess how students currently cope with psychological distress using the Brief-COPE-28 scale through an online survey. A total of 1 100 students completed the online survey.

Objective 2: To explore students' knowledge, awareness, and perceptions of psychological distress, and the feasibility of a mental health app as an intervention for distress through focus group discussions. A total of 62 participants were enrolled in the focus group discussions.

Objective 3: To explore counsellors' perceptions of psychological distress and the use of a mental health app as an intervention for university students through in-depth interviews. Six counsellors from the University of the Witwatersrand (Wits) Counselling and Careers Development Unit (CCDU) participated in the in-depth interviews.

Objective 4: To design and develop a mental health app for university students by combining data given by students and counsellors from the survey, in-depth interviews and focus group discussions.

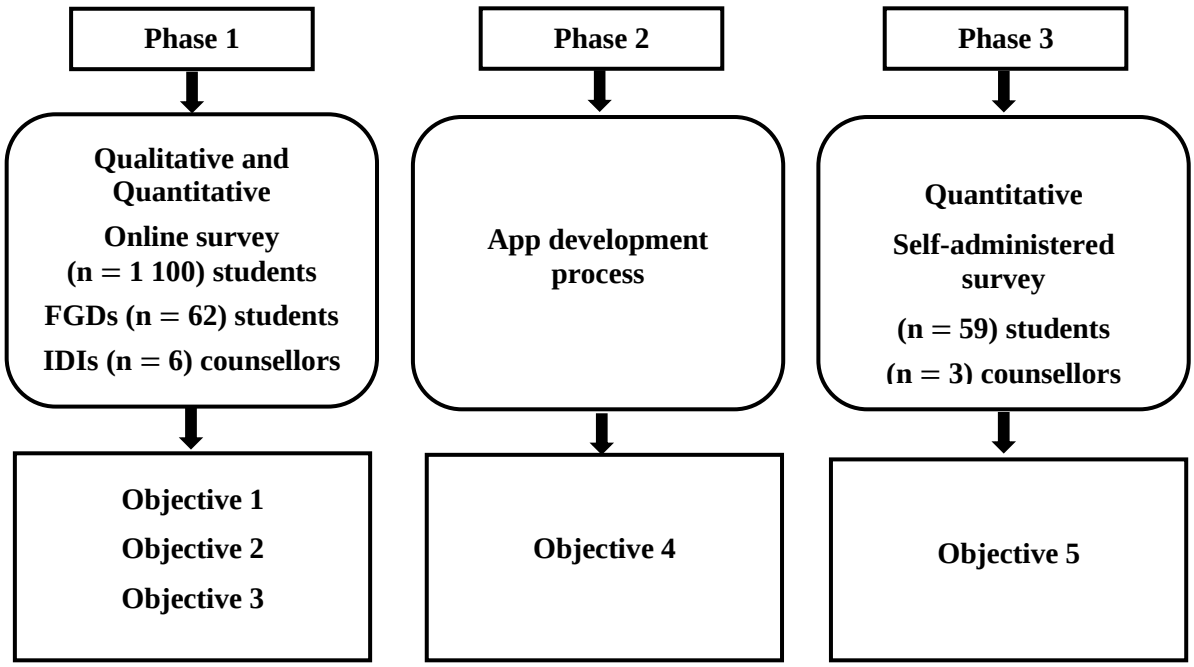


Figure 1.1: Study objectives

Objective 5: To test and evaluate the usability of a mental health app with students and campus counsellors through an online survey based on the mobile application rating scale. Altogether, 59 university students and three counsellors from Wits CCDU completed the online survey.

1.4 RESEARCH QUESTIONS

1. What is the prevalence of psychological distress in students enrolled at South African universities? Do differences in age, gender, and level of study exist in the reporting of psychological distress?

2. What are students' perceptions and understanding of psychological distress?
3. How do university students cope with psychological distress? Do differences in age, gender, and level of study exist in the reporting of psychological distress?
4. How do counsellors report and understand the mental health needs of students and their sources of psychological distress?
5. What are students' perceptions of using a mental health app?
6. What are counsellors' perceptions of the acceptability of using mobile apps as an alternative intervention to face-to-face therapy?
7. How do students and counsellors report the usability of app-based interventions as a means of supporting psychological distress amongst university students?

1.5 CHAPTER OUTLINE

Chapter 1 introduced the research. It presented the significance of the study by describing mental health, the prevalence of mental health challenges and potential use of mHealth interventions amongst university students. This chapter also provided the rationale, aims, objectives, and research questions for the study and presented a synopsis of subsequent chapters.

Chapter 2 critically engages with the available global and local literature on the topics of psychological distress among university students. This chapter further reviews the acceptability of mental health apps by counsellors and students and the effectiveness of available apps in addressing symptoms of mental health challenges in both the general population and among students.

Chapter 3 introduces and engages with the technology acceptance model and cognitive behavioural theory, which are theoretical frameworks for the study highlighting how technology can be used to address psychological distress.

Chapter 4 introduces the methodology applied in the study by discussing the methods, research paradigm, research design, study setting, sampling, data collection instruments and data analysis in their respective phases.

Chapter 5 presents quantitative and qualitative results from Phase 1 of the study. As Phase 1 used a convergent parallel research design, the results and discussion were merged and are presented simultaneously. This chapter also presents the theoretical results as per the research questions.

Chapter 6 provides a reflexive approach to the app development process completed in Phase 2 by mapping out the steps taken in integrating data from Phase 1 to developing the app.

Chapter 7 presents quantitative data results and a discussion from Phase 3. This chapter focuses on students' and counsellors' evaluation of the app.

Chapter 8 concludes the study by summarising the findings and highlighting the strengths and limitations of the study. Future considerations, implications drawn from the study are also discussed in this chapter.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter contextualises mental health by examining theories used to understand and define psychological distress. It examines the prevalence and causes of psychological distress among university students by engaging with quantitative and qualitative literature. It further maps out the available literature on mobile app-based interventions addressing psychological distress amongst young people and the general population. Finally, it highlights global and local literature on the acceptability of mobile app-based psychological interventions amongst young people and counsellors.

2.1.1 Contextualising mental health

Mental health is commonly understood as the presence or absence of mental disorders (Westerhof & Keyes, 2010). However, the World Health Organization (WHO, 2014) argues that the absence of a mental disorder does not imply the presence of mental health. This infers that mental health is more than the absence of a mental disorder. According to Keyes (2014) mental health is wellness in three integral areas: emotional, psychological, and social. Poor functioning in one of these areas may lead to poor mental health and not necessarily a diagnosable mental disorder. An individual can experience distress associated with negative emotions, thought patterns, or destructive behaviours that do not meet the DSM-5 diagnostic criteria, but which affect their optimal functioning and overall mental well-being (Njoku, 2022).

The continuous model of mental health by Westerhof and Keyes (2010), as illustrated in Figure 2.1, maintains that mental health needs to be understood along a continuum as an ongoing process that fluctuates with time depending on contextual experiences.

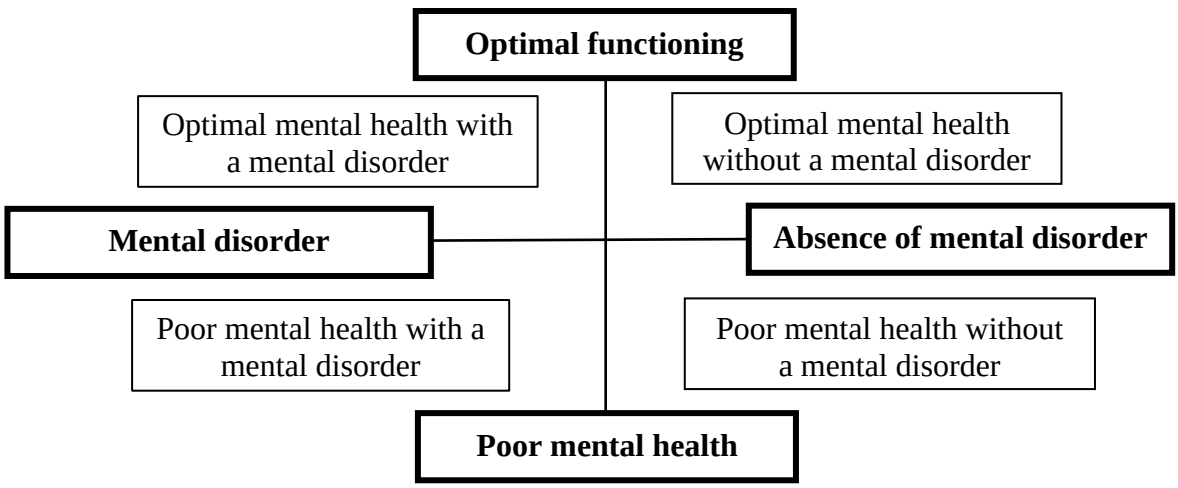


Figure 2.1: The dual continuum model

Source: Westerhof & Keyes, 2010

According to the dual continuum model, mental health is not based on the presence or absence of mental challenges but on the extent to which a person functions optimally with or without mental health challenges (Westerhof & Keyes, 2010). While mental disorders and mental health are distinct from each other, there may be points of overlap regarding the ability to function optimally. For example, a person diagnosed and receiving treatment for a mental disorder can function more optimally than a person with unaddressed psychological distress (Westerhof & Keyes, 2010). Psychological distress is exemplary, because it represents a mental health challenge that does not fit within the DSM-5 criteria but has the potential to affect a person's emotional, psychological and social well-being and, eventually, the ability to function optimally (Drapeau et al., 2012). For this reason, this study focused on psychological distress as a mental health challenge requiring investigation.

2.1.2 Conceptualisation of psychological distress

Despite the increasing prevalence of psychological distress globally, there is no single definition for this mental health challenge; therefore, the conceptualisation of psychological distress remains vague (Drapeau et al., 2012). Social factors such as culture and language play an integral role in the connotations and denotations of psychological distress, which has also become detrimental to how people understand, cope with, and seek treatment for psychological distress (Lima-Smit et al., 2020). Because of its multiple influences and experiences, psychological distress has various definitions in different areas of study. Drapeau et al. (2012) viewed psychological distress as a precursor to anxiety or depression, but not necessarily as the conditions themselves. Arvidsdotter et al. (2016) defined psychological distress as an emotional imbalance caused by stressors that are difficult to cope with. Hakami (2018) stated that psychological distress is an emotional state that negatively impacts an individual's level of optimal functioning, while Sharp and Theiler (2018) described it as a negative mental health state that may not meet the typical DSM-5 diagnostic criteria. Although no single precise definition exists for psychological distress, consensus has been reached that it is a non-specific mental health challenge with symptoms of stress, depression, and anxiety (Arvidsdotter et al., 2015; Drapeau et al., 2012; Hakami, 2018). This study adopted the conceptualisation of psychological distress as a precursor to stress, anxiety, and depression, as determined by Drapeau et al. (2012).

2.1.3 Conceptualisation of stress

Over the centuries, stress has been defined in various ways. Holmes and Rahe (1967, as cited in Lazarus & Folkman, 1986), viewed stress as a significant life event that demands a response, adaptation or change. Selye (1974), who defined stress as an adaptation to the

experiences in one's environment, categorised stress in two ways: distress, which elicits negative emotion and outcomes; and eustress, which elicits positive emotions and outcomes. Lazarus and Folkman (1986) initially defined stress as a relationship between a person and their environment, which they appraise as important but has demands that exceed their coping capacity. Lefcourt et al. (1997) defined stress as any external or internal pressure that exceeds an individual's adaptive ability. The World Health Organization (WHO, 2023) defined stress as tension caused by a difficult situation that causes physical, emotional or mental strain, adding that it is only an indicator of areas needing attention.

According to Wheaton and Montazer (2010), stress is a result of a stressor and an individual's social context. Social context determines whether a stressor develops into stress, and if stress occurs, coping strategies are activated to reduce or manage the stress. When the coping strategies are maladaptive, psychological distress ensues (Wheaton & Montazer, 2010). On the contrary, Leger et al. (2016) argued that that personality traits also determine how individuals appraise stressors. Those who have agreeable traits are more likely to experience stress while those who are extraverted, conscientious and open to experience are less likely to experience stress (Leger et al., 2016). Therefore, the experience of stress is not entirely based on social context but also on personal characteristics. Despite the highlighted contradictions, this study adopted Wheaton and Montazer's (2010) conceptualisation of stress as it offers the study a better opportunity to understand and provide contextually based solutions for student's psychological distress.

The model depicted in Figure 2.2 highlights a critical point, indicating that psychological distress needs to be understood from the perspective of context, stressors, and coping strategies. What makes a stressor detrimental is the context in which it is experienced. Within the context of university students, a group of students could experience the same stressor, but depending on their social environment and ability to use to useful coping strategies, not all will experience stress, and not all who experience stress will have psychological distress.

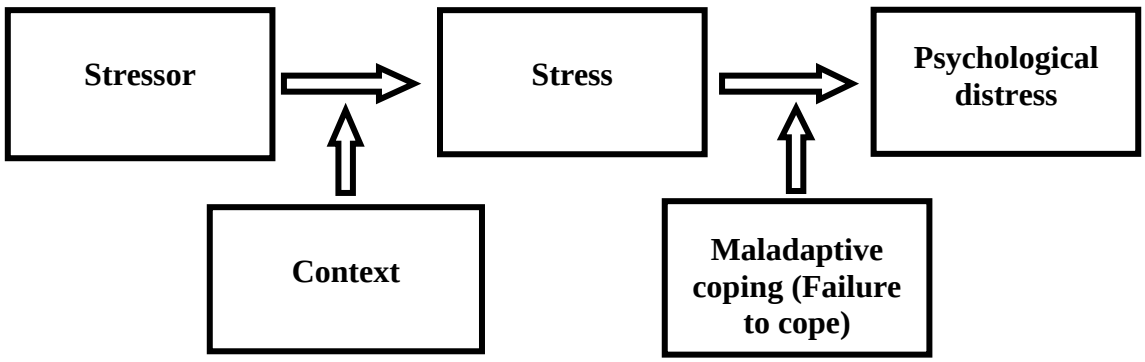


Figure 2.2: Model of stressor, stress and distress

Source: Wheaton & Montazer, 2010

Investigating how students perceive their stressors, causes of stress and coping strategies could enable researchers to understand and innovate ways to prevent stress from reaching a state of psychological distress. For those who have reached a state of psychological distress, such an investigation could help researchers innovate ways to address students' psychological distress contextually distress.

2.1.4 Conceptualisation of depression and anxiety

Psychological distress possesses clinical components of depression and anxiety, which are internalised clinical mental disorders. The term 'psychological distress' is frequently used in DSM-5 diagnostic criteria to describe symptoms of mental disorders such as post-traumatic stress disorder and obsessive-compulsive disorder (Drapeau et al., 2012). Psychological distress as a mental health challenge has DSM-5 clinical features associated with anxiety and depressive disorders, even though it is not categorised as a mental disorder (Drapeau et al., 2012).

Psychological distress is also understood as negative cognitive interpretations of situations or the emotions individuals feel when experiencing hardships (Yang et al., 2015). The negative cognitive interpretations and emotions elicited in psychological distress are like those expressed in depressive and anxiety disorders, such as feelings of sadness, hopelessness, negative thoughts, restlessness, muscle ache, fatigue, insomnia, and lack of energy (Drapeau et al., 2012; Yang et al., 2015).

What differentiates symptoms of psychological distress from those of depressive and anxiety disorders is the duration and intensity of symptoms. Symptoms related to psychological distress are momentary and less severe than symptoms of depressive and anxiety disorders (de Vos et al., 2019; Drapeau et al., 2012). Symptoms related to psychological distress are influenced by momentary pressures and disperse when the pressure subsides or when adaptive coping strategies are applied (Drapeau et al., 2012). However, symptoms related to depressive and anxiety disorders can persist, even in the presence of coping strategies (Mize, 2023). Unlike mental disorders measured using the DSM-5, psychological distress is measured by non-clinical scales that assess psychological, physical and emotional symptoms associated with depression and anxiety (Kessler & Bonnet, 2013). Psychological distress is, therefore, an indicator of early signs of anxiety and depression.

2.2 GLOBAL PREVALENCE OF PSYCHOLOGICAL DISTRESS IN UNIVERSITY STUDENTS

Depressive and anxiety-related symptoms are the most widely reported mental health symptoms globally (WHO, 2017). According to WHO (2021), 21% of students diagnosed

with depression will experience lifelong symptoms. Depressive symptoms are the leading cause of suicide among students globally; therefore, addressing psychological distress as a precursor to depression and anxiety is crucial (Auerbach et al., 2016; Bantjes et al., 2019).

Globally, at over 67%, the prevalence of psychological distress amongst university students is extremely high (Hakami 2018; Liébana-Presa et al., 2014; Tesfaye Kelemu et al., 2020). Research comparing the prevalence of psychological distress between university students and the general population shows that university students experience more symptoms of psychological distress than the general population (Agteren et al., 2019; Larcombe et al., 2016; Maser et al., 2019). Globally, over 40% of students have experienced symptoms of depression, 30% symptoms of anxiety, and 48% stress (Martinez, 2020; McLafferty et al., 2021). Historically, stress was considered the leading symptom of psychological distress among students. However, more recent studies reveal that anxiety has become the leading symptom of psychological distress, followed by stress and depression (Asif et al., 2020; Sahu et al., 2020).

According to data from Statista (2022), over 24% of American students previously diagnosed with anxiety were concerned about the increase in their anxiety-related symptoms. A study assessing mental health amongst American university students before and after the coronavirus disease (COVID-19) pandemic found that symptoms of depression and anxiety increased by 45% amongst university students (Fruehwirth et al., 2021).

Gruttadaro and Crudo (2012) found that over 64% of American students dropped out of university because of depressive and anxiety-related symptoms and 50% did not receive the support needed before dropping out. Pedrelli et al. (2015) showed that one in five students who dropped out of university would have continued with their studies had they received the support needed. These findings reveal that the prevalence of psychological distress is high at a global level.

2.3 PREVALENCE OF PSYCHOLOGICAL DISTRESS AMONG UNIVERSITY STUDENTS IN SOUTH AFRICA

Consistent with global findings, South African university students also report higher levels of psychological distress than the general population (Bantjes et al., 2019; Herman et al., 2009). Universities of South Africa (USAf) conducted one of the largest student mental health surveys in South Africa and found that South African university students have high levels of mental health challenges, with at least 23% of students diagnosed with major depressive

disorder and 28% with generalised anxiety disorder (USAf, 2022). Similarly, a study conducted at four universities in the Eastern Cape found a 53% prevalence of psychological distress amongst students (Mutinta, 2022).

While mental health challenges are significantly high, at least 67% of students with common mental health challenges do not seek treatment (Pedrelli et al., 2015). This could also explain the rise in suicide rates witnessed among university students in South Africa from 2015–2019. Research shows that 30.6% of students enrolled in South African universities considered suicide within a 12-month period, while 16.6% planned to commit suicide, and 2.4% attempted suicide (Wilks et al., 2019). More alarmingly, a study by Bantjes et al. (2019) shows that 46.4% had suicidal thoughts, while 26.5% had a plan to commit suicide, and 8.6% had attempted suicide. These findings are typically higher than the statistics found in a global meta-analysis study on student mental health, which found that suicide attempts and plans were at 22% and the 12-month prevalence at 10% (Mortier et al., 2018).

Research conducted during the COVID-19 pandemic at a Gauteng based university shows that over 45% of students reported anxiety symptoms and 35% depression related symptoms (Visser & Law-Van Wyk, 2021). In comparison to studies conducted prior the COVID-19 pandemic, which show prevalence rates between 13% and 24%, the study by Visser and Law-Van Wyk (2021) suggested that psychological distress may have increased during the COVID-19 pandemic amongst university students (Bantjes et al., 2019; Visser & Law-Van Wyk, 2021). Conversely, a study conducted at two universities in the Western Cape comparing the prevalence of major depressive episodes, generalised anxiety disorders, and suicide ideation prior to and during the COVID-19 found no significant prevalence increases during the pandemic (Bantjes et al., 2023b). However, regardless of the impact of COVID-19 on university students, the prevalence of psychological distress remained a concern.

These statistics reveal a dire situation among South African university students, which could be detrimental to their functioning and academic success. They also highlight the importance of addressing mental health challenges in their formative stages—addressing and understanding the symptoms of psychological distress before developing into chronic mental conditions can help to improve the mental health of South African students.

2.4 CONTEXTUALISING PSYCHOLOGICAL DISTRESS AMONG UNIVERSITY STUDENTS

Worldwide research shows that the prevalence of psychological distress is higher amongst university students between the ages of 18 and 24 (Eskin et al., 2016; Hakami, 2018; Ramón-

Arbués et al., 2020). Research indicates that 75% of mental health challenges occur before the age of 24 (Gruttadaro & Crudo, 2012; Pedrelli et al., 2015). According to Arnett (2018), the transition from adolescence into emerging adulthood makes young people, including university students, susceptible to psychological distress; hence, the high level of psychological distress within this age group. Therefore, this study focused on university students within this age category.

2.4.1 Emerging adulthood

Emerging adulthood is a social, physical, and mental developmental stage which occurs from age 18 through to 25 (Arnett, 2006, Arnett, 2018). It is in this period when young people seek to create a sense of self, enjoy autonomy, and set goal-directed behaviours. According to Arnett (2018), emerging adulthood is a deeply complex phase, as it is neither adolescence nor young adulthood, but is distinct from both. Emerging adulthood is characterised by five distinct features influencing development: exploration, instability, self-focus, feeling in between, and probing possibilities (Arnett, 2018). Table 2.1 below explains each feature in depth.

Table 2.1: Features of emerging adulthood

Exploration	During this stage, young people explore their identity—who they are, where they come from, where they are going, their capabilities, limitations, beliefs, value systems, and how they fit into society (Côté, 2006). This is also the stage when young people explore their career prospects and romantic relationships.
Instability	With exploring one's place in the world comes instability. Young people find themselves in various unstable situations, such as moving out of home, changing friends and romantic partners, and discovering that some of their values do not always align with the real world (Arnett, 2018).
Self-focus	This is the stage when young people focus on themselves by building the skills, knowledge and self-understanding they will require as adults. It includes making decisions independently, with minimal involvement from their parents (Arnett, 2006; Rosenberger, 2007).

Feeling in between	Emerging adults are neither adolescents nor adults. At this stage, most still rely on their parents for financial support and fluctuate between dependence and independence. Some maintain that they are fully adults in some areas but are still developing in other areas (Arnett, 2012).
Probing possibilities	Emerging adulthood is also a stage of possibilities, where most dreams and goals have not yet been accomplished, but where hope or optimism motivate young people to work towards these dreams and goals (Arnett & Schwab, 2012).

As described in Table 2.1, emerging adulthood is the state of exiting the dependency of adolescence and entering a stage of lifelong responsibilities that are normalised in adulthood (Arnett, 2018). During this stage, emerging adults often explore possibilities in their lives, including relationships, careers, and worldviews (Arnett, 2018). Exploring possibilities for university students includes starting or completing higher education or considering employment prospects. The uncertainties and pressures that come with studying and working or exploring what to do with one's life can be distressing for students. Arguably, university students have a greater mental health burden because, along with navigating the distinct features of being an emerging adult, they experience other challenges related to being a university student.

2.5 FACTORS LEADING TO PSYCHOLOGICAL DISTRESS IN UNIVERSITY STUDENTS

Various factors cause psychological distress among university students, and manifest themselves differently, depending on the social context and the university environment (Wadman et al., 2019). Distress amongst university students is usually related to academic pressure, social factors and developmental or demographic factors, such as background, age, gender, and level of study. Factors causing psychological distress may differ between undergraduate and graduate students (Hakami, 2018; Kumaraswamy, 2013; Wadman et al., 2019). Factors may also vary, depending on the location of the university; research shows that students in urban universities experience fewer stressors than students in rural universities (Tasnim, 2021). The following section presents a comprehensive analysis of the primary factors contributing to psychological distress amongst university students.

2.6 ACADEMIC STRESSORS

Academic-related factors are the greatest cause of psychological distress among university students. Wilks (2008) referred to psychological distress caused by academic factors as 'academic stress', describing a variety of academic-related demands with which students struggle to cope.

2.6.1 Examinations

Over 35% of students have experienced high levels of anxiety and stress during examination periods, making examination stress one of the leading sources of psychological distress among university students (Hassel & Ridout, 2017; Pitt et al., 2017). According to a study by Chaudary (2017) among Pakistani students, over 60% of students experienced stress and anxiety from tests and assignments and 62% from giving class presentations.

Students face enormous pressure to perform well on their exams or tests, which can lead to performance anxiety (Jerrim, 2022). According to Bedewy and Gabriel (2015), low exam marks or failures are often attributed to high stress levels or anxiety. Adjusting to the university marking system can also be stress-inducing, particularly for first-years students. For example, 30% is a pass mark in South African high schools, which differs vastly from universities' pass mark of 50% (Maddock & Maroun, 2018; Moodley & Singh, 2015). Some South African universities allow students with an average of at least 40% to write exams, provided they score over 60% in the exam, to pass the module (Moodley & Singh, 2015).

Several studies have also shown that the examination period contributes immensely to stress, eating disorders, anxiety, and depression in students (El Ansari et al., 2014; Shah et al., 2010). A Sudanese study on students' mental health found that negative perceptions about exams influenced by previous failed exams and long nights of studying were associated with psychological distress, marked by symptoms of anxiety and depression (Bashir et al., 2019). Similarly, research conducted by Chaudary (2017) among university students found that 67.3% were stressed by exams, which was argued to be more detrimental than writing the examination itself.

2.6.2 Language barriers

Between 40% and 60% of students enrolled in South African universities speak English as a second or even a third language (Makoni, 2017). Despite being only the sixth most spoken language in South Africa, English is the mode of teaching, learning, and communication in South African universities. However, for many students in South Africa and other countries

whose first language is not English, communicating fluently in academic English becomes challenging, particularly for those from lower-socio-economic backgrounds. (Heugh, 2013; Saneka & de Witt, 2019). A South African study shows that challenges relating to language can cause immense stress and pressure, resulting in anxiety about engaging with other students, lecturers, and academic work (Shabani, 2012). Albalawi and Nadeem (2020) stated that the inability to communicate effectively in the classroom can create massive pressure for students, particularly those whose first language is not English.

Language barriers can also negatively affect students' sense of belonging—feelings of being connected to one's environment, acceptance, and inclusion (Ahn & Davis, 2020). According to Ahn and Davis (2020) a sense of belonging amongst students is enhanced through academic and social engagement, environment, and personal space. The inability to engage academically or socially because of language barriers can affect students' ability to immerse fully in their studies and contribute meaningfully to their environments, eventually affecting their ability to function optimally. O'Keeffe (2013) stated that when students have a sense of belonging, they are also less likely to drop out of university. Stebleton et al. (2014) showed students who do not have a sense of belonging struggle with their mental health and are less likely to seek counselling for fear of being ostracised. The feeling that one is an integral part of the university is important to students' mental health and the absence of this feeling can contribute to psychological distress.

2.6.3 University support

Research on university students found that over 60% who dropped out of university lacked the support they needed from the university (Sosu & Pheunpha, 2019). Other studies show that many students arrive at university with expectations that are inconsistent with the reality of university (Kandiko Howson & Mawer, 2013; Murtagh, 2010). For example, Hassel and Ridout (2017) found that first-year students usually overestimate the amount of contact time from staff that will be offered to them at university. They also have unrealistic expectations about class sizes, contact sessions with lecturers, and workload (Hassel & Ridout, 2017). First-year students often expect university to resemble high school in terms of teaching and performance; however, the university academic system demands students to be more independent and to perform at a higher level than high school (Hassel & Ridout, 2017). Despite attempts to provide first-years with support through mentorship and well-being programmes, research indicates that first-year students experience a lack of interpersonal support, as they are expected to adjust to academic and social environments without being provided with consistent support from university structures (Pather et al., 2017). The

transition from high school can cause major academic pressure among university students and the lack of support from the university increases that pressure, giving rise to psychological distress (Hassel & Ridout, 2017).

2.6.4 Financial challenges

University fees and the cost of living at university increase every year, making it difficult for middle-class students to afford higher education. Global studies show that university debt and lack of financial support are the leading causes of stress among university students globally (Mngomezulu et al., 2017; National Survey of Student Engagement, 2012). Students face the challenge of obtaining funds to study and those who have funding are pressured to work extra hard to retain their funding (Heckman et al., 2014; Trombitas, 2012).

Blanden and Macmillan (2014) found that most students from disadvantaged backgrounds have longstanding educational debt and those who received bursaries often use part of their funds to support family members to improve difficult living conditions (Blanden & Macmillan, 2014). A study conducted by Shambare and Rugimbana (2012) contends that most university students have low levels of financial literacy which is influenced by belonging to a disadvantaged family background, lack of previous opportunities to manage their money and a lack of financial education.

Mushtaq and Khan (2012) maintained that when students face financial challenges, they become vulnerable to competing psychological challenges such as peer pressure, anxiety, and unhealthy ways of sourcing money. Research also provides evidence of extensive competition amongst students for placement or scholarships, which, instead of encouraging healthy competition, fuels stress and anxiety (Posselt & Lipson, 2016).

2.6.5 University culture

Over 27% of students are diagnosed with stress related to homesickness and adjusting to university campus life (Palai & Kumar, 2016). Most academic institutions are embedded within an academic and campus culture, where students are expected to excel academically and simultaneously get involved in the social activities available on campus (Shen & Tian, 2012). To thrive, students are required to become accustomed to the university's academic culture rapidly. This involves familiarising themselves with equipment, books, information, the social environment, research labs, and libraries, and accessing funds. However, this process is complicated, particularly for students from disadvantaged or less exposed backgrounds (Devlin, 2013). For example, students are expected to use electronic devices for

online reading, classwork, and assignments, but for many students, accessing electronic devices remains a massive challenge. Many do not own laptops, which may cause feelings of alienation and places them under immense pressure to complete their assignments using campus computer facilities (Khalid et al., 2020).

Research conducted in South Africa, following a first-year to final-year trend analysis, found that academic culture influences degree completion, with only 30% of students in that cohort graduating, 56% leaving the institution without graduating, and 14% still registered with the university (Letseka et al., 2009). Academic culture plays a significant role in students' progress; performing poorly in this area can lead to frustration, psychological distress and, eventually, academic exclusion.

Campus culture refers to the socialisation process that occurs at university (Shen & Tian, 2012). The socialisation process involves defining and stipulating the way students on a particular campus behave by introducing activities, behaviours, and places that are popular with students (Shen & Tian, 2012). Behaviours such as dress codes, lifestyle choices and spending practices are introduced, some of which may alarm or intimidate some students, particularly first-year students (Lane & Miranda, 2018). Often, first-year students feel pressured to adapt to the culture on campus, usually inducing acculturative stress—psychological and social tension arising from incongruence with their own cultural values and beliefs (Lane & Miranda, 2018). Research by Marszalek et al. (2021) suggested that incongruence between activities and cultural values and beliefs may be associated with mental health challenges amongst university students.

2.6.6 Living at university

According to research by Gilavand (2016), the provision of adequate and healthy living spaces for students enhances academic performance, vitality, mental well-being, and motivation to increase learning; the lack of such spaces can lead to boredom, anxiety, and sedentary behaviours. Environmental challenges with the potential to affect students' well-being include unsafe residential accommodation, poor hygiene around the university, poor sanitation, and inadequate university-based residences (Khan, 2013). Research further shows that adverse living conditions, such as excessive noise in residences, impact students' performance and affect their psychological well-being (Gilavand, 2016). In some residences, students are compelled to share a room with other students who may be from different cultures, beliefs, and socioeconomic backgrounds. This may evoke feelings of discord and dissatisfaction about living arrangements, sleeping schedules, and lifestyle choices (Wangeri et al., 2012).

The literature suggests that living in a residence can become a trigger for psychological distress. Research conducted at some South African universities found that practices and symbols were used at certain residences to maintain white supremacy and heterosexuality (Robertson, 2015). Harwood et al. (2012) stated that some students reported microaggressions and negative treatment from their peers based solely on their race or sexuality. Although most universities in South Africa are still working towards transforming oppressive residence practices to achieve greater diversity and equality, many students remain vulnerable to psychological distress (Githaiga et al., 2018) where prejudices persist.

2.6.7 Level of study

Undergraduate students studying full-time have higher levels of psychological distress than postgraduate students studying part-time (Hakami, 2018; Kumaraswamy, 2013; Stallman, 2010; Wadman et al., 2019). While one of the greatest concerns for students in their first year is adjusting to the university environment, once they have adapted, other challenges related to finances, academic pressure and interpersonal relationships begin to surface (Kumaraswamy, 2013). Research indicates that psychological distress varies according to level of study, with evidence from several studies revealing that first-years and third-years have the highest levels of psychological distress (Hakami, 2018; Liébana-Presa et al., 2014). A study by Govendor (2015) found that second- to fourth-year students displayed higher levels of psychological distress than first-year students, while studies by Moss et al. (2021) and Milicev et al. (2021) showed that postgraduate students had higher levels of psychological distress than undergraduate students. These findings indicate a lack of consensus on the prevalence of psychological distress by level of study. However, the trends in research suggest that undergraduate students, particularly first-years and third-years may be at a greater risk for psychological distress, because they were either starting university for the first time or leaving for the first time to explore postgraduate studies or work.

2.7 NON-ACADEMIC STRESSORS

2.7.1 Risky behaviours

Being at university gives students the freedom to explore without parental supervision. According to Moore and Gullone (1996), risky behaviour is any behaviour that has perceived positive consequences but ends in a negative consequence. The most common risky behaviours that are leading triggers for psychological distress are substance use, risky sexual behaviours, and unhealthy physical habits (Kwan et al., 2016). A study conducted in a European university found that 73.3% consumed alcohol along with other drugs such as

cannabis, 51.4% consumed alcohol only, and 16.6% consumed alcohol together with illicit drugs (Colomer-Pérez et al., 2019). Another national study conducted in America found that over 60% of university students had consumed alcohol in their lifetime, almost 39% of whom had participated in binge drinking, which is the consumption of six or more drinks in a single sitting (Lipari & Beda, 2016). These global statistics resemble those reported in South Africa, with one study reporting that over 57% of university students had consumed alcohol, 18% of whom had taken part in hazardous drinking activities (Tesfai, 2016). Another study conducted in South Africa confirmed that over 65% of students had used alcohol, 49% of whom had participated in binge drinking, and that 17.2% of students used illicit drugs infrequently (one to nine times in 12 months) (Kyei & Ramagoma, 2013).

2.7.2 Poor lifestyle choices

Poor eating habits, insomnia, and lack of exercise are identified as outcomes of poor lifestyle choices (Chaudary, 2017). Sogari et al. (2018) found that over 32% of students were obese and did not adhere to a healthy diet, with only 2% reporting that they consumed fruits and vegetables daily. The prevalence of unhealthy eating habits ranged from 8% to 17%, with over 4% of students reportedly overeating and purging (Eisenberg et al., 2011; Tanton et al., 2015). An unhealthy diet and physical inactivity place university students at a higher risk for obesity—Kemmler et al. (2015) claimed that students gained weight five times more than the general population, placing them at a higher risk of developing physiological challenges, low self-esteem, mood disorders, and life dissatisfaction (Alkhateeb et al., 2019). In their study, Deasy et al. (2014) found that unhealthy diet and physical inactivity increased psychological distress amongst university students.

2.7.3 Relationships

Romantic relationships, friendships and familial relationships are a crucial part of emerging adulthood. While healthy romantic relationships are an important aspect of the development of emerging adults and can positively contribute to their emotional growth, unhealthy relationships can equally affect them negatively (Chow et al., 2015). Breakups, betrayal and neglect in romantic relationships can cause negative emotions and, ultimately, psychological distress (Field et al., 2010). Stress, anxiety, and depression have been associated with romantic relationships among university students (Braithwaite et al., 2010).

Research has also shown that risky behaviours in relationships contribute to psychological distress among university students (Chaudary, 2017; Kwan et al., 2016). Risky behaviours in relationships are common among university students, as most prefer to explore sex and

substance use with their romantic partners (Kwan et al., 2016). Risky sexual behaviour is an area of concern in the context of South Africa and the university environment, as the number of young people living with HIV increased substantially by 30% between 2005 and 2016 (UNICEF, 2017). Research suggests that being at university gives young people the freedom of sexual experimentation, which may involve unprotected sex, engaging in sex with multiple partners, or transactional sex with older partners (Brouard & Crewe, 2012; Chanakira et al., 2014). Transactional sex—colloquially a blesser-blessee relationship—is becoming more prevalent among university students (Bauermeister et al., 2017). In their study, Blum et al. (2018) showed that the prevalence of transactional sex was 2.1% and that students who engaged in transactional sex experienced mental health challenges. Similarly, a study by Nduna et al. (2010) found that young people who engaged in transactional sex reported depressive symptoms.

Familial relationships may also contribute significantly to psychological distress among university students. While emerging adults are exploring their independence by exiting the home and living by themselves, they tend to experience instability (Goldsmith, 2018). Part of this instability stems from being stuck between being an independent adult and an adult who is still dependent on their parents (Wightman et al., 2013). Emerging adults are unable to dissociate instantly from their familial values and beliefs but rely on them until they are sufficiently independent to form their own. Consequently, some remain under pressure to adhere the expectations of their parents (Goldsmith, 2018). This pressure to meet expectations while exploring their own identities and capabilities can also cause psychological distress (Arnett, 2018).

2.7.4 Socio-cultural factors

Several studies maintain that socio-cultural factors, such as ethnicity, culture and race, influence psychological distress (Hofmann & Hinton, 2014; Sternthal et al., 2011). The prevalence of common mental health disorders, such as depression and anxiety, differs for people from disadvantaged backgrounds (Hofmann & Hinton, 2014). A study conducted at a university setting in the United Kingdom (UK) revealed that people from disadvantaged backgrounds reported higher levels of depression and anxiety (63.5%) than those from more privileged backgrounds (28.5%) (Arday, 2018). A study conducted at 17 South African universities found that black students attending historically white universities had a higher prevalence of psychological distress than other races (Bantjes, 2023a).

Research indicates that people from disadvantaged ethnic groups were less likely to reach out for mental health services, and when they did, their health outcome was poor compared with those from advantaged ethnic groups (Arday, 2018).

2.7.5 Gender

The prevalence of psychological distress differs between genders, with females reporting over 18% higher levels of psychological distress than male students (Hakami, 2018; Pedrelli et al., 2015; Tesfaye Kelemu et al., 2020). Gefen and Fish (2012) found that female students experienced more academic and relationship stressors than their male counterparts who expressed more financial-related stressors. Research by Bantjes (2023a) shows that gender non-confirming students reported higher levels of psychological distress. Overall, research indicates that female students experience more stressors and perceive these stressors as more of a threat than male students (Hamaideh, 2012).

Male students are less likely to seek mental health than female students because of gender stereotypes and stigma associated with mental health challenges, fewer reports exist of psychological distress amongst male students (Sagar-Ouriaghli et al., 2020). However, male students are more likely to commit suicide than female students, and account for 69% of university student suicides (Sagar-Ouriaghli et al., 2020). It is likely, therefore, that male and female students experience the same level of psychological stressors but process these stressors differently because of gender stereotypes. Masculinity stereotypes such as "men cannot be weak or seen in an emotional state such as crying or confused", contribute significantly to their failure to seek help for mental health challenges (Rice et al., 2018). Several studies reveal that certain 'acceptable' attributes of masculinity—such as aggression, anger or externalising behaviours, such as substance abuse—can conceal what has been termed 'male depression' (Rice et al., 2018; Stiawa et al., 2020).

Research from the South African context asserts that poorer mental health in females is associated with gender inequality (Gibbs et al., 2018), exposing women to stressors that are exclusive to females, such as gender-based violence, sexism, and intimate partner violence. South African research has shown that females who have experienced gender-based violence had more severe depressive symptoms (21%) than their male counterparts (14%) (Nduna et al., 2013). Differences in mental health challenges between the genders may relate to low mental health reporting in males (Sagar-Ouriaghli et al., 2020). In some cultures, males are deemed physically and emotionally stronger than females, and having a mental health challenge is viewed as a weakness (Gough & Novikova, 2020).

2.7.6 Age

Age is a significant contributor to the experience of psychological distress. Although age is not a direct cause, maturing in age can become a risk factor for psychological distress. The physical or social developmental changes and expectations associated with these changes can be burdensome or challenging (Solmi et al., 2022).

The onset of these challenges varies depending on social context; however, research shows that the onset of mental health challenges occurs before the age of 15 (De Lijster et al., 2017; Paruk & Karim, 2016). The prevalence of psychological distress by age has changed over time. Approximately 15 years ago, the 45–54 age group had the highest rate of psychological distress (Kilkkinen et al., 2007). More recent research shows that the 15–24 age group had the highest prevalence, while those within the 50 and above age group had lower rates (Al-Tammemi et al., 2020; Caron et al., 2012). One explanation for these differences is that young people between the ages of 15 and 24 experience major life changes, such as puberty, entering high-school or university, establishing relationships, and exploring independence, which can cause instability (Knapstad et al., 2021; Milicev et al., 2021). After the age of 25, most of these pressures subside, an age when most people are fully developed physiologically, mentally, and socially. It is also assumed that at the age of 25, individuals have learnt how to cope and are capable of handling the pressures encountered in their lives (Knapstad et al., 2021; Milicev et al., 2021).

Similarly, research by Brown (2018) revealed higher levels of psychological distress amongst students within the 18–24 age group. A study by Sahu et al. (2020) indicated that younger students displayed 8% more symptoms of psychological distress than older students. Concurring with this research, Al-Tammemi et al. (2020) found that students within the 18–22 age group experienced higher levels of psychological distress than older students. According to Cage et al. (2021), higher levels of psychological distress among younger university students are related to difficulties in transitioning from high school to university and the many unexpected developmental changes which occur in the early stages of the 18–24 age group.

2.8 STUDENTS' COPING STRATEGIES WITH PSYCHOLOGICAL DISTRESS

Students respond to psychological distress in different and non-specific ways, which are usually translated to physical, psychosocial, and behavioural responses (Babicka-Wirkus et al., 2021; Graves et al., 2021; Mozid, 2022). The process of coping with stressful situations is best described by Lazarus and Folkman's transactional theory of stress and coping, positing

that stress stems from an interaction between an individual and their social environment (Lazarus & Folkman, 1984). In their environment, individuals experience challenges that can precipitate stress. How they relate to these challenges determines their level of stress and how they deal with stress. These processes are known as cognitive appraisal and coping.

2.8.1 Cognitive appraisal and coping

Cognitive appraisal refers to the idea that individuals are always assessing experiences within their environment that can bring forth either positive or negative emotions (Lazarus & Folkman, 1984). When an experience is appraised as harmful, challenging or threatening, individuals experience negative emotions, which prompts an action to either manage their emotions or directly address the challenge (Biggs et al., 2017; Lazarus & Folkman, 1984). When experiences are not appraised as harmful, coping strategies are not employed. However, when coping strategies are employed and they do not work, individuals experience more distress, which forces them to seek new coping strategies (Lazarus & Folkman, 1984).

2.8.2 Gender and coping strategies

Global research has been conducted to assess the relationship between gender and the use of coping strategies among students (Graves et al., 2021; Rahardjo et al., 2013). Some studies reveal major gender differences in coping strategies, with female students mostly adopting emotion-focused and avoidance-focused coping strategies, while their male counterparts mostly use problem-focused coping strategies (Graves et al., 2021; Rahardjo et al., 2013; Sawhney et al., 2018). Other studies found no gender differences in coping strategies (Dhurup & Dubihela, 2014). Although findings on differences in coping strategies between genders are inconclusive, the literature suggests that female students are more likely than males to use emotion-focused coping strategies (Graves et al., 2021; Rahardjo et al., 2013). Males are more likely to suppress their feelings or attempt to modify their emotional responses, while females are socialised to be expressive and use emotion-focused strategies to cope with their stressors (Chaplin, 2015; Monteiro et al., 2014).

2.8.3 Major coping styles among university students

Lazarus and Folkman (1984) identified two major coping styles: problem-focused or emotion-focused coping, while Roth and Cohen (1986) added avoidance-focused coping. These three coping styles are the most common ways of coping discussed amongst university students (Babicka-Wirkus et al., 2021; Graves et al., 2021; Mozid, 2022; Rathakrishnan et al., 2022).

2.8.3.1 *Problem-focused coping*

Problem-focused coping strategies are cognitive or behavioural actions directed at addressing the source of the challenge or stressor, and include strategies such as active coping, use of informational support, positive reframing, and planning (Carver, 1997; Dias et al., 2012). Problem-focused strategies have been identified as efficient for coping with psychological distress related to depressive and anxiety-related symptoms (Graves et al., 2021; Oryan et al., 2021; Rathakrishnan et al., 2022).

2.8.3.2 *Emotion-focused coping*

Emotion-focused strategies entail behaviours directed at reducing emotional distress caused by the challenge or stressor, and include venting, emotional support, humour, acceptance, self-blame, and religion (Carver, 1997; Dias et al., 2012). Emotion-focused coping has been identified as effective for coping with psychological distress amongst university students (Mozid, 2022). However, another study conducted amongst university students show that maladaptive emotion-focused coping positively predicted psychological distress, suggesting that emotion-focused strategies can be effective but should be used in moderation (Ding et al., 2021).

2.8.3.3 *Avoidance-focused coping*

Avoidance coping is a part of emotion-focused coping (Folkman & Moskowitz, 2004) and refers to action directed away from the challenge or stressor. Avoidance strategies include self-distraction, substance use, denial, and behavioural disengagement (Carver, 1997; Dias et al., 2012). Avoidance-focused coping is less common and is associated with exacerbating symptoms of distress (Sawhney et al., 2018).

2.8.3.4 *Using multiple coping styles*

Folkman and Lazarus (1980) found that in 98% of stressful situations, participants used more than just one coping strategy. Students usually use multiple coping strategies to address psychological distress, because its sources and impact differ from person to person (Mahmoud et al., 2012; Steinhardt & Dolbier, 2010). For example, a student who is anxious about an exam may study vigorously, taking action to decrease anxiety, but may also take smoke breaks or naps in between study sessions, as a form of escapism (Mahmoud et al., 2012; Steinhardt & Dolbier, 2010).

Emotion- and avoidance-focused coping strategies have been found to increase symptoms of psychological distress, depression and anxiety (Graves et al., 2021; Oryan et al., 2021;

Rathakrishnan et al., 2022). However, research shows that emotion-focused and problem-focused coping can be effective in reducing psychological distress when used in moderation, particularly for short term challenges (Mozid, 2022). The effectiveness of the coping strategy is dependent on the source of distress—if the source is unchangeable, problem-focused coping will be less effective than emotion-focused coping (Blum et al. 2018).

2.8.4 Age and coping strategies

Shirazi et al. (2011) found that although age and level of study at university may also play a role in the choice of coping strategies, consensus has not been reached on the influence of age on the use of coping strategies. Some research findings show that older students are more likely to use problem-focused solving coping than younger students (Monteiro et al., 2014), while other studies suggest no association between age and the choice of coping strategies (Dhurup & Dubihela, 2014). A study by Deasy et al. (2014) showed that students under 26 years were more likely to use avoidance-focused coping by escaping or avoiding the situation, while those above 26 years were more likely to use emotion-focused coping strategies such as positive reappraisal. Another study found that older adolescents used more emotion-focused coping strategies than younger adolescents. The same study showed that the use of problem-focused strategies was not associated with age (Brown & Prinstein, 2011).

2.8.5 Level of study and coping strategies

Level of study may influence the adoption of coping strategies. A study by Ickes et al. (2015) conducted at an American university found no significant differences in coping strategies between undergraduate and postgraduate students, while a study conducted amongst medical students in the UK revealed that postgraduate students used problem-focused coping more than other coping strategies (Zvauya et al., 2017).

Limited research is available globally on the differences in coping strategies by gender, age and level of study in South Africa. However, based on the global literature, these differences are to be expected amongst university students. This study intended to assess the differences in coping strategies gender, age and level of study.

2.8.6 Help-seeking behaviours of students

Coping can be an automatic response to a stressful situation. However, healthy coping strategies can also be learned through psychoeducation during counselling. Global research shows that, unless it is urgent or intolerable, most students do not seek counselling, despite the availability of free mental health counselling services on campus (Cornally & McCarthy,

2011; Mitchell et al., 2017; Nash et al., 2017). In their study conducted at a South African University, Bowman and Payne (2011) found that only 3.1% of 26 243 students sought counselling. A recent study by Broglia et al. (2021) conducted at five universities in the UK showed that only 8% of the 28 000 students enrolled at these universities sought counselling. These findings point to low help-seeking behaviours—intentional actions directed at seeking help for a health- or psychological-related issue (Mitchell et al., 2017).

2.8.6.1 Barriers to help-seeking

Major barriers to help-seeking amongst university students include mental health literacy, socio-cultural factors, stigma, and counselling strategies used on campus (Arday, 2018; Czyz et al., 2013; Miles et al., 2020).

a) Mental health literacy

Mental health literacy refers to individuals' personal beliefs and attitudes which help them recognise, prevent or treat their mental health challenges. Low mental health literacy is one of the many leading causes of low help-seeking behaviours amongst university students (Gorczynski & Sims-Schouten, 2022; Mahfouz et al., 2016; Reavley et al., 2012).

Jorm et al. (1997) described seven components of mental health literacy: (1) ability to identify a mental health challenge; (2) knowledge of where to seek the right information; (3) understanding of the causes of mental health challenges; (4) awareness of personal risk factors; (5) familiarity with treatment or coping strategies; (6) knowledge about available professional assistance; and (7) a personal attitude that facilitates help-seeking (Jorm et al., 1997).

Research shows that university students are unable to identify a mental health challenge, are unaware of available professional assistance, and have negative perceptions about mental health challenges (Mahfouz et al., 2016; Reavley et al., 2012). Research by Seboka et al. (2022) conducted at a University in Ethiopia shows that at least 49% of the students did not have adequate mental health literacy. A study conducted at a South African university in Kwa-Zulu Natal shows that at least 7% of the students did not know whether young people could be diagnosed with mental health challenges, and 6% were uninformed about mental health challenges (Zita, 2018).

Students are more likely to know more about mental health challenges after being diagnosed. Studies conducted amongst university students show that higher mental health literacy and help-seeking behaviours were associated with a history of a mental health challenge diagnosis or having done a psychology course (Almanasef, 2021; Miles et al., 2020). A study of

pharmacy undergraduate students in Saudi Arabia revealed that students with low mental health literacy sought mental health information from informal sources, rather than from professional therapists (Almanasef, 2021).

b) Socio-cultural barriers

Socio-cultural and personal beliefs are also major barriers to help-seeking. According to Arday (2018), conversations on mental health are framed within a stereotypical Western context, making it difficult for students unfamiliar with this context to openly disclose and discuss their experiences for fear of contradicting the dominant discourse. Many students, particularly in the South African context, originate from rural areas and different ethnicities, which have different linguistic and cultural interpretations about mental health challenges (Lima-Smit et al., 2020). South Africa has 11 official languages, most of which do not have precise words to describe a mental health challenge. For example, in isiZulu, the closest word to depression is "ukukhatazeka", directly translated as being worried or bothered, which is inconsistent with the descriptions of depression from a Western context (Ellis, 2003).

Within the African context, mental health challenges can be perceived and associated with cultural beliefs such as ancestral callings, witchcraft, spirit possession, demons, and curses, which can influence how students who ascribe to these beliefs understand and address their mental health challenges (Adekson, 2016; Jithoo, 2018; Sorsdahl et al., 2010). According to Hechanova and Waelde (2017), emotional and behavioural responses influenced by culture, such as lack of emotional response, shame, power dynamics, a collectivist lifestyle, and religious beliefs, can also shape how students perceive and seek mental health assistance.

c) Stigma

Lally et al. (2013) stated that stigma is another contributor to the lack of help-seeking behaviours amongst university students. Goffman (1963) defined stigma as discrediting a person because of their attributes, which then reduces their social status. Corrigan et al. (2003) further defined stigma as a negative attitude held by other people regarding an issue. Global research shows that most students perceive mental health challenges negatively. Often, students believe that other students with mental health challenges are weak, incompetent, and cannot take care of themselves (Chen et al., 2016). Research shows that people can reproduce and internalise public stigma, which causes low self-esteem, feelings of shame, and negative views about mental health counselling (Hamidi et al.,2023; Sori et al., 2022).

To reduce the stigma associated with mental health, some universities have become more vocal about mental health awareness and the services available to students. Some have provided platforms for students to interact with resources and have conversations with people with mental health challenges (Yamaguchi et al., 2013). These findings suggest that once-off resources and conversations did not change students' personal attitudes about mental health or their attitudes towards others with mental health challenges (Mehta et al., 2015). Mehta et al. (2015) suggested that teaching students by using diagnostic manuals and materials, and constantly engaging with them through the sharing of resources, may reduce stigma and encourage students to recognise and acknowledge their own mental health issues.

2.8.6.2 *Counselling strategies*

Most universities worldwide adhere to traditional counselling methods, which include face-to-face therapy between client and therapist (Baskin et al., 2010). Research on campus counselling has provided evidence that cognitive behavioural therapy (CBT) and psychodynamic therapy are effective counselling methods, particularly for developmental challenges in students (Cuijpers et al., 2009; Worsley et al., 2020). Despite the long-standing effectiveness of face-to-face counselling in the university setting, many university counselling centres globally are struggling to meet the needs of all their students (Cornish et al., 2017). Counselling reports reveal that 88% of students do not receive timely counselling because of the high demand for, or lack of availability of, counsellors; 79% of students are not seen often unless their situation is considered a crisis; and 35% of students are on the waiting list (Cornish et al., 2017; Mistler et al., 2017).

In South Africa, clinical and counselling psychologists are in acutely short supply. Bantjes et al. (2016) stated that in 2015, South Africa only had 2 965 clinical psychologists and 1 652 counselling psychologists. Most of these preferred to work in private practice, while only a handful were eager to work in a university setting. South African universities receive a plethora of applications from students to study for their master's degree in clinical or counselling psychology. However, relatively few students are accepted into these programmes, because resources to train them are limited. Only about 150 students a year across all South African universities receive training in fields of psychology registered with the Health Professions Council of South Africa (Booysen & Naidoo, 2016; Pillay et al., 2013). The training of fewer South African clinical and counselling psychologists has contributed to the shortage and burnout of mental health staff at universities.

The literature shows that students present more nuanced mental health challenges, including adjustment, emotional and addiction challenges, and not necessarily severe mental health challenges (Mistler et al., 2017). Students displaying severe symptoms are usually considered a higher priority than students struggling with everyday life stressors (Mistler et al., 2017). Many universities do not offer programmes for students addressing everyday life stressors and if these programmes are available, they are either presented as campaigns or offered for a few days, which may fail to provide ongoing support. This makes it difficult for students to either track their progress or seek support when they have relapsed (Stallman, 2010).

Furthermore, most universities' counselling services are closed on weekends and after hours, hampering students from seeking help for mental health emergencies (Stallman, 2010). This points to the benefits of providing students with a way of monitoring their own emotional and psychological well-being, instead of relying solely on counselling services.

Universities all over the globe have introduced telephonic counselling to expand their service offering, which has been embraced as an alternative to face-to-face counselling models (Chan et al., 2017; Mistler, 2017). Students rate telephonic counselling highly as it offers them an anonymous platform, which is relatively affordable and convenient, and gives them a sense of control (Chan et al., 2017). Globally, telephonic counselling has been found to be effective amongst both adults and young people for restricted problems, such as smoking cessation and other mental health challenges, such as suicide ideation, stress management, anxiety, and post-traumatic stress (Chan et al., 2017; Irvine et al., 2020; Matkin et al., 2019). The effectiveness of telephonic counselling is not without its challenges, however, which include poor tracking of clients' progress, poor rapport between client and therapist, and long waiting periods before the telephone is answered (Chan et al., 2017; Mistler et al., 2017). These challenges can hinder the delivery of prompt services or treatment of psychological distress in students, which can be addressed through digital interventions.

2.8.6.3 *Digital interventions*

The digital era has provided wider access to smartphones, offering new opportunities to supplement access to mental health care. Despite the wealth of research showing that mobile apps are effective for treating mental health challenges, few universities have developed apps as a supplementary tool for counselling (Chandrashekar, 2018; Kern et al., 2018; Lipschitz et al., 2019). Kern et al. (2018) provided evidence that 23.8% of students found mental health apps beneficial to their mental health, while 13.2% of students were concerned that, although beneficial, most mental health apps are not evidence-based or linked with the university's

student counselling services (Kern et al., 2018). Mobile health interventions, if presented well to students, are a practical option for less pressing help-seeking.

2.9 MOBILE HEALTH

Mobile health (mHealth) interventions are rapidly becoming common in addressing various health challenges, including mental health challenges (Chandrashekar, 2018; Lipschitz et al., 2019). mHealth interventions designed with a focus on university students are a plausible intervention for psychological distress. However, before introducing a mental health app, assessing factors such as smartphone ownership, affordability, acceptability and the app's effectiveness is crucial.

2.9.1 Smartphone ownership

With the high levels of mobile phone ownership amongst young people, mHealth interventions can be appropriate for university students. Research conducted in the US amongst the general population found that over 90% of young people between the ages of 18 and 29 owned a smartphone (Statista, 2022). A study conducted in India found that over 55% of students always carried and frequently checked their smartphones (Kim et al., 2013; Saraswathi, 2017). Similarly, in South Africa, at least 72% of young people between the ages of 15 and 24 have access to a smartphone (Berger, 2013; Hampshire, et al., 2015), while 75% of online traffic in South Africa comes from mobile phone devices and 15% is from social media users between the ages of 18 and 35 (Qwerty Digital, 2017). A study conducted among South African university students in the Western Cape found that students spent almost 16 hours on their smartphones daily (Uys et al., 2012). These findings show that university students have access to smartphones, implying that mHealth interventions are a feasible option for university students.

2.9.2 Acceptability of mHealth

Over the past decade, the acceptability of mHealth apps has been on the rise. Acceptability reached an all-time high during the COVID-19 pandemic, following the psychological and physical challenges experienced globally by individuals during this time (Ming et al., 2020). The World Health Organization has identified at least 1 536 mobile phone health apps, only 32 of which had been tested and evaluated (Chandrashekar, 2018; Lipschitz et al., 2019). These findings suggest that various apps are available online that have not been evaluated or tested for efficacy.

The acceptability of mHealth apps depends on various factors, such as usability, design, engagement, and effectiveness (Larson, 2018; Schnall et al., 2016). Despite studies showing that mHealth apps are effective whether used independently or in conjunction with a healthcare professional, a gap remains in understanding the best way to use them.

Newman et al. (2011) suggested that the best way to use mHealth apps for mental health is in conjunction with healthcare workers, while Byambasuren et al.'s (2018) systematic review showed that when effective and efficient, mHealth apps can function independently without healthcare workers. Larson's (2018) review showed that the best way to use an mHealth app is alongside healthcare workers, healthcare organisations and medical associations, such as the USA Food and Drug Administration, to assess the accuracy of clinical advice. Despite the conflicting literature, the most effective way to use mental health apps appears to be alongside organisations that can provide extra support and engagement in assessing mental health challenges. In the case of students experiencing psychological distress, working with the university and other organisations focused on students' mental health may be more helpful (Lee & Jung, 2018).

2.9.3 Review of mental health mobile application interventions

Limited peer-reviewed evidence has shown that mHealth interventions have a high positive outcome for various mental health challenges, including depressive and anxiety symptoms (Chandrashekar, 2018; Lipschitz et al., 2019). A meta-analysis of randomised controlled trials conducted amongst individuals between the ages of 18 and 41, analysed 22 mobile apps and found these to be effective in reducing psychological distress symptoms (Firth et al., 2017). Another meta-analysis of nine randomised controlled trials evaluating the effects of smartphone-based interventions on symptoms of non-clinical and diagnosed anxiety disorders found that users' anxiety decreased after using anxiety treatment apps (Firth et al., 2017). A systematic review by Lui et al. (2017) assessed 16 studies using mental health apps to treat mood and anxiety disorders, all of which significantly decreased symptoms for different age groups. However, separate studies suggest that certain mental health apps designed for depressive disorders amongst individuals with chronic pain and bipolar disorder were not effective in reducing symptoms (Ahmedani et al., 2015; Wenze et al., 2014).

According to Chandrashekar (2018), high efficacy of mobile phone interventions in the Firth et al. (2017) and Lui et al. (2017) reviews are a consequence of high patient engagement, as patients use the app in their own time without pressure from their therapists.

2.9.4 Acceptability of apps amongst young people

Studies on the feasibility of mental health apps found that young people in the UK and USA demonstrated high levels of acceptability of mental health apps, which focused on providing coping strategies (Kenny et al., 2015; Scotti, 2014). Grist et al. (2017) found evidence that young people in the UK were more open to using a mental health app designed to address self-harm. Their acceptability was influenced by several factors, such as ease of use, satisfaction, privacy, discretion, and interactive design (Grist et al., 2017; Kenny et al., 2015; Reid et al., 2012; Scotti, 2014).

Young people in the USA and Australia found using mental health apps more affordable than seeing a therapist regularly, as they saved on consultation fees, transport fees, and other hidden costs (Czyz et al., 2013; Eisenberg et al., 2011; Gulliver et al., 2010). Similarly, research shows that with their demanding schedules, students normally question the usefulness and cost benefit of professional assistance when they can receive prompt assistance from an app (Czyz et al., 2013; Eisenberg et al., 2011; Gulliver et al., 2010). Moreover, most mental health apps on Play Store or App Store are free, and paid apps are not as expensive as therapy sessions, making apps an easy and affordable alternative to face-to-face therapy (Czyz et al., 2013; Eisenberg et al., 2011; Gulliver et al., 2010).

To increase acceptability for students and young people, research findings suggest the use of telepresence and gamification principles—or gaming—as part of mHealth designs (Fleming et al., 2016; Fleming et al., 2017). Grist et al. (2017) suggests that apps need to be evidence-based by conducting pilot studies and trials before they are made available for download (Grist et al., 2017). Moreover, apps should be used as an adjunct to face-to-face therapy or as a tool that introduces students to the importance of therapy (Grist et al., 2017).

2.10 USE OF CBT TO ADDRESS MENTAL HEALTH CHALLENGES

Several reviews and meta-analyses provide sufficient evidence of cognitive behavioural theory's effectiveness in addressing mental health challenges, such as depression (Hofmann et al., 2012; Tolin, 2010) anxiety disorders (Hofmann et al., 2012; Olatunji et al., 2014), insomnia (Okajima et al., 2011), substance use (McHugh et al., 2010), and post-traumatic stress disorder (Kar, 2011). CBT principles are usually used in face-to-face therapy but are currently being implemented in mental health apps, which, as research reveals, can achieve similar outcomes (Bakker et al., 2016).

Cognitive behavioural theory asserts that thoughts, emotions and behaviour are interrelated—how people think influences their emotions and behaviour (Fenn & Byrne, 2013). As a therapy technique, cognitive behavioural therapy (CBT) aims to mitigate mental health challenges by addressing thoughts, emotions and behaviours (Fenn & Byrne, 2013).

A meta-analysis by van Ballegooijen et al. (2014) comparing face-to-face CBT and online CBT techniques among individuals over 18 found that guided online CBT techniques had a high-level outcome of 81%. A study by Grist et al. (2017) reviewed 24 articles focusing on apps that targeted adolescents between the ages of 12 and 18. These articles included randomised controlled trial outcomes, design and development studies, feasibility studies, available apps in the App Store and mental health outcome data. According to the findings, adolescents had 83% adherence to self-monitoring apps based on CBT principles. A randomised controlled trial by Ly et al. (2015) for individuals from the age of 18 with major depression found that using both an app and face-to-face sessions based on CBT reduced the need for therapy by 47%.

2.10.1 Effective CBT techniques for mental health in mHealth

Research shows that apps that applied basic self-guided CBT principles were effective in treating psychological distress symptoms. A CBT-based app called ‘Mood Trainer’ used to improve mood by applying techniques such as mental health assessment and modules on feelings and thoughts was successful in addressing anxiety- and depression-related symptoms amongst individuals over the age of 18 (Addepally & Purkayastha, 2017). A study by McCloud et al. (2020) amongst UK university students found that an app called 'Feel Stress Free’, which included self-guided behavioural relaxation activities, thought challenging, mood tracking, and mini games, successfully addressed anxiety and stress symptoms. Huberty et al. (2019) tested the CBT mindfulness-based app ‘Calm’ among American university students and found that it improved their mood. In their review on mental health apps developed for anxiety amongst adolescents between 11 and 18 years, Wright et al. (2023) showed that techniques such as offering immediate coping strategies for anxiety symptoms were effective.

Several CBT based features are suggested to increase efficacy of mental health apps. According to Doherty et al. (2012), including practical modules based on CBT can encourage user engagement. These modules should incorporate videos, short quizzes, information on depression, personal stories, and activities. Since individuals with depressive symptoms have memory-related challenges, the intervention should have fewer cognitive demands by using a

simple user interface, which will increase the capacity for learning and decrease cognitive load (Chandrashekar, 2018).

Self-monitoring features are also regarded as important in online CBT-based interventions. When users report their thoughts, actions, behaviours and emotions, their self-awareness increases, allowing them to replace negative thought patterns with positive ones. The process of thought replacement in online CBT may be conscious or unconscious. When users report their own thoughts, they can trace them over a period, allowing them to see a pattern of thought to create a new one. Gamification and activities can unconsciously redirect them into positive thought patterns (Dennison et al., 2013).

CBT has been proven to work in different cultural settings, including the USA, UK and Pakistan (McCloud et al., 2020; Naeem et al., 2010; Wright et al., 2023). A study in Pakistan testing the effectiveness of CBT on depression and anxiety adapted a culturally acceptable CBT evaluation. They concluded that a culturally adapted CBT effectively treated depression and anxiety (Naeem et al., 2010). These findings demonstrate that it is possible to design a CBT-guided mobile application, which, if developed and used properly, can mitigate psychological distress in students.

2.11 COUNSELLORS' PERCEPTIONS OF MOBILE INTERVENTIONS

With the rapid growth in mHealth interventions, healthcare workers have varied perspectives regarding the usefulness and effectiveness of mental health apps. Healthcare workers, particularly those in medical and private settings, are more open than others to using mobile apps to supplement their services (Larson, 2018).

Many therapists affirm that mental health apps can bridge the gap between counsellors and patients by cultivating flexibility, accessibility through provision of resources, and ongoing support (Gindidis et al., 2020; Liu et al., 2013). A study by O'Dea et al. (2017) in Australia found that school counsellors maintained that using apps to interact with students could avert burnout and increase counsellors' ability to provide a better service to their students. This study also mentioned that the use of mobile-based services could help to identify issues that students experienced, which could alert them to areas requiring increased attention (O'Dea et al., 2017). Because of factors already highlighted as detrimental to help-seeking, such as stigma, shame, and preference for anonymity, app-based services may encourage students to interact with counsellors without fear of judgement until they are ready to meet counsellors face to face (O'Dea et al., 2017).

Despite demonstrating the effectiveness of mental health apps, Kit et al. (2014) asserted that some therapists still preferred face-to-face therapy over online-based therapies, as it provides a physical presence that mHealth interventions cannot. Similarly, therapists from a study by Békés et al. (2021) suggested that online therapy downplays the intricacies of human behaviour, such as non-verbal cues, making it difficult to connect with the patient.

A review by Varghese and VandenBos (2019) showed that although counsellors believe in the effectiveness of mental health apps, they also lack genuine interaction and do not give users direct access to a psychologist or a counsellor. Wagner et al. (2014) reported that the counsellors in their systematic review on workplace interventions believed it took longer for online counsellors to develop a relationship with their patients than face-to-face counsellors did. Therefore, online interventions such as apps should not be used as a replacement, but as a supplement, for face-to-face therapy.

Although most counsellors were open to using apps, they argued that most online apps are not evidence-based and lack clinical expertise (Mesibov, 2018). They maintained that some of these apps were created by designers chasing deadlines or exploring the market and who often were not interested in patients' well-being (Mesibov, 2018). In addition, most app designers did not consult with healthcare professionals in the design phase but consulted with patients for information on what they thought they needed. However, patients are not experts and may not know what is effective (Mesibov, 2018).

Some counsellors feared that certain apps use a language that may be unintentionally triggering or misleading because of the lack of clinical expertise of its developers or designers. The major concern from counsellors was that most app designers were chasing the market to release an app before their competitor did, thus inadvertently developing a tool that was potentially more harmful than useful. Therefore, it was preferable for most counsellors to use evidence-based or validated apps (Mesibov, 2018).

Another important concern for counsellors relates to patients' security and safety. Counsellors assert that protecting patients' confidentiality and privacy is crucial (Békés et al., 2021). Unfortunately, most apps in the market do not have privacy policies that protect users. Because of concerns about misuse or the possibility of being misled, Furlonger and Budisa (2016) highlighted the importance of assessing the quality of apps that are made accessible to young people. Mesibov (2018) also mentioned the risks, including the possibility of being connected to someone who is not a qualified therapist.

Therapists whose patients used the Mood Diary app emphasised that—although it facilitated conversation during face-to-face therapy—patients expected therapists to check their mood data regularly, which was not possible (Grist et al., 2017; Matthews & Doherty, 2011). Although mobile apps have their challenges, most therapists conceded they facilitated conversation and encouraged regular reflection on one's behaviour and emotions (Grist et al., 2017; Matthews & Doherty, 2011).

2.12 CONCLUDING REMARKS

This chapter has presented extensive literature on the prevalence of psychological distress by exploring the challenges students encounter at university and the coping strategies they use. It has examined the use of mHealth interventions, such as mental health apps, to address students' challenges. Overall, the literature has shown that there is a growing acceptability of mental health apps amongst young people, who are also willing to use mobile apps to supplement their mental health. The literature has also shown that, although mental health apps are effective, they have not proven themselves entirely effective as the only form of mental health intervention. Most of the apps developed are neither evidence-based, nor do they have the capacity to assist students in uncovering other underlying psychological challenges. Mental health apps are recommended for behaviour change through incorporating CBT and can provide an opportunity for students to take charge of their own mental health. Apps can provide a viable solution for students to increase mental health literacy, identify and address psychological distress symptoms before they turn into a serious mental disorder.

Drawing from the findings of the literature, it is appropriate to explore the type of challenges students in South African universities are experiencing so that a mental health app that is relevant and relatable can be developed for their mental health.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 INTRODUCTION

This chapter describes the theoretical frameworks adopted in the study and their application during data collection and data analysis. This study is embedded within cognitive behavioural theory and the technology acceptance model (TAM) theoretical frameworks. The study aimed to explore the prevalence of psychological distress, and to design and evaluate a mental health app intervention to address students' psychological distress. Cognitive behavioural theory was utilised to understand students' experiences of psychological distress and to structure the content of the app intervention. TAM was utilised to explore students' and counsellors' perceptions on what would make the intervention useful, and to test the usability of the app amongst university students and counsellors. Cognitive behavioural theory and TAM were integrated to acquire an understanding of how the app's content would impact on its acceptability and usability.

3.2 COGNITIVE BEHAVIOURAL THEORY

Cognitive behavioural theory is a psychological theory introduced in the 1960s by Aaron Beck. Its premise is that how people perceive and interpret the events in their lives affects their emotions and behaviours (Fenn & Byrne, 2013). According to cognitive behavioural theory, mental health challenges, including psychological distress, can be explained by thoughts, emotions, and behaviours. What an individual thinks influences how they feel and, eventually, how they behave. When an individual has negative thoughts or interprets a situation negatively, they experience negative feelings and behave negatively (Fenn & Byrne, 2013). The cognitive behavioural theory framework in Figure 3.1 highlights the way thoughts, feelings, and behaviours are interconnected during an unfavourable situation.

In his seminal work in 1964, Aaron Beck—globally acknowledged as the father of cognitive behaviour therapy (CBT)—highlighted three levels of cognition contributing to mental health challenges: negative automatic thoughts, core beliefs, and dysfunctional assumptions (Figure 3.2). Negative automatic thoughts

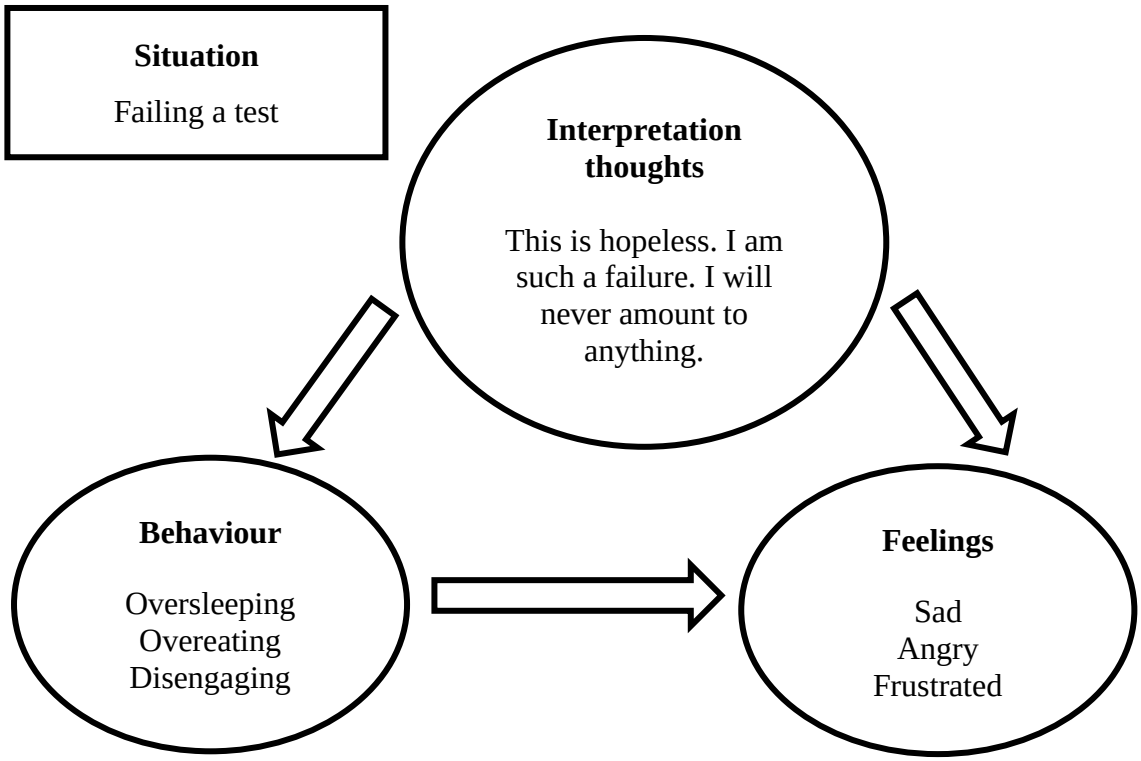


Figure 3.1: Cognitive behavioural theory framework: The cognitive triad of negative core beliefs

Source: Fenn and Byrne (2013)

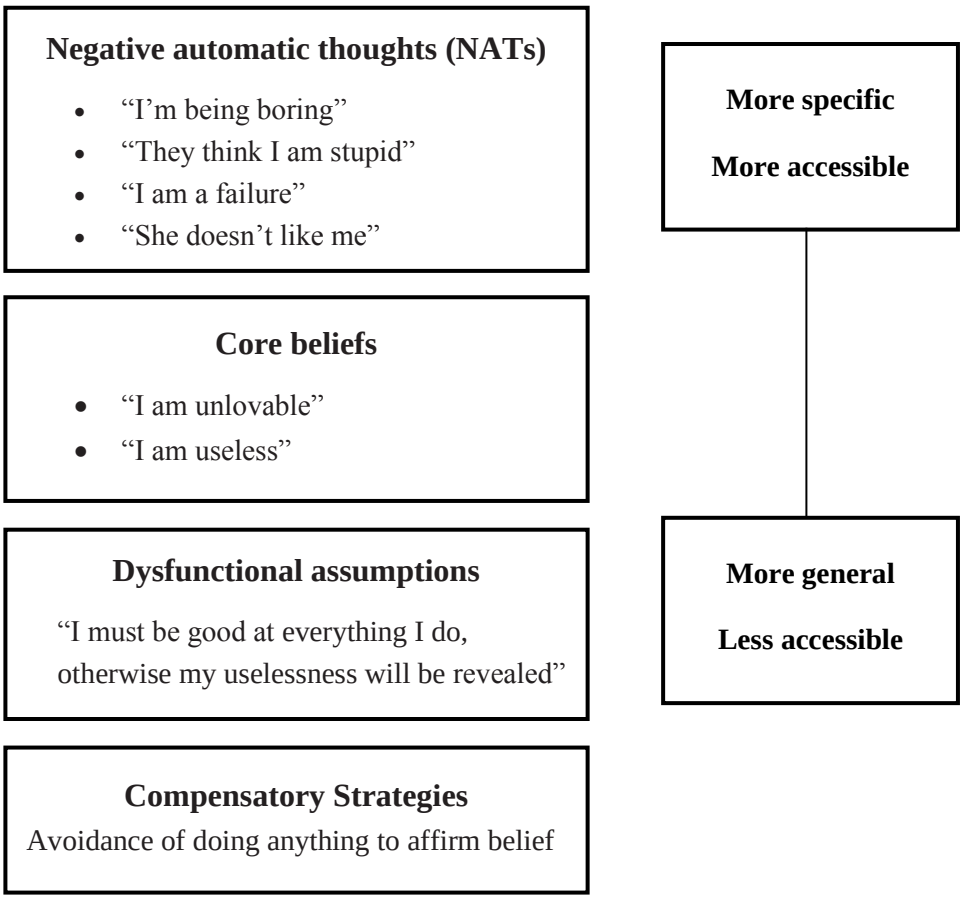


Figure 3.2: Levels of cognition

Source: Moghaddam et al., (2015).

Negative automatic thoughts (NATs) are brief, frequent negative thoughts that occur automatically and are easily accessible to an individual's consciousness (Knapp & Beck, 2008). Although these thoughts are easily accessible, most people are unaware of them because they do not require intense reflection. NATs are activated during a specific situation and influence an individual's feelings or behaviour. For example, when about to write an exam, a typical NAT would be "I am going to fail" (Knapp & Beck, 2008). NATs typically exacerbate negative thoughts about oneself and one's situation and are typified by feelings of low self-worth and low self-esteem (Fenn & Byrne, 2013).

3.2.1 Core beliefs

Core beliefs, also known as schemas, are fundamental beliefs an individual holds about themselves, others, and the world (Knapp & Beck, 2008). These thoughts are not easily accessible to a human being's consciousness and are absolute, fundamental, and applicable to all life experiences. Core beliefs are developed in the early stages of life but can also be adopted later, consequent to traumatic experiences (Knapp & Beck, 2008). Core beliefs also centre on negativity about oneself, others, and the world. For example, core beliefs about oneself can be "I am worthless", "No one cares about me because I am worthless", and "I will never amount to anything because I am worthless and everybody thinks I am worthless" (Fenn & Byrne, 2013).

3.2.2 Dysfunctional assumptions

Dysfunctional assumptions connect core beliefs and NATs and provoke negative automatic thoughts. Dysfunctional assumptions apply to specific situations and are framed by consequences or conditions, such as "If I do this, then this will happen" (Knapp & Beck, 2008). Unlike NATs, dysfunctional assumptions are not easily accessible. What makes them dysfunctional is that they are too rigid and over-generalised, and unhelpful for coping with life's setbacks (Knapp & Beck, 2008). These thoughts centre on achievement, acceptance and control. An example of this would be "If someone gets higher marks than me, it means they are a better person than me", or "Unless someone loves me, I will never be happy" (Fenn & Byrne, 2013). Dysfunctional assumptions can affect normal functioning, individuals then tend to engage in compensatory strategies to maintain a normal level of functioning (Beck & Dozois, 2011).

3.2.3 Compensatory strategies

Compensatory strategies refer to the use of cognitive and behavioural strategies to manage stressors that are related to one's beliefs (Beck & Dozois, 2011). For example, an individual who

believes they are unlovable would then focus on avoiding situations that make them feel loved or overwork in an attempt to be loved by others (Beck & Dozois, 2011). During difficult times, individuals then tend to overcompensate, which can be challenging when their behaviours are not acknowledged by others or do not yield the results they had hoped for (Beck & Dozois, 2011).

3.2.4 Evolution of cognitive behavioural therapy

Cognitive behavioural therapy (CBT) as a psychotherapeutic model is used to repair negative thinking and behaviour (Fenn & Byrne, 2013). It has been effective in treating psychological distress, including depression, anxiety and, in some instances, stress (Fenn & Byrne, 2013). The CBT approach is based on the premise that negative cognitions are derived from an inaccurate way of processing information (McLeod, 2019). CBT advocates substituting inaccurate processing of information with healthy and positive ways of processing information (Fenn & Byrne, 2013).

Cognitive behavioural therapy (CBT) as a form of therapy evolved in three interconnected waves. The first wave of CBT was introduced in the UK and USA in 1940s as a short-term treatment based on principles of operant learning and classical conditioning to treat psychological distress by changing overt behaviour (Carvalho et al., 2017; Hayes & Hoffmann, 2018. In the 1960s, Aaron Beck expanded CBT by introducing information processing to the intervention, referred to as the second wave of CBT and more commonly applied in the USA. The second wave of CBT targeted behaviour modification by challenging distorted cognitive mental structures, such as negative automatic thoughts, core beliefs and dysfunctional assumptions, which often led to behavioural challenges (Carvalho et al., 2017; Hayes & Hofmann, 2018). CBT was used to help individuals identify, evaluate and challenge their negative thoughts and behaviours to reduce psychological distress (Carvalho et al., 2017; Hayes & Hofmann, 2018).

The third wave of CBT started in the 1990s and focused on the individual's relationship with their own thoughts and behaviours. Instead of focusing on the content of the thoughts, third wave CBT focuses on a person's contextual experiences with their own thoughts. Third wave CBT focuses on issues such as values, goals, relationships, and emotions. Consequently, various interventions, such as acceptance commitment therapy, mindfulness-based cognitive therapy, compassion therapy and several others were introduced (Hayes & Hofmann, 2018). Therefore, CBT is not monolithic but should be understood as a family of interventions that has progressed in several waves (Hayes & Hofmann, 2018).

CBT has been used effectively in mobile health (mHealth) interventions, and various CBT techniques have been used to address mental health challenges (Fenn & Byrne, 2013; Kim et al., 2020). The following features are incorporated in mHealth interventions focused on addressing mental health challenges:

3.2.4.1 *Cognitive restructuring/reframing*

To remedy negative thinking, CBT follows three steps to modify thinking and behaviour: identifying negative thoughts, evaluating and challenging the negative thoughts (cognitive restructuring), and replacing unrealistic negative thoughts with realistic thoughts (Kaczkurkin & Foa, 2015). This form of CBT technique was included in the app, by including a section dedicated to reframing negative thoughts. Users are given a list of all their possible faulty thinking patterns, such as overgeneralisations, catastrophising, personalisation, and mindreading, and are then presented with ways to challenge any faulty thought patterns they have identified (Kelly, 2019).

3.2.4.2 *Journaling or thought recording*

Journaling or thought recording is a strategy to make users aware of their NATs, assess the legitimacy of their thoughts, and track how their thought patterns affect their mood (Fenn & Byrne, 2013). Thought recording entails identifying the triggering situation, the mood, the negative thought, the evidence for the NATs, evidence challenging NATs, and replacing NATs with new positive thoughts and, eventually, rating one's mood again (mood tracking) (Fenn & Byrne, 2013; Greenberger & Padesky, 2015). Journaling and thought recording usually use prompting questions (guided discovery), where the user is asked questions in a Socratic manner and forced to reflect and devise their own solution based on the information gathered (Padesky, 1994). This form of CBT technique was applied a section of the app dedicated to journaling, in which users are prompted to identify the triggering situation or event, their feelings about the situation, and their behaviour towards the situation.

3.2.4.3 *Problem-solving and goal setting*

Unlike other forms of talk therapy, CBT focuses on solving current problems or challenges. CBT focuses on one's current state of mind, concentrating less on the past and more on the present state of distress and symptoms, thus seeking to provide solutions for the existing state of distress (Fenn & Byrne, 2013; Martinengo et al., 2021). A major element of CBT is setting goals to help users address their cognitive, emotional or behavioural goals. During this process, the patient is encouraged to set SMART (specific, measurable, achievable, realistic

and time-limited) goals (Fenn & Byrne, 2013; Martinengo et al., 2021). This form of CBT technique was applied by including a section in the app dedicated to guiding users to set goals.

3.2.5 Application of cognitive behavioural theory in the current study

Cognitive behavioural theory was applied for data collection, data analysis, and interpretation, while basic CBT techniques were applied for the app intervention.

Cognitive behavioural theory was considered when designing questions for the interview guide for students (*What comes to mind when you hear the word psychological distress?)* and counsellors (*What kind of mental health challenges do students report at the CCDU [Wits Counselling and Career Development Unit]?*). The survey also comprised questions relating to thoughts, emotions and behaviours, even though the choice of scale was not based solely on cognitive behavioural theory but also on its ability to measure psychological distress. During the data analysis process, cognitive behavioural theory was used to identify thoughts and behaviours associated with psychological distress. Codes were determined based on cognitive behavioural theory, and only new emerging data relating to cognitive behavioural theory were coded and categorised under perceptions and knowledge of psychological distress.

The MentaLit mental health app intervention developed for this study used cognitive behavioural theory to identify any pertinent negative thoughts, feelings or behaviours that could be addressed by cognitive behavioural therapy (CBT). Other effective CBT strategies which were also used to guide the intervention included journaling, mood tracking, goal setting, and mindfulness relaxation techniques.

3.3 EVOLUTION OF THE TECHNOLOGY ACCEPTANCE MODEL

The technology acceptance model (TAM) is an information technology explanatory framework used to explain how users come to accept and use technology (Davis, 1989). TAM evolved from the theory of reasoned action and the theory of planned behaviour.

3.3.1 Theory of reasoned action

According to the theory of reasoned action (TRA), intention for behaviour is determined by attitudes and subjective social norms about the behaviour. Attitudes are an individual's personal beliefs about the behaviour and its outcomes. Subjective social norms are the acceptance of the behaviour of people who are important in the individual's life (Fishbein &

Ajzen, 1975). Therefore, an individual's behaviour is determined by the attitudes and beliefs held about the specific behaviour (Fishbein & Ajzen, 1975). However, TRA has been criticised for not recognising the difference between goal intention and behavioural intention, i.e., what a person intends to do is not always aligned with one's current behavioural characteristics. TRA does not account for unexpected behaviours such as spontaneity, habits, and impulses (Riffai et al., 2012). Further, TRA does not factor in that individuals are not always in control of their behaviours and attitudes (Granić & Marangunić, 2019).

3.3.2 Theory of planned behaviour

Fishbein and Ajzen (1975) extended TRA with the theory of planned behaviour (TPB). Unlike TRA, TPB accounts for situations where individuals have no control over their behaviour (Ajzen, 1991). TPB proposes that behavioural intention is influenced by attitudes, subjective social norms, and perceived behaviour control. Perceived behaviour control is the extent to which an individual believes they can perform a behaviour. This means that behavioural intention is not only determined by beliefs and attitudes but also by an individual's evaluation of their ability or inability to perform the behaviour (Ajzen, 1991). However, TPB has been criticised for overlooking emotional behaviour such as a person's mood, fear or negative feelings. It does not acknowledge that individuals can make decisions based on emotional experiences and not rationality (Granić & Marangunić, 2019; Riffai et al., 2012).

TRA and TPB play a significant role in explaining behaviour, but on their own do not sufficiently provide explanations about the drivers of human behaviour, particularly those related to the adoption of technology (Granić & Marangunić, 2019). Fred Davis (1989) appropriated the TRA by introducing the technology acceptance model (TAM).

3.3.3 Technology acceptance model

Davis (1989) extended TRA by developing the first TAM model (Figure 3.3). TAM is also used by researchers to guide them in testing the usability and acceptability of invented digital technologies (Ajibade, 2018). TAM asserts that, when users perceive a technology to be useful and easy to use, they will be more willing to use and accept it (Davis, 1989). Initially, TAM was based on beliefs (what we think), attitudes (what we believe), and intentions (what we want to do). To extend on the theory, Davis introduced two integral variables: perceived usefulness (PU)—the belief that users will benefit from using the technology, and perceived ease of use (PEOU)—the belief that the user will require minimal effort to navigate the technology (Davis, 1989). However, the most recent validation of TAM by Venkatesh and

Davis (2000) shows that attitudes are not significant in new technology usage because PU and PEOU have a direct influence on behaviour intention and usage.

TAM has been criticised for disregarding social influences that facilitate behaviour by focusing solely on PU and PEOU (Ajibade, 2018; Torres, & Gerhart, 2019). Furthermore, TAM fails to sufficiently explain specific individual user behaviour and people's choices to accept and adopt technology, particularly for non-problem-solving technologies (Ajibade, 2018).

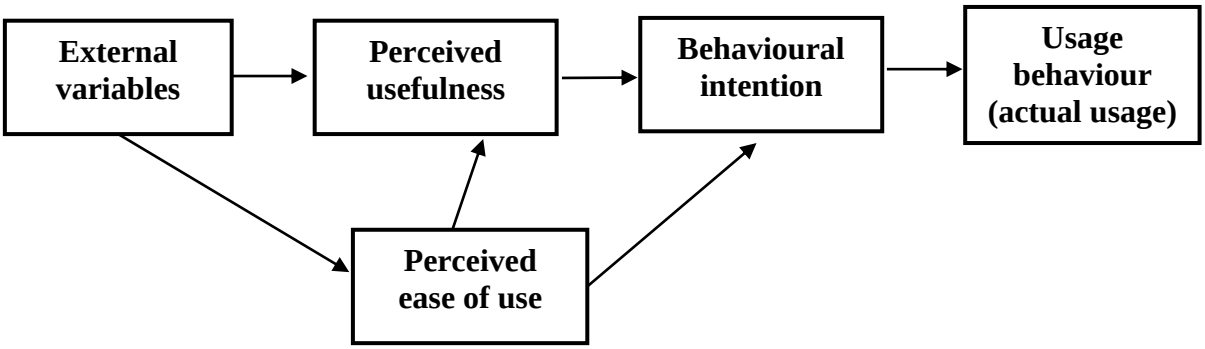


Figure 3.2: Technology acceptance model

Source: Venkatesh & Davis, 2000

3.3.4 Extended TAM models

Different models of TAM have since been developed to address the concerning challenges with the original TAM: TAM2, TAM3 and the unified theory of acceptance and use of technology (UTUAT) (Table 3.1).

Table 3.1: Technology acceptance models

TAM model	Theoretical perspective	Determinant of behavioural intention
TAM2 (Venkatesh & Davis, 2000)	From a theoretical perspective, TAM2 shows that if behaviour intention is based on subjective norms and PU, PEOU will happen under mandatory situations and not in a voluntary setting.	Social influences (e.g., subjective norms, voluntariness and image), cognitive instrumental processes, and PEOU to explain behavioural intention to use new technology.

TAM model	Theoretical perspective	Determinant of behavioural intention
TAM3 (Venkatesh & Bala, 2008)	From a theoretical perspective, TAM3 shows that behaviour is determined by whether using the technology is relevant for their job and the outcome they are seeking.	Social influences (subjective norms, image), job relevance, output quality, result demonstrability, experience, and voluntariness.
UTUAT (Venkatesh et al., 2003)	From a theoretical perspective, UTUAT shows how the determinants of intention and behaviour evolve over time.	Identifies performance expectancy, effort expectancy, social influence and facilitating conditions as determinants of intention and behaviour. Gender, age, voluntariness of use, and experience moderate the impact of the main four determinants of intention and behaviour.

3.3.4.1 *Selection of the TAM*

This study applied the original TAM because the study's final objective was to test the developed intervention for usability. Since this study was exploratory in developing and testing this specific mental health intervention, the original TAM was deemed more appropriate. The extended TAM frameworks focus on variables such as social influence, effort expectancy, cognitive instrumental processes, and result demonstrability, which need to be tested over time. This study assessed the mental health intervention in a single setting—participants were not required to use the app for a long period of time before the app evaluation; therefore, the assessment of usability of the app was based on the participant's once-off experience. Consequently, PU and PEOU were more appropriate variables to assess in the study in comparison to the variables in the extended TAM models.

As central variables in the study, PU and PEOU were applied in the different stages of the study, including during data collection, data analysis, interpretation, and discussion sections.

3.3.4.2 *Perceived usefulness*

Perceived usefulness (PU) was applied in both the survey and the qualitative components. The survey included questions exploring usability, such as mobile phone ownership, data accessibility, current use of health apps, and previous mental health diagnosis. The interview

guides included questions on PU with counsellors (*What would be the barriers/facilitators of using a mobile app for psychological distress? Would you be willing to use a mobile app for supporting psychological distress in students?*), and students (*If you were to use the app, how do you think it would benefit you? What result would you like to see after using the app?*). During data analysis, PU was used to identify emerging data relating to PU based on the interview guide questions. Several themes emerged during data analysis regarding the external variables, which would influence PU within this population group.

3.3.4.3 *Perceived ease of use*

Perceived ease of use (PEOU) was applied in both the exploratory qualitative and the evaluation components of the study. Questions on PEOU were asked during in-depth interviews with counsellors *(What would be the barriers/facilitators of using a mobile app for psychological distress?),* and focus group discussions with students *(What features would you like to see on the mobile app? What support structures would you like to see on the app? Which other technological platforms can assist with mental health?).* During data analysis, these questions were used to identify emerging data relating to PEOU.

PEOU was assessed during Phase 3 of the study by using the Mobile Application Rating Scale (MARS) questionnaire, which had questions based on ease of use, engagement, entertainment, interest, customisation, aesthetics, information interactivity, and navigation (Stoyanov et al., 2015). Several studies that have used TAM to predict usage of mHealth applications indicate that the use of apps is influenced by users' perceptions of the ease in navigating and content presentation (Abu-Dalbouh et al., 2017; Alasmari, 2017). Previous mHealth research studies have shown that external variables, such as easy navigation, time convenience, and accessibility, influence ease of use (Beldad & Hegner, 2018; Palos-Sanchez et al., 2021). Factors influencing perceived ease of use in this study's intervention were determined during Phase 3 of the study, when the app was evaluated.

3.4 INTEGRATING CBT AND TAM

Throughout the study cognitive behavioural theory and TAM frameworks were applied as independent theories to understand different constructs in the study. Cognitive behavioural theory was used to understand student's psychological distress and outline possible CBT content on the app. The TAM was used to understand students' perceptions on how the app should function for it to be useful and easy to use. However, during Phase 2 of the study (App development), the theories were integrated to understand how the app would function to

enhance perceived usefulness and ease of use when the user is under psychological distress. The integrated model shows that when the CBT-based app provides users with the relief they need for their psychological distress, they may find the app useful. Secondly, when the app requires minimal effort from the users when they are under psychological distress, they may find the app easy to use and therefore useful (Abu-Dalbouh et al., 2017; Alasmari, 2017).

The model therefore shows that the CBT content and elements that make using the app easy are central to its usage, further suggesting that for the CBT content to be useful, the content needs to be presented in a manner that enhances the app's usage. The process used to integrate CBT and TAM in the app to address negative feelings, thoughts and behaviour is explained in depth in Section 4.8.1 of Chapter 4.

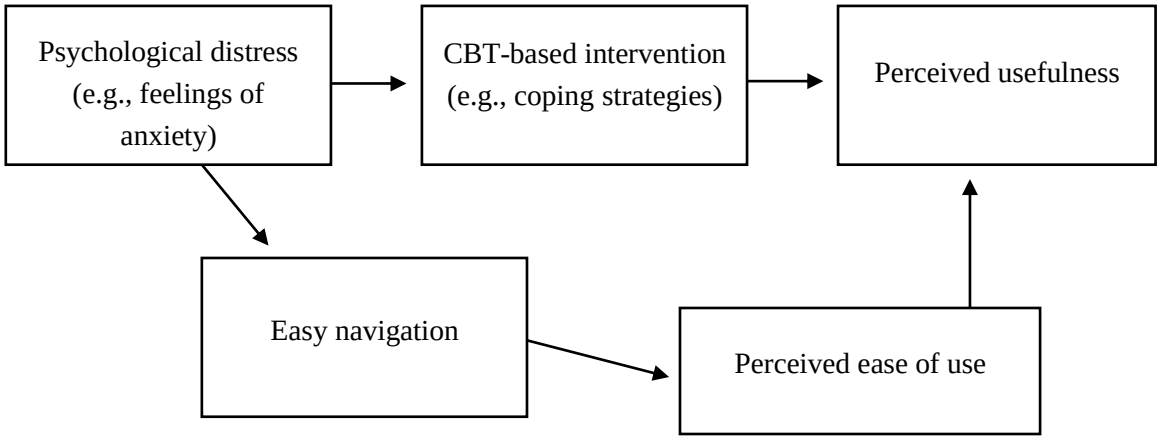


Figure 3.4 Integrated CBT and TAM Frameworks

3.5 CONCLUDING REMARKS

This chapter highlighted the theoretical frameworks for this study: CBT and TAM. These theories were used to understand students' perceptions of psychological distress and the use of a mental health app. The theories were applied during different stages of the study, including data collection, analysis, interpretation and discussion, which will be discussed in depth in the next chapter.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter describes the methodology applied in this study by explaining the research questions, study objectives, research paradigm, research design, research setting, data collection methods, and data analysis procedures. This chapter also discusses the trustworthiness of qualitative data by explaining how credibility, transferability, dependability, and confirmability were established, as prescribed by Lincoln and Guba (1985). It examines how validity, reliability, and triangulation were ensured for quantitative data, as suggested by Denzin (1978) and Greene et al. (1989). Finally, this chapter presents reflexivity of how my identity, social experiences and the contextual setting of the study may have influenced the data collection and data analysis processes from my perspective (TM) and that of the research assistant (SM) (Sutton & Austin, 2015).

4.2 RESEARCH QUESTIONS

The study aimed to explore the prevalence and sources of psychological distress experienced by university students. The study also aimed to design, test and evaluate the usability of a mobile phone app intervention that offers support for students experiencing psychological distress. The following research questions were posed:

1. What is the prevalence of psychological distress in students enrolled at South African universities? Do differences in age, gender and level of study exist in the reporting of psychological distress?
2. What are students' perceptions and understanding of psychological distress?
3. How do university students cope with psychological distress? Do differences in age, gender and level of study exist in the reporting of psychological distress?
4. How do counsellors report and understand the mental health needs of students and their sources of psychological distress?
5. What are students' perceptions of using a mental health app?
6. What are counsellors' perceptions of the acceptability of using mobile apps as an alternative intervention to face-to-face therapy?
7. How do students and counsellors report the usability of the app-based intervention?

4.3 STUDY OBJECTIVES

The study objectives, as illustrated in Figure 4.1, were:

Objective 1: To assess the prevalence and manifestations of psychological distress in students by using the student stress inventory (SSI) and the Kessler-10 (K-10) psychological distress scale. To assess how students cope with psychological distress using the Brief-COPE-28 scale through an online survey.

Objective 2: To explore students' knowledge, awareness, and perceptions of psychological distress and the feasibility of a mental health app as an intervention for distress through focus group discussions.

Objective 3: To explore counsellors' perceptions of psychological distress and the use of a mental health app as an intervention for university students through in-depth interviews.

Objective 4: To design and develop a mental health app for university students by combining data given by students and counsellors from the focus group discussion, survey, and in-depth interviews.

Objective 5: To test and evaluate the usability of a mental health app with students and campus counsellors through an online survey based on the Mobile Application Rating Scale (MARS).

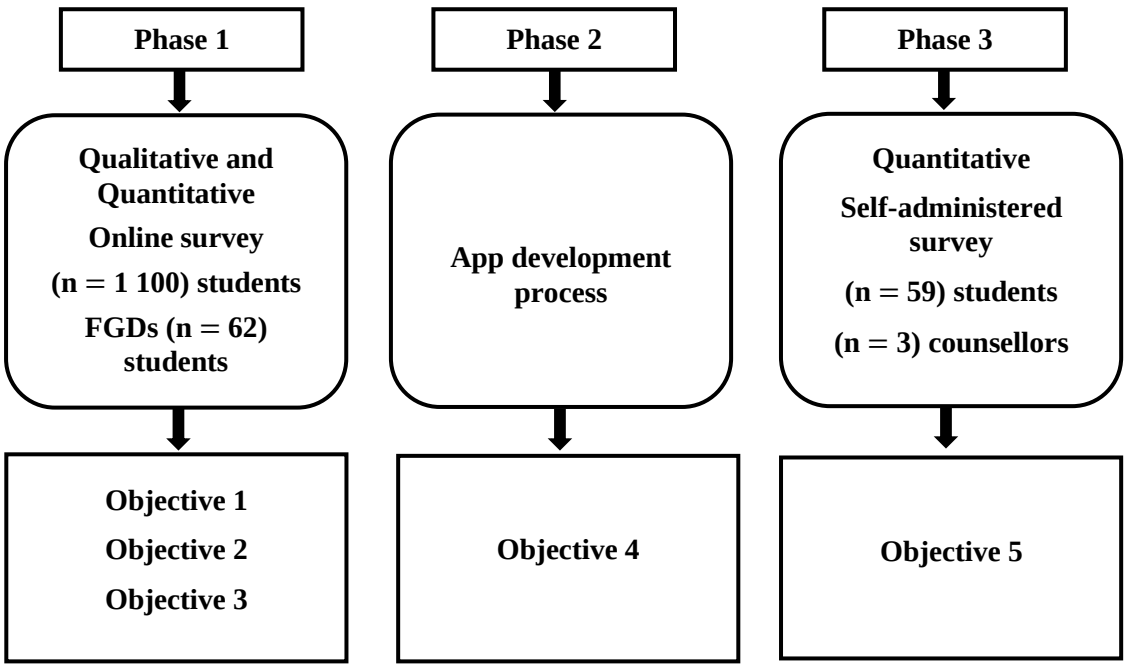


Figure 4.1: Study objectives

4.3.1 Hypotheses

Below are the hypotheses of the study:

H0: Younger students will have higher levels of psychological distress than older students.

H0: Female students will have higher levels of psychological distress than male students.

H0: First-year students will have higher levels of psychological distress than second-year, third-year and postgraduate level students.

H0: Older students will use more problem-focused coping strategies than younger students.

H0: Female students will use more emotion-focused coping strategies than their male counterparts.

H0: First-year students will use more avoidance and emotion-focused coping strategies than second, third and postgraduate level students.

H0: Students and university counsellors will find the app intervention easy to use.

4.4 RESEARCH PARADIGM

According to Creswell (2014), a paradigm is a way of thinking and seeing that helps researchers understand the realities of the world. As more ways of thinking and explaining realities in the world are emerging, multiple research paradigms have been established (Lincoln et al., 2011). Initially, two paradigms were prominent: positivism and interpretivism, and formed the basis of all existing research paradigms (Kivunja & Kuyini, 2017). Positivism holds the assumption that a single reality exists in the world, and that this reality can be investigated quantitively, understood, and measured through surveys and questionnaires (Kivunja & Kuyini, 2017). Interpretivism assumes that more than a single reality exists and that these realities are socially constructed and can be explored qualitatively through observations, interviews, and discussions (Kivunja & Kuyini, 2017; Lincoln et al., 2011). From these two research paradigms, other paradigms such as pragmatism (reality is constantly being constructed), constructionism (reality is socially constructed), subjectivism (reality is what we understand to be real), and critical theory (reality is always being influenced by external entities) were established (Kivunja & Kuyini, 2017; Lincoln et al., 2011).

This research study adopted a pragmatic research paradigm, which embraces principles from both positivism and interpretivism. While pragmatism encourages the use of multiple approaches, including subjective and objective perspectives to answer the research questions through quantitative and qualitative approaches, Teddlie and Tashakkori (2009) suggested that the essence of pragmatism is not in the philosophical assumptions of positivism and

interpretivism or using multiple approaches but in choosing methods that "work best" to answer the research questions of the study.

Below are key pragmatism assumptions that were integral to this study:

- Pragmatism assumes the existence of multiple realities and that reality is being constructed every day. Therefore, to understand reality, researchers should use more than one method when engaging with complex research questions (Creswell, 2014; Tashakkori & Teddlie, 2010). This study used both qualitative and quantitative methods to engage with the research questions.
- Pragmatism assumes that meaning and reality cannot be separated from human experience. Therefore, participants' experiences are important in making meaning of reality. This study prioritised participants' experiences and applied them to theory, and not the other way around (Dillon et al. 2000; Morgan, 2013).
- Pragmatism encourages abductive reasoning, which allows the researcher to alternate between deductive and inductive reasoning (Kaushik & Walsh, 2019). In this study, I was able to engage concurrently with both emerging data and existing theories.
- Pragmatism advocates solution-based research from the participants' perspectives and experiences (Kivunja & Kuyini, 2017). Participants' perspectives and experiences were central in the development and testing of the mental health app intervention.
- According to pragmatism, the researcher has the freedom to explore and choose the best approach (or approaches) to answer the research problem (Kivunja & Kuyini, 2017). As the researcher in this study, I had the liberty of choosing the best methods to answer the research questions.
- Pragmatism allows for social, political and historical viewpoints as a way of reflecting on the current context and reality in which the research is being conducted (Creswell, 2014; Kaushik & Walsh, 2019). This was particularly important for the study because, as a researcher, I was able to look at how the current social context may have contributed to the participants' responses and how the findings relate to the current South African social context.

4.5 RESEARCH DESIGN

A research design is a blueprint that coherently delineates all the methods used in a study to answer the research questions (Creswell & Creswell, 2017). This study used a mixed methods research approach to adequately answer the research questions.

According to Creswell & Creswell (2017), mixed methods research (MMR) approaches provide a richer and contextual understanding of the research problem. MMR combines qualitative and quantitative approaches, to either create a connection between the two approaches or compare findings from both approaches (Haines, 2011). In this study, mixed methods were used:

- To explore the prevalence of psychological distress and coping strategies.
- To explore students' and counsellors' perceptions of using a mental health app.
- To evaluate the usability of a mental health app amongst university students.

Various forms of MMR designs can be considered for studies, which include exploratory, explanatory, convergent, embedded, transformative, and multiphase mixed methods (Creswell, 2014). The researcher has the responsibility of choosing an appropriate MMR design that will significantly answer the study's research questions. The researcher a multiphase research design to answer the research questions.

Multiphase MMR designs are used when a single study has more than two phases (Creswell & Plano-Clark, 2018). This study used a type of triangulation multiphase MMR design, comprising three phases:

- Phase 1: Convergent parallel MMR
- Phase 2: Integrating quantitative and qualitative data and development of app intervention.
- Phase 3: Quantitative methods.

4.5.1 Multiphase MMR design

The multiphase MMR design was selected for the following purposes:

- Multiphase MMR designs are used in studies focusing on developing, evaluating and implementing programmes and interventions (Creswell, 2014). A significant outcome of this study was an app intervention, which was also evaluated during the study.
- A multiphase research design allows qualitative and quantitative approaches to be applied convergently or sequentially in the same or different phases of the study (Creswell, 2014). In this study, qualitative and quantitative approaches were applied convergently in a single phase.
- A multiphase research design allows for different phases in a study to build on each other, even though the approaches used in each phase are different (Creswell, 2014).

All the phases in this study are interconnected, data from Phase 1 were used in Phase 2 to develop the app intervention, which was evaluated in Phase 3.

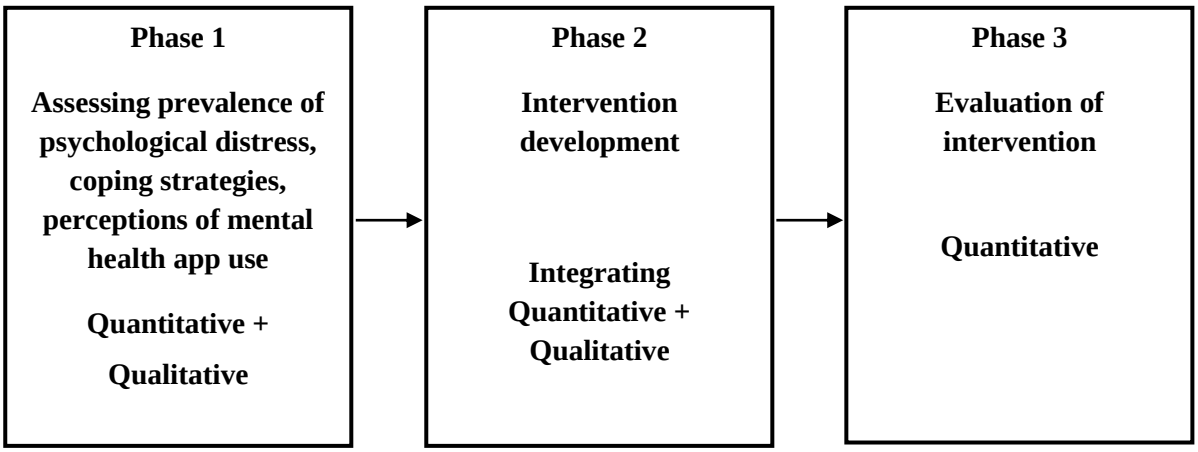


Figure 4.2: Multiphase research design

In MMR, the researcher chooses the timing of data collection (sequential, parallel, or concurrent) in which data are collected, the order (quantitative first and qualitative second), and the way in which the data are presented in the study (Creswell & Plano-Clark, 2018; Greene et al., 1989; Morgan, 1998). In Phase 1 of this study, quantitative and qualitative data were collected concurrently (together in a single phase).

The researcher chooses the weighting or priority of data to determine if both methods have equal priority or if one method has greater priority based on the research questions (Creswell & Plano Clark, 2018; Morgan, 1998). In this study, both quantitative and qualitative data were given equal priority, as each method played an equally significant role in answering the research question (Creswell & Plano-Clark, 2018).

The researcher also determines how data will be mixed or integrated. According to Creswell (2014), data can be integrated in three ways:

- Merging data: both qualitative and quantitative data sets are analysed separately in the results section and integrated in the discussion section.
- Embedding data at design level, e.g., embedding qualitative within a quantitative design.
- Connecting from data collection, analysis and reporting: where one type of data connects to the other, e.g., quantitative data connects with qualitative data.

This study mixed data by connecting the datasets, as both qualitative and quantitative datasets were connected and relied on each other significantly to answer the research questions and reach the end goal of the study (Figure 4.3). Data were analysed separately but were connected during the interpretation and results sections.

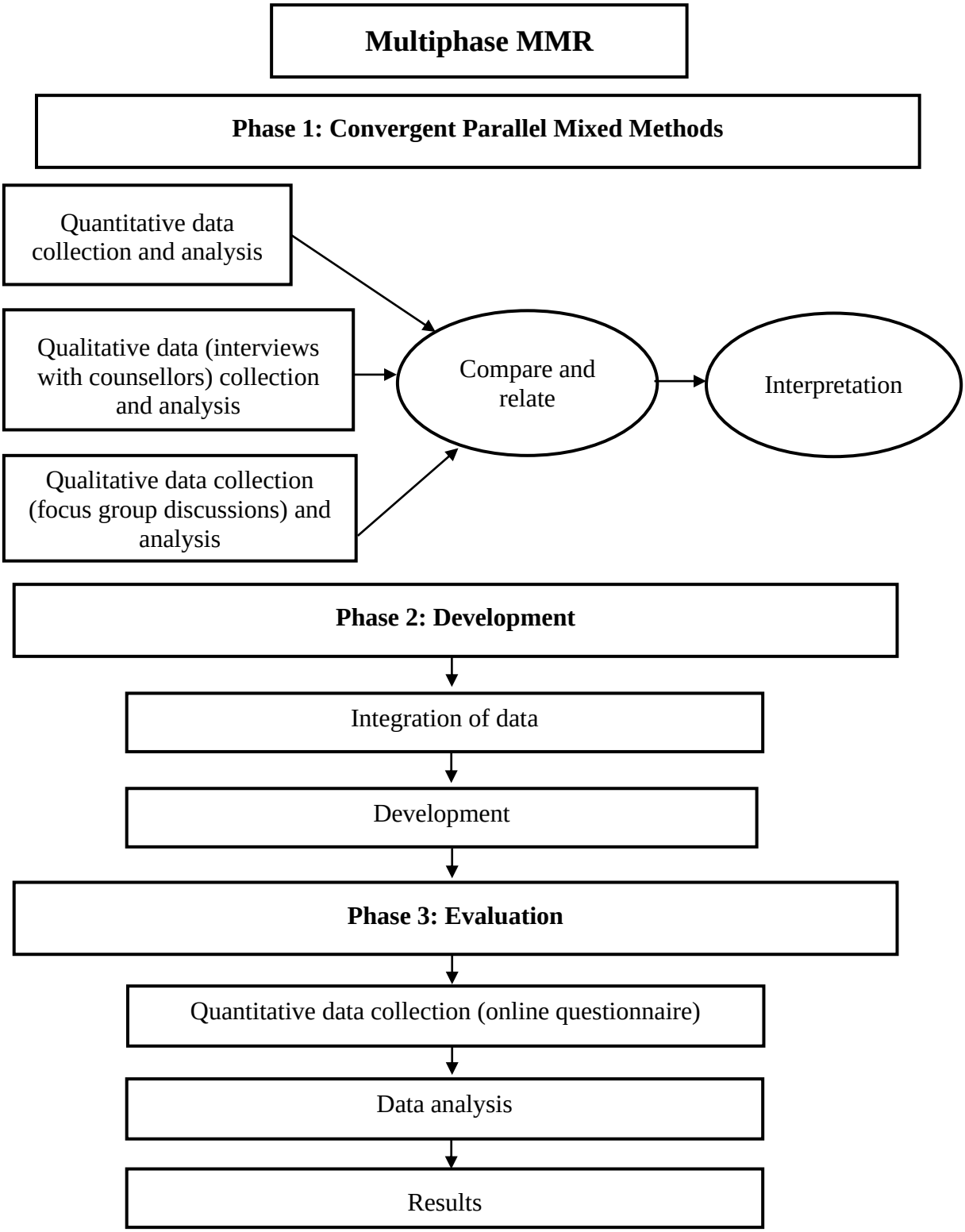


Figure 4.3: Multiphase MMR

4.5.1.1 *Phase 1: Convergent parallel MMR design*

Phase 1 used a parallel convergent MMR design, where quantitative data (survey) and qualitative data (in-depth interviews and focus group discussions) were collected concurrently in a single phase. Data collected in this phase were analysed separately using quantitative and

qualitative methods, respectively. The results of the analysis were compared and thereafter interpreted together. Quantitative data were reported separately, and some qualitative data were connected to specific results. Qualitative data were reported together (Creswell & Plano-Clark, 2018). A convergent parallel MMR design was chosen for Phase 1 for the following reasons:

- This form of mixed methods allowed me to collect data in the same phase with different data collection tools/methods (Creswell, 2014).
- Since data are collected in the same phase, they are more comparable based on the social context. For example, all the data in this phase were collected during the COVID-19 pandemic and from the same population group (Creswell, 2014).
- This design allowed me to compare quantitative data (survey) and qualitative data (interviews/focus group discussions) side-by-side in the interpretation of results, particularly when specific themes or quantitative data overlapped with each other.

4.5.1.2 *Phase 2: Data integration and app development*

Phase 2 integrated data from Phase 1. Phase 2 entailed designing and developing a mental health app intervention by integrating the results from the quantitative and qualitative data (Creswell, 2014).

4.5.1.3 *Phase 3: Testing and evaluation*

Phase 3 applied a descriptive quantitative methods research design, which used a cross-sectional online survey to evaluate the app intervention developed in Phase 2.

4.5.2 Study setting

The study was conducted online through the University of the Witwatersrand (Wits), a public research university in Johannesburg, South Africa's largest city with a population of over four million people (Statista, 2022). In 2021, at least 35 000 students were enrolled at Wits University, 65% of whom were undergraduate and 35% postgraduate students (University of the Witwatersrand, 2022). Phase 1 of the study was conducted online through Research Electronic Data Capture (REDCap) during alert level three lockdown of the COVID-19 pandemic. The survey was conducted online from 2 March 2021 to 2 May 2021, and in-depth interviews were conducted from 8 March 2021 to 15 June 2021. Focus group discussions were conducted online from 20 August 2021 to 12 October 2021. All components of the study were conducted online to avoid the spreading of COVID-19.

During the COVID-19 pandemic, students were restricted to online learning. Almost all

universities in South Africa provided students with laptops, tablets and mobile phone data, giving them easy access to the internet, which may have contributed to students' high levels of participation in the survey and focus group discussions (Motala & Menon, 2020; Hlatshwayo, 2022).

Phase 2, which entailed integration of data and the development of the intervention, was conducted from 13 December 2021 to 7 October 2022.

Phase 3 of the study, which was the evaluation of the app intervention, was conducted from 1 December 2022 to 20 January 2023 online on REDCap.

4.5.3 Study participants

Study participants were university students registered at any South African university, and counsellors employed at the Counselling and Careers Development Unit (CCDU) at Wits University.

4.5.3.1 *Students' inclusion criteria*

To participate in any phase of the study, participants had to meet the following criteria:

- Students had to be enrolled full time at any South African university.
- They had to be an undergraduate or postgraduate student.
- Students had to be between the ages of 18 and 24.
- Students had to complete an online informed consent form.

4.5.3.2 *Students' exclusion criteria*

The following were excluded from the study:

- Students who were not enrolled at a South African university.
- Students enrolled part-time at a South African university.
- Students younger than 18 and older than 24 years.
- Eligible students who did not complete the online informed consent form.

4.5.3.3 *Counsellors' inclusion criteria*

To participate in any phase of the study, counsellors had to meet the following criteria:

- Counsellors had to be employed part-time or full-time at the CCDU and had to have been employed for over four months at the time of the study. This measure was taken

to ensure that counsellors had been working at the CCDU long enough to describe and assess the issues presented by students.

- Counsellors had to be employed as a counsellor and be in contact with students at the CCDU.
- Counsellors had to complete an online consent form.

4.5.3.4 *Counsellors' exclusion criteria*

The following were excluded from the study:

- Counsellors who were employed part-time or full-time at the CCDU for less than four months at the time of the study.
- Counsellors not employed at the CCDU.
- Counsellors who did not complete the online consent form.

4.5.4 Study sampling

Purposive sampling was used to access counsellors based at the Wits CCDU. According to Babbie (2016), when using purposive sampling, participants should be selected based on the similarity of their characteristics, experience, and availability. Participants in this study were all campus counsellors at Wits University and had been working at the CCDU for over four months. All had direct contact with students and were knowledgeable about psychological distress.

Convenience sampling was used to access students enrolled at South African universities. According to Bryman (2016), convenience sampling is an effective method for student-related research because of their willingness and flexibility to participate in student-based research studies. Generally, conducting convenience sampling online is easy and affordable, simplifying access to students. Further, this form of sampling reduces biases as participants take part willingly and in their own time. However, convenience sampling can lead to under-coverage bias, where the sample is not representative of the entire student population, making generalisability of the findings to all university students impossible. Moreover, convenience sampling is subjective in that only individuals interested in the subject of mental health may have agreed to participate, thereby excluding those who were not interested in the topic.

Based on a population of close to 200 000 students between the ages of 18 and 24 enrolled at South African universities, with a 5% margin of error, 95% confidence level and 50% distribution response, an estimated minimum sample size of 384 respondents was

recommended for the data to be representative of the student population, as per the Raosoft calculator (Raosoft, 2004; Statistics South Africa, 2019). However, the students enrolled in the survey exceeded the intended 384 sample size, enhancing the reliability of the results. Overall, 1 100 students were enrolled in the whole survey.

Overall, the two phases of study enrolled 1 230 participants, 1 221 of whom were university students. At least 1 162 students were enrolled in phase one and 59 in phase three. Nine counsellors—six in phase one and three in phase two—were enrolled. Most participants were female students (872), within the 18–20 age group (758) and in their first year of study (532). To protect their identity, socio-demographic data, such as profession, gender and age, were not collected for counsellors.

Table 4.1: Overall study sample size

Demographics	Students	Counsellors	Overall
Participants	**1 221**	**9**	**1 230**
Female	**872**	**-**	**872**
Male	**325**	**-**	**325**
Non-binary/Prefer not to answer	**24**	**-**	**24**
18–20 age group	**758**	**-**	**758**
21–24 age group	**463**	**-**	**463**
First year	**532**	**-**	**532**
Second year	**236**	**-**	**236**
Third year	**255**	**-**	**255**
Postgraduate	**198**	**-**	**198**

4.6 PHASE 1: QUANTITATIVE METHODS

4.6.1 Survey participants

A total of 1 100 students were enrolled for the online survey to meet Objective 1 of the study, which was to explore the prevalence of psychological distress and assess how students coped with psychological distress.

4.6.2 Recruitment for online survey

Students from other universities were recruited through word of mouth and by sharing the recruitment poster, which had a link to the survey (Appendix A). The poster was shared on social media platforms, such as WhatsApp, Instagram, Twitter, and Facebook. According to Gelinas et al. (2017), social media has become a popular recruitment tool for identifying groups of people who, under normal circumstances, would be inaccessible to researchers.

4.6.3 Data collection instruments

Data were collected using an online survey developed on REDCap (Vanderbilt University, 2004). The survey collected data on students' socio-demographic information, the prevalence of psychological distress, students' stress levels, and coping strategies by using the following scales: Kessler-10 (K-10) (Appendix B), student stress inventory (SSI) (Appendix C) and Brief-COPE 28 scale (Appendices B–D).

4.6.3.1 *Socio-demographic information*

The psychological distress survey (Appendix E) collected socio-demographic data on gender, age, level of study, university enrolment, faculty, citizenship, geographic location, ownership of smartphone, access to data, previous diagnosis of a mental health challenge, and use of health apps.

4.6.3.2 *General psychological distress*

General psychological distress was measured by the Kessler psychological distress scale (K-10) (Appendix B). The K-10 is a non-clinical measure developed in 1992 to determine non-specific psychological distress by assessing mild symptoms of anxiety and depression (Kessler & Mroczek, 1992; Kessler et al., 2003). The K-10 comprises 10 questions about general their well-being in the past four weeks. For example: (1) *In the past 4 weeks, about how often did you feel tired for no good reason?* (2) *In the past 4 weeks, about how often did you feel nervous?* (3) *In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?* (4) *In the past 4 weeks, about how often did you feel hopeless?* (5) *In the past 4 weeks, about how often did you feel restless or fidgety?* (6) *In the past 4 weeks, about how often did you feel so restless you could not sit still?* (7) *In the past 4 weeks, about how often did you feel depressed?* (8) *In the past 4 weeks, about how often did you feel that everything was an effort?* (9) *In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?* (10) *In the past 4 weeks, about how often did you feel worthless?*. Participants are expected to respond using a five-point Likert scale, where "None

of the time" = 1, "A little of the time" = 2, "Some of the time" = 3, "Most of the time" = 4 and "All of the time" = 5 (Kessler et al., 2003). Finalised scores of the K-10 can range from 10–50, with scores from 10–15 indicating a low level of psychological distress, 16–21 indicating a moderate level of psychological distress, 22–29 indicating a high level of psychological distress and 30–50 indicating a very high level of psychological distress (Kessler et al., 2003).

The K-10 has been validated amongst university students and has a high reliability score with a Cronbach's alpha of $\alpha = 0.91$ (Stallman, 2010). The reliability score for the K-10 in this study was $\alpha = 0.92$. Different versions of the Kessler psychological distress scale have been tested and validated in the South African context (Andersen et al., 2011; Peltzer et al., 2012). The scale does not diagnose depression and anxiety but is a screening measure used to identify non-clinical symptoms of depression and anxiety (Kessler et al., 2003).

4.6.3.3 *The student stress inventory*

Stress levels among university students were measured using the student stress inventory (SSI) (Mohamed Arip et al., 2015). The SSI has 40 items divided into four subscales: physical *(e.g. headaches, back pain, sleep problems)*; interpersonal relationships *(e.g. I find it difficult to meet my parents' high standards, my friends did not care about me, I found it difficult to get along with groupmates when doing academic tasks)*; academic *(e.g. I have financial problems because of the expenses of the university, I feel stressed to sit for examinations, I feel the burden of my academic workload);* and environmental factors (*Crowding makes me feel uneasy, I have transportation problem, messy living conditions distract me)* (Appendix C). Each subscale has 10 questions to which participants are expected to respond using a four-point Likert scale, where "Never" = 1, "Somewhat frequent" = 2, "Frequent" = 3 and "Always" = 4. Scores for the SSI can range from 40– 160, with scores from 40–80 indicating mild stress, 81–121 indicating moderate stress and 122–160 indicating severe stress.

The SSI has been validated amongst university students globally and has a high reliability score with an overall Cronbach's alpha of $\alpha = 0.857$ (Mohamed Arip et al., 2015). In this study, the SSI had a high reliability score of $\alpha = 0.90$. This scale was selected for this study because of its ability to measure stress at different levels of functioning, such as physical stress, interpersonal relationships, academic stress, and environmental factors, which provided insights for this study when designing the intervention to suit students' needs. As evidenced in the literature, various psychosocial factors lead to stress in students (Bedewy & Gabriel, 2015).

4.6.3.4 *General coping skills*

Students' coping strategies were measured by the Brief-COPE 28 Scale. The Brief-COPE has 28 items measuring coping strategies based on avoiding or approaching coping styles, with 14 subscales and two items in each subscale: active coping *(I've been concentrating my efforts on doing something about the situation I'm in, I've been taking action to try to make the situation better;* self-distraction *(I've been turning to work or other activities to take my mind off things, I've been doing something to think about it less, such as going to movies or watching TV)*; denial *(I've been saying to myself "this isn't real", I've been refusing to believe that it has happened)*; use of emotional support *(I've been getting comfort and understanding from someone, I've been getting emotional support from others);* substance use *(I've been using alcohol or other drugs to make myself feel better, I've been using alcohol or other drugs to help me get through it)*; use of informational support *(I've been getting help and advice from other people, I've been trying to get advice or help from other people about what to do)*; venting *(I've been expressing my negative feelings, I've been saying things to let my unpleasant feelings escape)*; behavioural disengagement *(I've been giving up the attempt to cope, I've been giving up trying to deal with it)*; planning *(I've been trying to come up with a strategy about what to do, I've been thinking hard about what steps to take)*; positive reframing *(I've been looking for something good in what is happening, I've been trying to see it in a different light, to make it seem more positive)*; humour (*I've been making jokes about it, I've been making fun of the situation)*; religion (*I've been trying to find comfort in my religion or spiritual beliefs, I've been praying or meditating)*; acceptance *(I've been accepting the reality of the fact that it has happened, I've been learning to live with it)*; and self-blame *(I've been blaming myself for things that happened, I've been criticizing myself)* (Appendix D). The scale can determine an individual's primary coping style with scores on the following three subscales: problem-focused, emotional focused, and avoidance coping (Carver, 1997). Participants are expected to respond using a four-point Likert scale where "I haven't been doing this at all" = 1, "A little bit" = 2, "A medium amount" = 3 and "I've been doing this a lot" = 4. Scores are added for each coping style, and the style with the highest score indicates the most widely used coping style (Carver, 1997).

The scale has been validated and used in the student population and has a good reliability score ranging from 0.68 to 0.87 (Miyazaki et al., 2008). In this study, the Brief-COPE 28 had a reliability score of $\alpha = 0.78$. The Brief-COPE 28 Scale has been used in the South African context (Jordaan et al., 2007). This scale has been selected over the shortened versions because it measures several coping strategies, which provided insight into how students cope with psychological distress, and it helped when designing the intervention.

4.6.4 Procedures

A bulk e-mail with a link to the online survey was sent to 35 609 students registered at the University of the Witwatersrand on 8 March 2021. Thereafter, a recruitment poster with a link to the survey was shared on my social media platforms, such as Instagram and WhatsApp. The first part of the survey screened participants for eligibility. Eligible participants were directed to the online informed consent section and, if they agreed to the conditions of the study, they were directed to the survey. The survey ended if participants were ineligible or failed to complete the informed consent form.

4.6.5 Data analysis

Data were analysed using Statistical Analytics Software (SAS) version 9. Descriptive statistics, such as the means and standard deviation (SD), were assessed for continuous variables (psychological distress, stress, and coping). All the scales were tested for reliability by using the Cronbach alpha reliability test.

Frequency and percentage were determined for categorical variables (faculty, location, mobile phone use, citizenship, and university enrolment), and stratified by gender (female vs male vs non-binary), age group (18–20 vs 21–24) and level of study (first year vs second year vs third year vs postgraduate).

To test for statistical significance, chi-square analysis was used for gender and age, and the student t-test was used to compare continuous variables (psychological distress, stress, and coping). To compare the difference in mean scores between the level of study groups, analysis of variance (ANOVA) was used. If the p-value from the ANOVA test was significant between the groups, a Tukey test was used to determine which groups' means were significantly different.

4.7 PHASE 1: QUALITATIVE METHODS

4.7.1 In-depth interview participants

Although all 11 counsellors employed at the CCDU were invited to participate in the study, only six were enrolled. Two potential participants did not respond to the invitation to participate, one was not eligible, one was not interested in participating, and one was interested but not available owing to personal commitments.

According to Braun and Clarke (2013), the number of people enrolled in a qualitative research study is determined by data saturation. Data saturation refers to when interviews no

longer offer new data. Although a minimum of 12 interviews is recommended for data saturation, only half of the recommended interviews were conducted because of the unavailability of certain participants. Despite the small number of participants enrolled in the in-depth interviews, sufficient data were collected to reach data saturation. Burmeister and Aitken (2012) explained data saturation is about the depth of the data and not the number of interviews conducted. Therefore, the data that emerges from the interview is more important than the sample size. Data saturation was established when no new information occurred after five in-depth interviews. Participants gave similar responses in all five interviews on major study themes such as common mental health challenges experienced by students and counsellor's willingness to use an app intervention (Burmeister & Aitken, 2012; Fusch & Ness, 2015). During the sixth interview no new information occurred on the major themes, thereafter data saturation was determined (Burmeister & Aitken, 2012; Fusch & Ness, 2015). To ascertain data saturation, the depth of information and consistency of data were checked during the coding process by looking at the depth and similarity of the data associated with codes (Burmeister & Aitken, 2012; Fusch & Ness, 2015).

4.7.2 Focus group discussion participants.

Focus group discussions (FGDs) are unstructured discussions based on a specific topic between group members and a facilitator (Krueger, 2014). According to Kabir (2016), an FGD group size should range from 6 to 12 participants and 5 to 8 participants if the topic is sensitive (Fusch & Ness, 2015).

FGDs with university students were conducted online during the COVID-19 pandemic, when mental health challenges amongst university students were more acute than usual. Because of the sensitivity of psychological distress, the structure of the FGDs were adjusted to a ratio of 2 to 5 participants per FGD, which ran between 60 and 90 minutes. Krueger (2021) and Daniels et al. (2019) recommended 2 to 5 participants for online FGDs because a small group gives all participants an opportunity to take part, and the facilitator can manage the group with ease.

A total of 62 participants were enrolled in the FGDs, which were spread across 16 FGDs. Initially, the plan was to stratify the FGDs by gender, age, and level of study. However, given the sensitivity of the topic on psychological distress and the interviews being held online, some participants chose to form their own groups by asking the researcher if they could participate in the FGDs with their friends or classmates. This provided a safe space for them to talk without inhibition. As a result, the groups varied in age, gender, and level of study.

Although this is an unusual way of stratifying focus groups, rich data emanated from these groups because of the differences in participants' perspectives, experiences, and maturity (Kabir, 2016).

4.7.3 Recruitment for in-depth interviews

I requested permission from the registrar's office to conduct research with Wits University staff (Appendices F and G). Once approved, I sent an e-mail to the head of the CCDU requesting permission to interview CCDU staff (Appendix H). The e-mail included all the study documents, including a letter of permission, the participant information sheet and an informed consent form. Thereafter, the head of the CCDU forwarded the invitation e-mail to all her staff members. In the e-mail, she also informed the staff that I would send them a separate individual e-mail and that their participation would be voluntary. The following day, I sent an invitation e-mail to all counsellors employed at the CCDU. Interested participants replied to the e-mail by selecting the date they would be available and indicating which online platform worked best for them. Thereafter, another e-mail was sent with links to the online informed consent form (Appendix I) and the online meeting.

4.7.4 Recruitment for focus group discussions

Before submitting the online survey, participants were invited to be part of a focus group discussion. Those who expressed an interest were asked to share their contact details before submitting the survey on REDCap. In all, 146 students shared their contact details. When the survey closed, I retrieved all the contact information and sent invitation messages to all interested participants, either through WhatsApp, SMS, or e-mail. The invitation message included an online link to the participant information sheet, the informed consent form, and dates for the FGDs. Of the 146 potential participants contacted, only 35 replied, either by responding to the message or selecting a date that worked best for them.

At least 27 participants were accessed through social media or word of mouth. I shared the study poster (Appendix A) with the study details and my contact number on my social media platforms, such as WhatsApp and Instagram. Other people also reshared my posts on their social media platforms, which provided access to participants the study would not otherwise have reached. The date for the FGD meetings for participants accessed through social media or word of mouth were communicated and set up through WhatsApp messages.

All participants were sent a reminder message a day before the group discussions, which included a link to the informed consent form and online meeting.

4.7.5 Data collection instruments

A semi-structured in-depth interview guide (Appendix J) was developed to understand counsellors' experiences of working with students experiencing psychological distress and their perceptions of the acceptability of using a mental health app to address students' psychological distress. The interview guide had 10 questions to guide the discussions under the following headings: perceptions of psychological distress, work experience in psychological distress counselling, and perceptions of mental health mobile applications. The questions on the guide were developed based on the literature on psychological distress (Deasy et al., 2014; Drapeau et al., 2012), as outlined in Table 4.2.

Table 4.2: In-depth discussions with counsellors – interview guide

Question	Theory	Construct explored
1. What kinds of mental health challenges do students report at the CCDU?	Mental health literature	To understand the scope of psychological distress among students, and to determine whether their responses correlated with the findings from the survey and the literature showing that anxiety and depression are the most common mental health challenges amongst students
2. How do students describe their attempts to cope with these challenges?	Cognitive behavioural theory	Behaviours of students who reported to the counsellor when experiencing psychological distress
3. What could be the benefits of using a mobile app-based intervention for psychological distress?	Perceived usefulness	Potential benefits for students in using the app
4. What do students understand by psychological distress?	Mental health literature	Perceptions, thoughts and feelings students attached to the concept of psychological distress, and also to explore students' mental health literacy

Question	Theory	Construct explored
5. How is psychological distress addressed at CCDU?	Literature	The ways counsellors addressed psychological distress with students
6. What are your views on the use of mobile apps to support students' mental health needs?	Perceived usefulness	Counsellors' views on the use of apps for students' mental health
7. Do you think students would be willing to use a mobile app for psychological distress?	Perceived usefulness	Counsellors' perceptions of whether students would be willing to use a mental health app
8. What would be the barriers to using a mobile app for psychological distress?	Perceived usefulness	Potential barriers that would prevent students from using the app
9. Would you be willing to use a mobile app for supporting psychological distress in students?	Perceived usefulness	Counsellors' willingness to use the app in the future
10. What behaviours should this app target?	Perceived usefulness	Counsellors' perceptions of the focus of the app

4.7.5.2 *Semi-structured interview guide focus group discussions*

A semi-structured FGD interview guide was developed to collect data (Appendix K). Using the responses from the survey and the in-depth interview (IDI) with the counsellors, the FGD guide was adjusted. New questions were added based on the findings from the survey and IDIs. Initially, the guide had 27 questions, 17 under mental health and 10 under app development, but in the end, it had 15 questions, six under mental health and nine under app development.

According to Kabir (2016), an interview guide serves as a mind map for discussion. Therefore, the guide for this study was structured coherently and had two sections: mental health and mobile app development. The questions on the mental health section were adapted based on the literature, cognitive behavioural theory, and the technology acceptance model (TAM).

The questions on mental health were based on psychological distress, mental health literacy literature, and cognitive behavioural theory. Questions assessed students' perceptions of psychological distress, their knowledge of mental health structures on their campus, and barriers to accessing mental health care. Table 4.3 outlines the theory used, the construct that was being explored, and the question in the interview guide.

Table 4.3: Focus group discussions with students – interview guide

Question	Theory	Construct explored
1. What comes to mind when you hear the word psychological distress?	Mental health literacy literature Cognitive behavioural theory	Perceptions of psychological distress. Thoughts and behaviours associated with psychological distress
2. Would you say students are able to differentiate between stress and anxiety?	Mental health literacy literature Cognitive behavioural theory	This question was adapted from counsellors' interviews after findings from the IDIs revealed that students do not know the difference between stress and anxiety
3. What are the causes of psychological distress among students?	Mental health literacy	To identify stressors leading to psychological distress amongst university students
4. What support structures within the university do you know of that assist with psychological distress?	Mental health literacy literature	The mental health literacy of students regarding campus counselling
5. What do you think can be barriers to using the provided support structures at university?	Mental health literacy literature	This question aimed to explore the barriers preventing students from help-seeking.

One question posed to students concerned the coping strategies they employed. This question was based on cognitive behavioural theory and the coping strategies highlighted on the Brief-COPE scale (Carver, 1997).

Table 4.4: Question on coping strategies

Question	Theory	Construct explored
What ways do you know of for dealing with or coping with psychological distress?	Cognitive behavioural theory Coping styles	Behaviour, coping strategies

The questions on the mobile app development component were constructed based on TAM components: perceived usefulness and ease of use. Three sub-categories were applied: perceptions, features, and outcomes, which were used to explore other aspects of perceived usefulness (Davis, 1989). Table 4.5 below outlines the theory used, the construct being explored, and the question asked in the interview guide.

Table 4.5: Mobile app development questions

Question	Theory	Construct explored
1. What are your thoughts about using a mental health app to alleviate psychological distress? 2. What could be the barriers or challenges of using a mobile app for mental health? 3. What could be the benefits of using a mobile app-based intervention for psychological distress?	Perceived usefulness	Students' perceptions, attitudes, and beliefs about mental health apps
4. What features would you like to see on the mobile app? 5. What support structures would you like to see on the app? 6. Which other technological platforms can assist with mental health?	Perceived usefulness	To obtain information on features that would be useful for an app developed for university students

Question	Theory	Construct explored
7. What should the app do to be able to benefit students? 8. If you were to use the app, how do you think it would benefit you? 9. What result would you like to see after using the app?	Perceived usefulness	Perceived or expected benefits or outcomes from using a mental health app

4.7.6 Procedures

4.7.6.1 *In-depth interviews*

Data collection for in-depth interviews started on 8 March 2021 and ended on 15 June 2021. A day before the interview, participants were sent an online link via e-mail, which included the participant information sheet and an online informed consent form. All interviews were conducted on the Zoom online platform and lasted for at least 30 minutes. As a technical error occurred during the first interview, the interview could not be recorded. Therefore, this interview was not transcribed, but notes taken during this interview were used as a reference during the data analysis process.

4.7.6.2 *Focus group discussions*

Participants were sent a reminder message and a link to an online consent form the day before the discussion via WhatsApp or e-mail. After reading the consent form, all students were required to consent by clicking "I agree to participate" before participating in the FGDs. Owing to the COVID-19 pandemic, all FGDs were conducted online on the Google Meet platform, chosen by students when they were contacted regarding their availability for the FGD. The Google Meet platform appears to have been more was accessible to students and had no time limitations. The FGDs were 45–60 minutes long. While using the platform, some groups experienced technical or connection difficulties. When this happened, the meeting was moved to Zoom or Microsoft Teams, depending on the student's accessibility to the platforms. Focus group discussions were either facilitated or co-facilitated by myself (TM) or by an MA research assistant (SM). The co-facilitator of each FGD took notes, which were used for debriefing sessions after the discussions (Kabir, 2016). The debriefing session was conducted online immediately after the FGDs. We discussed the themes and mood that

dominated the discussion, and thereafter our own biases and feelings during the FGD. We also met ten minutes before the discussion to discuss our mental and emotional state, which allowed us to choose which person was most suited to facilitating the FGD.

4.7.7 Data analysis

4.7.7.1 *Thematic analysis*

All qualitative data were analysed using a reflexive thematic analysis (Braun & Clarke, 2006). Reflexive thematic analysis focuses equally on the theory guiding the study and participants' responses in answering the research questions (Braun & Clarke, 2019; Byrne, 2022). When using reflexive thematic analysis, themes are developed through the grouping of codes that speak to a specific core concept (Braun & Clarke, 2019; Byrne, 2022). This process is also known as deductive thematic analysis (Braun & Clarke, 2019).

The themes in this study were determined first by their relevance to answering the research questions and second by the recurrence of the theme throughout the data set. While quantitative methodologies rely on statistical significance, qualitative methodologies do not have a fixed measure. Braun and Clarke (2006) encouraged researchers to determine what elements of their data count as a code, subtheme or theme. This approach focuses on the data's ability to answer the research questions, instead of focusing solely on the recurrence of a concept.

I focused on the data emerging from the dataset and thereafter connected the data to the relevant theories guiding the study, i.e., cognitive behavioural theory and TAM. Cognitive behavioural theory was connected to data describing psychological distress and the content that should be included in the app, while the TAM component of perceived usefulness was connected to the data relating to how the app should function to benefit students. For both IDIs and FGDs, I followed the six steps of thematic analysis as recommended by Braun and Clarke (2006):

1. I familiarised myself with the data by listening to the first two audios sequentially and reading through all transcripts and notes taken during IDIs and FGDs. This process assisted with identifying central ideas emerging from the texts relating to the research questions, literature, and the guiding theories of the study.
2. I engaged with the transcripts by doing line-by-line coding, which involved highlighting and making notes on interesting words, sentences and phrases in the transcripts. Main codes that answered the research questions were organised in a meaningful and systematic way by highlighting each code differently. I then created a codebook with all the main codes, which were then paired with the relevant data extracts.

3. Thereafter, similar codes were collapsed together to develop themes. After the themes were developed, I scrutinised them to determine whether they overlapped and whether some of those themes could be classified as subthemes.

4. Once all the themes had been developed, I revised, rearranged and discarded some themes, while others became sub-themes. I then ensured that all the extracts were relevant to each theme and subtheme. In the process of reviewing the themes, I followed Braun and Clarke's (2006) suggestion to use a visual mind map to connect the identified main themes, subthemes and their connectedness to the research question. Figure 4.4 presents a rough draft visual map for the IDIs with the counsellors and Figure 4.5 for the FGDs with the students. Figure 4.6 integrates the themes and sub-themes highlighted in Figures 4.4 and 4.5.

5. Finally, I refined all the themes by renaming those that needed to be renamed to ensure they captured what the theme was about, and I related the essence of each theme to the research questions. The diagram for final themes and subthemes is reported in the results section in Chapter 5. Final themes from counsellors and students were integrated (Figure 4.6) to simplify reporting in the results section.

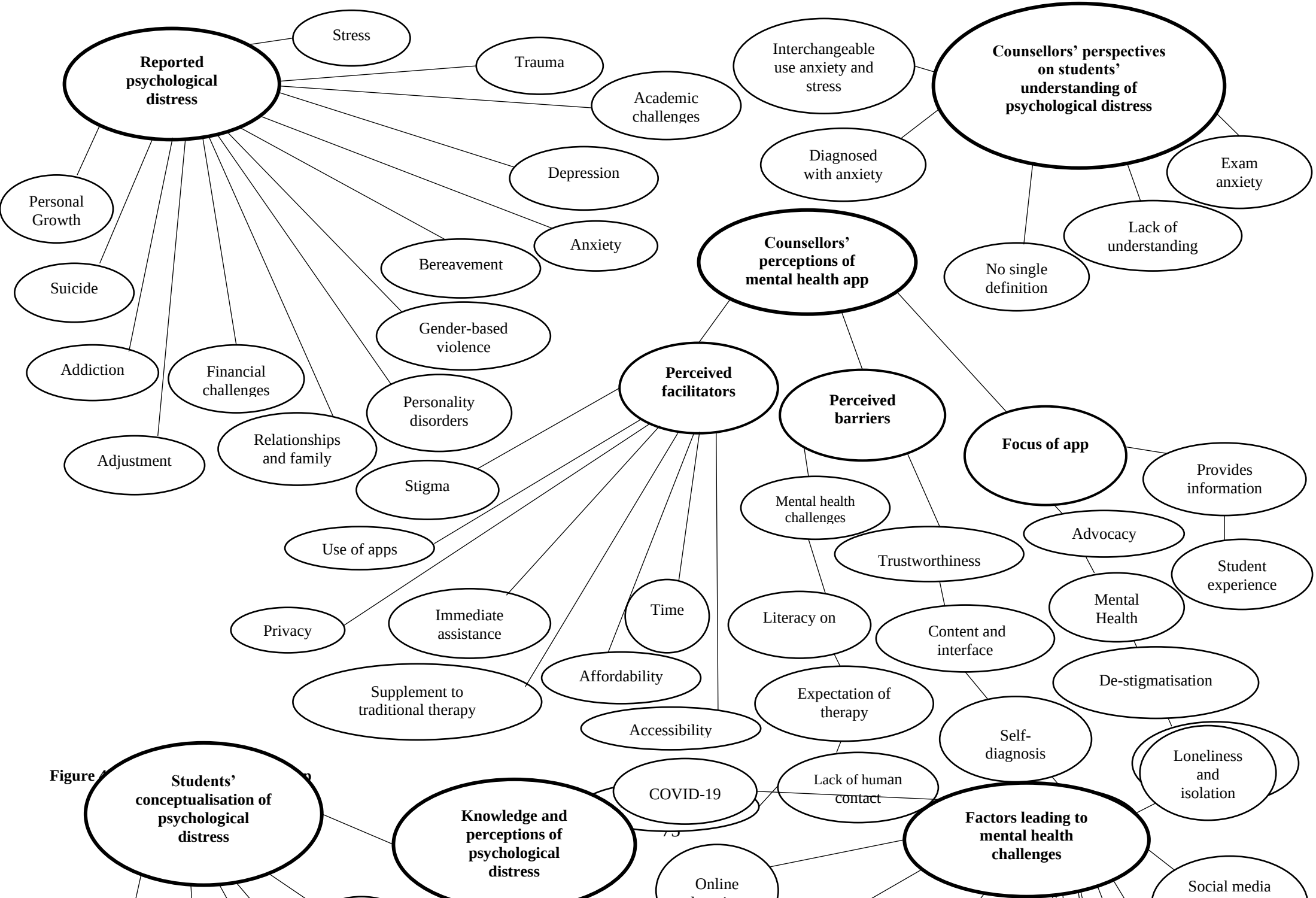

Reported psychological distress
Stress
Trauma
Academic challenges
Depression
Anxiety
Bereavement
Gender-based violence
Personality disorders
Relationships and family
Financial challenges
Addiction
Suicide
Personal Growth
Adjustment
Counsellors' perspectives on students' understanding of psychological distress
Interchangeable use anxiety and stress
Diagnosed with anxiety
Exam anxiety
Lack of understanding
No single definition
Counsellors' perceptions of mental health app
Perceived facilitators
Perceived barriers
Focus of app
Stigma
Use of apps
Privacy
Immediate assistance
Supplement to traditional therapy
Time
Affordability
Accessibility
Mental health challenges
Trustworthiness
Literacy on
Content and interface
Expectation of therapy
Lack of human contact
Provides information
Advocacy
Student experience
Mental Health
De-stigmatisation
Self-diagnosis
Loneliness and isolation
Students' conceptualisation of psychological distress
Knowledge and perceptions of psychological distress
COVID-19
Factors leading to mental health challenges
Online
Social media

Figure 4

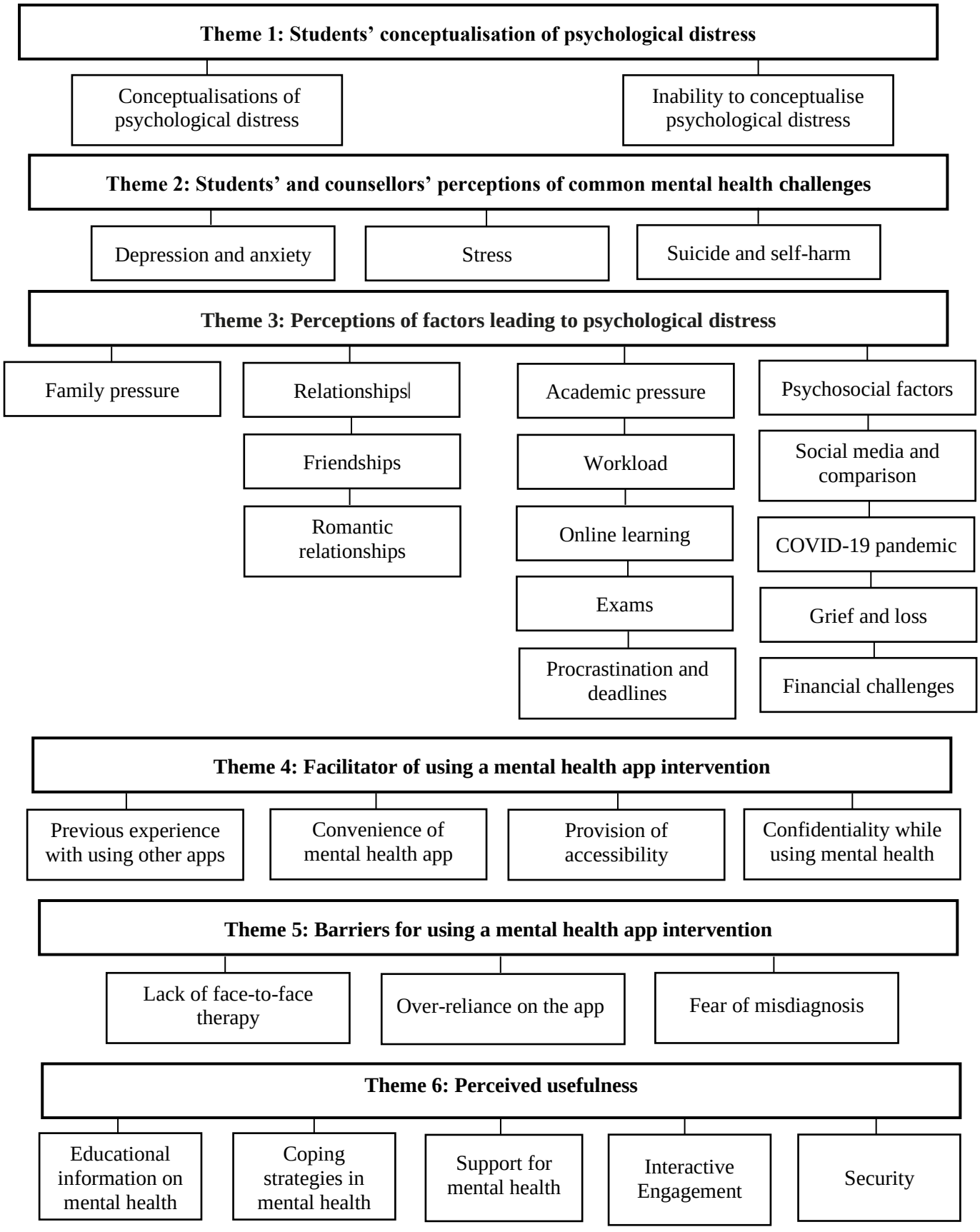


Figure 4.6: Integrated thematic map

4.7.7.2 *Themes for FGDs and IDIs*

To ascertain the themes captured from the above analysis, two research assistants trained in qualitative research methods recoded the data through NVIVO, a qualitative data analysis software package produced by QSR International. Inter-rater reliability was obtained by the two research assistants. The research assistants used the existing coding framework that I created during thematic analysis. They read through four transcripts to gain an understanding of the data and identify emerging codes. Each transcript was then individually coded using a line-by-line technique to assign codes to the text. A second analyst also coded the same transcripts using a line-by-line technique to identify codes. I reviewed the codebook after this process to resolve any discrepancies. All emerging codes were added to the existing coding framework and a final codebook was developed. Thereafter transcripts were uploaded on NVIVO, and the research assistants then coded all transcripts using the same codebook on NVIVO. Once the coding was completed, the research assistants compared the codes. Thereafter, we agreed on the all the codes that were highlighted.

4.8 PHASE 2: APP DEVELOPMENT PROCESS

Phase 2 integrated the quantitative results and qualitative findings from Phase 1 to develop the mental health app intervention.

4.8.1 Integration process

In mixed methods research, triangulation and method matrices are the most widely used approaches to combine quantitative and qualitative data (O'Cathain et al., 2010). Moran-Ellis et al. (2006) introduced a different method for integrating qualitative and quantitative data called 'following a thread', which entails four steps, as illustrated in Figure 4.7.

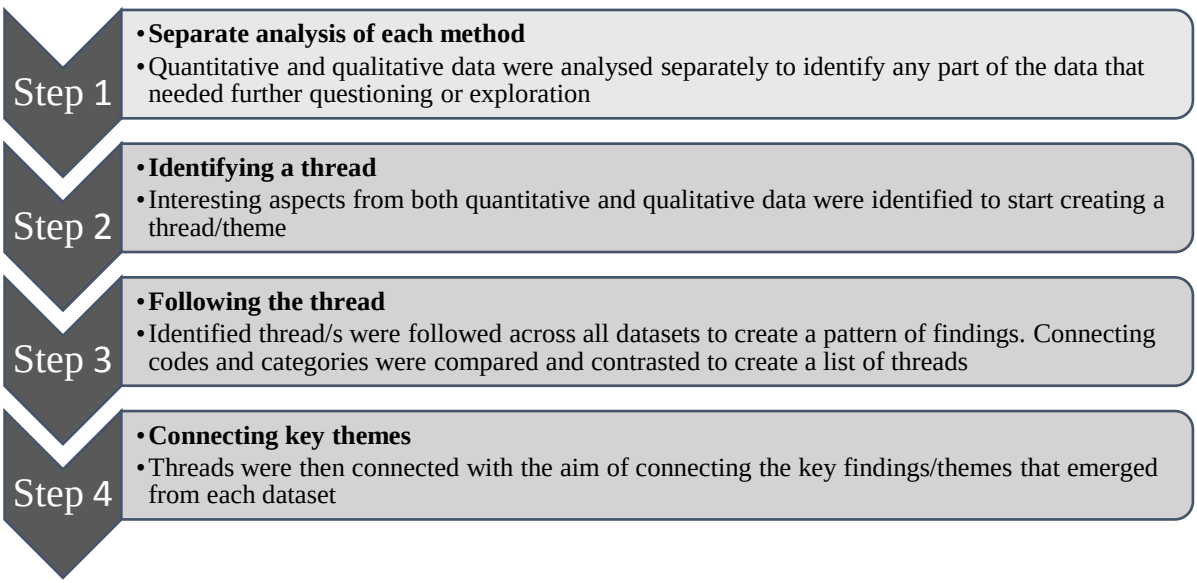


Figure 4.7: The four-step methods of integrating qualitative and quantitative data

4.8.2 Quantitative thread

Specific quantitative data were identified as useful for developing the app and were used to identify threads that could be followed into the IDI and FGD dataset. These included data on the levels of psychological distress, mental health challenge diagnoses, and common coping strategies, which were essential in connecting data on the content to be included in the app.

While data such as level of study, mobile phone use, health app use, and accessibility to mobile data were used to determine the feasibility of a mental health app for university students, these are discussed in depth in the results section.

To follow the thread relating to the prevalence of psychological distress, mental health diagnosis, and common coping strategies, the qualitative key findings relating to these were categorised based on cognitive behavioural theory principles of thought patterns, feelings, and behaviours. The thread was also used to identify components of cognitive behavioural theory that both participants and counsellors highlighted as important in addressing psychological distress (Table 4.6).

Table 4.6: Cognitive behavioural theories for addressing psychological distress.

Thread followed	Cognitive behavioural theory principle	Students and counsellors	Applied cognitive behavioural therapy (CBT) technique	App reference
Mental health diagnosis/prevalence of psychological distress	Thoughts	Experiences such as worthlessness, failure, despondency, and hopelessness associated with negative automatic thoughts were highlighted by both counsellors and students.	According to Knapp and Beck (2008), negative automatic thoughts are addressed by cognitive restructuring, which includes challenging negative thoughts. I looked for themes or ideas related to the CBT technique shared by both students and counsellors to assist with cognitive restructuring. These included a personal journal, reminders, and educational information regarding thought processes.	Journal, Information, Podcast, Videos, Seek Help and Forum

Thread followed	Cognitive behavioural theory principle	Students and counsellors	Applied cognitive behavioural therapy (CBT) technique	App reference
Prevalence of psychological distress	Feelings	Experiences of anxiety, sadness, stress, feeling overwhelmed, lack of control, and pressure surfaced from both students and counsellors.	Cognitive restructuring is also important in addressing negative feelings (Knapp & Beck, 2008). I looked for themes that were related to CBT techniques shared by both students and counsellors that could be used to assist with addressing negative feelings, which included relaxed breathing, reflective journaling, and tracking one's own mood. These components were added into the app intervention.	Track Mood, Podcast, Videos, Seek Help and Forum
Common coping strategies	Behaviours	Experiences regarding students' behaviours when under psychological distress were highlighted by both students and counsellors. These included substance use, sleeping, denial, procrastination, and comfort eating.	I looked for themes that were related to CBT techniques shared by either students or counsellors, which could be used to assist with addressing negative behaviours or ways of coping. They included information on how to be physically active, how to develop sleep habits, relaxed breathing, and setting personal goals for one's behaviour.	Coping Strategies, Podcast, Videos, Seek Help and Forum

Data on mobile phone use, health app use, and accessibility to mobile data were identified as important components to consider before developing the app. Threads were followed on these aspects and were categorised within the TAM framework, which was used to identify the common key findings relating to these threads amongst both students and counsellors, as highlighted in Table 4.7.

Table 4.7: Common findings relating to threads among students and counsellors.

Thread followed	TAM	Students and counsellors	TAM application	App reference
Mobile phone use Health app use	Perceived usefulness	Support for mental health, coping strategies, educational information, immediate assistance	I looked at the common themes students and counsellors shared and believed would make the app useful for students.	Mood Diary, Thought Diary, Coping Strategies, Podcast, Videos, Seek Help and Forum.
Accessibility to mobile phone data Mobile phone use	Perceived ease of use	Reminders, accessibility, affordability	I looked at themes from both students and counsellors highlighting aspects they believed would make the intervention easy for students to use.	Free Access, push notifications for Thought Diary and Mood Diary

4.8.3 Prototype development process (step-by-step)

1. During a preliminary analysis, all data emerging from the survey, IDIs, and FGDs were integrated. Major themes of study and specific aspects to be included in the app intervention were presented to the supervisors.
2. A meeting with a mobile health (mHealth) and CBT expert was held to discuss the findings of the study and the incorporation of CBT principles into the app.
3. A meeting was held with the app developers, who were presented with a mind map to follow for the app's development.
4. A prototype app, MentaLit, was developed on a website (https://www.mentalit.co.za/) based on the mind map presented to the developers. Several meetings were held between the developers and me to refine the app's content and interface. Once I was satisfied, a link to the website-based app was sent to supervisors for feedback.

5. Once all queries from the supervisors had been addressed, a member-check meeting was held with students who had participated in the FGDs to test the content on the website and offer feedback.
6. Once feedback had been received, improvements were made on the website, and then transferred to the app.

4.9 PHASE 3: EVALUATION OF THE APP INTERVENTION

Phase 3 of the study aimed at evaluating the app based on perceived ease of use, which is a component of TAM. Evaluation started from 1 December 2022 and ended on 20 January 2023.

4.9.1 Participants

4.9.1.1 *Students*

A total of 119 students were enrolled in the online survey to meet Objective 5 of the study, which was to test and evaluate the usability of a mental health app designed for students. However, only 59 students completed all the MARS subscales and only these were included in the overall analysis. While the initial plan was to enrol 90 university students and 10 counsellors, this was not possible because of incomplete responses from the survey from students and lack of participation from counsellors. However, the current sample provides sufficient data and meets the criteria suggested by Zou (2012) of enrolling at least 41 participants to establish a confident estimation of the inter-rater reliability of the MARS.

4.9.1.2 *Counsellors*

Three counsellors from the CCDU completed the online survey. Two participants sent an e-mail stating they were not interested in the study, while two participants were interested but could not download the app on their phones because they owned IOS software mobile phones.

4.9.2 Recruitment

An invitation e-mail to complete the online MARS survey was sent to 38 701 students enrolled at Wits University. Students from other universities were recruited through word of mouth and by sharing a recruitment poster which had a link to the app and the survey. The poster was shared on social media platforms, such as WhatsApp and Instagram.

To recruit counsellors, an invitation e-mail to participate in Phase 3 of the study was sent out to all nine counsellors employed at the CCDU at the time. Four of the counsellors were previously recruited for Phase 1 and five of the counsellors were a recent addition and not employed at the CCDU when Phase 1 of this study commenced.

4.9.3 Data collection instrument: Survey

An online survey based on the MARS was used to collect data on REDCap (Vanderbilt University, 2004). Two types of mobile application rating scales have been developed: the original MARS designed for researchers and consumers (Stoyanov et al., 2015) and the uMARS, which was validated for end users (Stoyanov et al., 2015). Although the scales are almost identical, the original MARS includes three crucial questions on information (*Does the app contain what it describes? Does the app have specified, measurable and achievable goals? Has the app been trialled or tested?)*, which are excluded from the uMARS. For this reason, the original MARS was used instead of uMARS.

4.9.3.1 *Sociodemographic information*

The survey collected students' socio-demographic data on gender, age, level of study, university enrolment, and faculty.

4.9.3.2 *Perceived ease of use*

The survey evaluated perceived ease of use based on the MARS. The MARS has been used in 59 studies testing mobile health apps, including mental health (Stoyanov et al., 2015). The MARS has been used to evaluate the quality of mobile health applications in different health settings including HIV/AIDS, dentistry, and diabetes (Kalhori et al., 2021; Raeesi, 2022; Roy et al., 2022; Stoyanov et al., 2015). The MARS has two components:

- The first component measured participants' experiences using the app and included 23 items based on five categories: engagement, functionality, aesthetics, information, and subjective quality. Participants were required to give a score from 1 to 5 for each question, where 1 = "Inadequate" and 5 = "Excellent".
- The second component measured the perceived impact of the app on the user's knowledge, attitude, intention to change, and potential change in the target health behaviour. The second component comprised six questions, and participants were required to give scores on a scale of 1–5, where 1 = "Strongly disagree" and 5 = "Strongly agree". This is an extra scale on the MARS and has rarely been used in other studies.

The MARS has been proven to be reliable, with a high Cronbach's alpha of $\alpha = .90$ and inter-reliability of 0.79 (Stoyanov et al., 2015). In this study, the MARS had a reliability of 0.93. The MARS corresponds with TAM as it measures the intention of use, which may help to explain people's motive behind people using an app. Components of the MARS, such as

engagement, functionality, aesthetics, and information, significantly influence an individual's perceptions of the ease of use. For example, if participants like the aesthetics of the app, they may be influenced to use it (Chandrashekar, 2018). To my knowledge, the MARS has not been used in the South African context and within the student population but has been piloted for validity in Arabic-speaking African countries, such as Sudan and Algeria (Bardus et al., 2016).

4.9.4 Procedures

Permission to conduct Phase 3 of the study was obtained during Phase 1 of the study. Permission was granted by the research ethics committee, the registrar's office, and the head of CCDU. Although the app was completed in November, the survey could not be sent out during this time because students were busy with exams. Once exams were completed, a bulk e-mail inviting students to participate in the study was sent on 1 December 2022 to 38 701 students registered at Wits University. The e-mail invitation included a link—https://my.mobiroller.com//downloadAPK/?apk=2116923381216.apk—which was used to download the app. Within the app, participants could click on a section titled 'App Survey' to complete the survey. A link to the survey was also provided in the e-mail in case they experienced a problem with the in-app survey. A poster with a link to the survey was shared on social media platforms, such as WhatsApp and Instagram.

4.9.5 Data analysis

Data were analysed using statistical analysis software (SAS). Overall frequencies and percentages were determined for categorical variables and means (standard deviations) were calculated for continuous measures. The MARS uses mean scores instead of total scores to rate the quality of the app. The overall quality mean score of the mobile app is obtained by summing up the mean scores of the subscales (engagement, functionality, aesthetics, information, and subjective quality). The MARS can also be assessed by the average of the total mean score of each subscale and is based on a 5-point Likert scale. Therefore, mean scores range from 1.0 to 5.0, with scores from 3.0 indicating high quality (Roy et al., 2022).

Internal consistency for the scales was assessed using Cronbach's alpha to determine how closely related the items are as a group. The total correlation for each item was calculated using Pearson's correlation coefficient (r) by calculating the correlation between each item and the sum of the other items on the scale. Factor analysis was conducted for questionable scales to determine items that contributed the least to factor loadings.

4.10 ETHICAL CONSIDERATIONS

4.10.1 Permissions

Permission to conduct research with students and staff at Wits University was requested from the registrar's office for all three phases (Appendices F and G). Thereafter, permission to conduct research with counsellors from the head of the CCDU (Appendix H) was requested and granted for all three phases. Once all permissions had been granted, ethical clearance to conduct the research was requested and granted (Appendix L).

4.10.2 Ethics approval

The study received ethical clearance from the Human Research Ethics Department (HREC), non-medical at Wits University, ethics clearance number: H21/01/23.

4.10.3 Informed consent

All participants enrolled in the survey, in-depth interviews, focus group discussions, and questionnaire were required to read a participant information sheet (Appendix M) and complete an online-based informed consent form (Appendix N) before participating. In both the information sheet and online consent form, participants were informed that their participation was voluntary and that there would be no benefit to them for participating. They were also informed that they could withdraw from the study at any time.

4.10.4 Anonymity, confidentiality and privacy

Anonymity was maintained in the survey—participants' identifying information was not collected during the survey, and no personal information was mentioned in the thesis or publications. Some participants shared their e-mail addresses and cell phone numbers for recruitment purposes on the survey, which could potentially identify them. Therefore, to maintain their anonymity and the confidentiality of their information, all data were stored in REDCap, which has a secure web-based password authentication (Vanderbilt University, 2004).

The IDIs were based on confidentiality and not anonymity, as participants were known to the lead researcher (TM). Participants used their real names in the interviews, but none of their identifying details were mentioned in the thesis or publications.

Confidentiality in focus groups was encouraged. Participants were requested not to divulge information shared in the group or each other's identities. Participants were also requested to conceal their faces during the discussion by switching off their cameras. To maintain anonymity in reporting, no identifying details of participants were mentioned in the thesis or publications.

To maintain privacy, the IDIs and FGDs were conducted in a private room occupied only by the researcher. Data collection was conducted online, which allowed participants to choose the time and a place in their own environment to allow for their own privacy. The researcher refrained from asking questions unrelated to the research aims and excluded irrelevant information during analysis. Participants' personal data such as mobile phone numbers and email addresses were saved on REDCap, which is password protected and can only be accessed by the researcher; personal data would not be shared with third parties or reused for other studies.

4.10.5 Data storage

All online documentation, including demographic forms, participants' contact details, and informed consent forms, was stored on REDCap (https://projectredcap.org/software/). REDCap is a password-protected web-based application used to create and store online surveys and databases.

Audio-recordings and transcribed data were kept on a password-protected computer. All paper-based documentation was kept in a locked filing cabinet in a supervisors' office at the Department of Psychology. Only the supervisors have access to the locked filing cabinets. Paper-based data would be destroyed after six years unless submitted for publication.

4.10.6 Psychological risk

The research topic and the data collection tools were categorised to carry low psychological risk by the Wits HREC. A distress protocol for sensitive topics in qualitative research guided by Draucker et al. (2009) and Haigh and Witham (2013) were put in place in case of emotional distress. The distress protocol comprised three stages. Stage one would be implemented if a participant started showing distress—the researcher would stop the interview to ascertain the participant's emotional state and whether they were able to continue with the discussion. If they were not able to continue, stage two was initiated—the researcher would inform the participant about the available counselling services and connect them with a counsellor if they expressed an interest in receiving counselling. In the final stage, the researcher would follow up two days after the discussion to assess the participant's wellbeing.

Since the study carried low psychological risk, it was not expected that students would experience psychological distress. However, during the FGDs, a participant showed emotional distress during the discussion. I followed the steps in the distress protocol by contacting the Wits crisis line on the participant's behalf and with their permission, and the

participant received the support needed. I followed up with the participant two days after the counselling session to ascertain their wellness. It is worth noting that data were collected during the COVID-19 pandemic when students were isolated and learning remotely, which may have triggered emotional distress.

4.11 TRUSTWORTHINESS

Ensuring trustworthiness is a crucial element in research. Trustworthiness in qualitative methods is assessed through credibility, transferability, dependability, and confirmability, as introduced by Guba and Lincoln (1981).

4.11.1 Credibility

Credibility refers to the "confidence in the truth of the research findings" and was ensured in this study by using peer debriefing and member checks, as recommended by Guba and Lincoln (1981). After each focus group discussion, I shared my experiences and perceptions about the FGDs with the co-facilitator, who, in turn, offered her own insights. This helped me to avoid having a one-sided approach when interpreting the data. I also conducted a synthesised member check, also known as informant feedback (Birt et al., 2016). I shared my interpretations of the findings with focus group participants to ensure that my interpretations of the findings matched the meanings and perspective shared by participants. Participants were also presented with a prototype mental health app for which they offered feedback on whether their perspectives and expectations matched the app's outcome. The feedback offered by participants was then used to make changes on the final app.

4.11.2 Transferability

Transferability is when the findings of a study can be applied to similar studies within different contexts, settings, and with different participants (Korstjens & Moser, 2018). To ensure transferability, all details pertaining to the study were described comprehensively, including the study setting, procedures and participant demographic information.

4.11.3 Dependability

Dependability refers to a trail of information showing how the study is conducted and how it can be replicated in the same context to obtain the same results (Guba, 1981; Moon et al., 2016). To ensure dependability, the process leading to using a multiphase convergent parallel mixed methods research design was detailed, including the adopted paradigm and all the data collection tools. These tools included an online survey, in-depth interviews (IDIs) and focus

group discussions (FGDs). All six steps of the thematic analysis, including the coding process and a thematic map, were provided. The co-facilitator and I shared an in-depth reflexive review of the study to share any biases which may have influenced the study. Two researchers ascertained the data by conducting data analysis on NVIVO process to ensure reliability of the data.

4.11.4 Confirmability

Confirmability is when research findings can be confirmed by another researcher (Korstjens & Moser, 2018). To establish confirmability, I had two research assistants who assisted with the data coding and analysis process. The final codebook was then shared with the study supervisors for approval. This process reduced any personal biases I may have held as a researcher.

4.11.5 Reflexivity

According to Sutton and Austin (2015), the researcher is also a tool for data collection in qualitative research, which can give rise to subjectivity in the research process. Therefore, it is essential for the researcher to reflect and acknowledge any personal biases, contextual influences, or experiences which may have influenced the research processes. This process is known as reflexivity (Olmos-Vega, 2022). The literature suggests three forms of reflexivity: personal (about the researcher), methodological (applied methods), and contextual (setting of the study).

4.11.5.1 *Personal reflexivity*

Personal reflexivity focuses on evaluating the researcher's subjective experiences, assumptions, and expectations, which may influence how data are collected, analysed, and presented (Olmos-Vega, 2022). Jacobson and Mustafa (2019) maintained that identifying one's social identity and how it impacts research is an important way of beginning personal reflexivity. An important part of personal reflexivity is one's identity and positionality, which refers to the position the researcher adopted throughout the research. This includes how their personal characteristics, such as identity, age, gender, and academic background may have influenced the study process (Wilson et al., 2022).

4.11.5.2 *Identity and positionality*

I believe that parts of my identity may have influenced how the research was conducted. I am a black female psychology postgraduate student at the University of the Witwatersrand and was 25 years old at the inception of the study. Because of these parts of my identity, I am

aware of the limited availability of knowledge, awareness and services for mental health, particularly for youth. These elements were motivating factors for me to start the research study. When I started the PhD degree, I had two years' working experience at a research institute (Perinatal HIV Research Unit) and had been exposed to different digital health research projects, which may have influenced how I selected the methods and my overall approach to the study.

During the time of data collection, I was 26 years old and enrolled in university. The participants in the study were between the ages of 18 and 24, enrolled at a South African university, undergraduate students, and mostly in their third year of study. Common characteristics between myself and the participants, such as age range and university enrolment, could have reduced any power dynamics and awkwardness that can occur when discussing sensitive issues. However, my identity as a psychology postgraduate student may also have put me in a position of social power with the participants. It is possible that they perceived my co-facilitator and me as more knowledgeable. I noticed that during FGDs, most participants kept saying "I'm not sure if this is correct" or "correct me if I am wrong" before sharing their perspectives, I had to remind participants that the aim was to share different perspectives and not provide correct answers. This reminder put participants at ease to share freely.

As a student who has been studying at university level since 2013, I am aware of the social and academic pressures that come with being a student and have had personal experiences with psychological distress. As a result, the challenges highlighted during the FGDs were relatable, compelling and gave me a deeper appreciation for the students' perspectives. I believe my experience with difficulty adjusting to the university social and academic environment as an undergraduate student and my current challenges as a postgraduate student compelled me to be more compassionate and understanding, and to create a safe space for participants to speak freely without fear of judgement.

4.11.5.3 *Researcher's reflexivity*

This section describes the reflexivity process by highlighting personal biases that may have influenced the research and the steps I took to address these personal biases. The reflexivity process began before and continued after the data collection process.

During the discussions, I became aware that some participants used the FGD platform to share their personal experiences with psychological distress, particularly during COVID-19. Some participants were using the platform to share personal experiences they had never shared with other people. While this confirmed that students had a lot to share regarding their mental

health, it also confirmed that, if given the right platform, discussions on mental health could bring awareness and prompt students to seek help. I became concerned that some of the participants could be triggered later after the discussion or trigger other participants. To address this concern, I encouraged all participants to seek professional help if they wanted to discuss their feelings further.

Some of the topics discussed during the FGDs were sensitive and triggering. During one of the FGDs, a participant showed emotional distress, which also caused me to experience emotional discomfort. To address this discomfort, I had a discussion with my co-facilitator and supervisor after the FGD about my emotions. We also discussed how to better approach FGDs to avoid the stirring of emotional distress from participants.

During the FGDs, I also realised that I may have approached the study with a mindset that an app is a practical and suitable intervention for students' mental health. This may have affected the way I probed participants who had a different perspective or who preferred face-to-face counselling. However, my co-facilitator, a master's student (SM) who was not part of the proposal writing of this project, facilitated half (8 out of 16) of the FGDs while I co-facilitated. I believe this minimised any biases I may have had regarding the mental health app. The co-facilitator shares her own personal reflections below.

4.11.5.4 *Co-facilitator's personal reflexivity*

"I approached each interview—either as a facilitator or co-facilitator—with an open mind and tried to maintain a neutral position. I was aware of the potential biases considering my relatively recent status as a university student. Based on my recent experience, I was aware of the complexities and challenges students face in university. This reality sometimes influenced the interview process. For example, when students shared their experiences, I could relate to most of them, which may have influenced which responses I chose to dwell on as a facilitator or the way I probed them."

"Our differences and similarities played different roles in the data collection process. While our similarities (age, gender, race) made participants open and trusting with their information, our differences caused them to put us on a pedestal. They thought we had the power to make the changes they wanted as university students. They felt that we, the facilitators, could influence how universities approached and addressed students' mental health issues. For example, in numerous instances with different participants, they had grand, sometimes unrealistic, ideas about the functions of the mobile app. They were unaware of our limitations (in terms of budget and technological expertise) as researchers."

From my personal reflection (TM) and that of the co-facilitator (SM), it is evident that our identity and positions as young female psychology postgraduate students at an elite university

cast us as knowledgeable and capable of providing solutions. Our positions within the department of psychology may also have given the impression that we were qualified to counsel students in their mental health challenges, despite having reiterated that we were only researchers.

Having been undergraduate students ourselves, our reflexivity also reveals that we are not completely divorced from the issues triggering psychological distress amongst students. Moreover, while we approached the FGDs from a neutral position, we concede that certain biases may have influenced how we interviewed participants and interpreted what they were saying. Finally, we acknowledged the importance of regularly checking how our identities and positionalities were influencing the interview process. Demonstrating an understanding of how our identities and positionalities made us relatable and contributed to students' responses and the overall study.

4.11.5.5 *Methodological reflexivity*

Methodological reflexivity refers to the consideration of how the methods applied in a study may have affected its outcomes (Olmos-Vega, 2022). This study was conducted from a pragmatism paradigm and used multiphase mixed methods as a research design. While these methods were suitable for the study, some aspects need to be highlighted. A multiphase design using qualitative and quantitative methods is usually designed to be completed after several years. While this method was suitable for the study, it was not feasible for the submission timeframe and the funding I had available as a PhD student. Consequently, some parts of the design had to be removed. For example, Phase 2 in the proposal stage had a component to assess the app qualitatively but had to be removed as this would have extended my PhD submission date.

Cognitive behavioural theory and TAM were the applied theoretical frameworks, which were appropriate for the study. However, the application of cognitive behavioural therapy (CBT), particularly in the app component, was rather complex, although the theory was used to guide the study and the app. The application of CBT in the app required more expertise for the app to function as part of CBT.

4.11.5.6 *Contextual reflexivity*

Contextual reflexivity refers to evaluating how the cultural and historical setting of a study may have impacted participants' responses (Olmos-Vega, 2022). Mental health is still a taboo and sensitive topic in many cultures, which may have influenced how participants responded. The study took place during the COVID-19 pandemic, a time when psychological distress amongst students was more intense because of the adjustments they needed to make, such as

online learning and social distancing, which could have influenced how participants responded. The FGDs were all online, which may have eased any anxieties students had with face-to-face discussions and could have influenced participants to be more expressive.

4.12 VALIDITY, RELIABILITY AND TRIANGULATION

Validity and reliability are methods used in quantitative research to ensure the rigour of the data (Bryman, 2016; Heale & Twycross, 2015). Validity refers to how accurately a concept is measured (Heale & Twycross, 2015). The instruments in this study had construct and convergence validity.

Construct validity refers to the ability to draw inferences from a test about the issue being studied (Heale & Twycross, 2015). From the K-10, SSI, Brief-COPE 28, and MARS, I was able to draw inferences about the prevalence of psychological distress and common coping styles amongst the sampled population and the quality of the app.

Convergence validity is when the instrument used measures constructs that are similarly measured by other instruments (Heale & Twycross, 2015). This study used similar scales as have been used in the past to measure psychological distress, such as the general health questionnaire and ways of coping amongst university students (Deasy et al., 2014). The study also adopted the shorter versions of the scales. Other shortened scales measuring psychological distress and coping, such as the DASS-21, Cope Inventory and student stress rating scale, have been used in similar studies (Balamurugan & Kumaran, 2008; Carver, 2011; Lovibond & Lovibond, 1996).

4.12.1.1 *Reliability*

Reliability looks at the consistency of an instrument in yielding similar results if repeated in similar situations (Heale &Twycross, 2015). Internal consistency in this study was assessed using Cronbach's alpha, which has a score ranging from 0 to 1. A score is considered reliable when it is 0.7 or higher. Cronbach's alpha was run for the instruments in the study, and all had a score greater than 0.7.

4.12.1.2 *Triangulation*

Triangulation is a method used to corroborate findings from two different research methods (Denzin, 2012; Noble & Heale, 2019). Triangulation usually occurs during the interpretation section, after data from the different methods have been analysed separately (Denzin, 2012; Noble & Heale, 2019). Four forms of triangulation applied in this study—method, theory,

investigator, and data triangulation—are discussed below.

a) *Method triangulation*

Different methods of data collection were used in the study, including in-depth interviews, focus group discussions and surveys. In the first phase, findings from qualitative data were used to confirm findings from the quantitative data, particularly on psychological distress—since psychological distress was quantitatively high, the qualitative aspect elaborated more on what psychological distress looks like for students and their causes of distress. Findings from the third phase (evaluation) also confirmed that the suggestions participants made for the app development work.

b) Theory triangulation

Theoretical triangulation refers to using multiple theoretical frameworks to analyse and interpret research findings of the study (Wilson, 2014). Cognitive behavioural and TAM theories were used to guide the study. Using more than one theory helped in providing additional perspectives on psychological distress and the use of mental health apps. It also gave the study a broader structure and understanding of the topic (Denzin, 1978; Denzin, 2012).

c) Investigator triangulation

Investigator triangulation refers to using more than one researcher in a study (Denzin, 2012). In the initial stages of the study, my supervisor and co-supervisor gave critical feedback on the study's research design, data collection tools, and the literature I would be reviewing. In addition, I had a co-facilitator present during all focus group discussions. I took turns with my co-facilitator in facilitating the group discussions. The differences in our interviewing styles and approach to interviewing minimised interpretation and reporting biases (Denzin, 1978; Denzin 2012).

d) Data triangulation

According to Denzin (2012) three factors are integral to data triangulation: people, time, and space. These three elements, rather than the specific methods employed to generate data, are vital in determining triangulation. This study interviewed counsellors and students to obtain a variety of perspectives on psychological distress and the use of mental health apps. Using both counsellors and students enhanced the validity and reliability of the findings, which converged between both groups of participants (Denzin, 1978; Denzin, 2012*).* All data were collected during the COVID-19 pandemic but at stages of the pandemic, which allowed the researcher to observe similarities and differences in data over time. Differences and similarities in

counsellors' and students' perceptions are compared in the results section in Chapter 5.

4.13 DEVELOPMENT OF PHASES

According to Greene et al. (1989), multiphase mixed methods studies should stipulate how methods and results from the first phase assisted in the development of the following methods and phases to ensure validity. Quantitative data in the form of an online survey were collected to paint a demographic picture of the prevalence of psychological distress by gender, age, and level of study. This was instrumental in the development of FGD questions. It guided the structure of the discussion, as the findings already highlighted important areas of discussion, such as the conceptualisation of psychological distress, coping styles, and mobile phone use for mental health challenges. The findings from the FGDs and IDIs were compared, and the common findings in each method guided areas the app should focus on. For example, both counsellors and students shared the importance of seeking help in one's own private space, which was then incorporated in the app as 'Seek Help'. Moran-Ellis et al. (2006) called this process 'following a thread'.

4.14 CONCLUDING REMARKS

This chapter presented all the methods and methodology applied in the study. A multiphase mixed methods research design with three phases was chosen for this study to explore the prevalence of psychological distress, design, test, and evaluate the usability of a mental health app. This chapter showed how pragmatic research paradigm principles were used to philosophically guide the study for both qualitative and quantitative methods. Further, the chapter detailed all the steps followed during recruitment, data collection, and data analysis. It also explained how the trustworthiness of qualitative data was obtained through the application of credibility, transferability, dependability, confirmability, as well as reflexivity from the researcher and the research assistant. Finally, the chapter showed how reliability, validity, triangulation and development of phases were applied to ensure the validity of quantitative data.

CHAPTER 5: RESULTS AND DISCUSSION PHASE 1

5.1 INTRODUCTION

This chapter reports and discusses the results for the objectives addressed in Phase 1. Phase 1 had three objectives, achieved through a convergent parallel mixed methods research design using an online survey, in-depth interviews (IDIs) and focus group discussions (FGDs). Quantitative and qualitative data were collected simultaneously and analysed separately, after interpretation the findings were merged and reported concurrently (Figure 5.1).

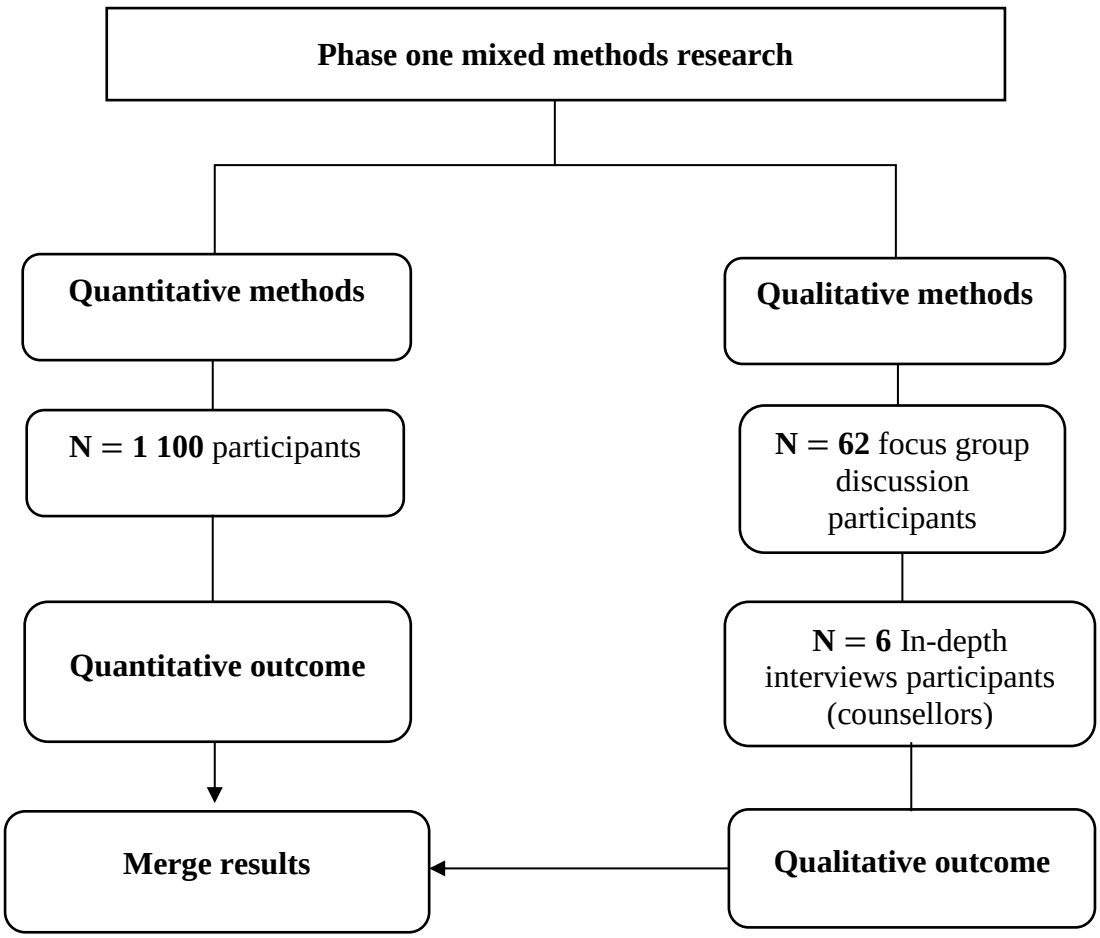


Figure 5.1: Phase 1—convergent parallel mixed methods research design

5.2 PREVALENCE OF PSYCHOLOGICAL DISTRESS

The first objective of the study was to quantitatively assess the prevalence of psychological distress and determine common coping strategies amongst students through an online survey. Psychological distress was measured using the Kessler 10 psychological distress scale (K10) and the student stress inventory (SSI). Common coping strategies were determined by the Brief-COPE 28. The quantitative data were analysed by gender, age, and level of study. For triangulation purposes, qualitative data on coping strategies will be reported during the

discussion on coping strategies. Socio-demographic data were collected at the start of the survey.

5.2.1 Survey participant demographics

A total of 1 100 university students were enrolled in the online survey. A majority of participants were female (72.7%), within the 18–20 age group (64.6%), and in their first year of study (46.2%). A substantial majority (94.1%) of the participants were enrolled at the University of the Witwatersrand (Wits) and 36.1% in the faculty of humanities. Most participants were South African citizens (95.6%), from an urban location (61%), and few had previously been diagnosed with a mental health challenge (20.09%). The findings show that female first-year students younger than 24 years participated more than their counterparts, suggesting that younger female students are more likely to participate in mental health research. However, this is not certain as similar studies show variations in participant demographics (Hakami, 2018; Pedrelli et al., 2015; Tesfaye Kelemu et al., 2020). In this study, Wits students participated more than students from other universities, which may be associated with the recruitment process. While research shows that social media is an effective way to recruit students to participate in studies (Sledzieski et al., 2023), in this study, more students were recruited through the university than through other channels.

5.2.1.1 *Mobile phone use*

A majority of participants (98.7%) owned a smartphone with Android software (66.9%). Most (81%) reported having easy access to data and only a few (26.6%) had used an online health app for their health needs. These findings reveal that students have access to smartphones and Android software mobile phones. The TAM analysis of this data suggests that the students who participated in this study find Android phones useful and easy to use (Abu-Dalbouh et al., 2017; Alasmari, 2017). Overall, most participants appeared not to have had used health apps, indicating that their perceived usefulness of such apps may be low (Peng et al., 2016)

5.2.1.2 *Survey response rate*

Altogether, 1 688 students were screened for the online survey, 588 of whom were ineligible for one or more of the following reasons:

- Lack of data on university enrolment.
- Did not meet enrolment criteria.
- Did not consent or provided insufficient data.

A total of 1 100 participants were enrolled in the study and included in the analysis. Of those, eight participants did not complete the SSI scale items, 231 did not complete the general psychological distress items and 318 did not complete the Brief-COPE 28 items (Figure 5.2*)*

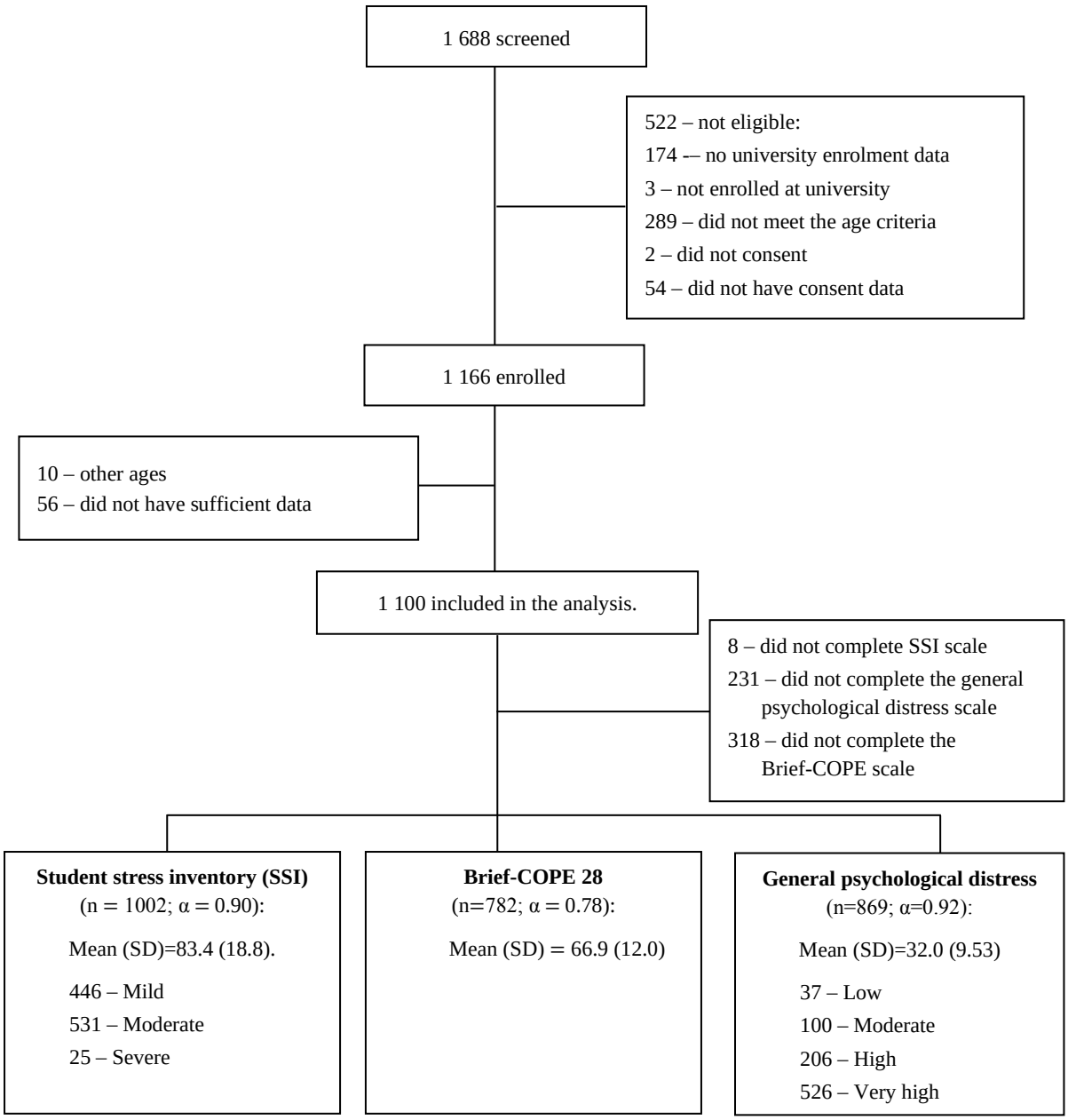


Figure 5.2: Survey response flow chart

5.2.2 Overall prevalence of psychological distress among students

As presented in Table 5.1, the prevalence of psychological distress was high among this population group of university students. The analysis of the SSI scale showed that 53% of the participants experienced moderate levels of stress, 44.5% mild stress and 2.5% severe stress, with an overall mean score of 83.4 (SD = 18.8). The SSI academic subscale accounted for most of the stressors among the participants, with a mean score of 25.2 (SD = 6.75). While

the researcher is unaware of any studies that have used the SSI amongst South African students, other studies show that academic related factors are a stressor for university students (Hassel & Ridout, 2017; Pitt et al., 2017).

The K-10 scale revealed that 60.5% of participants reported very high levels of general psychological distress, 23.7% reported high levels, 11.5% reported moderate levels, and 4.3% reported low levels of psychological stress. The mean score was 32.0 (SD = 9.53). These findings reflect higher scores than those previously reported in similar studies conducted amongst university students (Bantjes, 2019; Mutinta, 2022; USAf, 2022). Data were collected during the COVID-19 pandemic, when psychological distress was reported to be high for this population group because of the need to adapt to social distancing protocols and online learning (Visser & Law-Van Wyk, 2021).

5.2.3 Psychological distress by gender

According to the SSI and K-10 scale, male participants were more likely than females to have mild stress (63.3% vs 39.1%; $p < 0.0001$) and very high levels of general psychological distress (71.4% vs 57.8%; $p < 0.0001$).

Females were more likely to have moderate stress (57.9% vs 35.5%; $p < 0.0001$), moderate psychological distress (12.8% vs 6.4%; $p = 0.0125$), and high general psychological distress (25.4% vs 18.2%; $p = 0.0372$) compared to males.

Table 5.1: Psychological distress by gender

Variable	Overall	Female	Male	P-value
Student stress inventory (SSI) category				
Mild (%)	443/982 (45.11)	288/737 (39.08)	155/245 (63.27)	< .0001
Moderate (%)	514/982 (52.34)	427/737 (57.94)	87/245 (35.51)	
Severe (%)	25/982 (2.55)	22/737 (2.99)	3/245 (1.22)	
n, Median (IQR*)	982, 83.0 (69.0–96)	737, 85.0 (72.0–98)	245, 74.0 (62.0–88)	< .0001
n, Mean (SD)	982, 83.2 (18.8)	737, 85.7 (18.3)	245, 75.7 (18.3)	<.0001

Variable	Overall	Female	Male	P-value
General psychological distress category				
Low (%)	35/854 (4.10)	27/651 (4.15)	8/203 (3.94)	0.0035
Moderate (%)	96/854 (11.24)	83/651 (12.75)	13/203 (6.40)	
High (%)	202/854 (23.65)	165/651 (25.35)	37/203 (18.23)	
Very high (%)	521/854 (61.01)	376/651 (57.76)	145/203 (71.43)	
n, Median (IQR)	854, 32.0 (25.0–40)	651, 31.0 (24.0–39)	203, 37.0 (28.0–43)	< .0001
n, Mean (SD**)	854, 32.1 (9.50)	651, 31.2 (9.21)	203, 35.1 (9.83)	< .0001

** IQR = interquartile range* *** SD = standard deviation*

Interestingly, the results show that male students reported very high levels of general psychological distress compared to female students. This finding is contrary to global literature showing that female students report higher levels of psychological distress than their male counterparts because of more exposure to social challenges such as gender inequality, discrimination and gender-based violence (Idowu et al., 2022; Schmits et al., 2021; Tesfaye Kelemu et al., 2020). This finding highlights a shift in the reporting of mental health amongst male students, possibly because of the COVID-19 pandemic, a period when mental health was openly discussed globally by all genders. The self-report survey was anonymous and completed in the comfort of participants' private space, which could also have contributed to male participants responding honestly about their experiences with psychological distress. This finding was important in understanding the prevalence of psychological distress and informing the study that male students could also benefit from a mental health app intervention.

5.2.4 Differences in reporting psychological distress by age group

Compared to the 18–20 age group, students within the 21–24 age category significantly had higher scores in the SSI (mean: 86.0 [SD = 18.6] vs 81.9 [18.8]; p = 0.0010). However, the 21–24-year-old students were more likely to have low scores of general psychological distress than the 18–20 group (2.98% vs 6.33%; p = 0.0176).

Table 5.2: Psychological distress by age group

Variable	Overall	18–20	21–24	P-value
Student stress inventory (SSI) category				
Mild (%)	446/1002 (44.51)	297/634 (46.85)	149/368 (40.49)	0.0510
Moderate (%)	531/1002 (52.99)	325/634 (51.26)	206/368 (55.98)	0.1493
Severe (%)	25/1002 (2.50)	12/634 (1.89)	13/368 (3.53)	0.1086
n, Median (IQR)	1002,83.0 (70.0–96)	634,82.0 (68.0–95)	368,85.0 (72.0–97.5)	0.0025
n, Mean (SD)	1002,83.4 (18.8)	634,81.9 (18.8)	368,86.0 (18.6)	0.0010
General psychological distress category				
Low: 10–15 (%)	37/869 (4.26)	16/537 (2.98)	21/332 (6.33)	0.0176
Moderate: 16–21(%)	100/869 (11.51)	60/537 (11.17)	40/332 (12.05)	0.6945
High: 22–29 (%)	206/869 (23.71)	137/537 (25.51)	69/332 (20.78)	0.1112
Very high: 30–50 (%)	526/869 (60.53)	324/537 (60.34)	202/332 (60.84)	0.8816
n, Median (IQR)	869,32.0 (25.0–40)	537,32.0 (25.0–39)	332,32.0 (24.0–40)	0.7105
n, Mean (SD)	869,32.0 (9.53)	537,32.2 (9.30)	332,31.8 (9.90)	0.5543

Students within the 21–24 age group reporting higher levels of stress is an interesting finding, as individuals in this age group are expected to be more resilient because of greater life experience compared to the 18-20 age group (Deasy et al., 2014). However, this finding can also be justified given that emerging adulthood begins at 18 and proceeds through to 25 (Arnett, 2018). Therefore, students within the 21–24 age group are still at a higher risk for psychological distress (Al-Tammemi et al., 2020; Brown, 2018). These findings were vital to understanding the differences in the levels of stress among students by age and informed the study to include all age groups in the app and not only to cater for younger students.

5.2.5 Differences in the reporting of psychological distress by level of study

Based on the SSI, third-year students (59%) had moderate stress levels with a mean of 86.0 [SD = 17.8]) compared to first-years (50%) with a mean of 81.0 [SD = 19.0], second-years (55.6%) with a mean of 85.0 [SD = 19.9] and postgraduate students (50%) with a mean of 83.9 [17.5].

The K-10 shows that third-year students (65%) had very high levels of general psychological distress with a mean of 32.2 [SD = 9.55] compared to first-years (58%) with a mean average

of 31.6 [SD = 9.51], second-years (59%) with a mean average of 31.8 [SD = 9.60] and postgraduate students (61%) with a mean average of 32.8[SD = 9.50].

Table 5.3: Psychological distress by level of study

Variable	Overall	First year	Second year	Third year	Postgraduate
Student stress inventory (SSI) category					
Mild (%)	446/1002 (44.51)	215/444 (48.42)	75/187 (40.11)	76/200 (38.00)	80/171 (46.78)
Moderate (%)	531/1 002 (52.99)	223/444 (50.23)	104/187 (55.61)	118/200 (59.00)	86/171 (50.29)
Severe (%)	25/1 002 (2.50)	6/444 (1.35)	8/187 (4.28)	6/200 (3.00)	5/171 (2.92)
n, Median (IQR)	1 002, 83.0 (70.0–96)	444, 82.0 (67.0–95)	187, 86.0 (70.0–99)	200, 86.0 (73.5–98)	171, 83.0 (71.0–96)
n, Mean (SD)	1 002, 83.4 (18.8)	444, 81.0 (19.0)	187, 85.0 (19.9)	200, 86.7 (17.8)	171, 83.9 (17.5)
General psychological distress category					
Low: 10–15 (%)	37/869 (4.26)	15/360 (4.17)	7/169 (4.14)	10/183 (5.46)	5/157 (3.18)
Moderate: 16–21(%)	100/869 (11.51)	48/360 (13.33)	17/169 (10.06)	18/183 (9.84)	17/157 (10.83)
High: 22–29 (%)	206/869 (23.71)	87/360 (24.17)	45/169 (26.63)	36/183 (19.67)	38/157 (24.20)
Very high: 30–50 (%)	526/869 (60.53)	210/360 (58.33)	100/169 (59.17)	119/183 (65.03)	97/157 (61.78)
n, Median (IQR)	869, 32.0 (25.0–40)	360, 32.0 (24.0–39)	169, 32.0 (24.0–40)	183, 33.0 (26.0–41)	157, 33.0 (25.0–41)
n, Mean (SD)	869, 32.0 (9.53)	360, 31.6 (9.51)	169, 31.8 (9.60)	183, 32.3 (9.55)	157, 32.8 (9.50)

Students in their third-year of study reported very high levels of general psychological distress. This finding is unique, as previous studies show that first-year students tend to report higher levels of psychological distress because of adjustment-related challenges (Agteren et al., 2019; Bantjes et al., 2019). However, this finding is justified, for most degree qualifications, the third year marks the final year of the degree, and most students are under pressure to perform well to compete in the job market or qualify for postgraduate studies (Keane et al., 2021). As stated by Salam et al. (2015), most third-year students experience competition in their classes and are under pressure to complete their degree and concerned about the new social and academic transition awaiting them. This finding was significant in that it adjusted the study's focus of developing an app targeted for first-years to including all university students.

5.3 COMMON COPING STRATEGIES AMONGST UNIVERSITY STUDENTS

The SSI shows that participants with moderate or severe stress used emotion-focused (mean: 30.6 [SD = 5.71] vs 28.8 [S = 6.21]; p < .0001) and avoidance coping styles (mean: 16.3 [SD = 3.82] vs 13.2 [SD = 3.51]; p < .0001) more than those with mild stress (Table 5.4).

Table 5.4: Coping styles by stress (SSI)

Variable	Overall	Mild	Moderate/severe	P-Value
Problem-focused	780, 22.0 (5.60)	304, 22.4 (5.76)	476, 21.7 (5.49)	0.1221
Emotion-focused	780, 29.9 (5.97)	304, 28.8 (6.21)	476, 30.6 (5.71)	<.0001
Avoidance coping	782, 15.1 (4.00)	305, 13.2 (3.51)	477, 16.3 (3.82)	<.0001

The K-10 revealed that participants with no distress used emotion-focused (mean: 32.6 [SD = 5.00] vs 29.6 [SD = 6.00]; p < .0001) and avoidance coping styles (mean: 18.9 [SD = 3.85] vs 14.7[SD = 3.78]; p < .0001) (Table 5.5). These findings are consistent with findings from previous distinct research showing that university students use emotion-focused and avoidance coping styles (Ding et al., 2021; Rehr & Nguyen, 2021).

Table 5.5: Coping styles by psychological distress (K-10)

Variable	Overall	Mild	Moderate/severe	P-Value
Problem-focused	780, 22.0 (5.60)	697, 22.0 (5.66)	83, 21.6 (5.11)	0.5065
Emotion-focused	780, 29.9 (5.97)	697, 29.6 (6.00)	83, 32.6 (5.00)	<.0001
Avoidance coping	782, 15.1 (4.00)	699, 14.7 (3.78)	83, 18.9 (3.85)	<.0001

5.3.1 Differences in reporting coping strategies by gender

Females used denial (mean: 3.50 [SD = 1.77] vs 1.54 [SD = 3.13]; p = 0.001), emotional support (mean: 5.03 [SD = 1.96] vs 4.50 [SD = 1.82]; p = 0.0001), informational support (mean: 2.00 vs 1.88, p = 0.0001), behavioural disengagement, (mean: 3.63 [SD = 1.63] vs 3.82 [SD = 1.52]; p = 0.001), and religion (mean: 5.53 [2.24] vs 4.63 [2.17]; p = 0.001) more than their male counterparts (Table 5.6).

Table 5.6: Coping strategies by gender

Variable	Overall	Female	Male	P-value
Self-distraction	768, 5.64 (1.69)	581, 5.73 (1.68)	187, 5.38 (1.72)	0.0138
Active coping	766, 5.58 (1.72)	579, 5.59 (1.69)	187, 5.58 (1.79)	0.9466
Denial	766, 3.41 (1.72)	579, 3.50 (1.77)	187, 3.13 (1.54)	0.0064
Substance use	766, 2.52 (1.25)	579, 2.46 (1.18)	187, 2.70 (1.44)	0.0397
Emotional support	767, 5.03 (1.95)	580, 5.20 (1.96)	187, 4.50 (1.82)	< .0001
Use of informational support	764, 4.86 (1.98)	578, 4.97 (2.00)	186, 4.49 (1.88)	0.0041
Behavioural disengagement	767, 3.55 (1.61)	580, 3.63 (1.63)	187, 3.28 (1.52)	0.0096
Venting	764, 4.42 (1.63)	578, 4.51 (1.64)	186, 4.17 (1.58)	0.0137
Positive reframing	764, 5.65 (1.84)	578, 5.72 (1.82)	186, 5.46 (1.90)	0.1019
Planning	764, 6.02 (1.69)	578, 6.00 (1.68)	186, 6.08 (1.75)	0.5818
Humour	764, 4.48 (2.09)	578, 4.47 (2.11)	186, 4.49 (2.04)	0.8916
Acceptance	763, 5.87 (1.69)	577, 5.80 (1.69)	186, 6.06 (1.69)	0.0739
Religion	763, 5.31 (2.24)	577, 5.53 (2.17)	186, 4.63 (2.34)	< .0001
Self-blame	764, 4.88 (2.00)	578, 4.91 (1.99)	186, 4.80 (2.04)	0.5118

** n, mean (SD)*

This study's findings also highlighted gender differences in the use of coping strategies, with female students reportedly using emotion-focused coping and avoidance coping styles more than male students, which is consistent with previous literature (Graves et al., 2021; Rahardjo et al., 2013; Sawhney et al., 2018). Research shows that the use of coping strategies is not determined by gender but the differences of exposure to stressors amongst genders—females are more likely to experience stressful situations, such as sexual harassment, rape, and assault, requiring strategies which will help them address the stressful situation promptly, either through avoidance or by managing their emotions (Shirazi et al., 2011). Further, research has shown that gender is not a major factor in the adoption of coping strategies, but rather the severity of the situation and an individual's knowledge and capacity to attend to the situation (Dhurup & Dubihela, 2014; Eisenbarth, 2019). Therefore, given the lack of consensus on gender differences in the use of coping strategies, understanding how genders adopt different coping strategies under different circumstances is more appropriate than associating certain coping strategies with a specific gender.

5.3.2 Differences in reporting coping strategies by age group

As illustrated in Table 5.7, participants within the 21–24 age group had significantly higher scores for venting (mean: 4.63 [SD = 1.60] vs 4.31 [SD = 1.65]; p = 0.0076) and substance use (mean: 2.71 [SD = 1.43] vs 2.42 [SD = 1.13]; p = 0.0025) as coping strategies than the 18–20-age group. Participants within the 18–20 age group had significantly higher scores for religion as a coping strategy (mean: 5.53 [SD = 2.22] vs 4.93 [SD = 2.23]; p = 0.0003).

Table 5.7: Coping strategies by age group

Variable	Overall	18–20	21–24	P-value
Self-distraction	781, 5.65 (1.69)	485, 5.72 (1.66)	296, 5.52 (1.74)	0.1087
Active coping	779, 5.58 (1.72)	482, 5.54 (1.75)	297, 5.64 (1.67)	0.4444
Denial	779, 3.42 (1.72)	482, 3.52 (1.82)	297, 3.27 (1.55)	0.0361
Substance use	779, 2.53 (1.26)	483, 2.42 (1.13)	296, 2.71 (1.43)	0.0025
Emotional support	780, 5.01 (1.95)	483, 5.04 (1.92)	297, 4.97 (1.99)	0.6175
Use of informational support	777, 4.84 (1.98)	481, 4.92 (2.00)	296, 4.72 (1.94)	0.1620
Behavioural disengagement	780, 3.57 (1.62)	483, 3.57 (1.64)	297, 3.56 (1.59)	0.8809
Venting	777, 4.43 (1.63)	481, 4.31 (1.65)	296, 4.63 (1.60)	0.0076
Positive reframing	777, 5.63 (1.85)	481, 5.70 (1.87)	296, 5.51 (1.82)	0.1558
Planning	777, 6.00 (1.70)	481, 6.01 (1.74)	296, 5.98 (1.64)	0.8152
Humour	777, 4.50 (2.10)	481, 4.43 (2.13)	296, 4.60 (2.06)	0.2832
Acceptance	776, 5.85 (1.70)	480, 5.89 (1.730	296, 5.79 (1.65)	0.4256
Religion	776, 5.30 (2.24)	480, 5.53 (2.22)	296, 4.93 (2.23)	0.0003
Self-blame	777, 4.90 (2.01)	481, 4.86 (2.01)	296, 4.96 (1.99)	0.5384

These findings are supported by qualitative findings from students and counsellors showing how student use substances to cope:

> *I think that substances are common to students because most people I know are using. It's either alcohol or weed to deal with depression. I also have a friend close to me—she doesn't drink but when she's dealing with depression, she drinks; she just drinks a lot. So alcohol is common amongst students.* ***(FGD6, female, 22, second year)***

Some of them use what I would say are negative mechanisms as coping strategies, so they drink a lot. Some smoke weed but for them, that is a coping strategy. ***(Counsellor, IDI2)***

Previous literature from a multi-country study conducted across Africa, America and Asia has also shown that many students use alcohol and illicit drugs to cope or to socialise with their peers (Peltzer & Pengpid, 2016). Previous research conducted at an American university amongst master's and doctoral students has also shown that postgraduate students are more likely than undergraduate students to use substances (Allen et al., 2022). This could be attributed to greater accessibility and knowledge than undergraduate students of where to obtain these substances. Emotion-focused strategies, such as religion and venting to cope with psychological distress, were also corroborated by students and counsellors through qualitative findings as coping strategies:

I just wanted to add that some people cope with their religion, right? Religion also plays an important role in… students' lives. ***(FGD3, female, 20, second year)***

Some students speak about using prayer and going to church to cope with their challenges. ***(Counsellor, IDI5)***

Speaking also heals a person, and letting go of things that are deep inside and you cannot actually share with someone else. So I feel like just that mere fact of telling people that you can, it will help. ***(FGD15, male, 20, second year)***

Some students include really talking to people that they feel safe around. It can be a partner, an intimate partner, can be a friend. ***(Counsellor, IDI6)***

Praying, going to church, and talking to friends were deemed the most used by students, irrespective of their age (Babicka-Wirkus et al., 2021; Deasy et al., 2014; Mozid, 2022; Rathakrishnan et al., 2022). Although research indicates a lack of consensus on coping strategies by age (Dhurup & Dubihela, 2014), older students were expected to use more problem-focused coping, while younger students used avoidance coping strategies (Brown & Prinstein, 2011; Deasy et al., 2014; Monteiro et al., 2014).

5.3.3 Differences in reporting coping styles by level of study

First-years were more likely to use a problem-solving coping style than postgraduate students (mean: 22.5 [SD = 5.86] vs 22.5 [SD = 5.29]; p = 0.0165). Postgraduate students were more likely than second-year students to use active coping strategies (mean: 5.83 [SD = 1.59] vs 5.27 [SD = 1.71]; p = 0.0244). First-year students were more likely than postgraduates to use denial coping strategies (mean: 3.65 [SD = 1.87] vs 3.09 [SD = 1.50]; p = 0.0070). First-year students were more likely than third-year students to use emotional support coping strategies

(mean: 5.15 [SD = 1.92[vs 5.15 [SD = 1.93]; p = 0.1507). First-years were more likely than third-year students to use positive reframing (mean: 5.86 [SD = 1.87] vs 5.36 [SD = 1.79]; p = 0.086) (Table 5.8).

Table 5.8: Coping strategies by level of study

Variable	Overall	First year	Second year	Third year	Postgraduate	P-value
Self-distraction	781, 5.65 (1.69)	317, 5.69 (1.72)	154, 5.71 (1.64)	165, 5.59 (1.63)	145, 5.55 (1.76)	0.7763
Active coping	779, 5.58 (1.72)	315, 5.67 (1.76)	154, 5.27 (1.71)	166, 5.47 (1.70)	144, 5.83 (1.59)	0.0244
Denial	779, 3.42 (1.72)	315, 3.65 (1.87)	154, 3.44 (1.78)	166, 3.28 (1.50)	144, 3.09 (1.50)	0.0070
Substance use	779, 2.53 (1.26)	316, 2.39 (1.08)	154, 2.62 (1.42)	166, 2.60 (1.34)	143, 2.65 (1.31)	0.0928
Emotional support	780, 5.01 (1.95)	316, 5.15 (1.92)	154, 4.83 (1.96)	166, 4.81 (1.97)	144, 5.15 (1.93)	0.1507
Use of informational support	777, 4.84 (1.98)	314, 5.05 (2.05)	154, 4.59 (1.85)	166, 4.56 (1.97)	143, 4.99 (1.93)	0.0179
Behavioural disengagement	780, 3.57 (1.62)	316, 3.59 (1.62)	154, 3.69 (1.64)	166, 3.54 (1.66)	144, 3.42 (1.56)	0.5185
Venting	777, 4.43 (1.63)	314, 4.25 (1.70)	154, 4.38 (1.51)	166, 4.56 (1.49)	143, 4.73 (1.73)	0.0228
Positive reframing	777, 5.63 (1.85)	314, 5.86 (1.87)	154, 5.38 (1.85)	166, 5.36 (1.79)	143, 5.70 (1.81)	0.0086
Planning	777, 6.00 (1.70)	314, 6.06 (1.75)	154, 5.86 (1.76)	166, 5.93 (1.67)	143, 6.10 (1.56)	0.5165
Humour	777, 4.50 (2.10)	314, 4.43 (2.17)	154, 4.49 (2.12)	166, 4.34 (2.06)	143, 4.83 (1.98)	0.1841
Acceptance	776, 5.85 (1.70)	313, 5.95 (1.74)	154, 5.82 (1.75)	166, 5.82 (1.61)	143, 5.71 (1.69)	0.5498
Religion	776, 5.30 (2.24)	313, 5.50 (2.18)	154, 5.23 (2.34)	166, 5.28 (2.24)	143, 4.95 (2.26)	0.1040
Self-blame	777, 4.90 (2.01)	314, 4.84 (2.06)	154, 5.02 (2.01)	166, 4.87 (1.97)	143, 4.93 (1.93)	0.8337
Problem-focused	780, 22.0 (5.60)	316, 22.5 (5.86)	154, 21.1 (5.43)	166, 21.3 (5.41)	144, 22.5 (5.29)	0.0165
Emotion-focused	780, 29.9(5.97)	316, 29.9 (6.16)	154, 29.8 (5.80)	166, 29.7 (5.77)	144, 30.1 (6.00)	0.9223
Avoidance coping	782, 15.1 (4.00)	317, 15.3(4.03)	154, 15.5 (4.07)	166, 15.0 (3.82)	145, 14.6 (4.03)	0.2551

Contrary to expectations, the study found that first-years were more likely to use the problem-solving coping styles than postgraduate students. Conversely, the literature shows that postgraduate students are more likely to use problem-solving styles than undergraduate students, associated with their experience with stressful situations and knowledge of how to

tackle such situations (Zvauya et al., 2017). First-year students in this study used a combination of coping strategies, such as emotional support, positive reframing, and denial. This finding reveals that students use different coping strategies and there is not one single coping strategy associated with a specific level of study (Ickes et al., 2015). Overall, based on the quantitative findings, participants use various coping mechanisms depending on social factors. This was also corroborated by qualitative findings from this study showing that students use various coping strategies that may sometimes be used simultaneously (Schiller et al., 2018). The qualitative findings highlight that not all aspects of human behaviour can be categorised quantitatively and that, because individuals use strategies that are accessible to them (sometimes more than one), it is almost impossible to associate a coping strategy with specific identities:

> *You know I've been all around the spectrum: I've been to a therapist, I've spoken to friends, I've used mental health meditation apps, I've done exercising. Like those are the ways I coped.* ***(FGD1, female, 19, second year)***

> *There is a whole lot of range of different strategies that students use. Some are helpful and have worked up until that point. Some are not so helpful and led to a more perpetuating of the problem and not actually helping to get better. So that is kind of the broad spectrum there.* ***(Counsellor, IDI3)***

Overall, the findings on coping strategies revealed that students use coping strategies that are accessible to them, which may or may not be healthy. These findings suggest the importance of incorporating helpful information on coping strategies in the mobile app intervention to educate participants on different ways to cope when experiencing challenges.

5.4 THEME 1: STUDENTS' AND COUNSELLORS' PERCEPTIONS OF PSYCHOLOGICAL DISTRESS AND MENTAL HEALTH APP USE

The second objective of the study explored students' knowledge, awareness and perceptions (through FGDs) of psychological distress, and the use of a mental health app to address psychological distress. Data is categorised by the number of FGD, gender, age and level of study *(e.g., FGD1, female, 20, first year).* The third objective of the study explored counsellors' perceptions of students' psychological distress and the use of a mental health app as an intervention for university students through in-depth interviews. Data from counsellors is categorised by the number of the in-depth interview *(e.g., Counsellor, IDI, 5).* The data from both objectives were merged during interpretation and are reported concurrently below.

5.4.1 Participant demographics

A total of 62 university students were enrolled in mixed gender focus group discussions. A total of 16 group discussions were conducted comprising three female-only, three male-only, and 10 mixed-gender group discussions. Of the 62 participants, 34/62 (55%) were female and 28/62 (45%) were male. Twenty-five participants (40%) were within the 18–20 age group and 37/62 (59%) were within the 21–24 age group. Most of the students (22/62, 35%) taking part in the focus group discussions were third-years, followed by 20/62 (32%) second-years, then first-years 16/62 (25%) and lastly postgraduate students 4/62 (6%) (Table 5.9).

Table 5.9: Participant demographics

Variable	Category	Frequencies
Gender	**Female**	**34/62 (55%)**
	Male	28/62 (45%)
Age group	18–20	25/62 (40%)
	21–24	**37/62 (59%)**
Level of study	First year	16/62 (25%)
	Second year	20/62 (32%)
	Third year	**22/62 (35%)**
	Postgraduate	4/62 (6%)

Six counsellors working at the Counselling and Careers Development Unit (CCDU) at Wits University were enrolled for in-depth interviews. Because the CCDU has a limited number of employees, to protect their identities, further participant characteristics such as gender, qualification, and work duration have not been included in this thesis.

5.4.2 Knowledge and perceptions about psychological distress

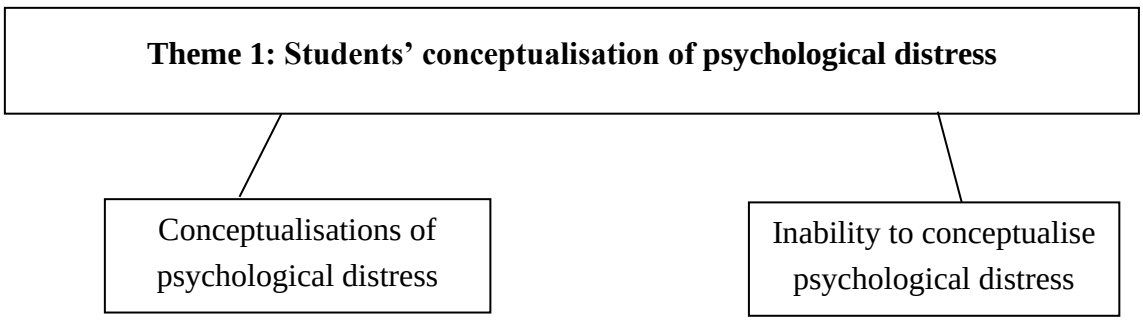


Figure 5.3: Theme 1

The overarching theme describes students' perceptions and understanding of psychological distress from the perspectives of both students and counsellors. These perceptions highlight the different ways of defining and understanding psychological distress. These findings are discussed in detail under the main theme: students' conceptualisations of psychological distress, which has two subthemes 1) conceptualisation of psychological distress, and 2) inability to conceptualise psychological distress (Figure 5.3). Counsellors' perceptions of how students conceptualise psychological distress will be used to corroborate the views of students.

5.4.3 Conceptualisation of psychological distress

Students conceptualised psychological distress based on their own understanding of the word. When asked what came to mind when hearing the words 'psychological distress', most participants used words and phrases associated with negative emotions such as 'feeling overwhelmed', 'lack of control' and 'inability to cope or handle pressure'. Counsellors also affirmed that students conceptualised psychological distress as the inability to cope:

> *I'm associating it [psychological distress] with several things—feeling overwhelmed, lack of motivation or even feeling hopeless.* ***(FGD7, female, 22, third year)***
>
> *First word to come to me is emotional exhaustion.* ***(FGD3, female 18, first year)***
>
> *So, I can't speak for what they understand because as much as we may ask what it means for them, it is very different for different students. They use different words to describe a similar feeling of being overwhelmed and unable to cope with some of their life experiences.* ***(Counsellor, IDI5)***

Other participants defined psychological distress as a way of thinking, which was often associated with negative thought patterns, the inability to think positively or lack of understanding oneself:

> *In my opinion, psychological distress is when one can no longer control their thoughts—maybe a thinking overload, which can be stressful and block thinking capacity.* ***(FGD5, female, 18, first year).***
>
> *But you are in a state of psychological distress when you cannot understand yourself because you don't know exactly how you are feeling and how you are basically going to move forward from that point.* ***(FGD1, male, 20, second year)***

Other students used metaphors such as "weight of the world on my shoulders" or phrases such as "when your mind is a mess" to explain psychological distress as an emotional or psychological experience:

*Basically, it's how one feels emotionally…. It is having the weight of the world on my shoulders and having so many responsibilities and expectations from family, which is overwhelming. (**FGD6, male, 21, third year)***

*It's like when your mind is like a mess, and you cannot think straight because you have a lot on your plate. **(FGD2, female, 22, third year)***

The conceptualisations of psychological distress as negative emotions and negative ways of thinking are consistent with the literature describing psychological distress as a negative emotional state and negative mental health as affecting one's ability to function (Hakami, 2018; Sharp & Theiler, 2018). The use of metaphors instead of precise definitions emphasises the complexity of discussing psychological distress and other mental health-related challenges. Roystonn (2021) explained that superficial words are often used when discussing or identifying complex mental health challenges related to depression, especially among those who speak English as a second language. Metaphors can also be associated with the colloquial language used to define sadness and depressed moods. For example, "down in the dumps" has been used since the mid-1960s, when cognitive theories of depression started to emerge (Pearson, 2021). The metaphors used also fit the colloquial descriptions, suggesting some understanding of psychological distress but also indicating difficulty in explaining psychological distress.

5.4.4 Inability to conceptualise psychological distress

Some participants defined psychological distress as stress, depression, or anxiety. Although counsellors concurred with this perspective, they asserted that these terms are used loosely without understanding what it really means to have depression or anxiety:

*So psychological distress to me is basically self-explanatory: It is stress that is coming to your well-being but psychologically, so basically, mentally and what you're thinking and how everything around you is impacting your psyche. (**FGD1, female, 19, first year)**.*

*The first thing that came to mind was anxiety for me. **(FGD7, female, 23, third year)***

*In one word, psychological distress is depression. (**FGD13, female, 21, third year)***

*They will say I am under stress; I am feeling stressed out, or they will say I am very nervous about this or that or the other. People do not necessarily use the word anxiety like we would from a professional perspective. So obviously the use of the words anxiety and stress are often used interchangeably. **(Counsellor, IDI3)***

*And they can use any term to describe that... you know, anxiety or stress or feeling overwhelmed. Some even speak about being depressed but they are really talking about anxiety, you know, when you go into it. **(Counsellor, IDI5)***

I think anxiety is one of those terms like depression that is kind of loosely used, sometimes inappropriately, by students. ***(Counsellor, IDI2)***

Despite participants' literal definition of psychological distress as stress, depression or anxiety, these findings are consistent with the literature showing that psychological distress includes symptoms of depression, anxiety, and stress (Drapeau et al., 2012). Additionally, psychological distress is considered a precursor for stress, anxiety, and depression. Some participants expressed some difficulty in finding the right words to conceptualise psychological distress, as exemplified in the quotes below:

I don't know how to put it but maybe because of my lack of knowledge on mental health things. ***(FGD13, female, 18, first year)***

I'm not quite sure what the word means. ***(FGD14, female,18, first year)***

I really can't explain it, I really can't explain it. Yeah, it's tough. That's all I wanted to say. ***(FGD6, male, 19, second year)***

With the high levels of poor mental health literacy among students globally, it is not surprising that some participants struggled with conceptualising psychological distress (Mahfouz et al., 2016; Shankar et al., 2021). In South Africa, this may be attributed to language barriers and sociocultural factors, such as religion and culture, and not necessarily a lack of understanding (Jithoo, 2018). Psychological distress can be defined in various ways because of differences in language use, aetiology and presentation (Drapeau et al., 2012). It seems that the struggle to conceptualise psychological distress relates to a lack of correct vocabulary. Vocabulary is essential in understanding mental health challenges because it empowers people to identify their challenges. This is evident in the student participants' responses—when asked if they were able to identify symptoms of psychological distress, most maintained that they were unable to tell when they were experiencing psychological distress. Some explained that they had to wait for a therapist or someone else to point out that they may be experiencing psychological distress or showing symptoms of a mental health challenge:

It [psychological distress] is not understood well enough according to my perspective, and it's not expected. You know, it's something that's hidden behind closed doors and people don't really talk about it, and therefore people don't learn about it. And if people don't learn about it, people don't identify the symptoms as they come up, until it's too late. ***(FGD10, male, 21, third year).***

We are not aware of the symptoms. We are not aware that this is what we are going through, you know. I feel like I just realised after I was told what you need to do now is

be on antidepressants and I'm thinking not painkillers? Antidepressants for what, you know? What is going on? And, the other thing was also just knowing that in the society it's like you're mental [crazy]. ***(FGD10, female, 24, third year)***

I don't think you can easily identify that you are stressed or something like that until you talk to someone about your situation. Cause, like, most people, like, they could be in denial about whatever they are facing, and I think it's not easy. ***(FGD16, male, 19, second year)***

Counsellors also concurred that students are not able to identify symptoms of psychological distress and have different interpretations for what it may be:

So, people have their own ideas and use their own words as they are sharing their account of what they are experiencing and identifying symptoms. ***(Counsellor, IDI4)***

These findings reveal that knowledge regarding psychological distress is still limited (Miles et al., 2020). Further, the findings show that education on mental health challenges, particularly in terms of how to identify and seek help for mental health challenges, is still lagging amongst university students (Miles et al., 2020). These findings suggest that universities need to make mental health resources more easily accessible to students, particularly undergraduate students. Seboka et al. (2022) suggested the introduction of mental health literacy programmes to students through online digital platforms, as these are easily accessible to this population group.

5.5 THEME 2: COMMON MENTAL HEALTH CHALLENGES

This theme describes the common mental health challenges amongst university students as identified by students and counsellors. Common mental health challenges amongst university students were categorised into three-subthemes: 1) depression and anxiety, 2) stress, and 3) self-harm and suicide.

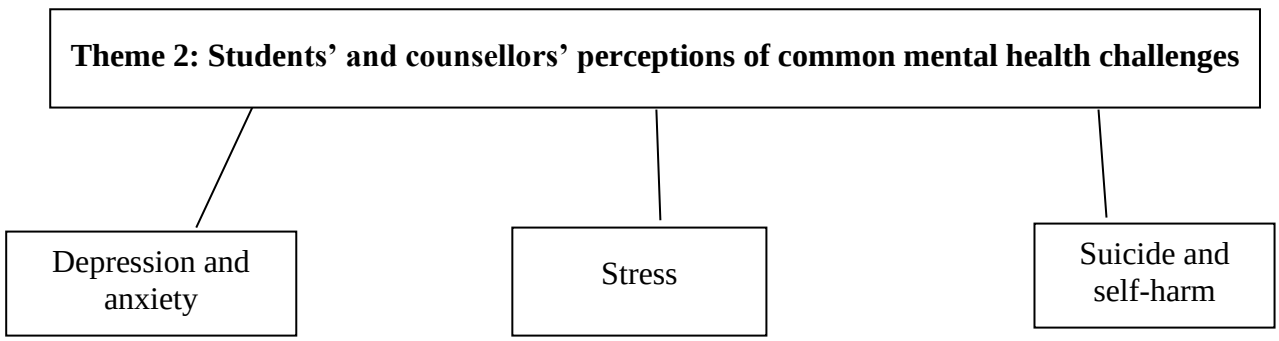


Figure 5.4: Theme 2

5.5.1 Depression and anxiety

Student participants emphasised depression and anxiety as common mental health challenges with which they are familiar with amongst the student population. Depression and anxiety were discussed by the participants as separate mental health challenges, thereafter as mental health challenges that occur simultaneously.

5.5.1.1 *Depression*

Depression was discussed as a common mental health challenge amongst both male and female students across all genders and levels of the study.

> *Well, I would say that the most common challenge... I mean the most common mental health problem would be depression. We see that a lot of kids become depressed.* ***(FGD14, female, 21, third year)***

> *I think the most common one [mental health challenge] would be depression.* ***(FGD5, male, 21, third year)***

When asked about the most common mental health challenges reported at the CCDU by students, counsellors also highlighted depression as a common mental health challenge:

> *We are sitting amid COVID right now with people just experiencing losses, whether emotional losses, financial losses and I mean different kinds of losses, and even just going as much as losing someone in your life. So, depression is very high, so that is what we see a lot.* ***(Counsellor, IDI4)***

This finding is consistent with global literature showing that depression is a common mental health challenge amongst students (Bantjes et al., 2019; Brown 2018). Depression was also discussed in relation to the hardships participants experience with their schoolwork at university:

> *I think the challenges that we as students face the most is depression. School is depressing, like it's hard. It's very hard here [being at university]. (****FGD12, male, 21, third year****)*

> *So, I kind of struggled a bit with my schoolwork. Because I was depressed, I struggled to do my schoolwork and to study or to eat until I finally decided to talk to someone to get help.* ***(FGD1, female, 18, first year)***

> *Because high school is very different from university and you kind of control your work, and that's how it ultimately stems into depression. So those are the main things I've seen.* ***(FGD8, female, 19 second year)***

This finding is consistent with the literature reporting that students experience low moods, which may be associated with symptoms of depression when they are experiencing academic difficulty (Kumaraswamy, 2013). There were notable gender differences in the discussion on depression amongst participants. Female participants spoke about depression from a personal perspective; some even expressed that they had been diagnosed with depression or had experienced symptoms of depression. Male participants spoke about depression in general terms by using words such as "other people" or "most students", without sharing their own personal experiences:

> *I did have depression. I'd spend like a week without actually taking care of myself, not actually taking care of my schoolwork. I didn't want to be seen; I didn't want to go out anymore. Luckily now we are learning online, so it was a bit of an advantage to me. I'd want to be pushed to do everything that's connected to my life. So, it was so hard.* ***(FGD16, female, 24, third year)***

> *Depression is a common mental health challenge. Most of the students or people have that problem.* ***(FGD16, male, 21, third year)***

This finding is expected, as the literature reveals that females are more open to self-reporting and discussing their mental health challenges than males (Salk et al., 2017). It is also important to note that the way participants discussed depression was not in reference to clinical depression but rather to a low mood or sadness.

5.5.1.2 *Anxiety*

Anxiety as a common mental health challenge was discussed retrospectively from personal experience, particularly amongst female third-year students. Anxiety was pinpointed as something students experienced during exams:

> *I used to have a lot of anxiety before writing an exam, when we were still doing face-to-face. Then I'd start shaking, so it would take me time during the session of writing the exam.* ***(FGD2, female, 22, third year)***

> *Mental health challenges can be anxiety and any other thing the comes with anxiety. I would find it difficult to study and write [exams]. I would panic a lot. Even though I knew the answers, I would panic just because I would be thinking that, like, ok last year I failed.* ***(FGD4, female, 20, third year)***

This finding resembles findings in the literature from an Albanian study amongst undergraduate students, indicating that students experience more symptoms of anxiety during the examination period, also known as 'exam anxiety' (Trifoni & Shahini, 2011). Anxiety was also discussed by first-year students as a feeling experienced due to transitioning from high

school to university, particularly the pressure related to course work. Some participants also mentioned that they wanted to drop out from university:

> *I can attest to that because I said I'm in my first year. Like, in the first semester, I felt a lot of anxiety. like, it got so much to the point where I felt like I even wanted to drop out. It was just too much, like, meeting new people, having a lot of schoolwork. The work is more than in high school. The pressure was just a lot. So yeah, I do agree—anxiety is like the biggest issue when it comes to students.* ***(FGD8, female, 19, first year)***

> *They get anxious, and they start stressing, and they drop out.* ***(FGD6, male, 19, first year)***

> *The one thing I've noticed widely is the anxiety levels of students at university, especially first year.* ***(FGD8, female, 20, second year)***

Counsellors also concurred that anxiety is a common mental health challenge. One counsellor confirmed that anxiety is the most reported mental health challenge at the CCDU:

> *The most common ones [mental health challenge] are anxiety disorders, that whole spectrum.* ***(Counsellor, IDI3)***

> *The most common, and I say from experience, anxiety seems to be the leading, followed by depression.* ***(Counsellor, IDI6)***

These findings emphasise how the transition from high school to university can cause anxiety among first-year students and, if not addressed, can cause students to drop out. These findings are consistent with research showing that anxiety has contributed to university drop-out rates, particularly amongst male students (Hjorth et al., 2016). Some participants also pointed out that students often have symptoms of both depression and anxiety, and that the presence of symptoms from one condition can lead to the other:

> *What I have heard is the anxiety has been rising, which has now led to a depression. So, I think anxiety leads to depression; the depression doesn't lead to anxiety.* ***(FGD1, female, 19, first year)***

> *I think the three mentioned interact, and then with anxiety and depression because of pressure, because of schoolwork, or maybe home situations as university students. I really think one leads to another.* ***(FGD14, female, 21, third year)***

This perspective was also shared by some counsellors, who found that anxiety and depression tend to co-exist:

> *Anxiety, it goes very well with depression, so comorbidities around that, so we see that quite often.* ***(Counsellor, IDI4)***

Being diagnosed with one condition heightens the possibility of being diagnosed with the other, which can happen concurrently or separately at different life stages (Kessler et al., 2015). Although evidence is lacking that one condition leads to the other, research has shown that the presence of anxiety can be a precursor to depression, as most individuals diagnosed with anxiety experience occasional symptoms of depression (Kalin, 2020).

5.5.2 Stress

Previously, stress was known as the most common mental health challenge among students (Asif et al., 2020; Sahu et al., 2020). However, fewer participants mentioned it in passing and did not emphasise or elaborate more on it as a common mental health challenge. One participant maintained that all mental health challenges can be summarised as stress:

> *When it comes to mental health struggles and all that stuff, I would like to summarise it; basically, it is stress, whether that be external or internal.* ***(FGD7, female, 23, third year)***

Counsellors, too, discussed stress together with other mental health challenges and did not give it the same attention as depression or anxiety:

> *Lots of anxiety, stress and depression that come through as well. And those are the main things.* ***(Counsellor, IDI5)***

Amongst the university student population, stress is considered a normal reaction to daily pressures, also known as 'student stress', which could explain why fewer comments were made on stress as a common mental health challenge (Martinez, 2020; McLafferty et al., 2021). Most social and educational settings have raised considerable awareness of the topic over the years, which may have normalised the challenge and made it less threatening. Therefore, stress may be viewed as something that can be easily addressed compared to depression and anxiety (Monteiro et al., 2014).

5.5.3 Suicide and self-harm

Suicide and self-harm were discussed as a common occurrence among university students. Suicide among students was discussed in sympathetic retrospection of the suicides that have occurred on university campuses. One participant's understanding of why individuals committed suicide was related to depression and the university system:

> *As I said before, suicides, and there was like what, three suicides this year. And it's kind of depressing. Like, I remember when the suicide rates went up even. And (deep breath) I can't blame those guys that did the thing, you know, kill themselves just because (deep breath) the system is messed up and we can't change this now. Yeah, that's all I'm saying.* ***(FGD6, male, 22, second year)***

Since I've been there, it's been four years now. Every year, there's like a student or students who commit suicide. Every year. ***(FGD13, female, 21, third year)***

One counsellor also shared that suicide ideation was an issue reported by students at the CCDU. However, the counsellors did not discuss suicide in depth compared to other mental health challenges:

So, we see quite a lot of students presenting different things, sometimes suicidal ideation and those kind of things. ***(Counsellor, IDI4)***

This finding is consistent with research that university students are at a higher risk of suicide, which is the second leading cause of death amongst young people (Bantjes et al., 2019; Wilks et al., 2019). Suicide was discussed mainly by male participants as a possible solution to failing, repeating an academic year, depression or overthinking about the future:

If you could fail a year or repeat a year, you would most think of the easy way out and there will be suicide. ***(FGD, 2, male, 20 second year)***

We tend to overthink now that what would happen if we don't become successful or something. Like that then leads to depression and then others suicide or something like that, so yeah. ***(FGD12, male, 21, third year)***

More male than female participants highlighted suicide as an outcome of pressure, particularly from family and academics:

Yeah, it is pressure. With most suicides, the fundamental pressure is from the family. If anything happens to you that you think will bring shame to your family, you think of suicide. ***(FGD2, male, 20 third year)***

You can get pressure. It can be pressure from school. At home, there could be a lot of things that need to be done, and you just find yourself ending your life might be better, or hurting yourself might ease the pain. ***(FGD5, male, 21, third year, #1)***

According to research by Yadav and Srivastava (2020) conducted in India, a positive relationship exists between academic pressure and suicide ideation amongst university students. More males spoke about suicide than females. Research also shows that male students are at a higher risk for suicide than females; statistics reveal that more male students commit suicide than female students (Wilks et al., 2019).

Self-harm was also discussed by students as a common occurrence amongst university students. However, this topic did not emerge during the in-depth interviews with counsellors. Self-harm was discussed mostly by female participants, one participant revealed that she self-harmed to physically feel the pain she was feeling emotionally:

For me, ok firstly, I used to like to cut myself. Like, take razors and just to hurt myself a little bit so that I could feel the emotional pain physically. ***(FGD5, female, 21, third year)***

Participants emphasised that self-harm was common and occurred as early as high school. These perspectives were shared mostly by first-year female participants, which could indicate that self-harm is something practised by students already in high school:

Already in high school, we see people with scars on their hands. You already know what that means when there are pressures of school, when there is pressure in matric you know? ***(FGD3, female, 18, first year)***

I feel like when you see cuts on people on their wrist and hand, it's become like a norm, so yeah. ***(FGD12, female, 18, first year)***

Although self-harm is not a mental health challenge, it is an important aspect of mental health, as it can be used to cope with difficult issues affecting mental health (Kiekens et al., 2017; Lewis et al., 2019).

5.6 THEME 3: PERCEPTIONS OF FACTORS LEADING TO PSYCHOLOGICAL DISTRESS

This theme describes factors identified by participants as major contributors to their psychological distress. The theme has four sub-themes: 1) family pressure, 2) relationships, 3) academic pressure, 4) psychosocial factors (Figure 5.5).

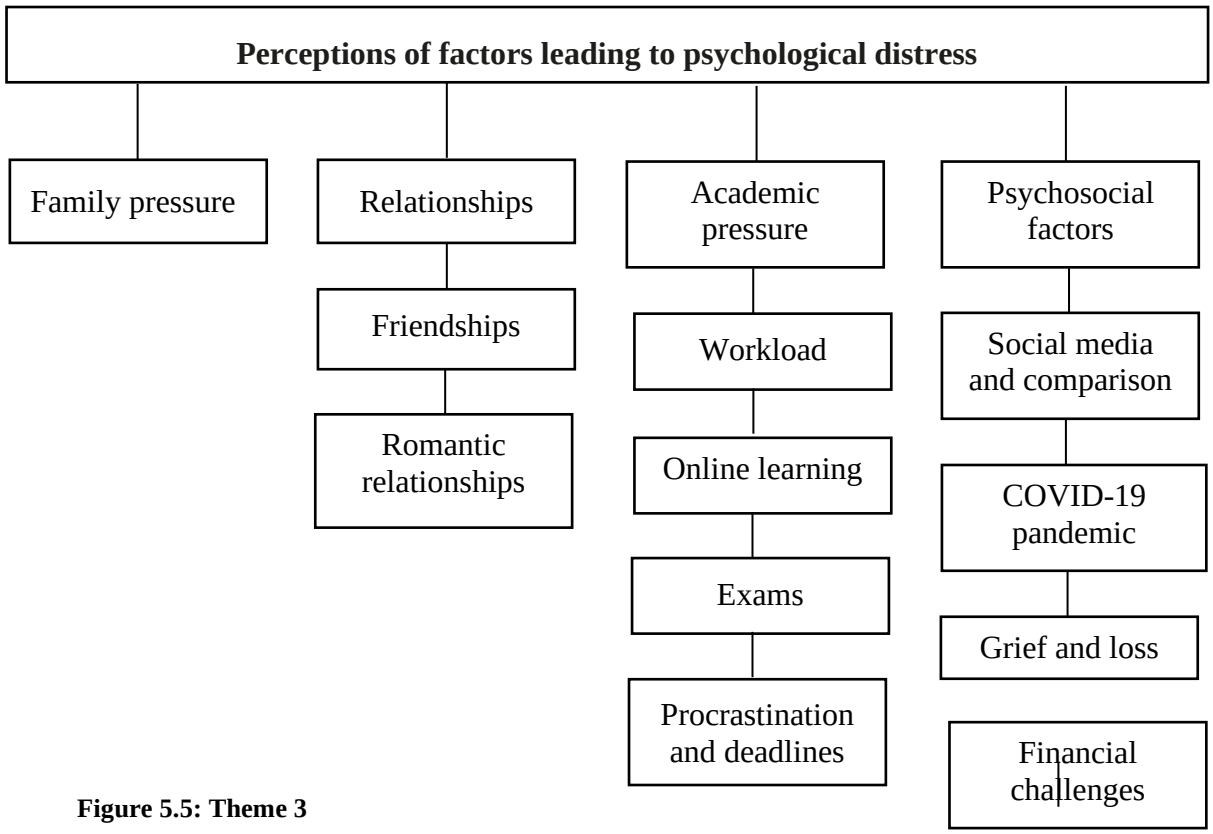


Figure 5.5: Theme 3

5.6.1 Family pressure

Pressure from family was identified as a major factor leading to psychological distress among university students. Counsellors emphasised that students' family-related challenges are some factors reported to trigger psychological distress in students:

> *People [students] have family issues. They come here [CCDU] for family-related issues.* ***(Counsellor, IDI4)***

> *Then there are a lot of interpersonal relationship issues that we deal with, family issues that we deal with.* ***(Counsellor, IDI3)***

Pressure from family was associated with high expectations from parents, parents' lack of knowledge of university challenges, being a first-generation student, and being raised by parents who uphold perfectionism:

> *I'm the only child at home that went to university, like I'm the first one. So, all the pressure is on me. Yeah.* ***(FGD4, female, 18, first year)***

> *I feel like family definitely contributes to those [mental health challenges]. I think some students have parents where they have, like, high expectations of them.* ***(FGD12, female, 18, first year)***

> *The most fundamental stress there is, is family…. They have so much faith in you. Only if they knew the challenges you face and understand what you face or come across every day, the stresses that you see, the work that you have to do.* ***(FGD2, male, 20 second year)***

Pressure from family was also linked to socioeconomic background. One participant explained that coming from a disadvantaged family background pressured him to do well at university because he wanted to get his family out of its situation:

> *I think for a lot of black people primarily, the anxiety comes from not wanting to disappoint your parents or your family and wanting to do just about them. Because you feel you have an overwhelming amount of pressure on you because you have a duty to pull your family out of poverty, and to advance the family into a new phase of well-to-do generation wealth. As we like to say, and that comes with a lot of mental strain and a lot of pressure, which can cause anxiety.* ***(FGD,10, male, 22, third year)***

In contrast, another participant highlighted that coming from a well-off and educated family background also added pressure to keep up with the family's established standard:

> *I think pressure, a lot of pressure, is from the family, which is trying to do best, trying to do well, better than their expectations. Like the other participant said, trying to not throw money down the drain. Mostly you find where you come from, you come from a*

very well-off family in terms of knowledge. They are good in school, and you are trying to keep up with it. ***(FGD10, male, 20, second year)***

Other participants added that they have family responsibilities to attend to, such as taking care of younger siblings or taking on their parents' or guardians' responsibilities, which added to the pressure:

I'm at home with my parents and we have a baby in the house because my parents recently had a baby. She is only one and, of course, with the age gap, it's crazy. But it's a lot of balancing with family, especially since she's growing up. I am feeling the need to be there for her and that sort of stuff. So, I feel like sometimes, it can even become a little emotionally overwhelming, cause again, it's in those balancing moments where you get anxiety. ***(FGD8, female, 20 second year)***

Students are facing a task of taking adult responsibilities; they are used to being taken care of by their parents or guardians or something like that, but yeah. ***(FGD16, male, 19, second year)***

The literature shows that the familial environment has an impact on emerging adults' mental health (Barmola, 2013). As the above quotes illustrate, parents and families play a significant role in the mental health of university students, especially those who are still financially and emotionally connected to their parents, guardians or family (Deng et al., 2022).

5.6.2 Relationships

Relationships were also identified as a major factor contributing to the mental health challenges of university students, particularly friendships and romantic relationships. This perspective was also shared by counsellors, as some students went to the CCDU to address the psychological distress caused by relationship challenges:

So predominantly it [psychological distress] has to do with relationship issues, whether it is family-related or relationship-related as in… as in love relationships, so friendships, etcetera. ***(Counsellor, IDI5)***

Most student participants, both male and female, highlighted that their friendships—particularly peer pressure and fitting in with their friends—contributed to mental health challenges. One participant suggested that the struggle of fitting in with friends could lead to low-self-esteem:

I think with friendships, there is pressure to engage in social activities. When you have a test, and you know there's a party this weekend (laughs)—yeah classic example—you can sort of become conflicted because you want to build up friendships. You know that this time that you are in university is sort of like the last time that you must be able to

really make long-lasting friendships, and you want to do right by your friends. But you know you also have the pressure of, like, you don't want to fail, you really want to do well. ***(FGD4, male, 18, first year)***

With friendships and so on, let's take it, for instance, you are having friends and you know we are from different backgrounds, with friendships if you find yourself much more different from your friends and then you become... you tend to want to fit in and it brings more pressure, and then that also adds on to decreasing your self-esteem and I think it also causes anxiety as well. ***(FGD14, female, 21, third year)***

Participants also expressed how romantic relationships, particularly those involving breakups, disloyalty or lack of trust from their romantic partners, could contribute to mental health challenges:

I think relationships, mostly the mjolo [dating] ones, I feel like that really contributes to mental health a lot cause I'm seeing it a lot here where I'm staying. Cause it's also affecting me, even though I'm not the one in the relationship. I can say that the disloyalty in the relationship, not trusting each other, can affect one's mental health. ***(FGD11, female, 21, third year)***

I went through a breakup, and I struggled with matric finals and my overall mental health. ***(FGD6, male, 18, first year)***

Contrary to common perceptions, one participant maintained that relationships were not a major contributor to mental health challenges, but rather how they were raised and how they perceived their relationships and themselves:

I feel like with mjolo [dating]. It goes back to home again, how you were raised. As you meet different kinds of people in varsity, you will see that some people depend on other people for their happiness and their well-being. So, I think it's not necessarily mjolo [dating] as a factor, but just the mere fact that some people depend on other people for their happiness. So that can affect their mental health if they're not getting attention, they feel bad if they are not, you know. All this kind of stuff; it depends on yourself and how you were raised. ***(FGD15, male, 20, second year)***

These findings are consistent with the literature showing that poor romantic relationships and break-ups among university students can affect their mental health (Field et al., 2010). Relationships are important in the development process of emerging adults, especially those at university (Arnett, 2018). While healthy relationships can be affirming and empowering for emerging adults, unhealthy ones can be a source of psychological distress (Braithwaite et al., 2010).

5.6.3 Academic pressure

Participants identified various academic challenges as contributing to psychological distress. Challenges included academic workload, online learning, deadlines, procrastination, examinations, and adjusting to the academic environment. Counsellors also shared that academic pressure was one of the most reported factors causing distress among students:

> *The most common lived challenge is also academic experiences, work overload, adjusting to work overload. Adjusting to the kind of way in which the system is used, tools that are used, the language used and what is required, the language itself being English, which is the medium of communication at university.* ***(Counsellor, IDI6)***

> *Studying at a varsity that just means that obviously if one part of your life is impacted, it impacts the entire part. Or it could either be vice versa—it could be an academic problem that spirals into a whole lot of personal other problems.* ***(Counsellor, IDI3)***

Most students identified academic workload as a trigger for psychological distress:

> *I can relate that students might get depressed and have anxiety because of the workload.* ***(FGD1, female, 18, first year)***

> *At my school, there is [mental health challenges] because of the workload. I've come across students, people from school—they do say they are depressed due to the workload.* ***(FGD13, female, 21, third year)***

> *I feel like depression is mostly caused by when a person is overwhelmed by schoolwork. Cause not entirely everything we do is new, but we get to a point whereby we've had so many lectures at one time and you can't comprehend everything.* ***(FGD13, female, 18, first year)***

Some participants also highlighted the major differences between the workload in high school and university. Transitioning from high school to university in terms of the workload was mentioned as a factor contributing to psychological distress:

> *I think the main cause of it was the huge work pressure. Like, you know, matric was already tough but first year sort of took it up another notch. And I guess the difference between matric and first year was that the support was a lot less. Like you don't get much from your lecturers. You have to sort of, like, you have to fend for yourself to survive.* ***(FGD4, male, 19, second year)***

> *I come from an ACE programme, so like with the curriculum that I come from, it was very difficult for me to adjust, especially in my first year [university]. With how different things are, the pressure, the amount of work and having to write sit-down, timed exams—it was like, a lot, you know.* ***(FGD4, female, 20, third year)***

Another finding about academic pressure was the transition from in-person contact classes to online learning, which was a trigger for psychological distress for some students. One participant stated that he failed some of his modules because of the difficulty of online learning and learning independently:

> *I failed three modules just because I can't study online, I really can't. I mean I'm just one of those people that learn by doing things face-to-face. It's hard to get through lectures if you want to ask any questions academically and not being able to do that on site on campus. That really does affect my learning.* ***(FGD6, male, 22, second year)***

Challenges with online learning were emphasised mainly by first-year students, because most were studying online for the first time, and some had to learn how to use their technological devices for everyday learning:

> *I'm a first-year. This thing of studying online is like new, it is new to me. I finished my matric in 2019. Because we were attending contact classes, when I get here and there is like… online classes. Like, I was very much confused.* ***(FGD4, female, 19, first year)***

> *On my side, online learning contributes to my mental health problem cause most of the time, there will be times that I will not be understanding what the lecturers are talking about. And then, when I try to ask, they won't give me the answers that I wanted. And then comparing to face-to-face lectures—on face-to-face lectures, I can ask someone maybe next to me and then they'll be able to help me. But then online is so difficult for me; it makes me stress.* ***(FGD13, female, 18, first year)***

> *Not able to participate in the schoolwork and the fact that we now actually studying online, most of students are not coping. It causes them anxiety. Most of them are not familiar with or did not familiarise themselves with the internet and gadgets. So they find it more difficult to participate, especially first-year students. So most of them are not coping through the online learning.* ***(FGD16, female, 24, third year)***

One participant indicated that online learning was difficult for her because of disturbances from family members:

> *Family members just don't understand that it's quite important for us to attend classes online. They only know that we attend contact classes and it's new to them. So it's easy for them to disturb us while we are learning, and it causes anxiety... to a point where I'm, like, I am giving up. Like, no, let me just quit. If they are disturbing me, I will exit the meeting. I will exit everything. And then something might come up that is very important here in the family. Like one of my siblings might injure themselves with a knife while I'm attending a meeting, so I must leave everything and attend to family matters. So, it's causing a lot of strain to students.* ***(FGD16, female, third year, 24)***

These findings are consistent with findings from global research concerning the psychological impact online learning has on students, particularly during the COVID pandemic (Goudeau et al., 2021; Irawan et al., 2020; Mpungose, 2020). These findings also need to be understood in the context of the early stages of the COVID-19 pandemic, where students were not allowed to move around or be on campus. As the restrictions were lifted by the government and more freedom of movement was allowed, students were able to return on campus but continued with online learning. This emphasises that the challenge may not have been solely online learning, but also a lack of resources and a suitable place to learn online at students' homes.

Participants also identified writing exams and failing as triggers for psychological distress. One participant stated that she would have anxiety attacks right before writing her exams, prolonging the time it took her to write:

> *I used to have a lot of anxiety before writing an exam, when we were still doing face-to-face. Then I'd start shaking, so it would take me time during the session of writing the exam.* ***(FGD2, female, 22 third year)***

Writing exams was expected to be a significant trigger for anxiety, as the literature shows that most students experience anxiety while writing exams, and some students discussed the exam period as anxiety- and stress-provoking (El Ansari et al., 2014; Shah et al., 2010).

Another participant stated that most institutions did not recognise mental health challenges as a valid reason for deferring an exam:

> *If you are struggling with mental health issues, say, before a test, you can try appealing for a deferred exam and using that as an issue. I know that it can be quite difficult for you to be granted for that deferred exam.* ***(FGD4, male, 19, second year)***

Although most universities are beginning to recognise mental health challenges and giving them the same attention as physical health challenges, the second quote below highlights the underlying negative perceptions students have about how universities handle students with mental health challenges. It is also important to consider that obtaining a mental health sick note may be difficult compared to a sick note for physical illness. Research reveals that few students visit campus therapists or psychologists because of lack of awareness or time constraints (Mitchell et al., 2017).

Participants also identified failing and repeating modules as a trigger for psychological distress. The feeling of being a failure was common in students who could not obtain distinctions and perform well in comparison to high school, which led to negative feelings, the desire to quit and question their ability and self-worth:

I finished school very early [at 16], so like in my first year I failed, and for me, failing was like a challenge. Having failed for the first time in my life, I didn't understand that. Ok fine, what am I doing wrong this time? Because all these years I have been passing in high school, you know, whatever and all of that. I have been a genius, ok? Yes, I come here—I get low marks and, you know, everything is just going south. The whole thing did actually mess up with my mental health when I had to repeat the first-year modules that I failed in the second year. I had to repeat them. ***(FGD4, female, 20, third year)***

That's why when you fail a module, you feel like a failure. And it's, like, very difficult to transition from high school to varsity and like, kind of like, oh okay, I am not getting distinctions. And you, like, ok is this what my worth is now? I feel like it's very difficult dealing with mental health and just being ok. ***(FGD2, female, 18, first year)***

These findings are consistent with findings that failure, or the fear of failure, affects students' mental health (Hassel & Ridout, 2017). Procrastination and striving to meet deadlines were highlighted as some factors that caused stress and anxiety among students. Most students revealed that leaving assignments or studying for tests at the last minute caused them stress or anxiety. Participants believed they faced pressure to meet deadlines. Juggling deadlines and personal matters created pressure, which triggered anxiety or stress in students:

And when it comes to assignments, you get this thing, but people actually start a day before. And I've done this lots of times and I have... I'm guilty of this myself. But I know people who stress by saying 'oh no, it's due in 5 hours and I haven't started', and they get anxious and they start stressing and they drop out or say, 'I want to change my course' to something that's easier. ***(FGD6, male, 18, first year)***

I think uh... the only problem that most students face with mental health is something that they cause themselves mostly because of procrastination. I think university's very much manageable if we are being realistic. If you do things in time and all these kinds of stuff. Cause it has been proven over and over that it is manageable but then I think procrastinating and tasting that little victory at first that if you procrastinate, you can still finish the task, and you get used to the habit. ***(FGD15, male, 20, second year)***

Previous research has shown that procrastination contributes to anxiety among students and stems from a fear of failure and the difficulty of tasks at hand (Saplavska et al., 2018). Highlighting the importance of time management amongst students to avoid the pressure and strain associated with meeting deadlines.

5.6.4 Psychosocial challenges

Psychosocial issues, such as social media, the COVID-19 pandemic, trauma and grief were highlighted as major contributors to psychological distress. Excessive use of social media has

been identified as negatively impacting young people's mental health (Bashir & Bhat, 2017). It was, therefore, not surprising to find that the students in this study identified social media as a trigger for anxiety, as most shared that they compare their lives to other people's lives on social media. However, the topic of social media and comparison did not emerge in the in-depth interviews with counsellors:

> *For me personally, I think it's social media. I find that, sort of, you can sort of increase my anxiety.* ***(FGD4, male, 19, second year)***

The anxiety from social media, for some participants, was triggered from seeing their peers who had chosen the social media influencer route earning more than they are as students, which triggered doubts about whether their degree was worth it, and whether they would be able to secure a future with their degree:

> *The generation we have built as a society and people or just because it's just been digitised. But seeing people our age, you know, already be like in inverted commas 'hustling' and already have jobs or, like, for influencers who are you know flying back and forth when they're making money and were like, oh my gosh, like, we going to school and will not even be guaranteed jobs. But these people got to drop out and are making stacks on stacks [money].* ***(FGD1, female, 19 first year)***

Some participants, mostly female, shared that they compared themselves with images of their peers on social media, which contributed to low self-esteem and anxiety:

> *People on social media seem like they are doing great and achieving a lot of things, so yeah. It also contributes to our mental health. Because if you see your peers on social media at 21 like myself, are having to drive a car, and then it makes me think that I'm not doing enough or I'm not going the right direction. For me to be or look like people on social media. So yeah, because the social media communities are achieving a lot and somehow, it's not true.* ***(FGD14, female, 20, third year)***

> *Sometimes I used to compare myself to other girls because most of the time I felt a little inferior. Because maybe I looked at myself and compared myself to them because they have better clothes or were better looking.* ***(FGD1, female, 18, first year)***

> *So, you kind of sit back and you, like, if they are doing that well, I must reach that standard. Because there's obviously a ton of other students that are reaching that standard and ultimately you just sit there, and you go into a spiral of anxiety. Like, at the end of this, am I going to be high enough standard? So I think that's what contributes to that bad anxiety in certain students.* ***(FGD8, female, 20, second year)***

One participant commented on how current affairs on social media, such as the economy, can plant seeds of doubt about their future and current degrees:

I think I'd say I mean sometimes stuff that you see on social media and the news can sort of affect you negatively. Like I mean, sometimes when you see a lot of negative things on social media, negative things about the country and everything's about the economy. I think one way that has sort of affected me personally is how I think about my future and in terms of job prospects and just sort of, like, sho! Am I even in the right degree? Will this degree guarantee me a job? How will I find that job? ***(FGD4, female, 18, first year)***

This finding that social media fosters anxiety and unrealistic comparisons is consistent with research conducted amongst students globally (Braghieri et al., 2021). Although an effective tool for information and entertainment, excessive dependence on social media can create a false reality for young people. It can also exert unnecessary pressure by enticing young people to follow trends or display unrealistic images of themselves. This can give rise to cognitive dissonance—when the real person is not consistent with the person portrayed on social media. Addressing social media use amongst students is an important aspect of improving their mental health.

5.6.4.1 *The COVID-19 pandemic*

The COVID-19 pandemic was identified as a trigger for psychological distress amongst students. During COVID-19, students were expected to adjust their lives by studying online and being away from their social and university environment, which, for some, caused psychological distress.

COVID-19 was also discussed in the context of help-seeking, as some participants highlighted how this pandemic affected the way students sought academic or mental health support from university structures:

So, when it comes to mental health, I think it is tough, especially during the COVID period of isolation and what nots. I don't know because there is always a new variant when it comes to COVID. And I just feel like I'm lost, and I would ask, how do I deal with the fact that I am lost, you know? ***(FGD6, male, 22, second year)***

Now especially with COVID… That might cause some kind of depression as well but just from the fact that you feel just lonely and isolated from everyone else and, sort of, no one to share the academic stress with or to, like, vent to. So I think that might be another challenge that we might face because of COVID and because of online schooling. That's one that's becoming prominent. ***(FGD12, female, 20, second year)***

I can elaborate on that with what we are facing right now through the pandemic. Most of the learners are not coping with their family members actually affected due to COVID, so they tend to fall into depression. ***(FGD16, female, 24, third year)***

These findings are consistent with the global literature showing that the COVID-19 pandemic increased symptoms of depression and anxiety amongst university students (Chen & Lucock, 2022; Visser & Law-Van Wyk, 2021).

5.6.4.2 *Trauma and grief*

Trauma was highlighted by both counsellors and students as potentially provoking psychological distress among students. Counsellors identified trauma, such as domestic violence and gender-based violence, as contributing to psychological distress among students:

> *Trauma… if you think about it being in varsity in the middle of Joburg, sometimes people do go through a lot of traumas, even histories of traumas that have been there. Just as anxiety creeps in and the pressure of being in an academic institution, we kind of have these things surfacing, things that seem to have been resolved. It could be domestic violence, it could be sexual violence, historical rape.* ***(Counsellor, IDI6)***

> *There has also been a lot of cases of gender-based violence, which we have also been seeing. So the whole spectrum of psychosocial problems.* ***(Counsellor, IDI3)***

Student participants emphasised abuse and gender-based violence in relationships or at home as triggers of psychological distress to the individual experiencing the trauma as well as those around the individual:

> *Witnessing someone be abused by their boyfriend is not an ideal thing for a student to see. Cause I'm already struggling with so much of myself and there's you taking your troubles and making them mine.* ***(FGD10, female, 21, third year)***

> *I got depression from home. For example, let me talk about myself so I can make this statement clearly. I grew up in a family where there was a controversy between parents, so that thing it affected me a lot. Whenever I see some people fighting, that thing comes up and pops up in my head.* ***(FGD16, male, 22, third year)***

Research also shows that students who have been exposed to interpersonal violence related trauma have experienced negative mental health (Artime et al., 2019). Further, a high number of female students have experienced intimate partner violence (Voth Schrag & Edmond, 2018). Gender-based violence is a critical issue in South Africa and women in South African universities live in fear of physical and sexual violence (Gordon & Collins, 2013). Universities in South Africa are experiencing a serious spate of violence, with male students as perpetrators, and increasing numbers of universities are having discourses around this issue (Finchilescu & Dugard, 2021; Mahlori et al., 2018). Therefore, discussing gender-based violence and the trauma related to it is crucial when examining mental health challenges.

Loss and grief were also highlighted as factors contributing to psychological distress among

students. Although death is part of life, it is also a painful and traumatic experience for those left behind. Grieving can lead to psychological distress. Deaths that occurred during the COVID period significantly impacted students and their ability to fully engage with their academic work. One participant revealed that she developed some anxiety after she was told of the passing of a friend:

> *I lost a friend of mine. After his death, like, I was just told over the phone and after that, I was literally going through a lot of fear. I kept it for a long, long-time cause obviously didn't even know what to do with it. Until I told this one girl at church that I have so much anxiety, I can't even walk to my room alone.* ***(FGD10, female, 24, third year)***

> *I don't think I accepted that my grandmother passed away [during COVID], which is one of the reasons I don't have motivation to work like I did in the first semester.* ***(FGD6, male, 18, first year)***

> *Three weeks ago, I went to a funeral for my aunt and it's tough. Last year I went to, like, there were like five different deaths that happened just because of COVID. And that really messed with me, with my mental health.* ***(FGD6, male, 22, second year)***

Although not discussed at length, counsellors stated that grief and bereavement are also possible causes of psychological distress:

> *It is a wide variety; you get anything from adjustment issues to bereavement to addictions.* ***(Counsellor, IDI2)***

Research has shown that students experiencing grief are more likely to be diagnosed with at least one mental health challenge, including insomnia, loss of motivation, and depression (Tan & Andriessen, 2021; Varga, 2016).

5.6.4.3 *Financial challenges*

Both counsellors and students mentioned financial challenges as an important contributor to students' psychological distress. Counsellors shared that financial challenges could be a trigger for psychological distress:

> *When it comes to the actual experiences which are common, things like financial difficulties. We find, you know, people [students] being helped with financial advice at the CCDU.* ***(Counsellor, IDI3)***

Students discussed financial challenges, particularly the lack of financial support for their studies and financial challenges within the home:

> *Students are depressed because of the circumstances at home. Maybe financially they can't afford because the parents are failing to pay the tuition.* ***(FGD13, female, 21, third year)***

Also, it was my financial situation because I was going through the most with my bursary—it wasn't paying and then after that, I got robbed, so it added to my financial baggage already. ***(FGD11, female, 21, third year)***

What scares me the most is that they [university] have mentioned that if you fail, you have to repeat that module the whole year. And there are chances that maybe my bursary, they could take it away. So I'm, like, if I'm failing, then it means it's over for me because no funding means I have to quit. ***(FG4, female, 18, first year)***

But maybe something like your financial situation might also then add onto it, and so then what ends up happening is that you are in a state where you are constantly feeling as if like you either inadequate or you are just unable to take on what's placed in front of you. ***(FGD1, male, 20, second year)***

Finances can be a challenge for students in various ways. Students coming from poor socioeconomic backgrounds face the challenge of meeting their needs with little, while other have the challenge of finding financial support as not all can receive financial support from the university.

Some students face the challenge of securing funds to study, while those who have funding are pressured to work extra hard to retain their funding (Lim et al., 2014; Trombitas, 2012). Retaining their financial support may require passing all or 75% of their modules. Blanden and Macmillan (2014) indicated that most students come from disadvantaged backgrounds and that their only way out of poverty is to secure a loan to study and, hopefully, find employment immediately after graduation, so that they can start paying off the loan. Not only does this place immense pressure on them, but it also leaves them with longstanding debt. The financial strains facing students was evident with the 'Fees must fall' movement across South African universities in 2015, when students protested the sharp increase in university fees and urged the government to subsidise their studies or provide free education.

Financial difficulties have been associated with poor mental health amongst students (McCloud & Bann, 2019; Richardson et al., 2017). When students have failed most of their modules and do not receive funding for their studies, they experience feelings of hopelessness, and some deregister while they seek funding. A study by Letseka et al. (2009) found that student poverty was the highest ranked reason for dropping out of university by Black South African students. They reasoned that, in the context of historical social and political factors, a lack of finances should be considered a major stress factor among disadvantaged students in South Africa.

5.7 STUDENTS' AND COUNSELLORS' PERCEPTIONS OF USING A MENTAL HEALTH APP AS AN INTERVENTION FOR PSYCHOLOGICAL DISTRESS

This theme describes students' and counsellors' perceptions regarding the use of a mental health app to assist with their mental health. This overarching theme includes three main themes: 1) facilitators to using mental health apps, 2) barriers to using mental health apps, and 3) perceived usefulness of the app.

5.8 THEME 4: FACILITATORS OF USING A MENTAL HEALTH APP INTERVENTION

Most participants stated that they were willing to use an app to meet and support their mental health needs. Facilitators included: 1) previous experience with using other apps, 2) convenience, 3) accessibility, and 4) confidentiality while using the mental health app (Figure 5.6).

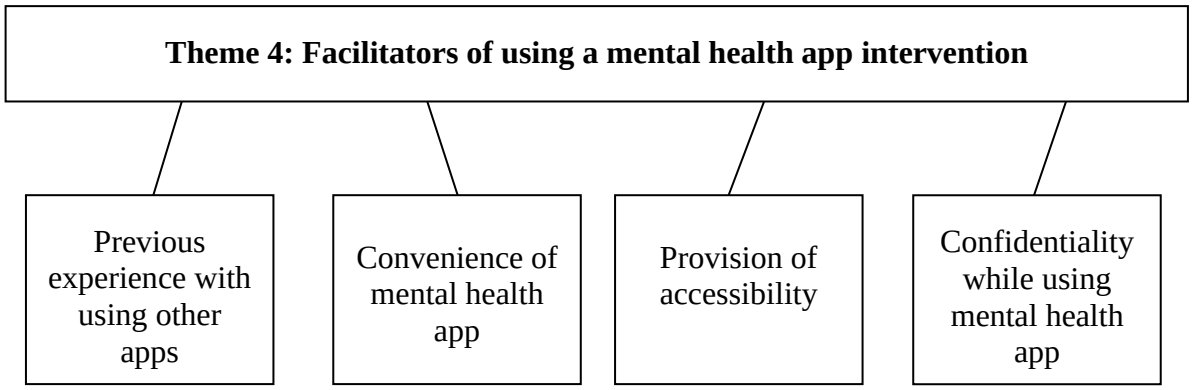


Figure 5.6: Theme 4

5.8.1 Previous experience with using other apps

A few student participants asserted that the previous use of other mental health apps, particularly meditation apps, had opened them up to using a mental health app:

> *For me, I used to use the app for meditation when I was in high school and it helped for a bit. So I think I can try and use the app.* ***(FGD2, female, 19, second year)***

> *Yeah, well, when it comes to an app, I've used an app before. A meditation app—yoga that was way better than me walking into a yoga session, you know. So yes, apps can work.* ***(FGD10, male, 22, third year)***

Some counsellors shared that they were already referring students to apps, particularly those designed specifically for the university or meditation apps:

I already refer my clients to certain apps, mainly for mindfulness. To be honest, using any other app would depend on what is covered there. ***(Counsellor, IDI5)***

This finding shows that some participants are already using apps as a self-help tool for their mental health care needs. It also indicates that exposure to mobile self-help tools can assist with encouraging the use of mental health apps. To my knowledge, little research exists on how exposure to mobile health (mHealth) apps can encourage individuals to use mental health apps (Torous et al., 2018).

5.8.2 Convenience of the mental health app

Some participants confirmed that convenience would influence their use of a mental health app:

So, in terms of having an app, I don't think I'd be opposed to it because it seems more convenient. ***(FGD1, male, 20, second year)***

People love convenience. Hey, we don't need a lot of apps in our phones, just one app that does all. ***(FGD3, female, 19, first year)***

I would want to use an app. It's on my fingertips; I can access it whenever, especially if it's an app designed to cater to the needs 24/7. I am just imagining sometimes people sit with a lot and they just want to make sense of relief of emotion during a particular time. ***(Counsellor, IDI4)***

Participants also stated that an app would provide students with the help they need in the comfort of their own homes or space. This could be especially helpful for introverts, people who have social anxiety, or those who have busy academic schedules and do not have time to seek face-to-face assistance. Using an app would mean that students are provided with mental health support without having to go outside of their comfort zone:

I think it will be a good option because I'm for those who aren't comfortable going in person… it becomes an alternative for them. So I guess it would make getting help more accessible and have different options so that someone can choose what they're more comfortable with. So I think it's a good idea. ***(FGD12, female, 20, third year)***

I think an app will work very well. It has been proven over and over that people are more confident when they are behind the keyboard than they are in real life, so I think an app can be a better start. To evaluate whether it will work or not but to my knowledge, I think it will actually work. People, when they are behind the keyboard and not actually face-to-face with the person, I think they are more confident. ***(FGD15, male, 20, second year)***

I can see how it has been more accessible to people in the comfort of their own spaces, so those are some of the highlights I can bring. ***(Counsellor, IDI3)***

5.8.3 Provision of accessibility

Student participants generally agreed that an app would make mental health care more accessible, because students are always on their phones:

> *That is smart because most of us students, we are always on our phones. So maybe we can use that app since it's on our phone and we are always on our phone. So I think it can work. It can increase the number of people now opening about their mental health, yeah.* ***(FGD12, male, 21, third year)***

> *I was saying, like most of us, we always have our, like, mobile phones. I think it's, like, it has become a part of us. So I think it will be much easier for me to open to my cell phone because I know that at the end of the day, there's no one's going to know my stuff.* ***(FGD16, male, 19, second year)***

Participants indicated that a mental health app could assist with providing access to mental health resources to students who may not have the resources to see a therapist, or who are not comfortable or restricted to see a therapist face-to-face because of distance, emotional or financial challenges. For these students, an app would be a bridge between students and therapists. Further, those who have had reservations about seeing a therapist could use the app to facilitate that relationship or ease themselves into seeking help from a therapist:

> *It might work for people who do not have the access to a real counsellor. So those people might download the app and might get help in some sense on what they're facing. So people who are far away from the city or far away from getting help with the counsellor.* ***(FGD2, male, 20, second year)***

> *I think an app would be extremely helpful, especially for those who... I don't want to say scared or afraid... but not willing to go to a therapist or talk to somebody intimately. So, I think an app would be helpful for people in need of something like that, yeah.* ***(FGD5, male, 21, third year)***

Counsellors had the same perspective, that mental health apps would provide students with accessibility, especially to those who may not have sufficient time to see a mental health professional:

> *Sometimes, when you have a student who is highly anxious about time, it means they feel like they cannot book a session. So, they can access an app at least, which is something that is accessible at the comfort of where they are. They also get to schedule the time which they engage with the app or interact with the app. If they feel like they are anxious and they feel like they want to finish a chapter before maybe until six o'clock in the evening, our offices are closed. So, the time they want to tap into their emotionality, it might be after hours, no one is available so… they can access the app. Sometimes they are students who are interested.* ***(Counsellor, IDI6)***

But I think because over the years I have done different things and have had to intervene in different ways. And also understanding that sometimes how we, if we limit how people can access us and our services, we might come across as a profession that is not very open to change and embracing technology within certain kinds of, you know, limits. ***(Counsellor, IDI3)***

Counsellors also raised the point that the accessibility of an app would also address issues of affordability; using a mental health app may be a more feasible option for students who cannot afford to see a private psychologist:

Students also cannot afford private psychologists, so because they cannot afford, because they are not comfortable with university therapists, and they are not comfortable with the affordability of seeing private therapists, then they have a resource at their disposal that they can explore, based on their levels of comfort. ***(Counsellor, IDI6)***

In some situations, students have data at a certain time. They might have more data in the evening, and our offices are closed. So they are able to independently, at whatever time, like I said earlier, get into the app as a resource to them. So I do think that it is something they would transition to. ***(Counsellor, IDI5)***

The affordability of using an app may not be a massive challenge as most students have access to internet data and Wi-Fi on and off campus. The quantitative findings of this study also ascertained that at least 80% of participants have easy access to data, making an app a plausible intervention in terms of affordability.

5.8.4 Confidentiality of the mental health app

Students emphasised confidentiality as a facilitator to using a mental health app. An important part of confidentiality discussed by participants was privacy. Some participants felt that an app would give them the privacy to address their challenges. Privacy was discussed around the fear of judgement, which most students had already stated was a barrier to their help-seeking. Participants believed an app would not judge them, compared to a human being who might have stereotypes:

I'd rather prefer to have an app rather than having it in person or online. You know, conversations because it's not really a breach of my privacy barriers that I put up. ***(FGD3, female, 19, second year)***

You can just do your own thing [on the app] without being afraid of being judged, as we mentioned. Yeah, I think it's great. ***(FGD5, female, 18, first year)***

Anonymity was also raised as an important aspect of confidentiality. One participant stated that she would prefer using an app with an anonymity function as opposed to attending a support group:

> *And maybe, let's say there is a support group, you are probably not going to go, even if that would be helpful. You are not going to go because everyone is going to know your story, and everyone is going to look at you differently or treat you different. So, if it's on an app and its anonymous, there is no problem.* ***(FGD2, female, 22, third year)***

Anonymity was also discussed as an important way to address the stigma associated with consulting a mental health professional face-to-face. Anonymity provided by the app would assist students in seeking help without fear of being known to be facing mental health challenges:

> *I would really go with the app because it also solves the previous point that you don't want to go to somebody who you know who might talk about you after, you know, for as long as you can see them. You're not comfortable sharing with him. An app is easier for as long as it's confidential and they don't know who you are, and you just talk about your problems, and you just get the solutions that you can get, and you are out. So, I totally agree with an app, yeah.* ***(FGD10, male, 22, third year)***

> *It will work. People, when they are behind the keyboard and not actually face-to-face with the person, I think they are more confident and all this other stuff. So, they are going to reveal more of themselves than when they're just sitting with the therapist right there.* ***(FGD15, male, 20, second year)***

> *But if there is this thing where I can type behind a screen, no one sees me and that's what I need. So yeah, an app can work. That is another survey for students themselves. They will be able to tell you what they need.* ***(Counsellor, IDI4)***

Convenience, accessibility, and confidentiality are central factors in the development of mHealth interventions globally (Dorsey et al., 2020). It is no surprise that the participants highlighted these factors as essential facilitators to their use of mental health apps. These factors were crucial to their motivation of why the app intervention would be good for students' mental health.

Both counsellors and students agreed that an app could help to reduce stigma amongst students regarding mental help-seeking. If students can seek assistance in their own private spaces and in their own time, this could help in addressing previously held beliefs on mental health help-seeking behaviours, while also getting them the help they need:

I think the good thing about that is because we know how students view counselling, there is a stigma attached to it. Whereas when they do it in their own comfort, in their own private spaces, then at least they can reach help. ***(Counsellor, IDI2)***

Because there is still a lot of stigma around coming to a therapist and coming to their office, versus kind of asking for help from a therapist in your own kind of space where you feel safe. So yeah, I think a lot of adolescents and maybe people in their early 20s have become quite comfortable that their resource for accessing a lot of different things is mobile kind of apps or whatever, would feel very comfortable. ***(Counsellor, IDI3)***

We know that there are students who are not comfortable to see psychologists on campus because of various stigma issues, so an app would help with this. ***(Counsellor, IDI6)***

But I guess you know it cancels the whole fear of their ego perspective with men that they are going to see me as weak as I walk in the counsellor's office. It's going to rub off the whole fear of I grew up in a very religious background, I cannot be talking to a psychologist. ***(FGD10, female, 24, postgraduate)***

Consistent to this finding, a systematic review by Koh et al. (2022) shows that mental health apps have the potential to reduce negative attitudes associated with mental health challenges, as users can use the app discreetly and can facilitate a transition to face-to-face help-seeking.

5.9 THEME 5: BARRIERS TO USING A MENTAL HEALTH APP INTERVENTION

The barriers presented in this section are associated with participants' unwillingness or uncertainty with using mental health apps. This theme has four sub-themes: 1) lack of face-to-face therapy, 2) over-reliance on the app, and 3) fear of misdiagnosis (Figure 5.7).

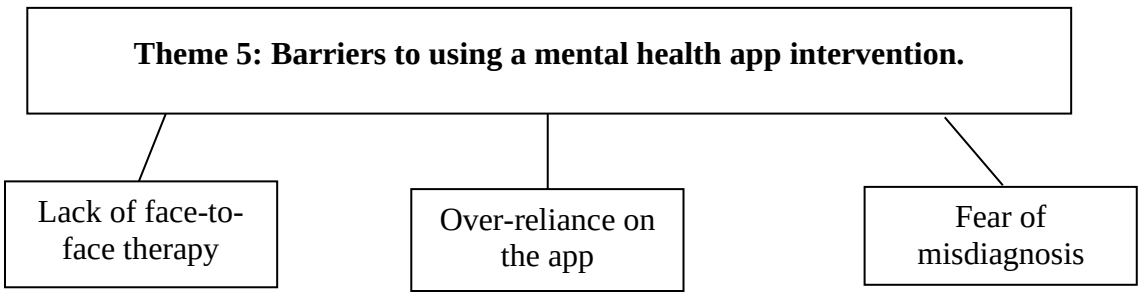


Figure 5.7: Theme 5

5.9.1 Lack of face-to-face therapy

This first barrier relates to some individuals' preference for face-to-face therapy. Students who had already used counselling services pointed out that face-to-face therapy offers a

human element such as warmth, physical affection and prompting the right questions, things that an app would be unable to provide:

> *So personally, I wouldn't want to use an app. I prefer talking to a person while I can see them and, uhm, still not through an app or calling them or text messages. I just prefer to talk to person in person when I can see them.* ***(FGD1, female, 18, first year)***

> *Okay this is face-to-face but not really face-to-face, if you get what I mean. Because, you know, sometimes you just need a hug man. Sometimes you just need a hug. You don't need someone to tell you just persevere, you are going to be fine. Sometimes you just need a hug, you know. So how can you get a hug over the phone?* ***(FGD11, male, 21, third year)***

> *The app will not work for me. A counsellor failed to assess me in person, so how would it be different if I was to use the application?* ***(FGD5, male, 21, third year)***

Counsellors added that students may have an expectation for face-to-face therapy on the app, which, if not met, could discourage them from using the app:

> *Students would prefer individuals, so I think the traditional way of doing therapy is still not just valid, but it is still needed and expected and requested by students. But I think an app can help but to a certain point.* ***(Counsellor, IDI4)***

> *What I also think might be a barrier. I think that for someone who is already isolated, they may desire a therapist rather than an app because they are already isolated, you know. They cannot talk to people; they do not feel like they belong, so it would feel safer in therapy and to have a level of connection with someone. Basically, it [an app] takes away from that personal human nature where you see the person and you can read more from their gestures, their behaviour. So, it takes that element away from counselling.* ***(Counsellor, IDI2)***

> *I would construct it in my mind that there is not the human element of seeing a therapist, having someone challenge you, having someone make clinical observations, having someone say according to what you are saying. And you are having an emotional reaction and there are inconsistencies, and I am wondering why? Right? Whereas with an app, those opportunities may be missed.* ***(Counsellor, IDI5)***

This barrier is critical as it speaks to emotional needs that an app would not be able to fulfil. This barrier also reveals how impractical it is for a mental health app to replace a counsellor completely, more particularly for those who have critical mental health challenges. The literature suggests that mental health apps should complement face-to-face therapy (Wentzel et al., 2016). Therefore, the app intervention should not be designed to work as a counsellor but as a resource for self-help. Some counsellors also suggested that the app be used in conjunction with face-to-face therapy and that the use of apps can be a bridge to face-to face-therapy:

I do think that the transition has to happen. If it means with time apps will be more effective than therapists, that's ok because they will develop and advance with time. But I do think that in this transition, it is better for them to be accessed in parallel because I do think there are certain qualities the other presents with strength in terms of the apps. And traditional therapy might present with some certain qualities that the student can benefit from both interventions. ***(Counsellor, IDI6)***

We have just said this week that we have had a higher number of therapy sessions over the months of February and March—and that's all-virtual sessions—than we have ever had, I do not know in how many years at CCDU. So, you know, I think it just goes to show that we can render a very effective service with the use of technology, whether it is on a laptop or whatever device within a very good security and confidentiality kind of limits. It is very viable, and I do not think it is going to change anytime soon. ***(Counsellor, IDI2)***

An app can open up certain things. Maybe when it opens certain things, which is a bridge between just having an app and just seeing someone. Maybe it can just help someone think if I can just get this from using an app, let me try a more personal kind of approach to it. ***(Counsellor, IDI4)***

Several studies (Borghouts et al., 2021; Kit et al.,2014; Koh et al., 2022; Varghese & VandenBos, 2019) have highlighted these challenges, although they do not diminish the effectiveness of apps, they show that there are certain human related aspects that apps cannot fulfil, confirming that an app is not a replacement for face-to-face therapy but a tool that should be used in conjunction with therapy.

5.9.2 Over-reliance on app

Possible over-reliance on the app was also recognised as a potential barrier, mostly by student participants. Students acknowledged that poor time management and spending more time than they should on their cell phone could become potential barriers to their use of a mental health app:

The only reservation that I might have been is not being able to manage it properly in terms of time management. It would be a bit different because now everything is in your hands. Say, if you have an addiction to your phone or certain apps on your phone, how will you make sure that this new app that you are getting? How does it not become a problem instead of helping you move forward? ***(FGD1, male, 20, second year)***

Another participant remarked that apps could have a level of toxicity, which, if present, could be a barrier to using a mental health app. She suggested that the app should have a good balance and help the user grow:

I'm not saying other apps are toxic but I'm saying, personally, I can get some toxic vibes from apps. So, apps that are different, that are going to grow me, those are the

type of apps I'd like on my phone. I'd appreciate something like that. So just if you know all apps have their good and their bad. ***(FGD3, female, 18, first year)***

I found this perspective helpful, as it is easy to approach the development of an intervention without considering the possible negative elements. Therefore, the app's development called for caution by incorporating features that would not be enabling or cause participants to become addicted or over-reliant. This participant's perspective also highlighted the importance of allowing the app intervention to become a bridge between therapists and students—not the only solution to assist with mental health challenges but rather a tool that can facilitate that process.

5.9.3 Fear of misdiagnosis

Participants also mentioned the fear of being misdiagnosed with a mental health challenge as a potential barrier to using a mental health app:

I want to make an example. Let's say, for example, I have anxiety... but I don't know specifically if I have anxiety and I go on the app and I tick all the boxes that I think I am experiencing or what people have told me that I am experiencing, and I tick on those boxes. And then the conclusion is that yes, you have anxiety but, all in all, the matter of fact is that I have depression. ***(FGD2, male, 20, second year).***

So, I think if we do have the app, we can always have your sessions and issues resolved. If it does work in a way that sometimes if a person is using it, it does not give them the wrong results. So instead of saying they have anxiety or says they have depression or something like that, giving them the wrong information. But then if everything is done correctly and information is being used correctly. ***(FGD2, female, 22, third year)***

One counsellor expressed concern that a possible barrier to using apps would be the ease of self-diagnosis, and that the app should focus less on diagnosing and more on encouraging participants to seek counselling for their challenges:

But of course, that particular tool can lead to self-diagnosis, which we often try to discourage. To say yes, it does seem like a good tool but sometimes you need to speak to someone about what is coming up so far, so that you have another perspective as well. But those are the common coping tools that I think, because of technology, as well as come up, and have been quite accessible. ***(Counsellor, IDI6)***

Given that pre-existing mental disorders can affect students' interactions with the app, those who feel tired all the time are less likely to pick up the phone and interact with it:

I think sometimes it's the motivation to just present a problem on its own, where… that's why I am saying it depends on where the student is at in terms of challenges that they are experiencing. So, if you have a student who feels quite demotivated, it means

there is a lot of reliance on self-initiatives. It means they must initiate using the app and they must go on it, be present. ***(Counsellor, IDI6)***

This perspective is important, as some participants indicated that they would like to see a mental health self-report scale on the app.

The moment I note that something is not exactly right with me, if I can log onto the app? Write my symptoms down and then it says you could be going through this and that and I will be, like, okay this is what I'm going through. ***(FGD10, male, 22 third year****)*

Honestly assessing yourself [on the app] too. Then, yes that would be perfect. ***(FGD7, female,23, third year)***

Their fear of misdiagnosis emphasises the importance of using non-clinical scales in mental health apps because of the sensitivity of mental health diagnosis. It is crucial for the app to not psychopathologise users but rather give them a chance to reflect on their own experiences or feelings by using non-clinical self-report scales not associated with a specific mental health condition.

5.9.4 Accessibility and affordability

Some counsellors pointed out that poor accessibility to smartphones and lack of data or Wi-Fi to log onto the app may be a barrier in the use of apps amongst students:

I think firstly, it is connectivity issues. I think that is also what we find. You know, even students who want to be able to do it, they do not have good reliable Wi-Fi, connectivity. That might be a little bit of a barrier. ***(Counsellor, IDI3)***

Not all students will have Wi-Fi when they are away from campus. Not all students can afford to, you know. It has a place in the mental health kind of avenue but at the same time, it is for people who can afford it; it is for the elite too. ***(Counsellor, IDI2)***

As much as this is powerful [raising a smartphone] it needs data, otherwise it still means nothing. Well, it dies, it gets limited, it's like a 3310, you know what I mean (laughs). ***(Counsellor, IDI4)***

This finding may seem peculiar, as in the previous studies based in America and Europe (Czyz et al., 2013; Eisenberg et al., 2011; Gulliver et al., 2010) accessibility and affordability were highlighted as facilitators to using mental health apps. However, given the socio-economic status of many students in South Africa and the high costs of data, lack of affordability could hinder students from accessing mental health apps (Harrisberg & Mensah, 2022).

5.10 THEME 6: PERCEIVED USEFULNESS

This theme examines the features and factors considered effective and useful for students and includes: 1) educational information on mental health, 2) coping strategies for mental health, 3) support for mental health, 4) engagement, and 5) security (Figure 5.8).

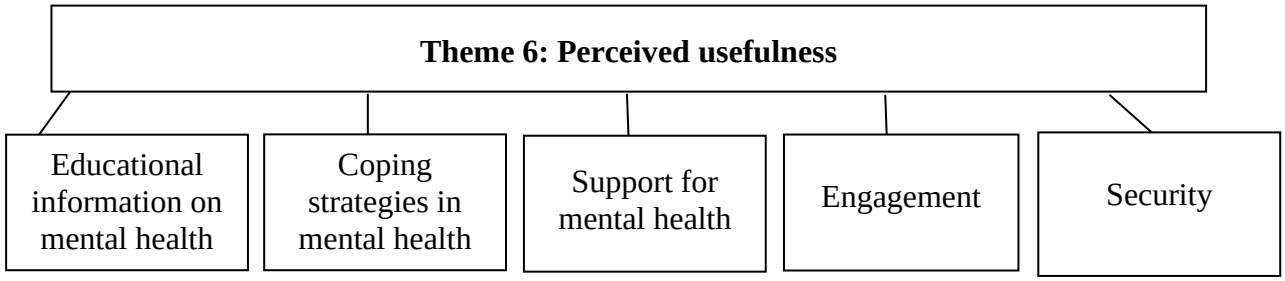


Figure 5.8: Theme 6

5.10.1 Educational information on mental health

Participants mentioned educational information as a vital element for the app to be effective and useful. When discussing information, participants indicated that they would like to have categories of information on various mental health challenges, particularly depression, anxiety, and stress, to better understand and manage them:

> *I think if you look at the most common mental health issues, like depression, anxiety, and stress, I think there should be, like, categories. Like this is a depression category; this is for people you can talk to. This is the anxiety category; these are the people you can talk to. And, like, special categories where it doesn't fall under the most common categories.* ***(FGD5, male, 21, third year)***

> *What I'd really like to see in the South African version, it's like the mental health categories. And you can click it and it would be statistics, tell you what it was, some symptoms, you know. If you're worried, contact your nearest [clinic], especially in the South African context because we do not always have information available to us.* ***(FGD1, female 19, first year)***

> *I think if we're to have an app, it would be better for the app to have all kinds of mental health disorders. There are students that are experiencing bipolar, students are experiencing depression, anxiety, and whatever stress.* ***(FGD14, female, 21, third year)***

Counsellors also proposed that the mental health app should focus on educational information regarding mental health challenges, particularly depression, stress, anxiety, and adjustment challenges, as these are most common among university students:

> *I think it needs to touch on a whole lot of different things—stress, anxiety, adjustment, depression. Those are the biggest mental problems that we know that a lot of people deal with, you know.* ***(Counsellor, IDI2)***

Even though we see a range, if we look at our stats or the prevalence of what we predominantly see, then it would be your anxiety disorders and then your mood disorders. Those would be kind of top prevalence in terms of our stats. So any app that kind of wants to target at a level that is meaningful and add value can look at that kind of area of intervention, I suppose. ***(Counsellor, IDI3)***

Both student participants and counsellors remarked that this category of educational information should also include information on where to find help when a mental health challenge is suspected:

Maybe a section where there's, like, contact details about organisations that help with anxiety and depression, stuff like that. ***(FGD3, female, 20, second year)***

I think it should include information on different things as well as supportive information—tips, processes; it should even include meditations. ***(Counsellor, IDI5)***

Providing clarity would be primary and I also think providing resources that are immediate to students, and providing resources that are external outside of the university context. To give them options factually and informative options, and that's a resource on its own—to know who to go to, for what, and feel and kind of normalise that accordingly. ***(Counsellor, IDI6)***

Jorm (2012) maintained that one aspect of mental health literacy is having knowledge of where to obtain help and to have a positive attitude about accessing this help. This study demonstrated that providing information on mental health challenges may empower users by enhancing their mental health literacy and help-seeking skills. One participant suggested that the app should also focus on raising awareness about mental health challenges, because when people are not aware of mental health challenges, they are oblivious to where to find assistance. Participants also remarked that the youth are not just concerned about sharing information, but also about how the information is shared. Participants indicated that they would like to find more information regarding mental health on podcasts and videos, and through written texts. These different ways of sharing information would provide an opportunity for a wider range of audiences because individuals have different preferences for how to seek information:

OMG [oh my gosh], I love podcasts, so I would listen to them. And it's special because it's like it's an easy thing to listen to. You can do it when you are cleaning your house or going to school or running. You know, it's just an easy thing to follow. ***(FGD1, female, 19, first year)***

I would like an app just like TikTok, or something like that but positive. I hate to wake up in the morning and watch a video on TikTok or YouTube or Instagram but it's

negative, and it's early in the morning. I would like to see something that is positive for once. ***(FGD3, female, 19, second year)***

Well, I'd like to see a video of somebody who has gone through it [mental health challenges]. If somebody who knows they've dealt with it and they're telling me now the app is great or not. Just the app thing, you know, I went through this, and I beat it, you know. I'd listen to that if I was going through a problem or stuff like that and maybe just somebody explaining what it is, like what mental health is, what is all that. ***(FGD10, male, 22, third year)***

5.10.2 Coping strategies for mental health

Most participants stated that they would like the app to include self-help solutions or coping strategies. As part of self-help solutions, participants suggested a diagnostic scale or a way to measure one's mental health. A diagnostic scale appeared to be a viable way for users to make sense of their distress and find direction regarding the cause of their challenges, or to identify a mental health challenge they may be experiencing:

The moment I noted that, no man, something is not exactly right with me, if I can log onto the app? Write my symptoms down and then it says you could be going through this and that, and I'll be, like, okay this is what I'm going through. ***(FGD10, male, 22, third year)***

Maybe the app can have something like a questionnaire asking you about the problems you are facing somehow. It can provide the responses of what you can do or what you cannot do, yes. ***(FGD12, male, 21, third year)***

Some participants recommended a journaling feature or audio journaling to help participants identify and engage with their emotions. One participant pointed out that most answers come from the people seeking help themselves, meaning that the exercise of journaling or audio journaling could prompt them to discover solutions to their challenges. Another participant suggested using the app to record and track one's moods and feelings:

So, like it's almost like a diary and you just write how you are feeling every day or set yourself a goal to win. You want to either update this diary of yours. So, like, whereas this one is, like, 'hey diary, I am struggling with this and this today'. And you know we don't need to unpack my childhood trauma right now; we need to unpack blah blah blah. I was going to say if that was an app, I would be there. ***(FGD1 female, 19, first year)***

It would be great to have something that is pretty much like a confidante you can talk to, and you can write a journal. You are journaling and all of that. That would be cool. I personally use my notes when I don't feel like writing in a journal, so I use the notes on my phone. So, if there is an app, I guess that's a feature that I would use. ***(FGD2, female, 22, third year)***

I think it can have features that calculates a person's mood rate. ***(FGD16, female, 24, third year)***

Journaling was also highlighted by counsellors as a feature that could be helpful for students experiencing psychological distress:

Students love journaling, sometimes unpacking things people are sitting with. There is so much power in journaling, just like there is so much power in music. ***(Counsellor, IDI4)***

What has been growing within the work itself is self-help mechanisms where the students have initiated, for example, downloading meditation guide apps. You also have students who have initiated certain techniques themselves, such as journaling. ***(Counsellor, IDI6)***

Most participants also suggested a section with coping strategies for several challenges, including symptoms of depression, anxiety, and stress, which users would refer to in order to address the symptoms immediately. The findings also revealed that participants wanted immediate solutions for anxiety more than other mental health challenges:

I think some self-help options would be good. So, let's say someone is feeling very anxious or something like that. If you are feeling very anxious, like, maybe here's a breathing exercise for you or a something that you can do immediately in that situation instead of waiting for someone. ***(FGD12, female, 20, second year)***

Maybe if I'm dealing with a certain issue and then maybe... Maybe the app can give me a few pieces of advice on how to handle that certain situation. ***(FGD4, female, 18, first year)***

I think on top of short videos, I think of tutorials on possible ways to handle and to deal with the mental issue. A short tutorial video to say if you are feeling this way, you can do this and that and that. As much as you can write it down and say this is a possible solution, but it just sounds more human to say you can try taking a nap, you can try taking a walk, you can do this and that. It sounds more attainable when someone else says it rather than when it is written down, you know, so I think videos like that could really help. ***(FGD10, male, 22, third year).***

This finding is not surprising, as global literature shows that anxiety has become the most prevalent mental health challenge amongst students (Asif et al., 2020; Sahu et al., 2020). Anxiety also has several physiological symptoms, such as shaking, heart palpitations, and sweaty palms. For this reason, most coping strategies for anxiety can be applied the moment one experiences such symptoms (Drapeau et al., 2012).

5.10.3 Psychosocial support for mental health

One of the most prominent findings of this research is that participants showed that support would be a major contributor, not only to the usefulness of the intervention, but also in

developing mental health help-seeking in general. Participants highlighted different forms of support from the app that would convince them to use the app more often. The first form of support mentioned was from health experts who would be able to give information, and guide and interact with the students regularly through the app:

> *I think the app should have… the psychologist and maybe the psychologist will be available from a certain time to a time. So that when the students need advice, they can. Because one thing I can say is these stresses that we have hit hard at night when we are trying to sleep. That's when we tend to think or overthink, so I think if the app can have such timetables for psychologists or psychiatrists, it can work.* ***(FGD12, male, 21, third year)***

Another participant suggested a tool on the app that could help family members understand mental health challenges and provide advice on how to support the user:

> *An option of adding a family member as part of the conversation without having to download the app as well. Cause you can imagine if you want to add your mum or your aunt that you trust. Then they'll have to download the app, which I think they won't get used to it.* ***(FGD2, female, 22, third year)***

One participant also mentioned involving lecturers and supervisors in the app, when necessary, particularly during times when students are not able to deliver their best work or are absent from classes:

> *So, on top of the app having instant access, there should also be, if possible, some kind of like communal aspect of it either between a small group of friends or a larger audience.* ***(FGD10, male, 22, third year)***

> *I think probably having different levels of people, because I know sometimes the issues you are facing do not really need a psychiatrist, and maybe you can have someone like a counsellor. And certain things, like, that are more serious, then a psychologist. If they get so serious that you need referral for, like, medication or something, so I think all those options should be available but within reason of the needs of the person. Because you do not need everyone seeing a psychiatrist because not everyone needs a psychiatrist.* ***(FGD12, female, 20, second year)***

> *Preferably, there can be a professional in that space to just also give good advice.* ***(FGD14, female, 21, third year)***

Support in the form of human interaction through a chat room was also pertinent to the discussions. Participants acknowledged the importance of community and having interactions with other human beings about their mental health challenges:

Yes, I was going to say yes to having an anonymous chat group because, personally, I feel like I do struggle with opening up a lot. So, if I know I'm talking to someone that I don't know, and that person doesn't know me, I would definitely open up because I think I do.... There are some things that I do want to talk about but because I just have trouble with opening up, especially because I have major trust issues. So if it's an anonymous group chat, I think most definitely that would work hundred percent for me. So that would be amazing. ***(FGD7, female, 22, third year)***

A significant benefit of chat rooms would be gaining new perspectives from individuals facing similar challenges or those who have overcome the challenge. Chatting to other students going through similar situations could reassure those struggling that they are not alone and that they should not be ashamed of their challenges. Some participants indicated that access to immediate assistance from therapists 24/7 would be an important factor in making the app useful and effective, particularly for emergency situations such as suicides and panic attacks:

I don't think I'd be opposed to using an app if I knew that I could talk to someone on-demand or have someone that's, like, assigned to me and just in that way. ***(FGD4, male, 19, second year)***

I think that the idea of accessibility is very important. So, if the app can provide almost instant access to a therapist or some kind of therapeutic diagnosis, it can be very effective. ***(FGD10, male, 22, third year)***

It would be good for the app to, like, work 24/7 cause mental health disorders happen, like, anytime. So yeah, I think for me those are the most important parts of the app. ***(FGD14, female, 20, third year)***

I think a platform where a person can talk to someone at any time, because you might have a negative about that anytime, when you will want to talk to someone. And I think that would be very helpful to that person. ***(FGD16, female, 18, third year)***

Counsellors agreed that apps that have immediate assistance may be more effective and useful for students. One participant pointed out that a mobile phone may be more effective for a person with suicide ideation, that instead of setting up an appointment to see a counsellor at a later date, they can use an app to contain their thoughts more quickly:

But I think absolutely, I think the more immediate it feels to a student to be able to just sit and communicate right here, right now and kind of get a more of immediate response, without maybe having to go to a room which can feel kind of daunting. ***(Counsellor, IDI3)***

Whereas if you are suicidal or someone having suicidal thoughts, it is possible that the app might be effective in containing them. ***(Counsellor, IDI6)***

Global literature on mental health apps shows that support is one of the most important features in an app (Denecke et al., 2022; Neary et al., 2018). It was, therefore, not surprising that the participants in this study also identified psychosocial support as an important element to include in the app. Research has also shown that online support can be a bridge to seeking face-to-face counselling (Chandrashekar, 2018; Ly et al., 2015).

5.10.4 Interactive engagement

Most students believed the app should create positivity and an escape from the real world. Participants suggested various ways to achieve this, including games, quizzes and music. Although some of the quizzes and games suggested would not address their mental health in particular, this approach could create a sense of escape from their challenges:

> *We could also do some fun online activities together because, like I said, this app should serve as an escape. Ultimately, we are just trying to have an escape. We should just try to have a platform where we'll build friendship, right, and ultimately become a family, so yeah.* ***(FGD3, female, 20, second year)***

> *Games are a good idea. Maybe some sort of quiz to ask progress or where they can improve or, you know.* ***(FGD11, male, 21, third year)***

> *Another thing I'd like for me personally would be just, you know, quizzes. Just the random quizzes just, you know, name a what country that starts with L or like, you know, educational quizzes, informative quizzes, yeah. So that's one feature I'd love to see. Yeah. And games here and there (laughs).* ***(FGD7, female, 23, third year)***

Some participants mentioned that it would be useful for the app to have daily reminders to take care of their mental health or to do things that make them happy. Other participants felt that receiving daily words of affirmation and motivational quotes would be effective in supporting them on their mental health path:

> *A healthy reminder that reminds you to take a break and do something that makes you happy.* ***(FGD10, male, 22, third year)***

> *So, it should also have one of those daily routines: activities that you do, like activities that you actually do in general, like sport.* ***(FGD16, female, 24, third year).***

These findings are consistent with literature showing that apps with interactive components that increase engagement, social connectedness, and personalised experiences are considered more acceptable and effective by users (Borghouts et al., 2021; Balaskas et al., 2022).

The app's interface and content were a greater concern amongst counsellors than students. Counsellors commented that the app's content and presentation would determine their

readiness to adopt. If the content and interface are complicated or do not meet the students' needs, they may be less willing to use it:

> *Also, if the app is too complicated and too busy, it can be a barrier. So, it needs to be, you know, user-friendly, interactive and, I think, just thinking about how the current generation likes getting information, kind of very quickly, right?* ***(Counsellor, IDI3)***

> *I do think that it can be a barrier, the same way we know language can be a barrier. The knowledge of using the app can be a barrier, or not having the knowledge to use the app from beginning to end can be a barrier. Having to experiment, being quite resistant to it, or preferring interventions other than the app.* ***(Counsellor, IDI6)***

> *And then I think it's about the look and feel and about just how immediately the question and the responses and information can come back to you. Because listen, you also must think about how it grabs that person's attention. If you are not going to give them what they are looking for, then they are going to go somewhere else. Right? I mean, if you think about social media in general. What keeps people coming back is that they are getting that hit of information or satisfaction just like that (snaps fingers), so you need to get that kind of balance right and not sound too preachy or too overly professional. You want to speak in a language that kind of connects you with that age demographic that you want to target.* ***(Counsellor, IDI6)***

Previous research also concurs that users are more likely to use a mental health app if it has a good interface design, is customisable and has content variation (Balaskas et al., 2022; Borghouts et al., 2021).

5.10.5 Security

Having a secure platform where users' information cannot be shared easily or accessed by other users or owners of the app was also crucial for participants:

> *First and foremost, it must have a password in case you, by accident, forgot to lock your phone.* ***(FGD5, female, 18, first year)***

> *I think my only concern with such an app would be the cyber security because that is also a big problem in today's age. So, if all your information were to be in an app such as this or your private conversations, etcetera, I think that there might be a danger but it's, I think, it's not something you can guarantee.* ***(FGD5, male, 21, third year)***

Another cause of concern from participants was a need for a safe space to have conversations without fear. One participant remarked that it would be difficult for her to have mental health discussions with a person she knows or does not get along with:

Just as long as you know it gets better, people keep it a safe space; people do their best to actually help people. Let's help each other, then I don't think it will be a bad thing, just as long as the app exists. You know because we've been waiting. ***(FGD3, female, 18, first year)***

Some participants also emphasised the importance of moderating the questions and chats that would be shared in the app:

And another thing is that… like, if executives who will monitor what the people are saying in the app? Will it be monitored? I'd prefer it to be monitored but it would be ideal because the robot would not be, and it will not be able to understand how you feel. The person who will be monitoring the app should be, like, your pen pal, so you don't have to really know the person. ***(FGD5, female, 18, first year)***

Someone might walk in trying to help, but in fact they are just there to market and find new victims. So, like yeah, it is going to be tough, but it can be good! ***(FGD3, female, 18, first year)***

We can actually render a very effective service with the use of technology, whether it is on a laptop or whatever device within a very good security and confidentiality kind of limits. It is very viable, and I do not think it is going to change anytime soon. ***(Counsellor, IDI2)***

Various systematic reviews conducted on the use of mental health apps have also highlighted lack of privacy, confidentiality, and protection of user information as barriers to using mental health apps (Borghouts et al., 2021; Koh et al., 2022). Therefore, security is a crucial consideration for mental health app use.

5.11 CONCLUDING REMARKS

This chapter detailed the results of the study and offered a discussion of each objective, together with the findings. Overall, the findings reveal a high level of psychological distress for which students used emotion-focused and avoidance coping styles. The study also found differences in prevalence and coping strategies by gender, age, and level of study, emphasising the importance of designing interventions that work for all genders, age groups, and levels of study. The findings revealed that, although students have some knowledge and understanding of psychological distress, a gap in mental health literacy still exists. This study also showed that students are willing to use a mental health app to address their psychological distress, provided privacy and confidentiality measures are in place. Counsellors corroborated that a mental health intervention could be useful for the student population, adding that it should be used as a tool to supplement and not replace face-to-face therapy.

CHAPTER 6: PHASE 2 RESULTS AND DISCUSSION

6.1 INTRODUCTION

The main objective of Phase 2 of the study was to design and develop a mental health application (app) for university students by using the data obtained from participants in Phase 1. The development of the app was based on integrating quantitative results and qualitative findings by following a thread of analysed data, as suggested by Moran-Ellis et al. (2006). Threads from analysed quantitative and qualitative data were used to determine the feasibility, content, and functionality of the app. Initial analysis of both quantitative and qualitative data was based on the technology acceptance model (TAM) and cognitive behavioural theory frameworks. TAM was applied in determining the perceived usefulness of the app and cognitive behavioural theory was applied in determining the content to be included in the app.

6.2 DETERMINING FEASIBILITY

Quantitative results were imperative in establishing whether an app would be a feasible intervention for university students. According to Bowen et al. (2009), when determining feasibility, it is important to focus on these eight areas: demand, acceptability, implementation, adaptation, integration, expansion, practicality and limited efficacy testing of an intervention. Given that this is a PhD study and has time limitations, the study focused on two areas: demand and practicality.

Specific quantitative data such as the prevalence of psychological distress, diagnoses of previous mental health challenges, mobile phone ownership, accessibility to data or Wi-Fi, experience with using health apps, and the most widely used mobile phone software were assessed**.**

To determine the demand—if the app is necessary—data on the prevalence of psychological distress and previous mental health challenge diagnosis were assessed. At least 60.5% of participants had high levels of psychological distress and 20% had been diagnosed previously with a mental health challenge. These findings provide evidence of students struggling with mental health challenges, further validating the need for a mental health intervention designed for their individual needs.

To determine practicality—if students would be able to use the app with ease—the study assessed data on user's affordability and convenience. To establish affordability, data on mobile phone ownership and students' accessibility to mobile data or Wi-Fi were assessed.

Almost 99% of the students owned a smartphone, and at least 81% had easy access to data or Wi-Fi. The results demonstrated that students would be able to access a mobile-based intervention if one were to be developed. These findings were expected, as university students spend considerable time on their phones. A study by Akıllı and Gezgin (2016) conducted at a Turkish university found that 34% of university students checked their smartphones 49 times or more in a single day for various reasons. Ataş and Çelik (2019) observed that over 80% of students used their smartphone for calls, text messages, and social media, while over 47% used their smartphones for educational purposes.

To establish convenience, data on previous health app use and mobile software were assessed. Almost 27% had previously used a health app for their health needs, suggesting that relatively few students used health apps to improve their well-being. This finding is contrary to findings from a study conducted in the UK where 80% of the students had used a health-related app for their well-being (Jabour et al., 2021). This finding also calls attention to a gap in the availability of student-based South African health apps. Although various health apps are available online, relatively few are designed specifically for South African students. The finding may also point towards a need to raise awareness about interventions available online. Most students (66.9%) used Android mobile phone software, compared to 31.7% who used IOS and 1.5% other software. This result is contrary to that of a study conducted in the UK where IOS was the most widely used mobile phone software amongst students (Jabour et al., 2021). Our findings suggest that android mobile devices could be more accessible and affordable amongst South Africa's student population. Research by Ruswa and Gore (2022) shows that students at South African universities face extreme financial challenges, which could explain why many students prefer to use Android smartphones which are relatively more affordable and efficient. This finding influenced the decision to develop a mobile-based intervention that uses a software accessible to most students.

6.3 PERCEIVED USEFULNESS

Qualitative data obtained from students and counsellors were assessed to highlight features they perceived would be useful for the app. Therefore, theme 6 (perceived usefulness) from the thematic analysis and threads associated with this theme were extracted from the qualitative data—the key themes were educational information on mental health, coping strategies for mental health, support for mental health, interactive engagement and security. These key themes were used to guide the app development process. Figure 6.1 below displays the interface of the app.

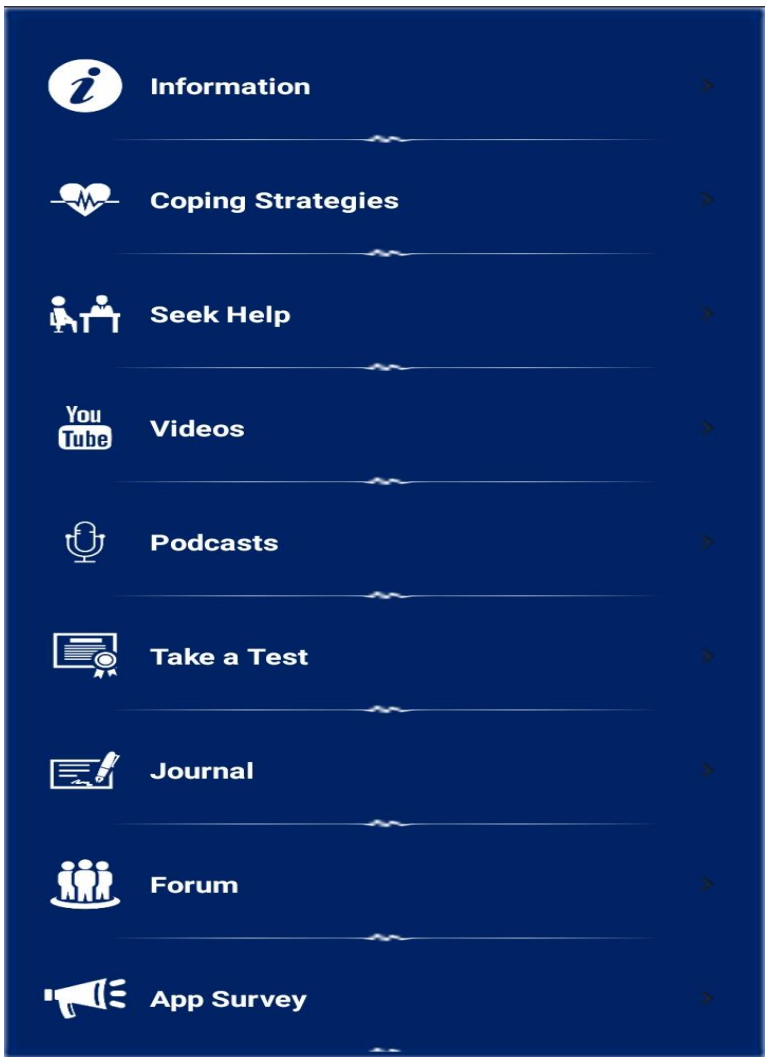


Figure 6.1: Mental health app interface

6.3.1 Educational information

Both students and counsellors discussed the importance of including mental health educational information on the app. Information, podcast and video components were developed in line with the educational information theme. Students expressed a desire for the information to be grouped according to categories of depression, anxiety and stress. Therefore, an information tab providing material organised under the different headings of mental health, depression, anxiety and stress was included. These categories offer specific information, such as the definition of mental health, mental health challenges, noticeable symptoms, causes, and solutions for each mental health challenge. Cognitive behavioural theory principles were applied in this component by explaining the cycle of thoughts, feelings and behaviours in relation to depression and anxiety.

Both counsellors and students suggested that information be shared in creative ways, including videos and podcasts, to cater for those who dislike reading. Stawarz et al. (2018) maintained that apps that presented information on mental health in an engaging way were

more likely to be effective. Therefore, categories for podcasts and videos offering information on mental health were designed.

The qualitative findings of this study revealed that university students still require mental health literacy. This finding is confirmed by global research (Gorczynski & Sims-Schouten, 2022; Mahfouz et al., 2016; Miles et al., 2020; Reavly et al., 2012). This component is, therefore, a crucial element of the mental health app as it could possibly psycho-educate students.

6.3.1.1 *Coping strategies for mental health*

Both counsellors and students shared that the app should include coping strategies that could address symptoms of mental health challenges as students experience them. A coping categories tab was designed and offers several coping strategies, including building self-worth, deep breathing, mindfulness, physical activities, reframing thoughts, improving sleeping, and goal setting. It also offers participants a non-clinical psychological distress test based on DASS-21— a non-clinical psychological distress scale that helps users determine their level of psychological distress.

The app also has a journaling tool allowing users to record their experiences or negative thoughts, the feelings they experienced while in a specific situation, and the behaviour that followed afterwards. Thereafter, users are prompted to positively reframe the situation or negative thought by challenging and replacing the negative thought with a positive one. The journalling tool incorporates mood tracking, in which users can track their mood. The journalling tool is valuable for users who may have challenges with their thoughts, and who want to identify their coping strategies or track their mood. The aim of this tool is to assist users become more aware of their own thoughts, behaviours and moods, which could prompt them to seek professional help. Research shows that guided journaling, mood tracking and thought challenging are the most widely used cognitive behavioural therapy (CBT) techniques in mental health apps designed for young people (Hodson et al., 2019; Wang, 2021; Stawarz, 2018).

6.3.2 Support for mental health

Counsellors and students both emphasised the importance of having a platform on the app for seeking mental health support. The seek help component was developed in line with the support for mental health theme. This section offers information in the following categories: professional help, student support, hotlines and useful websites. Counsellors specifically

stressed the importance of giving users information about the different types of mental health professionals available, which is incorporated under professional support on the app.

Both students and counsellors highlighted that the app should have 24/7 immediate assistance, however this could not be possible because of financial constraints. However, 24/7 hotlines of other organisations such as lifeline and SADAG were included under the seek help section. Receiving information on the hotlines to dial and other mental health help resources is common in most mental health apps developed for adolescents or youth (Grist et al., 2017; Lecomte et al., 2020).

6.3.3 Interactive engagement

Students said the app should provide a forum for users to connect with other students or counsellors to request or share information on mental health. A forum tool was developed in line with the engagement theme. Students felt users should be able to request and share information anonymously on the forum and thought the forum should be moderated.

This form of engagement is not common amongst mental health apps designed for young people, possibly because of the security and regulation challenges associated with opening a forum to individuals who would have the liberty to post anonymously (Bylieva et al., 2019). However, this component was added to the app because it could be useful for students to engage amongst themselves in unpacking their mental health challenges. For example, a South African app called ‘Panda’ designed for mental health has a feature called ‘Bamboo Forest’, in which users can share information and engage with each other (Jackson, 2021). Provided it is moderated carefully, this feature can be helpful for mental health discussions.

6.3.4 Security

Given that privacy and confidentiality are major issues for youth and influence their adoption of an app (Giota & Kleftaras, 2014; Kretzschmar et al., 2019), it was not surprising that students expressed their preference for an app that would protect their identity and privacy. Therefore, privacy and confidentiality were an integral aspect of the app’s security. Users had the option to select a username and password to log in to the app, which would keep their information safe in case another individual had access to their phone. Information shared by the participants in the journal and mood track sections was not accessible to the moderator and was only available to the users.

6.4 CONCLUDING REMARKS

The app's development process included both quantitative and qualitative data gathered from students and counsellors. Quantitative data were used to determine the feasibility and need for developing a mental health app for students based on their levels of psychological distress, previous mental health diagnosis, smartphone ownership, accessibility to Wi-Fi and the most widely used mobile software. The app's content and structure were based on qualitative data by specifically focusing on cognitive behavioural theory and perceived usefulness, a component of the TAM.

CHAPTER 7: PHASE 3 RESULTS AND DISCUSSION

7.1 INTRODUCTION

This chapter reports on the results and presents a discussion for Phase 3, which tested and evaluated the MentaLit mental health app through an online survey. The survey collected quantitative data concurrently from university students and counsellors from the Counselling and Careers Development Unit (CCDU) at Wits University. The survey was based on the Mobile Application Rating Scale (MARS), which assessed participants' perceptions on how easy it was to use the app by focusing on their overall subjective experience and the impact of the app on the user (Figure 7.1).

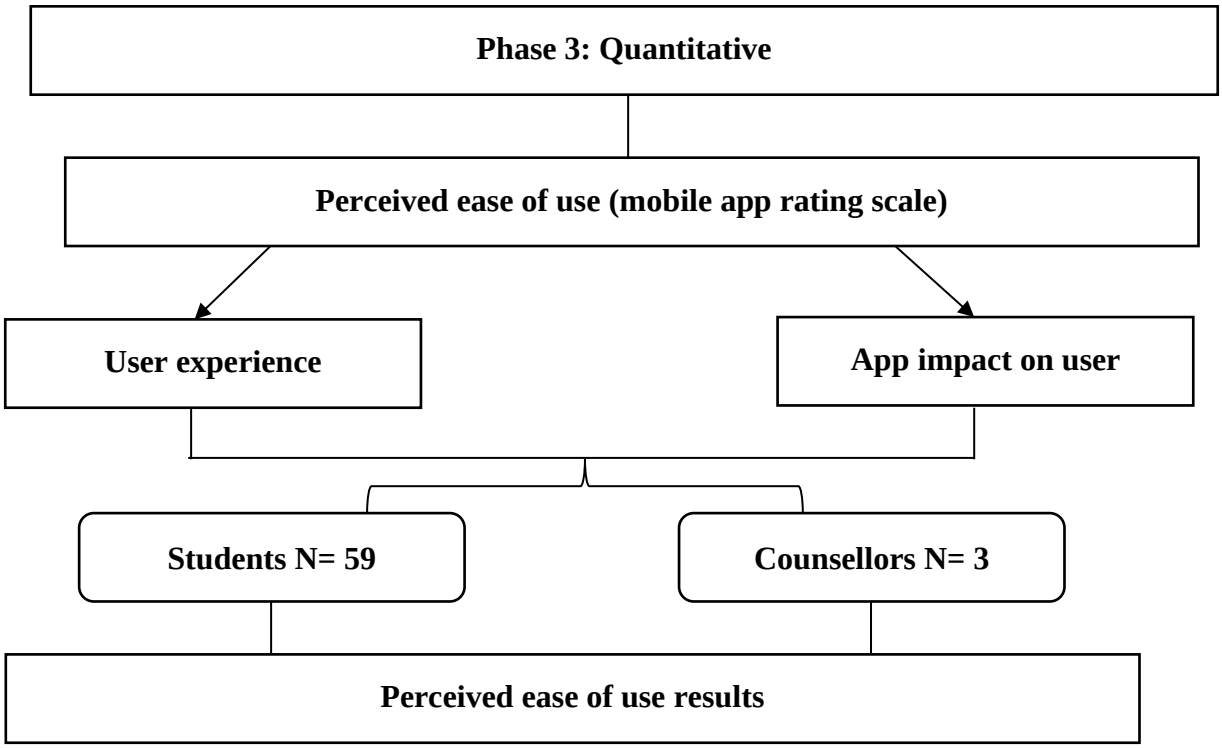


Figure 7.1: Phase 3

7.2 DEMOGRAPHICS

Overall, 126 participants were screened for the survey, seven of whom did not grant their consent. Altogether, 119 students consented to participate in the study, 45 of whom did not provide sufficient data and 11 of whom did not complete all the MARS scale items and were excluded from the overall analysis. Therefore, a total of 62 participants, comprising students and counsellors, were included in the overall analysis (Figure 7.2 and Table 7.1).

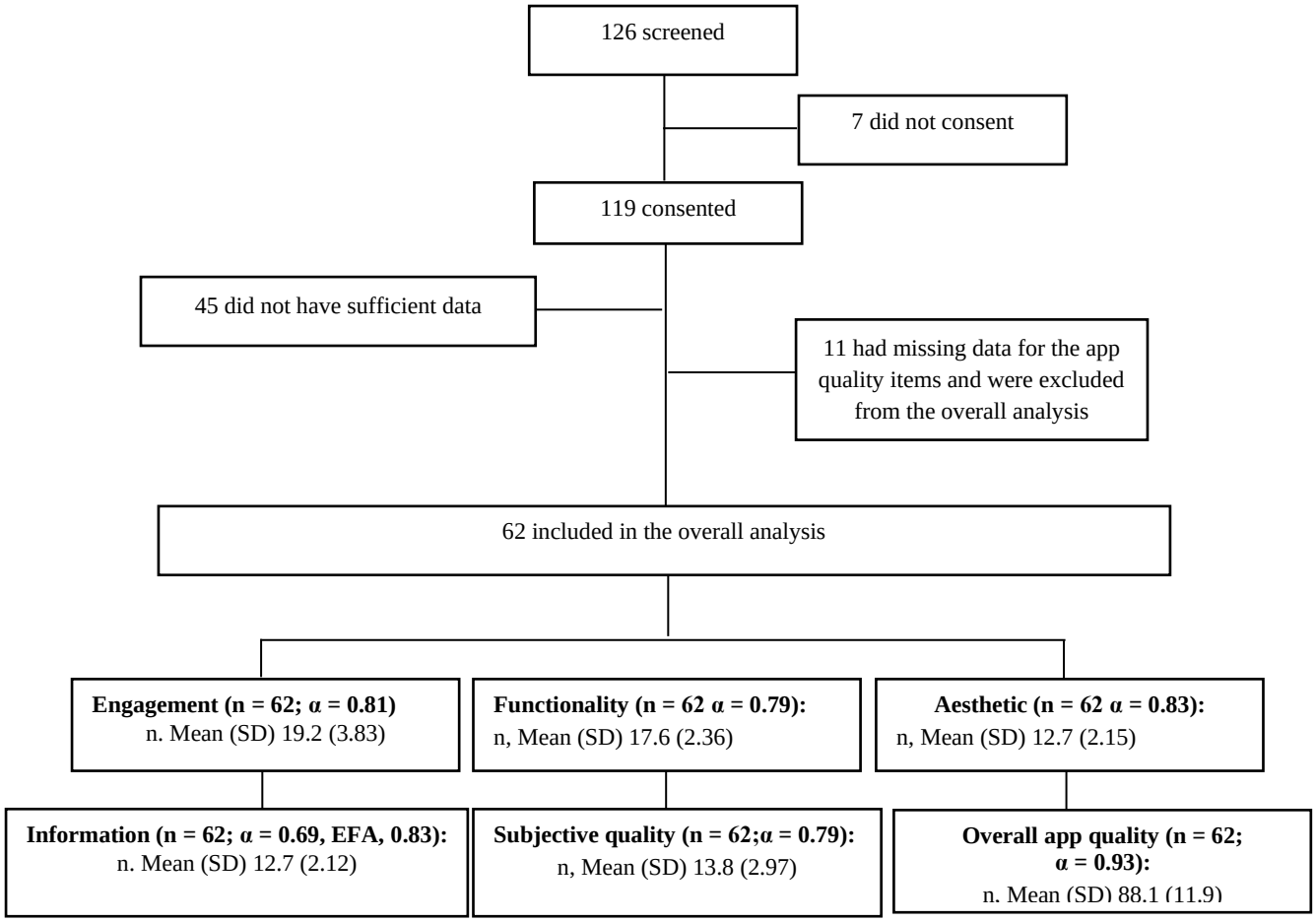


Figure 7.2: Student survey response flowchart

Table 7.1: Demographic data

Variable	Total (%) N = 62
Are you a student or counsellor?	
Student	59 (95.16)
Counsellor	3 (4.84)
With which gender do you identify?	
Female	38 (64.41)
Male	20 (33.90)
Prefer not to answer	1 (1.69)
What is your age group (in years)?	
18–20	22 (37.29)
21–24	37 (62.71)
At which university are you enrolled?	
University of the Witwatersrand	32 (54.24)
Other	27 (45.76)

Variable	Total (%) N = 62
What is your faculty?	
Humanities	17 (28.81)
Engineering and Built Environment	7 (11.86)
Science	9 (15.25)
Health Sciences	9 (15.25)
Other	12 (20.34)
Law & Management	5 (8.47)
What is your level of study?	
First year	8 (13.56)
Second year	14 (23.73)
Third year	22 (37.29)
Postgraduate	15 (25.42)
Did you participate in Phase 1 of this study (i.e. focus group discussion or survey)?	
Yes	24 (40.68)
No	35 59.32)

7.2.1 Students' demographics

Fifty-nine students were enrolled in the survey and the majority (38/59, 64%) were female, within the 21–24 age group (36/59, 63%), and in their third year of study (22/59, 37%). Over half of the participants (32/59, 54%) were enrolled at the University of the Witwatersrand, and almost a third were from the humanities faculty (17/59, 29%). Most participants (35/59, 59%) did not participate in the focus group discussions in Phase 1.

Research suggests feasibility studies to enrol between 20 and 50 participants to increase inter-rater reliability—consistency in responses from participants. This study enrolled 59 participants, thus increasing inter-rater reliability (Teresi et al., 2022; Zou, 2012). Phase 3 had slight differences in demographic responses, with more participants in the 21–24 age group and in their third year of study participating compared with Phase 1. Although, differences in participant demographics were not expected, they were not surprising as the two phases measured different constructs (Fetters et al.& Molina-Azorin, 2020). Moreover, although it would have been interesting to have the same participants in both phases, most participants did not participate in Phase 1. However, the aim of this phase was to evaluate the intervention, which does not require participant consistency in all phases (Aschbrenner et al., 2022)

7.2.2 Counsellors' demographics

Three counsellors were enrolled in Phase 3 of the study. Although nine CCDU counsellors were invited to participate, only three completed the survey. To protect the counsellors' identity, sociodemographic data, such as gender, age and professional qualification, were not collected. The demographic results show that fewer counsellors participated in this component of the study. Having more counsellors participate would have increased the inter-rater reliability of the data (Teresi et al., 2022). As few mHealth studies in SA have included healthcare professionals when evaluating an intervention (McCreesh-Toselli et al., 2021), it is difficult to compare current participation with that of previous similar studies.

Counsellors were asked questions on the focus of the app and the theories or strategies they believed were applied in the app. Of the three participants, two (66.7%) believed that the app focused on increasing happiness, mindfulness, anxiety or stress, and goal setting (Figure 7.3).

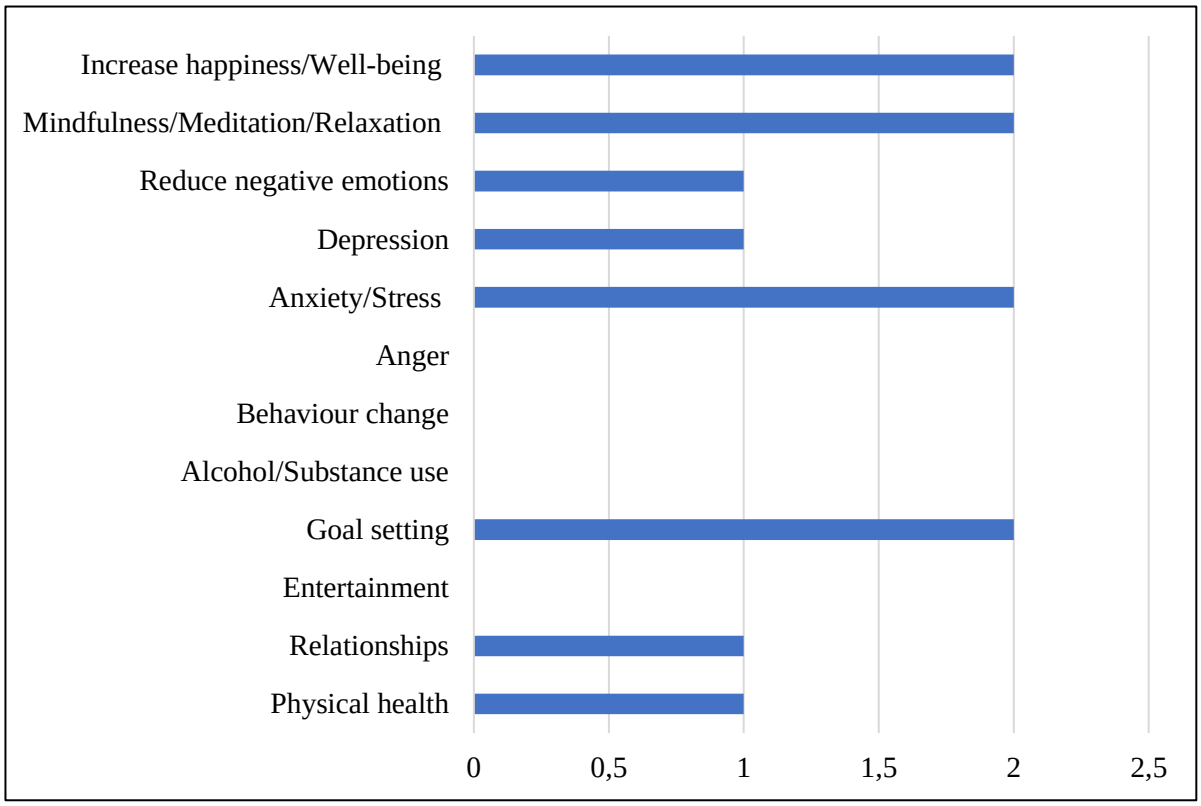


Figure 7.3: Counsellors' feedback regarding the focus of the app

All three counsellors (100%) agreed that the app provided information/education and two (66.7%) acknowledged the inclusion of advice/tips/strategies/skills training (Figure 7.4).

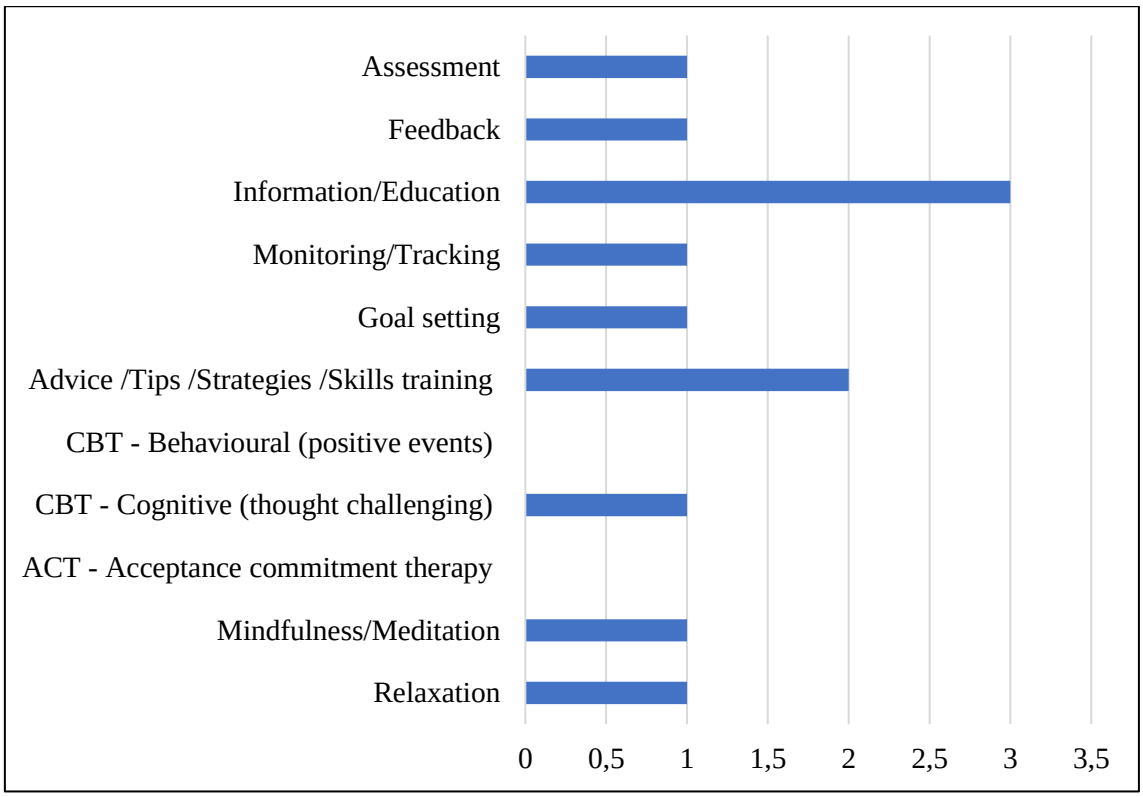


Figure 7.4: Counsellors' feedback regarding theories and strategies applied in the app

Interpreting these findings employing a cognitive behavioural theory framework reveals that the app does reflect CBT principles, such as goal setting, challenging thoughts, and mindfulness (Fenn & Byrne, 2013; Martinengo et al., 2021). In addition, responses from counsellors affirm that the app targets psychological distress, particularly symptoms of depression and anxiety (Drapeau et al., 2012).

7.3 APP STATISTICS

This section examines the backend data from the software used to develop the app, which was stored from 1 December 2022 to 20 January 2023. The backend data was stored to track the number of downloads and the activity on the app. No private details, such IP addresses and confidential information, were stored.

7.3.1 Assessment of app components

Of the eight components assessed, the majority of participants (45/59, 73%) assessed coping strategies and information, followed by seek help at 29/59 (47%), and take a test at 28/59 (45%). Podcasts and settings were the least assessed components at 14/59 (22.58) and 9/59 (15%), respectively (Table 7.2).

Table 7.2: Assessed app segments

Variable	Total (%) N = 62
Which tools in the app did you assess?	
Information	43 (69.35)
Coping Strategies	45 (72.58)
Seek Help	29 (46.77)
Take a Test	28 (45.16)
Journal	15 (24.19)
Forum	11 (17.74)
Videos	18 (29.03)
Podcasts	14 (22.58)
Settings	9 (14.52)

According to the backend data statistics, the components with the most screen views were information with 248 views, app survey with 182 views, take a test with 178 views, mental health with 174 views, professional help with 172 views and student support with 170 views. Components with the fewest screen views were podcasts with 76 views, journal with 72 views and settings with 68 views (Figure 7.5).

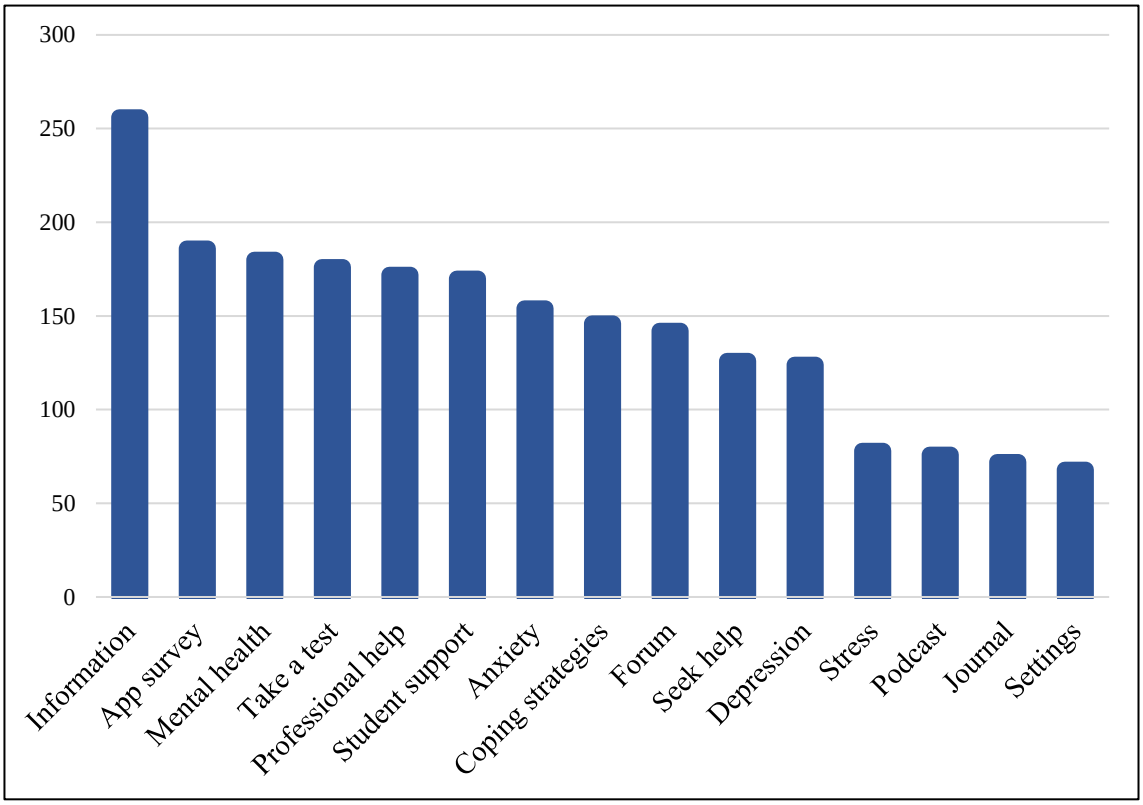


Figure 7.5: Counts of screen views on the app

These findings indicate consistency between actual app usage and survey completion, with most participants stating that they would use coping strategies (45/62, 73%), followed by information (including mental health) at 43/62 (69%), seek help (including students support and professional help) at 29/62 (48%), and take a test at 28/42 (45%). However, one inconsistency was noted—coping strategies was one of the most assessed components in the survey but, according to the backend data, had relatively few views. A plausible reason is that the data analysis focused on components assessed by participants, while the backend data focused on average overall views of the app (Figure 7.5).

7.3.2 Back-end data app download statistics

According to the backend data, 75 users downloaded the app and opted to receive notifications. However, these figures exclude downloads that may have been deleted after the completion of the survey and those who opted to not receive push notifications. The findings depicted in Figure 7.6 show that only 68 people viewed the settings and only 11 assessed this section, indicating that only a few participants opted to switch on their push notification buttons. Further prompts were sent out to all participants but only those who opted to receive push notifications are identified as active downloads.

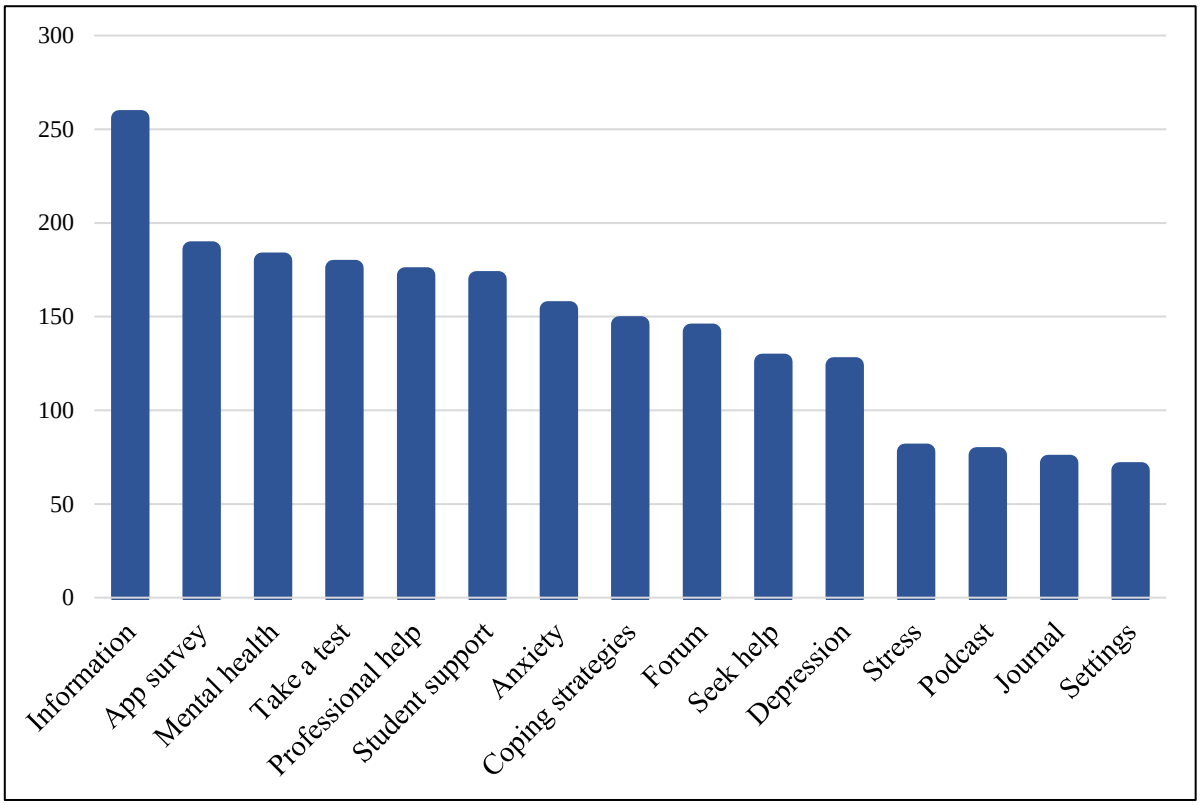


Figure 7.6: Counts of screen views on the app

7.3.3 Daily average time spent on the app

Backend results from 1 December to 20 January 2023 show an average of six daily users on the app and 48 daily screen views. The users spent on average, two minutes and thirty-three seconds on the app (Figure 7.7).

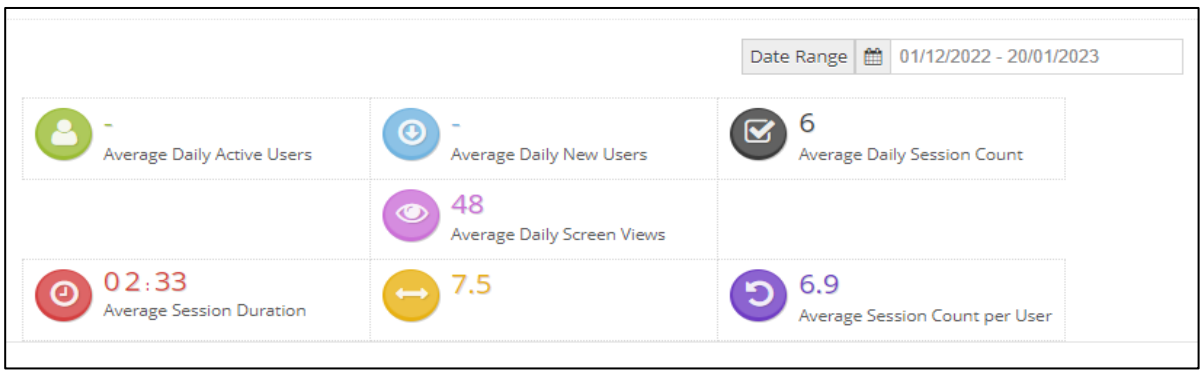


Figure 7.7: Daily app statistics

7.3.4 New and active users

With 12 participants having downloaded the app, more new users were reported on 5 December 2022 than on any other day. A plausible reason is that the invitation e-mail to complete the survey was sent out to students on Thursday, 1 December 2022; as 5 December 2022 was a Monday. This could have been the time when most students checked their student e-mails (Figure 7.8).

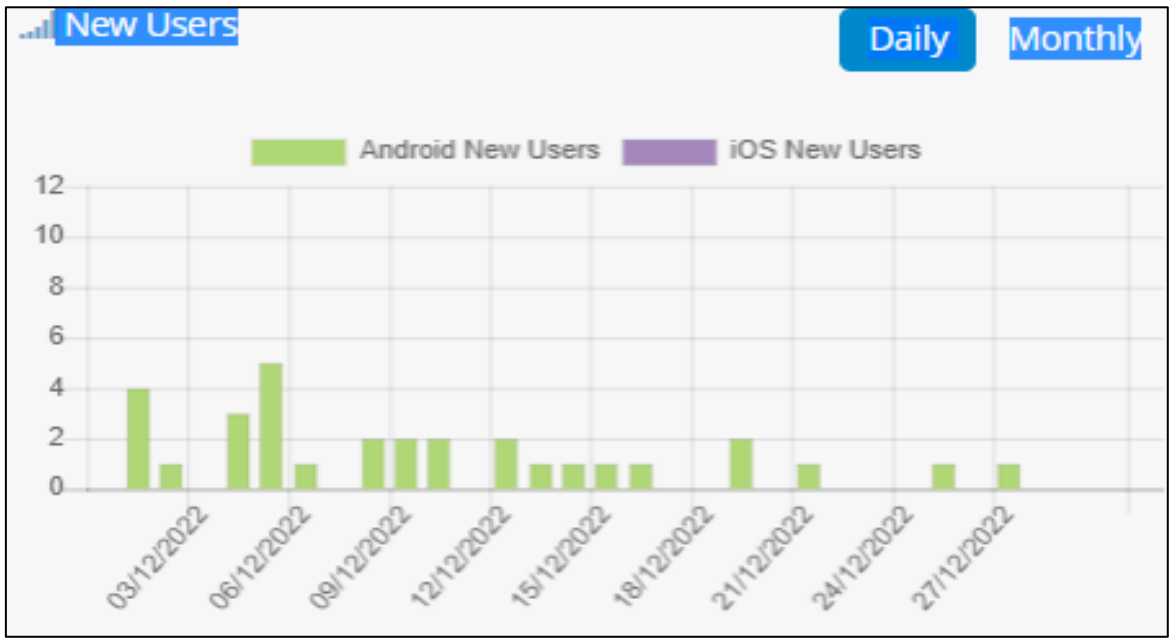


Figure 7.8: New users

Further, the backend data shows that between 17 January and 20 January 2023, the app had more active users than on other days, with 11 users who had downloaded the app before this period using the app. Between 9 January and 16 January, I shared posts on social media about the study to recruit study participants, which may have served as a reminder to those who already had the app to use it again (Figure 7.9).

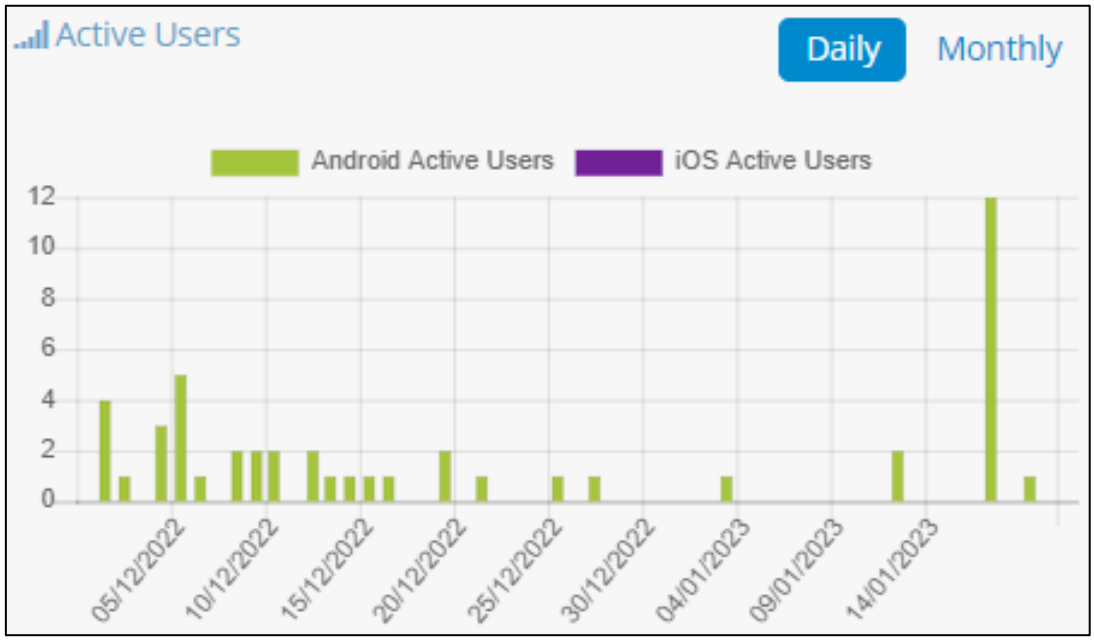


Figure 7.9: Active users

7.4 PERCEIVED EASE OF USE OF THE MENTAL HEALTH APP

7.4.1 User experience

In this study, perceived ease of use was applied from the technology acceptance model (TAM) to explore how easy or difficult it was to use the MentaLit app, by focusing on the MARS user experience component, which has five subscales: engagement, functionality, aesthetics, information, and subjective quality.

7.4.1.1 *Engagement*

As illustrated in Table 7.3, 35% of the participants (22/62) found the app to have good strategies to increase engagement through entertainment, and 24/62 (39%) found the app excellent to use. Nineteen of the 62 participants (31%) rated the app's settings as excellent, 19/62 (31%) thought it provided excellent user input feedback, and 33/62 (53%) stated that the app provided excellent content for the target audience. Studies on mHealth show that, engagement is an important aspect for a technology to be considered useful and easy to use (Lipschitz et al., 2019; Melia et al., 2021). The findings on engagement, show that the app had excellent content for the target audience but may need to improve on entertainment, settings, and overall usage. Research on mental health apps found that apps with excellent content tend to be rated as having high levels of engagement (Maghnati & Ling, 2013; Mani et al., 2015). Further, research based on the TAM and MARS shows that engaging mental health apps were more likely to be effective in addressing mental health challenges (Abu-Dalbouh et al., 2017; Alasmari, 2017; Maghnati et al., 2013). Findings suggest that the app has acceptable engagement properties but may need to be improved to increase usability.

Table 7.3: User engagement

Variable	Total (%) N = 62
Does this app use any strategies to increase engagement through entertainment?	
Inadequate	4 (6.45)
Poor	9 (14.52)
Acceptable	17 (27.42)
Good	22 (35.48)
Excellent	10 (16.13)

Variable	Total (%) N = 62
Is the app interesting to use?	
Acceptable	17 (27.42)
Good	21 (33.87)
Excellent	24 (38.71)
Does the app provide necessary settings such as sound, content, notifications?	
Inadequate	1 (1.61)
Poor	8 (12.90)
Acceptable	18 (29.03)
Good	16 (25.81)
Excellent	19 (30.65)
Does it allow user input such as providing feedback, prompts, reminders, sharing options, notifications, etc.?	
Inadequate	4 (6.45)
Poor	8 (12.90)
Acceptable	15 (24.19)
Good	16 (25.81)
Excellent	19 (30.65)
Is the app content (visual information, language, design) appropriate for the target audience?	
Poor	1 (1.61)
Acceptable	7 (11.29)
Good	21 (33.87)
Excellent	33 (53.23)

7.4.1.2 *Functionality*

A majority of participants (33/62, 53%) rated the features of the app as working well and 34/62 (55%) rated the app as easy to use. Over half of the participants (34/62, 55%) gave the app an excellent rating for logical navigation between screens, and 32/62 (52%) rated the consistency of interactions across all screens as excellent (Table 7.4). The findings suggest that the app functions well, with all items receiving a rating of over 50%. Studies on mHealth apps that used the MARS to assesses quality suggest that apps with high functionality scores were considered acceptable and effective (Raeesi et al., 2022; Schmeelk et al., 2022). Suggesting that an app that works well and is easy to navigate is more likely to be accepted and considered easy to use (Beldad & Hegner, 2018; Palos-Sanchez et al., 2021). The findings

indicate that the functionality of the app was acceptable to participants, suggesting good usability.

Table 7.4: Functionality

Variable	Total (%) N = 62
How accurately or fast do the app features (functions) and components (buttons/menus) work?	
Inadequate	2 (3.23)
Poor	10 (16.13)
Acceptable	17 (27.42)
Good	33 (53.23)
How easy is it to learn how to use the app?	
Acceptable (useable after some effort)	7 (11.29)
Good (easy to learn how to use the app)	21 (33.87)
Excellent (able to use app immediately)	34 (54.84)
Is moving between screens logical? (Are all necessary screen links present?)	
Poor (usable after a lot of effort)	1 (1.61)
Acceptable (usable after some effort)	5 (8.06)
Good (easy to use)	22 (35.48)
Excellent (perfectly logical and intuitive screen flow throughout)	34 (54.84)
Are interactions consistent across all components/screens?	
Acceptable (OK with some inconsistencies)	4 (6.45)
Good (mostly consistent)	26 (41.94)
Excellent (perfectly consistent and intuitive)	32 (51.61)

7.4.1.3 *Aesthetics*

As illustrated in Table 7.5, almost half of the participants (29/62, 48%) rated the arrangement and size of the buttons on the app as excellent, 32/62 (52%) considered the resolution and quality of graphics used for buttons to be excellent, and 26/62 (42%) considered the app to have a high level of visual appeal. The findings show that participants found the app to be aesthetically pleasing, with ratings over 40% for each item. Research on mental health apps show that apps that have an easy-to-use interface, graphics and infographics were more aesthetically pleasing and encouraged greater usage than those with a linear style interface (Mani et al., 2015). Overall, the TAM also shows that technology adoption is also influenced

by the overall outlook of the app (Abu-Dalbouh et al., 2017; Alasmari, 2017). The findings suggest that the app has acceptable aesthetics but has some aspects that may need to be improved to enhance usability.

Table 7.5: Aesthetics

Variable	Total (%) N = 62
Is the arrangement and size of buttons on the screen appropriate or zoomable if needed?	
Poor (bad design)	1 (1.61)
Acceptable (satisfactory)	12 (19.35)
Good (mostly clear)	20 (32.26)
Excellent (clear, orderly, logically organised)	29 (46.77)
How high is the quality or resolution of graphics used for buttons?	
Acceptable (generally consistent in style)	8 (12.90)
Good (stylistically consistent)	22 (35.48)
Excellent (stylistically consistent throughout)	32 (51.61)
Visual appeal: How good does the app look?	
Poor (little visual appeal)	5 (8.06)
Acceptable (some visual appeal)	7 (11.29)
Good (high level of visual appeal)	26 (41.94)
Excellent (memorable, stands out)	24 (38.71)

7.4.1.4 *Information*

The data in Table 7.6 shows that a majority of participants (39/62, 63%) rated the app as excellent for containing accurate descriptions of the components in the app. The table illustrates further that 28/62 (45%) rated the app as good for containing clearly specified goals, which are measurable and achievable, and 35/62 (56%) rated the app as excellent for being correct, well written, and relevant to the app's goal.

Most participants (28/62, 45%) rated the app as good for sharing information comprehensively or concisely, half (31/62, 50%) rated the app as excellent for its visual explanation of concepts, and 27/62 (44%) stated that although the app appeared to come from a legitimate source. This could not be verified because it lacked a webpage. Overall, the findings show that participants found the information presented in the app to be satisfactory. Research shows that when participants believe the information on an app is useful and from a legitimate source, they are more likely to adopt the technology (Stoyanov et al., 2015).

Research on mHealth suggests that information acquisition plays a significant role in enhancing the adoption of a technology (Sezgin et al., 2018). While the information on this app was acceptable, it may need to be improved to increase usability.

Table 7.6: Information subscale

Variable	Total (%) N = 62
Does the app contain what is described?	
Acceptable (contains some of the described components)	6 (9.68)
Good (contains most of the described components)	17 (27.42)
Excellent (highly accurate description of components)	39 (62.90)
Does app have specific, measurable and achievable goals (specified in app store description or within the app itself)?	
Poor (description lists some goals, but app has very little chance of achieving them)	2 (3.23)
Acceptable (app has clear goals, which may be achievable)	11 (17.74)
Good (app has clearly specified goals, which are measurable and achievable)	28 (45.16)
Excellent (app has specific and measurable goals, which are highly likely to be achieved)	21 (33.87)
Is the content in the app correct, well written, and relevant to the goal/topic of the app?	
Acceptable (barely relevant)	6 (9.68)
Good (relevant)	21 (33.87)
Excellent (highly relevant)	35 (56.45)
Quantity of information: Is the extent of coverage within the scope of the app comprehensive and concise?	
Poor (minimal or overwhelming)	1 (1.61)
Acceptable (insufficient or possibly overwhelming)	6 (9.68)
Good (mostly comprehensive or concise)	28 (45.16)
Excellent (comprehensive and concise)	27 (43.55)
Is visual explanation of concepts - through charts/graphs/images/videos, etc. - clear, logical, correct?	
Acceptable (mostly unclear)	6 (9.68)
Good (mostly clear)	25 (40.32)
Excellent (perfectly clear)	31 (50.00)
Credibility: Does the app come from a legitimate source (specified in app store description or within the app itself)?	
Source identified but legitimacy/trustworthiness of source is questionable	7 (11.29)

Variable	Total (%) N = 62
Appears to come from a legitimate source, but it cannot be verified (e.g., has no webpage)	27 (43.55)
Developed by government, university or as above but larger in scale	20 (32.26)
Developed using nationally competitive government or research funding	8 (12.90)

7.4.1.5 *Subjective quality*

With respect to subjective quality, over half of the participants (34/62, 55%) stated that they would recommend the app to everyone. Twenty-four of the 62 participants (39%) indicated that they would use app 3–10 times in the next 12 months if it was relevant to them. Forty-two percent (26/62) gave the app a five-star rating, adding that it was one of the best apps they had used, and 23/62 (37%) stated that they would be willing to pay for the app. Their reasons are outlined in Tables 7.7 and 7.8.

Table 7.7: Reasons for wanting to pay for the app

Quotes from respondents giving reasons for paying for the app
"The app is full of helpful information and almost feels like having one's own personal counsellor."
"Yes, because I think it costed the developer more money to develop the app, so I would just like to say thank you."
"I will pay for this app because it contains information worth paying for, like a doctor's visit."
"I know that there are people hired to work on updating systems and a lot of individuals who dedicate their time to work on the app to make it effective."
"I would pay at least 50–150 per month because my mental health is a priority, and I would like to receive 24/7 help, so by paying would be beneficial for me as a person who's more concerned about her mental health and to my psychologist who will be aiding me."
"It's an amazing app that would really help my mental health, so I would be willing to pay for it."

Overall, participants found the app to be of high quality, with at least 42% giving it a five-star rating. However, most participants were not willing to pay for the app to address their mental health challenges (Harrisberg & Mensah, 2022). This appears to be a general perspective and not specific to this app, suggesting that apps that are affordable or free are more likely to be accepted and adopted by South African university students (Ruswa & Gore, 2022).

Table 7.8: Reasons for either not wanting to pay or possibly paying for the app

Do not want to pay for the app	May consider paying for the app
"Many students are struggling to make ends meet and having to pay for the well-being of one's mental health could result in additional stress. The app should be accessible to all individuals, regardless of their circumstances."	"I have not been given a chance to compare it with the other devices."
"As a student that can barely afford stuff, I feel like there are many students that can relate to this. Most of them cannot afford certain things and with the cost of living rising, it just makes things worse. If it's a source of funding that is needed, there can be a link that directs the user to a page where they can donate or have patrons."	"I believe I can pay for it if it can offer online counselling, which, of course, can be scheduled."
"The app is meant for university students who need mental health. They can't afford to pay for this app, and if they had to pay no one would use it."	"It's not a bad app but can use some more improvements."
"The app has basic information and can improve more on engaging more with the user."	"As it is, no. But if the developer adds more interactive features, such as connecting to a therapist immediately, then maybe yes."
"I am a broke student. All my money goes towards meals. I would only pay for this app by downloading it."	

Table 7.9 : Subjective quality scale

Variable	Total (%) N = 62
Would you recommend this app to people who might benefit from it?	
There are very few people I would recommend this app to	3 (4.84)
Maybe—there are several people whom I would recommend it to	11 (17.74)
There are many people I would recommend this app to	14 (22.58)
Definitely—I would recommend this app to everyone	34 (54.84)

Variable	Total (%) N = 62
How many times do you think you would use this app in the next 12 months if it was relevant to you?	
None	2 (3.23)
1–2	10 (16.13)
3–10	24 (38.71)
11–50	13 (20.97)
> 50	13 (20.97)
What is your overall star rating of the app?	
Two stars	3 (4.84)
Three stars (average)	14 (22.58)
Four stars	19 (30.65)
Five stars—one of the best apps I've used	26 (41.94)
Would you pay for this app?	
No	20 (32.26)
Maybe	19 (30.65)
Yes	23 (37.10)

7.4.2 Impact on user

The MARS has an extra component that is not part of the subjective user experience scale, called user impact. This scale is used to assess the perceived impact of the app on a participant's willingness to change or improve behaviour. The scale has four subscales: knowledge, attitude, intention to change, and potential change in a user's mental health behaviour. While this scale does not measure perceived ease of use, it can assist with assessing the impact the app had on the user. Table 7.10 outlines participants' responses as they relate to the four subscales.

7.4.2.1 *Knowledge*

A majority of the participants (34/62, 55%) strongly agreed that using the app was likely to increase knowledge and understanding of their mental health. Moreover, 32/62 (52%) agreed that this app was likely to increase awareness of the importance of addressing mental health challenges. This is an important finding, particularly because the study found a need for mental health literacy amongst students. This finding suggests that the app can be used as a vehicle to educate users on mental health (Seboka et al., 2022).

7.4.2.2 *Attitude*

Most participants (29/62, 47%) strongly agreed that this app was likely to change attitudes toward improving mental health. In their explanation of the TAM, Granić and Marangunić (2019) demonstrated that attitude does not influence the adoption of a technology. However, the findings for the current study suggest that attitude can be altered when using the app intervention—the more participants use the app, the higher the likelihood of their negative attitude towards mental health changing, which will ultimately increase help-seeking.

7.4.2.3 *Intention to change.*

A majority of participants (32/62, 52%) agreed that this app was likely to increase people's intentions or motivation to address their mental health. According to the TAM, the intention to use the app would be based on one's perception of its effectiveness and ease of use (Granić & Marangunić, 2019). Therefore, for most participants to agree that the app would increase their motivation to use it may imply that they perceived the app to be easy to use and potentially effective. According to the theory of reasoned action (TRA), intention for behaviour is determined by attitudes and subjective social norms about the behaviour (Fishbein & Ajzen, 1985). From this perspective, this finding suggests that with the right attitude and affirmation from social surroundings, the app can increase a user's intentions to use the app.

7.4.2.4 *Potential change in user's mental health behaviour*

More than half of the participants (33/62, 53%) agreed that the app was likely to encourage further help-seeking for mental health, and 29/62 (47%) strongly agreed that using the app was likely to improve mental health. These findings suggest that participants found the app to be an acceptable alternative mental health intervention and one they are willing to use to learn more about mental health and improve their own mental health challenges (Choudhury et al., 2023).

Table 7.10: Impact on user

Variable	Total (%) N = 62
This app is likely to increase awareness of the importance of addressing mental health challenges	
Strongly disagree	2 (3.23)
Disagree	2 (3.23)
Neither agree nor disagree	4 (6.45)
Agree	22 (35.48)
Strongly agree	32 (51.61)
Use of this app is likely to encourage further help-seeking for mental health	
Strongly agree	24 (38.71)
Agree	33 (53.23)
Neither agree nor disagree	3 (4.84)
Disagree	1 (1.61)
Strongly disagree	1 (1.61)
Use of this app is likely to increase mental health	
Strongly agree	29 (46.77)
Agree	23 (37.10)
Neither agree nor disagree	5 (8.06)
Disagree	4 (6.45)
Strongly disagree	1 (1.61)
This app is likely to increase knowledge and understanding of mental health	
Agree	26 (41.94)
Strongly agree	34 (54.84)
Neither agree nor disagree	1 (1.61)
Strongly disagree	1 (1.61)
This app is likely to change attitudes toward improving mental health	
Strongly agree	29 (46.77)
Agree	28 (45.16)
Neither agree nor disagree	4 (6.45)
Disagree	1 (1.61)
This app is likely to increase intentions/motivation to address mental health	
Strongly agree	26 (41.94)
Agree	32 (51.61)
Neither agree nor disagree	4 (6.45)

7.5 INTERNAL RELIABILITY

The MARS has five subscales (engagement, functionality, aesthetics, information, and subjective quality), comprising 23 items, which assessed the app's quality. The items were summed to obtain the total scores for each subscale and to determine internal consistency.

The subscales had good to questionable internal consistency: aesthetics (Cronbach alpha $\alpha = 0.83$), engagement ($\alpha = 0.81$), functionality ($\alpha = 0.79$), subjective quality ($\alpha = 0.79$), and information ($\alpha = 0.69$). Factor analysis was conducted for the questionable information scale to determine items that contributed the least to factor loadings. 'Credibility' was identified and removed from the scale, which improved the internal consistency from questionable to good ($\alpha = 0.83$). The total score measuring app quality was created by summing the scores of all items in the scale, giving app quality an excellent internal consistency score ($\alpha = 0.93$).

Previously, the MARS has shown high levels of reliability, including among mental health apps (Mani et al., 2015; Stoyanov et al., 2015). Therefore, the high Cronbach's alpha scores were expected. However, low internal reliability of the information subscale was unexpected. This outcome can be attributed to the fact that the app is still an APK (Android Package Kit) file. As the app is not yet published on online app stores, such as Google Play Store or the Apple App Store, and has not been endorsed by the university or any institution. This could have caused participants to question its credibility.

The second component of the MARS assessed the user impact of the app. This subscale comprises six items measuring awareness, health seeking, behaviour change, knowledge, attitude, and intention to change. Most studies that have used the MARS to review apps have not included this component (Mani et al., 2015; Raeesi et al., 2022; Roberts et al., 2021; Stoyanov et al., 2015). However, it was important for this study to assess how the user was impacted by the app, particularly because the items on the scale—attitude, intentions and behaviour—are highly related to TAM's foundational principles of usage and behaviour change.

Two items on the user impact scale—awareness and knowledge—were reverse-scored in error when I designed the survey but were re-coded during analysis to follow the same direction as the other items. This reverse scoring resulted in poor internal consistency (Cronbach alpha = 0.67). After performing exploratory factor analysis to identify the item contributing the least to factor loading, 'awareness' was identified and was removed from the scale, which changed the internal consistency to good (Cronbach alpha = 0.72).

7.6 CORRELATIONS

Correlations were run for all the items on the MARS to assess their relationships, and to determine the quality of the app by using the Pearson correlation coefficient (*r*). The MARS total score had excellent reliability consistency (Cronbach alpha = 0.93) and was highly correlated to the overall star rating of the app ($r = 0.72$, $p < 0.0001$). The other scores had a positive significant relationship with the MARS total score based on the total correlation: layout of the app ($r = 0.77$, $p < 0.0001$), customisation ($r = 0.74$, $P < 0.0001$), interest ($r = 0.66$, $p < 0.0001$), accuracy of app description ($r = 0.66$, $p < 0.0001$), entertainment ($r = 0.64$, $p < 0.0001$, navigation ($r = 0.60$, $p < 0.0001$) and quality of information ($r = 0.60$, $p < 0.0001$).

The MARS also looked at overall and individual subscale mean scores to rate the quality of the app. Mean scores can range from 1.0 to 5.0, with scores from 3.0 indicating high quality (Roy et al., 2022). The overall mean score was 88.1 and the total mean scores for each subscale were engagement (19.2), functionality (17.6), aesthetics (12.6), information (21.8) and subjective quality (13.8).

The average for each four subscales revealed a high quality, aesthetics had the highest score (4.25) followed by information (4.36), engagement (3.84), functionality (3.52), and subjective quality (3.45). The overall average of the total mean score was 4.19. The overall subscale mean scores were higher than 3.0, indicating that the participants in this study rated the app as being of a high quality.

Few studies have used the MARS to evaluate mental health apps, particularly those designed for university students. However, several studies have systematically reviewed mental health apps using the MARS (Mani et al., 2015; Stoyanov et al., 2015; Terhorst et al., 2018). Although this study is not a systematic review, similarities in mean scores were found between this study and the systematic reviews, ranging from 3.0 to 4.0. In these systematic reviews, engagement and information subscales had lower mean scores ranging between 3.2 and 4.0 (Mani et al., 2015; Terhorst et al., 2018), which was also true for the engagement component in this study. These findings suggest the need to improve the app's engagement features before introducing it to students. A systematic review by Stawarz et al. (2018) showed that mental health apps with more engagement features, such as audio content, prompts, enabled sharing, reminders, and peer and professional support, were more effective.

This study had an item ("Would you pay for this app?") with a low mean score for the subjective quality subscale, which is unusual when compared to similar studies. This finding is significant, as it implies the unlikelihood that university students will pay for a mental health app.

While the mean score for user impact was below average at 1.19, to my knowledge, no other studies with which to compare these findings were available, as most systematic reviews and studies have not used this subscale. However, this finding indicates that the perceived impact of the app on users' knowledge, attitudes, behaviour and intention to change was poor. This finding may suggest that external variables, such as gender, age or other personal characteristics, are the greatest determinants of intention to improve mental health, as suggested by Fishbein and Ajzen (1975). In this case, psychological distress is a possible external variable that could drive the intention to use an app to improve mental health.

Participants in this study were not using the app to improve their mental health but to assess the app's usability. As the survey did not assess psychological distress before participants evaluated the app, it is impossible for users not in need of the app to assess its impact. This finding emphasises the importance of running a longitudinal study in the future to assess the app's effectiveness on university students.

Table 7.11: Internal consistency of subscale scores, total correlations and mean scores of MARS items

Variable	Total correlation	n, mean (SD)
Overall app quality: alpha = 0.93		
Overall mean score= 88.1		
Engagement: alpha = 0.81		
Total mean = 19.2		
Average mean score 3.84		
Entertainment	0.64	3.40 (1.12)
Interest	0.66	4.11 (0.81)
Customisation	0.74	3.71 (1.09)
Interactivity	0.59	3.61 (1.23)
Target group	0.48	4.39 (0.75)
Functionality: alpha = 0.79		
Total mean = 17.6		
Average mean score 3.52		
Performance	0.56	4.31 (0.86)
Ease of use	0.56	4.44 (0.69)
Navigation	0.60	4.44 (0.72)
Gestural design	0.49	4.45 (0.62)

Variable	Total correlation	n, mean (SD)
Aesthetics: alpha = 0.83		
Total mean = 12.7		
Average mean score (4.25)		
Layout	0.77	4.24 (0.82)
Graphics	0.73	4.39 (0.71)
Visual appeal: How good does the app look?	0.62	4.11 (0.91)
Information: alpha = 0.83		
Total mean = 21.8		
Average mean score 4.36		
Accuracy of app description	0.66	4.53 (0.67)
Goals	0.50	4.10 (0.80)
Quality of information	0.60	4.47 (0.67)
Quantity of information	0.56	4.31 (0.71)
Visual information	0.53	4.40 (0.66)
Subjective quality: alpha = 0.79		
Total mean = 13.8		
Average mean score 3.45		
Would you recommend this app to people who might benefit from it?	0.60	4.27 (0.93)
How many times do you think you would use this app in the next 12 months if it was relevant to you?	0.56	3.40 (1.09)
What is your overall star rating of the app?	0.72	4.10 (0.92)
Would you pay for this app?	0.46	2.05 (0.84)
User impact: alpha = 0.72		
Total mean = 8.33		
Average mean score 1.19		
Use of this app is likely to encourage further help-seeking for mental health	0.34	1.74 (0.77)
Use of this app is likely to increase mental health	0.48	1.79 (0.96)
This app is likely to increase knowledge and understanding of mental health	0.52	1.52 (0.70)
This app is likely to change attitudes toward improving mental health	0.59	1.63 (0.68)
This app is likely to increase intentions/motivation to address mental health	0.53	1.65 (0.60)

7.7 CONCLUDING REMARKS

This chapter has presented all the quantitative results from Phase 3 and has offered a discussion based on the results. It has reported on participants' subjective experiences with using the app and the impact of the app on the user. The internal consistency of MARS, correlations, and mean scores of all the subjective experience subscales (engagement, functionality, aesthetics, information, and subjective quality) were high, indicating that the app is of a high quality and worked well for the participants in this study. Overall, it can be concluded that the app was perceived to be easy to use by the participants. The user impact subscale had low internal consistency, correlations and mean scores, suggesting that the app had a low perceived impact on users' knowledge, attitudes, behaviour, and intention to change their mental health.

CHAPTER 8: CONCLUSION, STRENGTHS, LIMITATIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

This chapter presents the conclusions reached from phases 1 to 3 of the study, which included data from surveys, in-depth interviews and focus group discussions (FGDs) with university students and campus counsellors. The chapter further discusses the strengths and limitations of the study and offers recommendations for future studies.

This study was structured across three phases to achieve the stipulated aims and objectives. The principal aims of this study were to explore the prevalence of psychological distress and the sources of distress experienced by university students, and to design and evaluate a mobile phone application (app) offering support for mental health to university students.

8.2 PHASES OF THE STUDY

8.2.1 Phase 1: Prevalence of psychological distress and coping strategies

Phase 1 comprised three objectives. Objective 1 assessed the prevalence of psychological distress amongst students by using the K-10 scale and SSI. This objective also assessed how students cope with psychological distress by using the Brief COPE 28 Scale through an online survey. Objective 1 aimed to answer the following questions:

- What is the prevalence of psychological distress in students enrolled at South African universities? Do differences in age, gender, and level of study exist in the reporting of psychological distress?
- How do university students cope with psychological distress? Do differences in age, gender, and level of study exist in the reporting of psychological distress?

The results from this study show a very high (60.5%) prevalence of psychological distress and moderate stress levels (53%) according to the Kessler-10 Scale and SSI. These results call attention to the need for universities to seriously consider students' mental well-being. This finding also points to the need for mental health interventions designed particularly for university students.

Undergraduate students in their third year of study showed higher levels of psychological distress (65%) than postgraduate students. This finding is unique as previous research has shown higher levels of psychological research amongst first-year students (Agteren et al.,

2019; Bantjes et al., 2019). However, it is also consistent with recent research showing that students in their final year of study experience higher levels of psychological distress because of anxiety regarding the completion of their studies and their career prospects (Keane et al., 2021). This finding suggests that universities should design programmes for final-year students to guide them on how to approach life after completing their undergraduate degree and how to address their anxieties about the future.

These results may also suggest that most undergraduate students are still in the early stages of emerging adulthood and are therefore destabilised more by challenges than their postgraduate counterparts (Milicev et al., 2021). If this is the case, universities should consider developing interventions specifically for undergraduate students as part of their curriculum. Male participants in this study showed higher levels (71.4%) of psychological distress than females, a unique finding compared to previous studies conducted on student mental health (Hakami, 2018; Pedrelli et al., 2015; Tesfaye Kelemu et al., 2020). However, this finding is pertinent because it affirms that mental health interventions should also focus on male students and should also give information on how to destigmatise gender stereotypes surrounding help-seeking behaviours amongst male students.

The overall results further show that students with psychological distress—regardless of gender, age and level of study—used emotion-focused and avoidance coping styles. This finding is consistent with findings previous studies (Ding et al., 2021; Mozid, 2022). First-year students' use of problem-focused coping strategies emphasises the need for universities to consider offering students interventions that teach them how to apply problem-focused coping strategies to their day-to-day challenges. The findings also suggest that students use different coping strategies depending on the type of challenge they face and the resources they possess. These findings also point to the importance of defining the different ways of coping and delineating between healthy and unhealthy coping strategies.

8.2.2 Phase 2: Perceptions and understanding of psychological distress and use of mental health applications.

Objective 2 of Phase 1 was to explore students' knowledge, awareness and perceptions of psychological distress, and the feasibility of a mental health app as an intervention for distress through FGDs. The objective was to answer the following questions:

- What are students' perceptions and understanding of psychological distress?
- What are student's perceptions of using a mental health app?

The findings show that students lack the capacity to identify and articulate psychological distress, possibly because of their lack of mental health literacy. This finding highlights the importance of equipping university students with information about mental health. Poor mental health literacy may also explain the reason for low mental health help-seeking amongst university students (Mitchell et al., 2017).

For the most part, students were open and willing to use a mental health app for their mental health needs, as they felt it would offer them privacy and access to immediate help. Students expressed their unwillingness to seek counselling from their campus support structures because of stigma, lack of time, lack of immediacy, and the belief that their challenge is not serious enough to warrant contacting campus counselling.

Students perceived a mental health app to be a feasible intervention that could be effective if designed well and made easily accessible to students. While students understood the gravity of psychological distress and other mental health challenges, they wanted information on the app to be conveyed in a simple, fun and engaging manner. Most students shared that, in many settings, mental health challenges were addressed in a serious and clinical manner, which sometimes perpetuated the stigma around mental disorders. However, addressing mental health in a simple and fun way would increase engagement and reduce the stigma associated with having mental health challenges.

Security and privacy concerns were the main barriers to using a mental health app. Some students felt that their personal information would not be safe and would only use the app if it allowed them to log in anonymously. This finding is significant as it confirms the importance of developing a mental health app that will value and protect students' privacy and security.

The purpose of Objective 3 of Phase 1 was to explore, through in-depth interviews, counsellors' perceptions of psychological distress and the use of a mental health app as an intervention for university students. The objective was to answer the following questions:

- How do counsellors report and understand the mental health needs of students and their sources of psychological distress?
- What are counsellors' acceptability of using mobile apps as an alternative intervention to face-to-face therapy?

The findings from the in-depth interviews with counsellors affirm that university students, particularly undergraduate students, experience considerable psychological distress, with most students seeking counselling for depression, anxiety, stress, and self-harm or suicide.

Counsellors identified family pressure, relationships, academic pressure, and psychosocial factors as major sources of psychological distress amongst university students. These findings underscored the importance of mental health support for university students, particularly addressing psychological distress before it leads to depression, anxiety or suicide. They also highlighted the importance of interactive interventions with students regarding everyday life challenges, while providing solutions before the challenges become overwhelming.

Counsellors were open and accepting of the idea of university students using an app intervention for their mental health needs. However, most counsellors felt that the app should be used in conjunction with face-to-face therapy and not as an alternative. Counsellors generally felt that an app could be a good bridge between students and counsellors, and that once students are aware of the help available to them, an app could reduce the stigma associated with face-to-face therapy, at the same time encouraging students to seek campus counselling.

Counsellors expressed some reservations about the app, including the concern that students who preferred face-to-face counselling could find the app a hindrance rather than a help. They added that there was a danger that some students may become over-reliant on the app or misdiagnose themselves while using the app. These findings are significant because they emphasise the importance of introducing new technology-based interventions as an adjunct to and not a replacement for existing face-to-face therapy.

Phase 2 had one objective, which was to design and develop a mental health app for university students by integrating data given by students and counsellors from the survey, in-depth interviews, and FGDs.

The app's design was based on five aspects, as suggested from the findings: educational information on mental health, coping strategies for mental health, support for mental health, engagement, and security. The mental health app was presented to the participants during a member check, with participants electing to name the app 'MentaLit' (Mental Literacy). The app is still a prototype and has not yet been published online.

8.2.3 Phase 3: Testing and evaluation of the mental health app

Phase 3 had one objective, which was to test and evaluate the mental health app with students and campus counsellors through an online survey based on the Mobile Application Rating Scale (MARS). The question answered by this objective was:

- How do students and counsellors report the usability of the app-based interventions as a means of supporting psychological distress amongst university students?

Its overall internal reliability ($\alpha = 0.93$), correlations ($r = 0.72$, $p < 0.0001$) and mean score (88.1) suggests that the students and counsellors found the app to be of a high quality. The high correlations and mean score for the app's features (engagement, functionality, aesthetics, and information) suggest that the counsellors and students perceived the app to be easy to use.

8.3 STRENGTHS OF THE STUDY

This is one of the first studies in South Africa to develop and evaluate a mental health app intervention for university students as part of a PhD study. The findings of this study have the potential to contribute to the gap of knowledge in the area of student mental health and the use of mobile health (mHealth) interventions.

The study included diverse students in terms of gender, age group and level of study. The FGDs were particularly diverse and offered useful perspectives on mental health and the potential for mHealth apps to address mental health challenges. The study also had a large sample size, which offered more precise estimates regarding the prevalence of psychological distress among university students.

Implementation-based research requires the use of different methods to answer the research questions. This study applied a multiphase mixed methods research design, which answered all the research questions of the study adequately. Using both quantitative and qualitative methods provided the study with a more in-depth and comprehensive picture of the state of psychological distress among students and their openness to using mHealth interventions. This would not have been possible had a single method been used.

Conducting the study during the COVID-19 pandemic was a disadvantage, as discussed under the limitations and weaknesses of study. However, the COVID-19 pandemic also contributed positively to the study, as it provided an opportunity to contribute to students' mental health and provide possible future solutions at time when the need for technological intervention was undeniable. Further, the pandemic also provided an opportunity for the study to explore and contribute to qualitative research methods that were previously employed less frequently.

8.4 LIMITATIONS AND WEAKNESSES OF THE STUDY

Although the study aimed to enrol students from different South African universities, a large proportion of the participants were from the University of the Witwatersrand. Therefore, the

findings are not representative of all students enrolled at South African universities and cannot be generalised. The study was conducted during the COVID-19 pandemic, a time when students were under more psychological distress than normal because of social distancing and adjusting to online learning, which could have contributed to the high levels of psychological distress they were experiencing.

Students had many suggestions for the app, including 24/7 counselling services, mental health-based games and quizzes. While these were excellent ideas, they were not feasible within the confines of the budget allocated for this PhD study.

Of the nine counsellors at the CCDU, only three completed the evaluation survey. Therefore, the responses in this study cannot be generalised to all CCDU counsellors.

8.4.1 Methodological limitations

The app intervention was developed based on students' perceived usefulness in line with cognitive behavioural theory. However, given that students are not mental health experts and may have made hypothetical suggestions based on their own preferences and not on psychological knowledge and expertise, their opinions are not conclusive.

Despite being guided by cognitive behavioural theory principles, the supervisors, software developers and I are not cognitive behavioural theory specialists. Although a cognitive behavioural theory specialist was consulted after data collection, there is still uncertainty about how the content fits within the cognitive behavioural theory therapeutic framework, particularly because the counsellors enrolled in this study gave a low rating on the app being based on cognitive behavioural theory.

The app was tested once-off for usability and not for effectiveness over time. Further, it was designed for psychological distress; it does not address the needs of students with chronic mental health challenges such as depression and anxiety, as it only focuses more on providing information on psychological contacts of the available assistance and coping strategies. In addition, based on the findings from the user impact component, the app did not influence the users' intention, attitude or behaviour to address their mental health challenges, indicating that other external factors need to be in place to utilise the app effectively.

Further, limited funding restricted the app's development to Android devices. This was particularly challenging in Phase 3, as some students and counsellors who were eager to take part in the study could not do so because they used IOS or a different software.

Administering an online survey for Phase 3 limited the study's findings in several ways. First, as participants were required to use their own data, only those with access to Wi-Fi and data could download the app and complete the survey. Second, there was no way to verify that participants had assessed each component of the app—although the backend data on the app shows which components were mostly opened, it does not show how long each person spent on the segments. Third, the survey had 47 questions in total and the results show that most participants did not complete the whole survey, which can be attributed to respondent fatigue.

8.5 RECOMMENDATIONS

This study's findings and the global literature confirm that the prevalence of psychological distress amongst university students is high. Further, it confirms that the level of mental health literacy amongst university students remains low, despite rising mental health challenges in this population group. Therefore, universities need to implement effective policies and engaging mental health strategies focused on mental literacy and decreasing stigma. Students should be involved in policy development and strategy implementation, as they could recommend new ideas on how counselling services can encourage help-seeking behaviours amongst students without fear of stigma.

Student mental health remains a prominent topic in public health research. Currently, sufficient research studies have been conducted on the prevalence of psychological distress and mental health amongst university students. However, research on mHealth interventions for students is limited, particularly in South Africa. Studies across the globe, including this one, have found that university students find mHealth interventions acceptable. Therefore, in the future, mental health research needs to gravitate towards exploring and developing mHealth or digital interventions that will supplement face-to-face therapy in addressing students' mental health needs.

Future studies could explore developing digital interventions in different forms, such as chatbots, apps, and live interactions, that focus on students' mental health needs. To increase participation and usage, future studies could consider developing digital interventions that offer high levels of engagement, functionality, and information. Since mental health literacy is considered low amongst university students, future researchers and developers can begin by developing a psychoeducational-based intervention that uses everyday terms to describe mental health challenges, symptoms, and solutions. This may assist students to identify their symptoms and seek help.

In addition, for existing mHealth interventions, longitudinal studies should be conducted to assess or test digital interventions designed for students to determine their effectiveness—whether any cognitive or behavioural changes occur over time.

REFERENCES

Abrams, Z. (2020). A crunch at college counseling centers. *Monitor on Psychology, 51*(6), 14-22. https://www.apa.org/monitor/2020/09/crunch-college-counseling

Abu-Dalbouh, H., Al-Buhairy, M., & Al-Motiry, I. (2017). Applied the technology acceptance model in designing a questionnaire for mobile reminder system. *Computer and Information Science, 10*(2), 15-24. https://doi.org/10.5539/cis.v10n2p15

Addepally, S. A., & Purkayastha, S. (2017). Mobile-application based cognitive behavior therapy (CBT) for identifying and managing depression and anxiety. *International conference on digital human modeling and applications in health, safety, ergonomics and risk management*, (pp. 3-12).

Adekson, M. O. (2016). Traditional healing and mental health counseling. *JSM Health Education & Primary Health Care, 1*(2), 1011.

Agteren, J., Woodyatt, L., Iasiello, M., Rayner, J., & Kyrios, M. (2019). Make it measurable: Assessing psychological distress, wellbeing and resilience at scale in higher education. *Student Success, 10*(3), 1-13. https://doi.org/10.5204/ssj.v10i3.1411

Ahmedani, B. K., Crotty, N., Abdlhak, M. M., & Ondersma, S. J. (2015). Pilot feasibility study of a brief, tailored mobile health intervention for depression among patients with chronic pain. *Behavioral Medicine, 41*(1), 25–32. https://doi.org/10.1080/08964289.2013.867827

Ahn, M. Y., & Davis, H. H. (2020). Four domains of students' sense of belonging to university. *Studies in Higher Education, 45*(3), 622-634. https://doi.org/10.1080/03075079.2018.1564902

Ajibade, P. (2018). Technology acceptance model limitations and criticisms: Exploring the practical applications and use in technology-related studies, mixed-method, and qualitative researches. *Library Philosophy and Practice*, 1-13. https://core.ac.uk/download/pdf/189486068.pdf

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50(2), 179-211., 50*(2), 179-211. https://doi.org/10.1016/07495978(91)90020-T

Akıllı, G. K., & Gezgin, D. M. (2016). Examination of the relationship between nomophobia levels and different behavior patterns of university students. *Mehmet Akif Ersoy University Journal of the Faculty of Education, 1*(40), 51-69.

Alasmari, T. M. (2017). *Mobile learning technology acceptance among Saudi higher education students.* [Doctoral dissertation] Wayne State University. https://digitalcommons.wayne.edu/cgi/viewcontent.cgi?article=2675&context=oa_dissertations

Albalawi, H., & Nadeem, M. (2020). Exploring the impact of ineffective formal communication between teachers and students: A case study of Mustaqbal University and Jubail University College, Kingdom of Saudi Arabia. *English Language Teaching, 13*(3), 68-76. https://doi.org/10.5539/elt.v13n3p68

Alkhateeb, S. A., Alkhameesi, N. F., Lamfon, G. N., Khawandanh, S. Z., Kurdi, L. K., Faran, M. Y., Khoja, A. A., Bukhari, L. M., Aljahdali, H. R., Ashour, N. A., Bagasi, H. T., Delli, R. A., Khoja, O. A., & Safdar, O. Y. (2019). Pattern of physical exercise practice among university students in the Kingdom of Saudi Arabia (before beginning and during college): A cross-sectional study. *BMC Public Health, 19*, Article 1716. https://doi.org/10.1186/s12889-019-8093-2

Allen, H. K., Lilly, F., Green, K. M., Zanjani, F., Vincent, K. B., & Arria, A. M. (2022). Substance use and mental health problems among graduate students: Individual and program-level correlates. *Journal of American College Health, 70*(1), 65-73. https://doi.org/10.1080/07448481.2020.1725020

Almanasef, M. (2021). Mental health literacy and help-seeking behaviours among undergraduate pharmacy students in Abha, Saudi Arabia. *Risk Management and Healthcare Policy, 2021*(14), 1281-1286. https://doi.org/10.2147/RMHP.S289211

Al-Tammemi, A. A., Akour, A., & Alfalah, L. (2020). Is it just about physical health? An online cross-sectional study exploring the psychological distress among university students in Jordan in the midst of COVID-19 pandemic. *Frontiers in Psychology, 11*, https://doi.org/10.3389/fpsyg.2020.562213

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association Publishing. https://doi.org/10.1176/appi.books.9780890425596

American Psychological Association. (2022). *Mental health.* https://www.apa.org/topics/mental-health

Andersen, L. S., Grimsrud, A., Myer, L., Williams, D. R., Stein, D. J., & Seedat, S. (2011). The psychometric properties of the K10 and K6 scales in screening for mood and anxiety disorders in the South African Stress and Health study. *International Journal of Methods in Psychiatric Research, 20*(4), 215-223. https://doi.org/10.1002/mpr.351

Arday, J. (2018). Understanding mental health: What are the issues for Black and ethnic minority students at university? *Social Sciences, 7*(10), Article 196. https://doi.org/10.3390/socsci7100196

Arnett, J. J. (2006). The psychology of emerging adulthood: What is known, and what remains to be known? In J. J. Arnett, & J. L. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 303-330). American Psychological Association.

Arnett, J. J. (2012). New horizons in research on emerging and young adulthood. In A. Booth, S. L. Brown, N. S. Landale, W. D. Manning, & S. M. McHale (Eds.), *Early adulthood in a family context* (pp. 231-244). Springer.

Arnett, J. J., & Schwab, J. (2012). *The Clark University poll of emerging adults: Thriving, struggling, and hopeful.* Worcester, MA: Clark University.

Arnett, J. J. (2018). Conceptual foundations of emerging adulthood. In J. L. Murray, & J. J. Arnett (Eds.), *Emerging Adulthood and Higher Education.* (pp. 11-24). Routledge. https://doi.org/10.4324/9781315623405

Artime, T. M., Buchholz, K. R., & Jakupcak, M. (2019). Mental health symptoms and treatment utilization among trauma-exposed college students. *Psychological Trauma: Theory, Research, Practice, and Policy, 11*(3), 274–282. https://doi.org/10.1037/tra0000376

Arvidsdotter, T., Marklund, B., Kylén, S., Taft, C., & Ekman, I. (2016). Understanding persons with psychological distress in primary health care. *Scandinavian Journal of Caring Sciences, 30*(4), 687-694. https://doi.org/10.1111/scs.12289

Aschbrenner, K. A., Kruse, G., Gallo, J. J., & Plano Clark, V. L. (2022). Applying mixed methods to pilot feasibility studies to inform intervention trials. *Pilot and Feasibility Studies, 8,* Article 217. https://doi.org/10.1186/s40814-022-01178-x

Asif, S., Mudassar, A., Shahzad, T. Z., Raouf, M., & Pervaiz, T. (2020). Frequency of depression, anxiety and stress among university students. *Pakistan Journal of Medical Sciences, 36*(5), 971-976. https://doi.org/10.12669/pjms.36.5.1873

Ataş, A. H., & Çelik, B. (2019). Smartphone use of university students: Patterns, purposes, and situations. *Malaysian Online Journal of Educational Technology*, *7*(2), 59-70. https://files.eric.ed.gov/fulltext/EJ1214011.pdf

Auerbach, R. P., Alonso, J., Axinn, W. G., Cuipers, P., Ebert, D., Green, J., Hwange, I., Kessler, R. C., Liu, H., Mortier, P., Nock, M. K., Pinter-Amaker, S., Sampson, N. A., Aguilar-Gaxiola, S., Al-Hamzawi, A., Andrade, L. H., Benjet, C., Caldas-de-Almeida, J. M., Demyttenaere, K., & Bruffaerts, R. (2016). Mental disorders among college students in the World Health Organization world mental health surveys. *Psychological Medicine, 46*(14), 2955-2970. https://doi.org/10.1017/S0033291716001665

Babbie, E. (2016). *The practice of social research* (14th ed.). Cengage Learning

Babicka-Wirkus, A., Wirkus, L., Stasiak, K., & Kozlowski, P. (2021). University students' strategies of coping with stress during the coronavirus pandemic: Data from Poland. *PLoS ONE, 16*(7), e0255041. https://doi.org/10.1371/journal.pone.0255041

Bakker, D., Kazantzis, N., Rickwood, D., & Rickard, N. (2016). Mental health smartphone apps: Review and evidence-based recommendations for future developments. *JMIR Mental Health, 3*, e7. https://doi.org/10.2196/mental.4984

Balamurugan, M., & Kumaran, D. S. (2008). *Development and validation of Students' Stress Rating Scale (SSRS).* Chennai: University of Madras. https://files.eric.ed.gov/fulltext/ED501881.pdf

Balaskas, A., Schueller, S. M., Cox, A. L., & Doherty, G. (2022). Understanding users' perspectives on mobile apps for anxiety management. *Frontiers in Digital Health, 4*, 854263. https://doi.org/10.3389/fdgth.2022.854263

Bantjes, J. R., Kagee, A., McGowan, T., & Steel, H. (2016). Symptoms of posttraumatic stress, depression, and anxiety as predictors of suicidal ideation among South African university students. *Journal of American College Health, 64*(6), 429-437. https://doi.org/10.1080/07448481.2016.1178120

Bantjes, J., Kessler, M., Lochner, C., Breet, E., Bawa, A., Roos, J., Davids, C., Muturiki, M., Kessler, R. C., & Stein, D. J. (2023a). The mental health of university students in South Africa: Results of the national student survey. *Journal of Affective Disorders, 321*, 217226. https://doi.org/10.1016/j.jad.2022.10.044

Bantjes, J., Lochner, C., Saal, W., Roos, J., Taljaard, L., Page, D., Auerbach, R. P., Mortier, P., Bruffaerts, R., Kessler, R. C., & Stein, D. J. (2019). Prevalence and sociodemographic correlates of common mental disorders among first-year university students in post-apartheid South Africa: implications for a public mental health approach to student wellness. *BMC Public Health, 19*, Article 922. https://doi.org/10.1186/s12889-019-7218-y

Bantjes, J., Saal, W., Lochner, C., Roos, J., Auerbach, R. P., Mortier, P., Bruffaerts, R., Kessler, R. C., & Stein, D. J. (2020). Inequality and mental healthcare utilisation among first-year university students in South Africa. *International Journal of Mental Health Systems, 14*, Article 5. https://doi.org/10.1186/s13033-020-0339-y

Bantjes, J., Swanevelder, S., Jordaan, E., Sampson, N. A., Petukhova, M. V., Lochner, C., Stein, D. J., Kessler, R. C. (2023b). COVID-19 and common mental disorders among university students in South Africa. *South African Journal of Science, 119*(1/2), Article 13594. https://doi.org/10.17159/sajs.2023/13594

Bardus, M., van Beurden, S. B., Smith, J. R., & Abraham, C. (2016). A review and content analysis of engagement, functionality, aesthetics, information quality, and change techniques in the most popular commercial apps for weight management. *International Journal of Behavioral Nutrition and Physical Activity, 13,* Article 35. https://doi.org/10.1186/s12966-016-0359-9

Barmola, K. C. (2013). Family environment, mental health and academic performance of adolescents. *International Journal of Scientific Research, 2*(12), 531-533.

Bashir, H., & Bhat, S. A. (2017). Effects of social media on mental health: A review. *International Journal of Indian Psychology, 4*(3), 125-131. https://doi.org/10.25215/0403.134

Bashir, M. B., Albadawy, I. M., & Cumber, S. N. (2019). Predictors and correlates of examination anxiety and depression among high school students taking the Sudanese national board examination in Khartoum state, Sudan: A cross-sectional study. *The Pan African Medical Journal, 33,* Article 69. https://doi.org/10.11604/pamj.2019.33.69.17516

Baskin, T. W., Slaten, C. D., Sorenson, C., Glover-Russell, J., & Merson, D. N. (2010). Does youth psychotherapy improve academically related outcomes? A meta-analysis. *Journal of Counseling Psychology, 57*(3), 290–296. https://doi.org/10.1037/a0019652

Bauermeister, J. A., Eaton, L., Meanley, S., & Pingel, E. S. (2017). Transactional sex with regular and casual partners among young men who have sex with men in the Detroit metro area. *American Journal of Men's Health, 11*(3), 498-507. https://doi.org/10.1177/1557988315609110

Bantjes, J., Swanevelder, S., Jordaan, E., Sampson, N. A., Petukhova, M. V., Lochner, C., Stein, D. J., Kessler, R. C. (2023b). COVID-19 and common mental disorders among university students in South Africa. South African Journal of Science, 119(1/2), Article 13594. https://doi.org/10.17159/sajs.2023/13594 (1964). Thinking and depression: II. Theory and therapy. *Archives of General Psychiatry, 10*(6), 561–571. https://doi.org/10.1001/archpsyc.1964.01720240015003

Beck, A. T., & Dozois, D. J. (2011). Cognitive therapy: Current status and future directions. *Annual Review of Medicine, 62,* 397-409. https://doi.org/10.1146/annurev-med-052209-10003

Bedewy, D., & Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: The perception of academic stress scale. *Health Psychology Open, 2*(2), 1-9. https://doi.org/10.1177/2055102915596714

Békés, V., Aafjes-van Doorn, K., Luo, X., Prout, T., & Hoffman, L. (2021). Psychotherapists' challenges with online therapy during COVID-19: Concerns about connectedness predict therapists' negative view of online therapy and its perceived efficacy over time of online therapy and its perceived efficacy over time. *Frontiers in Psychology, 12*, 1-10. https://doi.org/10.3389/fpsyg.2021.705699

Beldad, A. D., & Hegner, S. M. (2018). Expanding the Technology Acceptance Model with the inclusion of trust, social influence, and health valuation to determine the predictors of German users' willingness to continue using a fitness app: A structural equation modeling approach. *International Journal of Human–Computer Interaction, 34*(9), 882-893. https://doi.org/10.1080/10447318.2017.1403220

Ben-Zeev, D., Schueller, S. M., Begale, M., Duffecy, J., Kane, J. M., & Mohr, D. C. (2015). Strategies for mHealth research: Lessons from 3 mobile intervention studies. *Administration and Policy in Mental Health and Mental Health Services Research, 42*(2), 157-167. https://doi.org/10.1007/s10488-014-0556-2

Berger, E. (2013, December 16). Study: Students who use cellphones more get lower grades. *Chron.* https://blog.chron.com/sciguy/2013/12/study-students-who-usecellphonesmore-get-lower-grades/

Berrouiguet, S., Baca-García, E., Brandt, S., Walter, M., & Courtet, P. (2016). Fundamentals for future mobile-health (mHealth): A systematic review of mobile phone and web-based text messaging in mental health. *Journal of Medical Internet Research, 18*(6), e135. https://doi.org/10.2196/jmir.5066

Biggs, A., Brough, P., & Drummond, S. (2017). Lazarus and Folkman's psychological stress and coping theory. In C. L. Cooper, & J. C. Quick (Eds.), *The handbook of stress and health: A guide to research and practice* (pp. 351-364). Wiley Blackwell. https://doi.org/10.1002/9781118993811.ch21

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research, 26*(13), 1802–1811. https://doi.org/10.1177/1049732316654870

Blanden, J., & Macmillan, L. (2014). *Education and intergenerational mobility: Help or hindrance?* London: Centre for Analysis of Social Exclusion, London School of Economics.

Blum, A. W., Lust, K., Christenson, G., Odlaug, B. L., Redden, S. A., & Grant, J. E. (2018). Transactional sexual activity among university students: Prevalence and clinical correlates. *International Journal of Sexual Health, 30:3,, 30*(3), 271-280. https://doi.org/10.1080/19317611.2018.1491922

Booysen, D. D., & Naidoo, A. V. (2016). On becoming a clinical psychologist: The experiences of initially unsuccessful applicants. *New Voices in Psychology, 12*(1), 23-39. https://doi.org/10.25159/1812-6371/1625

Borghouts, J., Eikey, E., Mark, G., De Leon, C., Schueller, S. M., Schneider, M., Stadnick, N., Zheng, K., Mukamel, D., & Sorkin, D. H. (2021). Barriers to and facilitators of user engagement with digital mental health interventions: systematic review. *Journal of Medical Internet Research, 23*(3), e24387. https://doi.org/10.2196/24387

Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Linnan, L., Weiner, D., Bakken, S., Kaplan, C. P., Squiers, L., Fabrizio, C., & Fernandez, M. (2009). How we design feasibility studies. *American Journal of Preventive Medicine, 36*(5), 452-457. https://doi.org/10.1016/j.amepre.2009.02.002

Bowman, B., & Payne, J. (2011). A profile of students receiving counselling services at a university in post-apartheid South Africa. *Journal of Child & Adolescent Mental Health, 23*(2), 143-153. https://doi.org/10.2989/17280583.2011.634544

Braghieri, L., Levy, R., & Makarin, A. (2022). *Social media and mental health.* http://dx.doi.org/10.2139/ssrn.3919760

Braithwaite, S. R., Delevi, R., & Fincham, F. D. (2010). Romantic relationships and the physical and mental health of college students. *Personal relationships, 17*(1), 1-12. https://doi.org/10.1111/j.1475-6811.2010.01248.x

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners.* SAGE Publications.

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589-597. https://doi.org/10.1080/2159676X.2019.1628806

Broglia, E., Millings, A., & Barkham, M. (2021). Student mental health profiles and barriers to help seeking: When and why students seek help for a mental health concern. *Counselling and Psychotherapy Research, 21*(4), 816-826. https://doi.org/10.1002/capr.12462

Brouard, P., & Crewe, M. (2012). Sweetening the deal? Sugar daddies, sugar mummies, sugar babies and HIV in contemporary South Africa. *Agenda, 26*(4), 48-56. https://doi.org/10.1080/10130950.2012.757862

Brown, B. B., & Prinstein, M. (Eds.). (2011). *Encyclopedia of adolescence.* Academic Press.

Brown, J. S. (2018). Student mental health: Some answers and more questions. *Journal of Mental Health, 27*(3), 193-196. https://doi.org/10.1080/09638237.2018.1470319

Bryman, A. (2016). *Social research methods* (4th ed.). New York: Oxford University Press.

Burmeister, E., & Aitken, L. M. (2018). Sample size: How many is enough? *Australian Critical Care, 25*(4), 271-274. https://doi.org/10.1016/j.aucc.2012.07.002

Byambasuren, O., Sanders, S., Beller, E., & Glasziou, P. (2018). Prescribable mHealth apps identified from an overview of systematic reviews. *NPJ Digital Medicine, 1*, 1-12. https://doi.org/10.1038/s41746-018-0021-9

Bylieva, D., Lobatyuk, V., & Safonova, A. (2019). Online forums: Communication model, categories of online communication regulation and norms of behavior. *Humanities & Social Sciences Reviews, 7*(1), 332-340. https://doi.org/10.18510/hssr.2019.7138

Byrne, D. (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality & Quantity, 56*(3), 1391-1412. https://doi.org/10.1007/s1113502101182-y

Cafazzo, J. A., Casselman, M., Hamming, N., Katzman, D. K., & Palmert, M. R. (2012). Design of an mHealth app for the self-management of adolescent type 1 diabetes: A pilot study. *Journal of Medical Internet Research, 14*(3), e70. https://doi.org/10.2196/jmir.2058

Cage, E., Jones, E., Ryan, G., Hughes, G., & Spanner, L. (2021). Student mental health and transitions into, through and out of university: Student and staff perspectives. *Journal of Further and Higher Education, 45*(8), 1076-1089. https://doi.org/10.1080/0309877X.2021.1875203

Caron, J., Fleury, M.-J., Perreault, M., Crocker, A., Tremblay, J., Tousignant, M., Kestens, Y., Cargo, M., & Daniel, M. (2012). Prevalence of psychological distress and mental disorders, and use of mental health services in the epidemiological catchment area of Montreal Sou. *BMC Psychiatry, 12*, Article 183. https://doi.org/10.1186/1471-244X-12-183

Carvalho, S. A., Martins, C. P., Almeida, H. S., & Silva, F. (2017). The evolution of cognitive behavioural therapy – The third generation and its effectiveness. *European Psychiatry, 41*(S1), s773-s774. https://doi.org/10.1016/j.eurpsy.2017.01.1461

Carver, C. (1997). You want to measure coping but your protocol's too long: Consider the brief COPE. *International Journal of Behavioral Medicine, 4*(1), 92-100. https://doi.org/10.1207/s15327558ijbm0401_6

Carver, C. S. (2011). Coping. In R. J. Contrada, & A. Baum (Eds.), *The handbook of stress science: Biology, psychology, and health* (pp. 221-229). Springer.

Chan, S., Godwin, H., Gonzalez, A., Yellowlees, P. M., & Hilty, D. M. (2017). Review of use and integration of mobile apps into psychiatric treatments. *Current Psychiatry Reports, 19*, 96. https://doi.org/10.1007/s11920-017-0848-9

Chanakira, E., O'Cathain, G., Goyder, E. C., & Freeman, J. V. (2014). Factors perceived to influence risky sexual behaviours among university students in the United Kingdom: A qualitative telephone interview study. *BMC Public Health, 14*, Article 1055. https://doi.org/10.1186/1471-2458-14-1055

Chandrashekar, P. (2018). Do mental health mobile apps work: evidence and recommendations for designing high-efficacy mental health mobile apps. *mHealth, 4*, 6. https://doi.org/10.21037/mhealth.2018.03.02

Chaplin, T. M. (2015). Gender and emotion expression: A developmental contextual perspective. *Emotion Review, 7*(1), 14-21. https://doi.org/10.1177/1754073914544408.

Chaudary, N. A. (2017). *Prevalence and determinants of mental health issues among the university students and its impact on their academic performance and well-being in Punjab, Pakistan.* [Doctoral dissertation] Bielefeld: Universität Bielefeld. https://pub.uni-bielefeld.de/record/2910519

Chen, J. I., Romero, G. D., & Karver, M. S. (2016). The relationship of perceived campus culture to mental health help-seeking intentions. *Journal of Counseling Psychology, 63*(6), 677–684. https://doi.org/10.1037/cou0000095

Chen, T., & Lucock, M. (2022). The mental health of university students during the COVID19 pandemic: An online survey in the UK. *PLoS ONE, 17*(1), e0262562. https://doi.org/10.1371/journal.pone.0262562

Choudhury, A., Kuehn, A., Shamszare, H., & Shahsavar, Y. (2023). Analysis of mobile app-based mental health solutions for college students: A rapid review. *Healthcare, 11*(2), Article 272. https://doi.org/10.3390/healthcare11020272

Chow, C. M., Ruhl, H., & Buhrmester, D. (2015). Romantic relationships and psychological distress among adolescents: Moderating role of friendship closeness. *International Journal of Social Psychiatry, 61*(7), 711-720. https://doi.org/10.1177/0020764015585329

Cilliers, C. D., Pretorius, K., & van der Westhuizen, L. R. (2010). A national benchmarking survey of student counselling centres/units in South Africa. *South African Journal of Higher Education, 24*(1), 48-65. https://doi.org/10.4314/sajhe.v24i1.63428

Colomer-Pérez, N., Chover-Sierra, E., Navarro-Martínez, R., Andriusevičienė, V., Vlachou, E., & Cauli, O. (2019). Alcohol and drug use in European university health science students: Relationship with self-care ability. *International Journal of Environmental Research and Public Health, 16*(24), 5042. https://doi.org/10.3390/ijerph16245042

Cornally, N., & McCarthy, G. (2011). Help-seeking behaviour: A concept analysis. *International Journal of Nursing Practice, 17*(3), 280-288. https://doi.org/10.1111/j.1440-172X.2011.01936.x

Cornish, P. A., Berry, G., Benton, S., Barros-Gomes, P., Johnson, D., Ginsburg, R., Whelan, B., Fawcett, E., & Romano, V. (2017). Meeting the mental health needs of today's college student: Reinventing services through Stepped Care 2.0. *Psychological Services, 14*(4), 428442. https://doi.org/10.1037/ser0000158

Corrigan, P., Markowitz, F. E., Watson, A., Rowan, D., & Kubiak, M. A. (2003). An attribution model of public discrimination towards persons with mental illness. *Journal of Health and Social Behavior, 44*(2), 162-179. https://doi.org/10.2307/1519806

Côté, J. E. (2006). Emerging adulthood as an institutionalized moratorium: Risks and benefits to identity formation. In J. J. Arnett, & J. L. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 85-116). American Psychological Association. https://doi.org/10.1037/11381-004

Creswell, J. W. (2014). *Qualitative, quantitative and mixed methods approaches. Sage.* (4th ed.). SAGE Publications.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

Cuadros, D. F., Tomita, A., Vandormael, A., Slotow, R., Burns, J. K., & Tanser, F. (2019). Spatial structure of depression in South Africa: A longitudinal panel survey of a nationally representative sample of households. *Scientific Reports, 9,* Article 979. https://doi.org/10.1038/s41598-018-37791-1

Cuijpers, P., Smits, N., Donker, ten Have, M., & de Graaf, R. (2009). Screening for mood and anxiety disorders with the five-item, the three-item, and the two-item Mental Health Inventory. *Psychiatry Research, 168*(3), 250-255. https://doi.org/10.1016/j.psychres.2008.05.012

Czyz, E. K., Horwitz, A. G., Eisenberg, D., Kramer, A., & King, C. A. (2013). Self-reported barriers to professional help seeking among college students at elevated risk for suicide. *Journal of American College Health, 61*(7), 398-406. https://doi.org/10.1080/07448481.2013.820731

Daniels, N., Gillen, P., Casson, K., & Wilson, I. (2019). STEER: Factors to consider when designing online focus groups using audiovisual technology in health research. *International Journal of Qualitative Methods, 18*(1), 1-11. https://doi.org/10.1177/1609406919885786

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance. *MIS Quarterly, 13*(3), 319-339. https://doi.org/10.2307/249008

Deasy, C., Coughlan, B., Pironom, J., Jourdan, D., & Mannix-McNamara, P. (2014). Psychological distress and coping amongst higher education students: A mixed method enquiry. *PLoS ONE, 9*(12), e115193. https://doi.org/10.1371/journal.pone.0115193

De Lijster, J. M., Dierckx, B., Utens, E. M., Verhulst, F. C., Zieldorff, C., Dieleman, G. C., & Legerstee, J. S. (2017). The age of onset of anxiety disorders. *Canadian Journal of Psychiatry, 62*(4), 237–246. https://doi.org/10.1177/0706743716640757

Denecke, K., Schmid, N., & Nüssli, S. (2022). Implementation of cognitive behavioral therapy in e–mental health apps: Literature review. *Journal of Medical Internet Research, 24*(3), e27791. https://doi.org/10.2196/27791

Deng, Y., Cherian, J., Khan, N. U. N., Kumari, K., Sial, M. S., Comite, U., Gavurova, B., & Popp, J. (2022). Family and academic stress and their impact on students' depression level and academic performance. *Frontiers in Psychiatry, 13*, 869337. https://doi.org/10.3389/fpsyt.2022.869337

Dennison, L., Morrison, L., Conway, G., & Yardley, L. (2013). Opportunities and challenges for smartphone applications in supporting health behavior change: Qualitative study. *Journal of Medical Internet Research, 15*(4), e86. https://doi.org/10.2196/jmir.2583

Denzin, N. K. (1978). *The research act: A theoretical introduction to sociological methods* (2nd ed.). Routledge.

Denzin, N. K. (2012). Triangulation 2.0. *Journal of mixed methods research, 6*(2), 80-88. https://doi.org/10.1177/1558689812437186

Devlin, M. (2013). Bridging socio-cultural incongruity: Conceptualising the success of students from low socio-economic status backgrounds in Australian higher education. *Studies in Higher Education, 38*(6), 939-949. https://doi.org/10.1080/03075079.2011.613991

de Vos, S., Patten, S., Wit, E. C., Bos, E. H., Wardenaar, K. J., & de Jonge, P. (2019). Subtyping psychological distress in the population: A semi-parametric network approach. *Epidemiology and Psychiatric Sciences, 29*, E36. https://doi.org/10.1017/S204579601900026X.

Dhurup, M., & Dubihlela, D. (2014). Stressors and coping mechanisms: Gender and age variations among university student-athletes and quality of life. *African Journal for Physical Health Education, Recreation and Dance, 20*(sup-2), 16-29. https://hdl.handle.net/10520/EJC162524

Dias, C., Cruz, J. F., & Fonseca, A. (2012). The relationship between multidimensional competitive anxiety, cognitive threat appraisal, and coping strategies: A multi-sport study. *International Journal of Sport and Exercise Psychology*, *10*(1), 52-65. https://doi.org/10.1080/1612197X.2012.645131

Dillon, D. R., O'Brien, D. G., & Heilman, E. E. (2000). Literacy research in the next millennium: From paradigms to pragmatism and practicality. *Reading Research Quarterly, 35*(1), 10-26. https://doi.org/10.1598/RRQ.35.1.2

Ding, Y., Fu, X., Liu, R., Hwang, J., Hong, W., & Wang, J. (2021). The impact of different coping styles on psychological distress during the COVID-19: The mediating role of perceived stress. *International Journal of Environmental Research and Public Health, 18*(20), Article 10947 https://doi.org/10.3390/ijerph182010947

Doherty, G., Coyle, D., & Sharry, J. (2012). Engagement with online mental health interventions: An exploratory clinical study of a treatment for depression. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1421-1430). Association for Computing Machinery. https://doi.org/10.1145/2207676.2208602

Dorsey, E. R., Okun, M. S., & Bloem, B. R. (2020). Care, convenience, comfort, confidentiality, and contagion: The 5 C's that will shape the future of telemedicine. *Journal of Parkinson's Disease, 10*(3), 893-897. https://doi.org/10.3233/JPD-202109

Drapeau, A., Marchand, A., & Beaulieu-Prévost, D. (2012). Epidemiology of psychological distress. In L. L'Abate (Ed.), *Mental illnesses: Understanding, prediction and control* (pp. 105-134). IntechOpen. https//doi.org/10.5772/30872

Draucker, C. B., Martsolf, D. S., & Poole, C. (2009). Developing distress protocols for research on sensitive topics. *Archives of Psychiatric Nursing, 23*(5), 343-350. https://doi.org/10.1016/j.apnu.2008.10.008

Eisenbarth, C. A. (2019). Coping with stress: Gender differences among college students. *College Student Journal, 53*(2), 151-162. https://www.ingentaconnect.com/content/prin/csj/2019/00000053/00000002/art00002

Eisenberg, D., Nicklett, E. J., Roeder, K., & Kirz, N. E. (2011). Eating disorder symptoms among college students: Prevalence, persistence, correlates, and treatment-seeking. *Journal of American College Health, 59*(8), 700-707. https://doi.org/10.1080/07448481.2010.546461

El Ansari, W., Adetunji, H., & Oskrochi, R. (2014). Food and mental health: relationship between food and perceived stress and depressive symptoms among university students in the United Kingdom. *Central European Journal of Public Health, 22*(2), 90-97. https://doi.org/10.21101/cejph.a3941

Ellis, C. G. (2003). Cross-cultural aspects of depression in general practice. *South African Medical Journal, 93*(5), 342-345. http://samj.org.za/index.php/samj/article/view/2151

Eskin, M., Sun, J-M., Abuidhail, J., Yoshimasu, K., Kujan, O., Janghorbani, M., Flood, C., Carta, M. G., Tran, U. S., Mechri, A., Hamdan, M., Poyrazli, S., Aidoudi, K., Bakhshi, S., Harlak, H., Moro, M. F., Nawafleh, H., Phillips, L., Shaneen, A., . . . Voracek, M. 2016. Suicidal behavior and psychological distress in university students: A 12-nation study. *Archives of Suicide Research,* 20(3), 369-388. https://doi.org/10.1080/13811118.2015.1054055

Fenn, K., & Byrne, M. (2013). The key principles of cognitive behavioural therapy. *InnovAiT*(6), 579-585. https://doi.org/10.1177/1755738012471029

Fetters, M. D., & Molina-Azorin , J. F. (2020). Utilizing a mixed methods approach for conducting interventional evaluations. *Journal of Mixed Methods Research, 14*(2), 131-144. https://doi.org/10.1177/155868982091285.

Field, T., Diego, M., Pelaez, M., Deeds, O., & Delgado, J. (2010). Breakup distress and loss of intimacy in university students. *Psychology*, *1*(3), 173-177. https://doi.org/10.4236/psych.2010.13023

Finchilescu, G., & Dugard, J. (2021). Experiences of gender-based violence at a South African university: Prevalence and effect on rape myth acceptance. *Journal of Interpersonal Violence, 36*(5-6), NP2749-NP2772. https://doi.org/10.1177/0886260518769352

Firth, J., Torous, J., Nicholas, J., Carney, R., Pratap, A., Rosenbaum, S., & Sarris, J. (2017). The efficacy of smartphone-based mental health interventions for depressive symptoms: A meta-analysis of randomized controlled trials. *World Psychiatry, 16*(3), 287-298. https://doi.org/10.1002/wps.20472

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Addison-Wesley.

Fleming, T. M., Bavin, L., Stasiak, K., Hermansson-Webb, E., Merry, S. N., Cheek, C., Lucassen, M., Lau, H. M., Pollmuller, B., & Hetrick, S. (2017). Serious games and gamification for mental health: Current status and promising directions. *Frontiers in Psychiatry*, 215. https://doi.org/10.3389/fpsyt.2016.00215

Fleming, T. M., de Beurs, D., Khazaal, Y., Gaggioli, A., Riva, G., Botella, C., Baños, R. M., Aschieri, F., Bavin, L. M., Kleiboer, A., Merry, S., Lau, H. M., & Riper, H. (2016). Maximizing the impact of e-therapy and serious gaming: Time for a paradigm shift. *Frontiers in Psychiatry, (7)*, 65. https://doi.org/10.3389/fpsyt.2016.00065

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*(3), 219-239. https://doi.org/10.2307/2136617

Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology, 55*, 745-774. https://doi.org/10.1146/annurev.psych.55.090902.141456

Fruehwirth, J. C., Biswas, S., & Perreira, K. M. (2021). The Covid-19 pandemic and mental health of first-year college students: Examining the effect of Covid-19 stressors using longitudinal data. *PLoS ONE, 16*(3), 16(3), e0247999. https://doi.org/10.1371/journal.pone.0247999

Furlonger, B., & Budisa, S. (2016). Internet sites and apps available to students seeking counselling, and what school counsellors should know about them. *Journal of psychologists and Counsellors in Schools, 26*(1), 68-83. https://doi.org/10.1017/jgc.2015.22

Fusch, P. I., & Ness, L. (2015). Are we there yet? Data saturation in qualitative research. *Qualitative Report, 20*(9), 1408-1416. https://doi.org/10.46743/2160-3715/2015.2281

Galderisi, S., Heinz, A., Kastrup, M., Beezhold, J., & Sartorius, N. (2015). Toward a new definition of mental health. *World Psychiatry, 14*(2), 231-233. https://doi.org/10.1002/wps.20231

Gefen, D. R., & Fish, M. C. (2012). Gender differences in stress and coping in first-year college students. *Journal of College Orientation, Transition, and Retention, 19*(2), https://doi.org/10.24926/jcotr.v19i2.2797

Gelinas, L., Pierce, R., Winkler, S., Cohen, I. G., Lynch, H. F., & Bierer, B. E. (2017). Using social media as a research recruitment tool: Ethical issues and recommendations. *The American Journal of Bioethics, 17*(3), 3-14. https://doi.org/10.1080/15265161.2016.1276644

Gibbs, A., Dunkle, K., & Jewkes, R. (2018). Emotional and economic intimate partner violence as key drivers of depression and suicidal ideation: A cross-sectional study among young women in informal settlements in South Africa. *PLoS ONE, 13*(4), e0194885. https://doi.org/10.1371/journal.pone.0194885

Gilavand, A. (2016). Investigating the impact of environmental factors on learning and academic achievement of elementary students: Review. *International Journal of Medical Research & Health Sciences, 5*(7S), 360-369. https://www.ijmrhs.com/medical-research/investigating-the-impact-of-environmental-factors-on-learning-and-academic-achievement-of-elementary-students-review.pdf

Gindidis, S., Stewart, S. E., & Roodenburg, J. (2020). Adolescent experiences of app-integrated therapy. *The Educational and Developmental Psychologist, 37*(1), 20-29. https://doi.org/10.1017/edp.2019.18

Giota, K. G., & Kleftaras, G. (2014). Mental health apps: innovations, risks and ethical considerations. *E-Health Telecommunication Systems and Networks, 3*(3). 19-23. https://doi.org/10.4236/etsn.2014.33003

Githaiga, J. N., Gobodo-Madikizela, P., & Wahl, W. P. (2018). 'They dug up wounds': University of the Free State students' experiences of transformation and integration in campus residences. *Race Ethnicity and Education, 21*(6), 773-790. https://doi.org/10.1080/13613324.2017.1376633

Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity.* Penguin.

Goldsmith, J. (2018). *Emerging adults' relationships with their parents.* Clinical Science Insights. pp. 1-6. Evanston, IL: The Family Institute at Northwestern University. https://www.family-institute.org/sites/default/files/pdfs/csi-emerging-adultsrelationships-with-parents.pdf

Gorczynski, P., & Sims-Schouten, W. (2022). Evaluating mental health literacy amongst US college students: A cross sectional study. *Journal of American College Health*, 1-4. https://doi.org/10.1080/07448481.2022.2063690

Gordon, S. F., & Collins, A. (2013). "We face rape. We face all things": Understandings of gender-based violence amongst female students at a South African university. *African Safety Promotion: A Journal of Injury and Violence Prevention, 11*(2), 93-106. https://www.ajol.info/index.php/asp/article/view/136103

Goudeau, S., Sanrey, C., Stanczak, A., Manstead, A., & Darnon, C. (2021). Why lockdown and distance learning during the COVID-19 pandemic are likely to increase the social class achievement gap. *Nature Human Behaviour, 5*, 1273-1281. https://doi.org/10.1038/s41562-021-01212-7

Gough, B., & Novikova, I. (2020). *Mental health, men and culture: how do sociocultural constructions of masculinities relate to men's mental health help-seeking behaviour in the WHO European Region?* Health Evidence Network Synthesis Report, No. 70. Copenhagen: WHO Regional Office for Europe.

Govender, P., Mkhabela, S., Hlongwane, M., Jalim, K., & Jetha, C. (2015). OT student's experiences of stress and coping. *South African Journal of Occupational Therapy*, *45*(3), 34-39

Granić, A., & Marangunić, N. (2019). Technology acceptance model in educational context: A systematic literature review. *British Journal of Educational Technology, 50*(5), 25722593. https://doi.org/10.1111/bjet.12864

Graves, B. S., Hall, M. E., Dias-Karch, C., Haischer, M. H., & Apter, C. (2021). Gender differences in perceived stress and coping among college students. *PLoS ONE, 16*(8), e0255634. https://doi.org/10.1371/journal.pone.0255634

Greenberger, D., & Padesky, C. A. (2015). *Mind over mood: Change how you feel by changing the way you think.* Guilford Publications.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11*(3), 255-274. https://doi.org/10.3102/01623737011003255

Grist, R., Porter, J., & Stallard, P. (2017). Mental health mobile apps for preadolescents and adolescents: A systematic review. *Journal of Medical Internet Research, 19*(5), e176. https://doi.org/10.2196/jmir.7332

Gruttadaro, D., & Crudo, D. (2012). *College students speak: A survey report on mental health.* Arlington, VA: National Alliance on Mental Illness. https://www.nami.org/Support-Education/Publications-Reports/SurveyReports/CollegeStudents-Speak_A-Survey-Report-on-Mental-H.

Guba, E. G. (1981). ERIC/ECTJ annual review paper: Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology, (29)*2, 75-91. https://www.jstor.org/stable/30219811

Guba, E. G., & Lincoln, Y. S. (1981). *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches.* Jossey-Bass.

Gulliver, A., Griffiths, K. M., & Christensen, H. (2010). Perceived barriers and facilitators to mental health help-seeking in young people: A systematic review. *BMC Psychiatry, 10*, Article 113. https://doi.org/10.1186/1471-244X-10-113

Haigh, C., & Witham, G. (2013). *Distress protocol for qualitative data collection.* Department of Nursing: Manchester Metropolitan University. https://www.mmu.ac.uk/media/mmuacuk/content/documents/rke/AdvisoryDistressProtocol.pdf

Haines, C. A. (2011). *Value added by mixed methods research: A multiphase mixed methods design.* [Doctoral dissertation] University of Nebraska. https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1115&context=cehsdiss

Hakami, R. M. (2018). Prevalence of psychological distress among undergraduate students at Jazan University: A cross-sectional study. *Saudi Journal of Medicine & Medical Sciences, 6*(2), 82-88. https://doi.org/10.4103/sjmms.sjmms_73_17

Hamaideh, S. H. (2012). Gender differences in stressors and reactions to stressors among Jordanian university students. *International Journal of Social Psychiatry, 58*(1), 2633. https://doi.org/10.1177/0020764010382692

Hamidi, S., Ebrahimi, H., Vahidi, M., & Areshtanab, H. N. (2023). Internalized stigma and its association with hope, self-esteem, self-efficacy, and treatment adherence among outpatients with severe mental illness: A cross-sectional survey. *Iranian Journal of Nursing and Midwifery Research, 28*(3), 345-351. https://doi.org/10.4103/ijnmr.ijnmr_248_21

Hampshire, K., Porter, G., Owusu, S. A., Mariwah, S., Abane, A., Robson, E., Munthali, A., DeLannoy, A., Bango, A., Gunguluza, N., & Milner, J. (2015). Informal m-health: How are young people using mobile phones to bridge healthcare gaps in Sub-Saharan Africa? *Social Science & Medicine, 142*, 90-99. https://doi.org/10.1016/j.socscimed.2015.07.033

Harrisberg, K., & Mensah, K. (2022). *As young Africans push to be online, data cost stands in the way*. World Economic Forum. https://www.weforum.org/agenda/2022/06/asyoung-africans-push-to-be-online-datacost-stands-in-the-way/

Harwood, S. A., Huntt, M. B., Mendenhall, R., & Lewis, J. A. (2012). Racial microaggressions in the residence halls: Experiences of students of color at a predominantly White university. *Journal of Diversity in Higher Education, 5*(3), 159173. https://doi.org/10.1037/a0028956

Hassel, S., & Ridout, N. (2018). An investigation of first-year students' and lecturers' expectations of university education. *Frontiers in psychology, 8*, 2218. https://doi.org/10.3389/fpsyg.2017.02218

Hayes, S. C., & Hofmann, S. G. (Eds.). (2018). *Process-based CBT: The science and core clinical competencies of cognitive behavioral therapy.* New Harbinger Publications.

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-Based Nursing, 18*(3), 66-67. https://doi.org/10.1136/eb-2015-102129

Hechanova, R., & Waelde, L. (2017). The influence of culture on disaster mental health and psychosocial support interventions in Southeast Asia. *Mental Health, Religion & Culture, 20*(1), 31-44. https://doi.org/10.1080/13674676.2017.1322048

Heckman, S., Lim, H., & Montalto, C. (2014). Factors related to financial stress among college students. *Journal of Financial Therapy, 5*(1), 3. https://doi.org/10.4148/19449771.1063

Herman, A. A., Stein, D. J., Seedat, S., Heeringa, S. G., Moomal, H., & Williams, D. R. (2009). The South African Stress and Health (SASH) study: 12-month and lifetime prevalence of common mental disorders. *South African Medical Journal, 99*(5 Pt 2), 339-344

Heugh, K. (2013). Multilingual education policy in South Africa constrained by theoretical and historical disconnections. *Annual Review of Applied Linguistics, 33*, 215-237. https://doi.org/10.1017/S0267190513000135

Hjorth, C. F., Bilgrav, L., Frandsen, L. S., Overgaard, C., Torp-Pedersen, C., Nielsen, B., & Bøggild, H. (2016). Mental health and school dropout across educational levels and genders: A 4.8-year follow-up study. *BMC Public Health, 16*, Article 976. https://doi.org/10.1186/s12889-016-3622-8

Hlatshwayo, M. (2022). Online Learning during the South African Covid-19 Lockdown: University Students Left to Their Own Devices. *Education as Change, 26*(1), 1-23.

Hodson, E., Dadashi, N., Delgado, R., Chisholm, C., Sgrignoli, R., & Swaine, R. (2019). Co-design in mental health; Mellow: A self-help holistic crisis planning mobile application by youth, for youth. *The Design Journal, 22*(sup1), 1529-1542. https://doi.org/10.1080/14606925.2019.1594975

Hofmann, S. G., & Hinton, D. E. (2014). Cross-cultural aspects of anxiety disorders. *Current Psychiatry Reports, 16*(6), 450. https://doi.org/10.1007/s11920-014-0450-3

Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive therapy and research, 36*, 427-440. https://doi.org/10.1007/s10608-012-9476-1

Huberty, J., Green, J., Glissmann, C., Larkey, L., Puzia, M., & Lee, C. (2019). Efficacy of the mindfulness meditation mobile app "calm" to reduce stress among college students: Randomized controlled trial. *JMIR mHealth and uHealth, 7*(6), e14273. https://doi.org/10.2196/14273

Ickes, M. J., Brown, J., Reeves, B., & Zephyr, P. M. (2015). Differences between undergraduate and graduate students in stress and coping strategies. *Californian Journal of Health Promotion, 13*(1), 13-25. https://doi.org/10.32398/cjhp.v13i1.1810.

Idowu, O. M., Adaramola, O. G., Aderounmu, B. S., Olugbamigbe, I. D., Dada, O. E., Osifeso, A. C., Ogunnubi, O. P., & Odukoya, O. O. (2022). A gender comparison of psychological distress among medical students in Nigeria during the Coronavirus pandemic: a cross-sectional survey. *African Health Sciences, 22*(1), 541-550. https://doi.org/10.4314/ahs.v22i1.63

Irawan, A. W., Dwisona, D., & Lestari, M. (2020). Psychological impacts of students on online learning during the pandemic COVID-19. *KONSELI: Jurnal Bimbingan dan Konseling, 7*(1), 53-60. https://doi.org/10.24042/kons.v7i1.6389

Irvine, A., Drew, P., Bower, P., Brooks, H., Gellatly, J., Armitage, C. J., Barkham, M., McMillan, D., & Bee, P. (2020). Are there interactional differences between telephone and face-to-face psychological therapy? A systematic review of comparative studies. *Journal of Affective Disorders, 265*, 120-131. https://doi.org/10.1016/j.jad.2020.01.057

Jabour, A. M., Rehman, W., Idrees, S., Thanganadar, H., Hira, K., & Alarifi, M. A. (2021). The adoption of mobile health applications among university students in health colleges. *Journal of Multidisciplinary Healthcare, 14*, 1267-1273. https://doi.org/10.2147/JMDH.S310539

Jackson, T. (2021, December 7). SA startup launches mental health support app. *Disrupt Africa*. https://disrupt-africa.com/2021/12/07/sa-startup-launches-mental-healthsupportapp/

Jacobson, D., & Mustafa, N. (2019). Social identity map: A reflexivity tool for practicing explicit positionality in critical qualitative research. *International Journal of Qualitative Methods, 18*. https://doi.org/10.1177/1609406919870075

Jerrim, J. (2022). Test anxiety: Is it associated with performance in high-stakes examinations? *Oxford Review of Education, 49*(3), 321-341. https://doi.org/10.1080/03054985.2022.2079616

Jithoo, V. (2018). Contested meanings of mental health and well-being among university students. *South African Journal of Psychology, 48*(4), 453-464. https://doi.org/10.1177/0081246317731958

Jordaan, I., Spangenberg, J. J., Watson, M. B., & Fouchè, P. (2007). Emotional stress and coping strategies in South African clinical and counselling psychologists. *South African Journal of Psychology, 37*(4), 835-855. https://doi.org/10.1177/008124630703700411

Jorm, A. F., Korten, A. E., Jacomb, P. A., Christensen, H., Rodgers, B., & Pollitt, P. (1997). "Mental health literacy": A survey of the public's ability to recognise mental disorders and their beliefs about the effectiveness of treatment. *The Medical Journal of Australia, 166*(4), 182-186. https://doi.org/10.5694/j.1326-5377.1997.tb140071.x

Jorm, A. F. (2012). Mental health literacy: Empowering the community to take action for better mental health. *American Psychologist, 67*(3), 231-243. https://doi.org/10.1037/a0025957

Kabir, S. M. (2016). *Basic guidelines for research: An introductory approach for all disciplines.* Book Zone.

Kaczkurkin, A. N., & Foa, E. B. (2015). Cognitive-behavioral therapy for anxiety disorders: An update on the empirical evidence. *Dialogues in Clinical Neuroscience, 17*(3), 337-346. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4610618/

Kalhori, S. R. N., Hemmat, M., Noori, T., Heydarian, S., & Katigari, M. R. (2021). Quality evaluation of English mobile applications for gestational diabetes: App review using Mobile Application Rating Scale (MARS). *Current Diabetes Reviews, 17*(2), 161-168. https://doi.org/10.2174/1573399816666200703181438

Kalin, N. H. (2020). The critical relationship between anxiety and depression. *American Journal of Psychiatry, 177*(5), 365-367. https://doi.org/10.1176/appi.ajp.2020.20030305

Kaminer, D., & Shabalala, N. (2019). Developing a student mental health policy for a South African university: Consultation, contestation and compromise. *South African Journal of Higher Education, 33*(5), 196-212. https://doi.org/10.20853/33-5-3597

Kandiko Howson, C. B., & Mawer, M. (2013). *Student expectations and perceptions of higher education.* London: King's Learning Institute.

Kar, N. (2011). Cognitive behavioral therapy for the treatment of post-traumatic stress disorder: A review. *Neuropsychiatric Disease and Treatment, 7*(1), 167-181. https://doi.org/10.2147/NDT.S10389

Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for social work research. *Social Sciences, 8*(9), 255. https://doi.org/10.3390/socsci8090255

Keane, C., Waldeck, D., Holliman, A., Goodman, S., & Choudhry, K. (2021). Exploring the experience of anxiety among final year students at university: A thematic analysis. *The Qualitative Report, 26*(8), 2621-2630. https://doi.org/10.46743/2160-3715/2021.4874

Kelly, J. D. (2019). Your best life: Managing negative thoughts—The choice is yours. *Clinical Orthopaedics and Related Research, 477*(6), 1291-1293. https://doi.org/10.1097/CORR.0000000000000791

Kemmler, W., von Stengel, S., Kohl, M., & Bauer, J. (2015). Impact of exercise changes on body composition during the college years - a five year randomized controlled study. *BMC Public Health, 16,* Article 50. https://doi.org/10.1186/s12889-016-2692-y.

Kenny, R., Dooley, B., & Fitzgerald, A. (2015). Feasibility of" CopeSmart": a telemental health app for adolescents. *JMIR Mental Health, 2*(3), e22. https://doi.org/10.2196/mental.4370.

Kern, A., Hong, V., Song, J., Lipson, S. K., & Eisenberg, D. (2018). Mental health apps in a college setting: Openness, usage, and attitudes. *MHealth, 4*(6), 255. https://doi.org/10.21037/mhealth.2018.06.01.

Kessler, R. C., & Bromet, E. J. (2013). The epidemiology of depression across cultures. *Annual review of public health, 34*, 119-138. https://doi.org/10.1146/annurevpublhealth-031912-114409.

Kessler, R. C., & Mroczek, D. (1992). *An update of the development of mental health screening scales for the US National Health Interview Study.* Ann Arbor: University of Michigan, Survey Research Center of the Institute for Social Research, 31118-5.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., Howes, M. J., Normand, S-L. T.,; Manderscheid, R. W., Walters, E. E., & Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry, 60*(2), 184-189. https://doi.org/10.1001/archpsyc.60.2.184

Kessler, R. C., Sampson, N. A., Berglund, P., Gruber, M. J., Al-Hamzawi, A., Andrade, L., Bunting, B., Demyttenaere, K., Florescu, S., de Girolamo, G., Gureje, O., He, Y., Hu, C., Huang, Y., Karam, E., Kovess-Masfety, V., Lee, S., Levinson, D., Medina Mora, M.E., . . . Wilcox, M. A. 2015. Anxious and non-anxious major depressive disorder in the World Health Organization World Mental Health Surveys. *Epidemiology and Psychiatric Sciences,* 24(3), pp. 210-226. https://doi.org/10.1017/S2045796015000189.

Keyes, C. L. (2014). Mental health as a complete state: How the salutogenic perspective completes the picture. In G. F. Bauer, & O. Hämmig (Eds.), *Bridging occupational, organizational and public health* (pp. 179-192). Springer. https://doi.org/10.1007/978-940075640-3_11

Khalid, M., Bashir, S., & Amin, H. (2020). Relationship between self-directed learning (SDL) and academic achievement of university students: A case of online distance learning and traditional universities. *Bulletin of Education and Research, 42*(2), 131148. https://files.eric.ed.gov/fulltext/EJ1281053.pdf.

Khan, M. (2013). Academic self-efficacy, coping, and academic performance in college. *International Journal of Undergraduate Research and Creative Activities, 5*.(1), Article 4. http://dx.doi.org/10.7710/2168-0620.1006

Kiekens, G., Hasking, P., Bruffaerts, R., Claes, L., Baetens, I., Boyes, M., Mortier, P., Demyttenaere, K., & Whitlock, J. (2017). What predicts ongoing nonsuicidal self-injury? A comparison between persistent and ceased self-injury in emerging adults. *The Journal of Nervous and Mental Disease, 205*(10), 762-770. https://doi.org/10.1097/NMD.0000000000000726

Kilkkinen, A., Kao-Philpot, A., O'Neil, A., Philpot, B., Reddy, P., Bunker, S., & Dunbar, J. (2007). Prevalence of psychological distress, anxiety and depression in rural communities in Australia. *Australian Journal of Rural Health, 15*(2), 114-119. https://doi.org/10.1111/j.1440-1584.2007.00863.x

Kim, J., Ilon, L., & Altmann, J. (2013). Adapting smartphones as learning technology in a Korean university. *Journal of Integrated Design and Process Science, 17*(1), 5-16. https://doi.org/10.3233/jid-2013-0002.

Kit, P. L., Wong, S. S., D'Rozario, V., & Teo, C. T. (2014). Exploratory findings on novice group counselors' initial co-facilitating experiences in in-class support groups with adjunct online support groups. *The Journal for Specialists in Group Work, 39*(4), 316-344. https://doi.org/10.1080/01933922.2014.954737

Kivunja, C., & Kuyini, A. B. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education, 6*(5), 26-41. https://doi.org/10.5430/ijhe.v6n5p26

Knapp, P., & Beck, A. T. (2008). Cognitive therapy: foundations, conceptual models, applications and research. *Brazilian Journal of Psychiatry, 30*, s54-s64. https://doi.org/10.1590/s1516-44462008000600002

Knapstad, M., Sivertsen, B., Knudsen, A. K., Smith, O. R., Aarø, L. E., Lønning, K. J., & Skogen, J. C. (2021). Trends in self-reported psychological distress among college and university students from 2010 to 2018. *Psychological Medicine, 51*(3), 470-478. https://doi.org/10.1017/S0033291719003350

Kobak, K. A., Mundt, J. C., & Kennard, B. (2015). Integrating technology into cognitive behavior therapy for adolescent depression: A pilot study. *Annals of General Psychiatry, 14*, 37. https://doi.org/10.1186/s12991-015-0077-8

Koh, J., Tng, G. Y., & Hartanto, A. (2022). Potential and pitfalls of mobile mental health apps in traditional treatment: An umbrella review. *Journal of Personalized Medicine, 12*(9), 1376. https://doi.org/10.3390/jpm12091376

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice, 24*(1), 120-124. https://doi.org/10.1080/13814788.2017.1375092

Kretzschmar, K., Tyroll, H., Pavarini, G., Manzini, A., Singh, I., & NeurOx Young People's Advisory Group. (2019). Can your phone be your therapist? Young people's ethical perspectives on the use of fully automated conversational agents (chatbots) in mental health support. *Biomedical Informatics Insights, 11*, 1178222619829083. https://doi.org/10.1177/1178222619829083

Krueger, R. A. (2014). *Focus groups: A practical guide for applied research* (5th ed.). SAGE Publications.

Kumaraswamy, N. (2013). Academic stress, anxiety and depression among college students: A brief review. *International Review of Social Sciences and Humanities, 5*(1), 135-143. https://www.academia.edu/4262192/International_Review_of_Social_Sciences_and_HumanitiesAcademic_Stress_Anxiety_and_Depression_among_College_Students_A_Brief_Review

Kwan, M. Y., Arbour-Nicitopoulos, K. P., Duku, E., & Faulkner, G. (2016). Patterns of multiple health risk–behaviours in university students and their association with mental health: application of latent class analysis. *Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice, 36*(8), 163. https://doi.org/10.24095/hpcdp.36.8.03

Kyei, K. A., & Ramagoma, M. (2013). Alcohol consumption in South African universities: Prevalence and factors at the University of Venda, Limpopo province. *Journal of Social Sciences, 36*(1), 77-86. https://doi.org/10.1080/09718923.2013.11893175

Lally, J., ó Conghaile, A., Quigley, S., Bainbridge, E., & McDonald, C. (2013). Stigma of mental illness and help-seeking intention in university students. *The Psychiatrist, 37*(8), 253-260. https://doi.org/10.1192/pb.bp.112.041483

Lane, R., & Miranda, R. (2018). The effects of familial acculturative stress and hopelessness on suicidal ideation by immigration status among college students. *Journal of American College Health, 66*(2), 76-86. https://doi.org/10.1080/07448481.2017.1376673

Larcombe, W., Finch, S., Sore, R., Murray, C. M., Kentish, S., Mulder, R. A., Lee-Stecum, P., Baik, C., Tokatlidis, O., & Williams, D. A. (2016). Prevalence and sociodemographic correlates of psychological distress among students at an Australian university. *Studies in Higher Education*, *41*(6), 1074-1091. https://doi.org/10.1080/03075079.2014.966072

Larson, R. S. (2018). A path to better-quality mHealth apps. *JMIR mHealth and uHealth, 6*(7), e10414. https://doi.org/10.2196/10414

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.

Lazarus, R. S., & Folkman, S. (1986). Cognitive theories of stress and the issue of circularity. In M. H. Appley, & R. Trumbull (Eds.), *Dynamics of stress* (pp. 63-80). Springer.

Lecomte, T., Potvin, S., Corbière, M., Guay, S., Samson, C., Cloutier, B., Francoeur, A., Pennou, A., & Khazaal, Y. (2020). Mobile apps for mental health issues: meta-review of meta-analyses. *JMIR mHealth and uHealth, 8*(5), e17458. https://doi.org/10.2196/17458

Lee, R. A., & Jung, M. E. (2018). Evaluation of an mhealth app (DeStressify) on university students' mental health: Pilot trial. *JMIR Mental Health, 5*(1), e2. https://doi.org10.2196/mental.8324

Lefcourt, H. M., Davidson, K., Prkachin, K. M., & Mills, D. E. (1997). Humor as a stress moderator in the prediction of blood pressure obtained during five stressful tasks. *Journal of Research in Personality 31*, 523-542.

Leger, K. A., Charles, S. T., Turiano, N. A., & Almeida, D. M. (2016). Personality and stressor-related affect. *Journal of Personality and Social Psychology, 111*(6), 917-928. https://doi.org/10.1037/pspp0000083.

Letseka, M., Cosser, M., Breier, M., & Visser, M. (2009). *Student retention and graduate destination. Higher education and labour market access and success.* Human Sciences Research Council. http://hdl.handle.net/20.500.11910/4388 http://hdl.handle.net/20.500.11910/4388

Lewis, S. P., Heath, N. L., Hasking, P. A., Whitlock, J. L., Wilson, M. S., & Plener, P. L. (2019). Addressing self-injury on college campuses: Institutional recommendations. *Journal of College Counseling, 22*(1), 70-82. https://doi.org/10.1002/jocc.12115

Liébana-Presa, C., Fernández-Martínez, M., Gándara, Á. R., Muñoz-Villanueva, M., Vázquez-Casares, A. M., & Rodríguez-Borrego, M. (2014). Psychological distress in health sciences college students and its relationship with academic engagement. *Revista da Escola de Enfermagem da USP, 48*, 715-722. https://doi.org/10.1590/s0080-623420140000400020

Lim, H., Heckman, S., Montalto, C. P., & Letkiewicz, J. (2014). Financial stress, self-efficacy, and financial help-seeking behavior of college students. *Journal of Financial Counseling and Planning, 25*(2), 148-160. https://files.eric.ed.gov/fulltext/EJ1048681.pdf

Lima-Smit, B., Nel, K., & Setwaba, M. (2022). Cultural knowledge and perceptions of students towards mental illness in South Africa. *Journal of Psychology in Africa, 32*(4), 400-406. https://doi.org/10.1080/14330237.2022.2066367

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.

Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011). Paradigmatic controversies, contradictions, and emerging confluences, revisited. In N. K. Denzin, & Y, S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 97-128).

Lipari, R. N., & Beda, J.-F. (2016). *A day in the life of college students aged 18 to 22: Substance use facts.* The CBHSQ Report. https://www.ncbi.nlm.nih.gov/books/NBK396154/

Lipschitz, J., Miller, C. J., Hogan, T. P., Burdick, K. E., Lippin-Foster, R., Simon, S. R., & Burgess, J. (2019). Adoption of mobile apps for depression and anxiety: cross-sectional survey study on patient interest and barriers to engagement. *JMIR Mental Health, 6*(1), e11334. https://doi.org/10.2196/11334

Lovibond, S. H., & Lovibond, P. F. (1996). *Manual for the depression anxiety stress scales*. Psychology Foundation of Australia.

Lui, J. H., Marcus, D. K., & Barry, C. T. (2017). Evidence-based apps? A review of mental health mobile applications in a psychotherapy context. *Professional Psychology: Research and Practice, 48*(3), 199-210. https://doi.org/10.1037/pro0000122

Ly, K. H., Topooco, N., Cederlund, H., Wallin, A., Bergström, J., Molander, O., Carlbring, P., & Andersson, G. (2015). Smartphone-supported versus full behavioural activation for depression: a randomised controlled trial. *PloS ONE, 10*(5), e0126559. https://doi.org/10.1371/journal.pone.0126559

Maddock, L., & Maroun, W. (2018). Exploring the present state of South African education: Challenges and recommendations. *South African Journal of Higher Education, 32*(2), 192-214. https://doi.org/10.20853/32-2-1641

Maghnati, F., & Ling, K. C. (2013). Exploring the relationship between experiential value and usage attitude towards mobile apps among the smartphone users. *International Journal of Business and Management, 8*(4). https://doi.org/10.5539/ijbm.v8n4p1

Mahfouz, M. S., Aqeeli, A., Makeen, A. M., Hakami, R. M., Najmi, H. H., Mobarki, A. T., Haroobi, M. H., Almalki, S. M., Mahnashi, M. A., & Ageel, O. A. (2016). Mental health literacy among undergraduate students of a Saudi tertiary institution: A cross-sectional study. *Mental Illness, 8*(2), 35-39. https://doi.org/10.1108/mi.2016.6806

Mahlori, X. F., Byrne, D. C., & Mabude, L. A. (2018). Perceptions of gender-based violence among university staff: Interim results. *SAGE Open, 8*(3). https://doi.org/10.1177/2158244018800163

Mahmoud, J. S., Staten, R., Hall, L. A., & Lennie, T. A. (2012). The relationship among young adult college students' depression, anxiety, stress, demographics, life satisfaction, and coping styles. *Issues in Mental Health Nursing, 33*(3), 149-156. https://doi.org/10.3109/01612840.2011.632708

Makoni, M. (2017, March 10). *Addressing language barriers is key to student success.* Retrieved September 7, 2020, from https://www.universityworldnews.com/post.php?story=20170306095908750

Mani, M., Kavanagh, D. J., Hides, L., & Stoyanov, S. R. (2015). Review and evaluation of mindfulness-based iPhone apps. *JMIR Mhealth and Uhealth, 3*(3), e82. https://doi.org/10.2196/mhealth.4328

Marszalek, M. A., Faksvåg, H., Frøystadvåg, T. H., Ness, O., & Veseth, M. (2021). "A mismatch between what is happening on the inside and going on, on the outside": A qualitative study of therapists' perspectives on student mental health. *International Journal of Mental Health Systems, 15,* Article 87. https://doi.org/10.1186/s13033-021-00508-5

Martinengo, L., Stona, A. C., Griva, K., Dazzan, P., Pariante, C. M., von Wangenheim, F., & Car, J. (2021). Self-guided cognitive behavioral therapy apps for depression: systematic assessment of features, functionality, and congruence with evidence. *Journal of Medical Internet Research*, *23*(7), e27619. https://doi.org/10.2196/27619

Martinez, A., & Nguyen, S. (2020). The impact of COVID-19 on college student well-being. *American College Health Association.* https://doi.org/10919/99741

Maser, B., Danilewitz, M., Guérin, E., Findlay, L., & Frank, E. (2019). Medical student psychological distress and mental illness relative to the general population: A Canadian cross-sectional survey. *Academic Medicine, 94*(11), 1781-1791. https://doi.org/10.1097/ACM.0000000000002958

Matkin, W., Ordóñez-Mena, J. M., & Hartmann-Boyce, J. (2019). Telephonic counselling for tobacco cessation. *Cochrane Database of Systematic Reviews, 5,* Article CD002850. https://doi.org/10.1002/14651858.CD002850.pub4.

Matthews, M., & Doherty, G. (2011, May). In the mood: Engaging teenagers in psychotherapy using mobile phones. *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 2947-2956)

McCloud, T., & Bann, D. (2019). Financial stress and mental health among higher education students in the UK up to 2018: rapid review of evidence. *Journal of Epidemiology and Community Health, 73*(10), 977-984. https://doi.org/10.1136/jech2019-212154

McCloud, T., Jones, R., Lewis, G., Bell, V., & Tsakanikos, E. (2020). Effectiveness of a mobile app intervention for anxiety and depression symptoms in university students: Randomized controlled trial. *JMIR mHealth and uHealth, 8*(7), e15418. https://doi.org/10.2196/15418

McCreesh-Toselli, S., Torline, J., Gouse, H., Robbins, R. N., Mellins, C. A., Remien, R. H., Rowe, J., Peton, N., Rabie, S., & Joska, J. A. (2021). Staff perceptions of preimplementation barriers and facilitators to a Mobile health antiretroviral therapy adherence counseling intervention in South Africa: qualitative study. *JMIR mHealth and uHealth, 94*, e23280. https://doi.org/10.2196/23280

McHugh, R. K., Hearon, B. A., & Otto, M. W. (2010). Cognitive behavioral therapy for substance use disorders. *Psychiatric Clinics of North America*, *33*(3), 511-525. https://doi.org/10.1016/j.psc.2010.04.012

McLafferty, M., Brown, N., McHugh, R., Ward, C., Stevenson, A., McBride, L., Brady, J., Bjourson, A. J., O'Neill, S. M., Walsh, C. P., & Murray, E. K. (2021). Depression, anxiety and suicidal behaviour among college students: Comparisons pre-COVID-19 and during the pandemic. *Psychiatry Research Communications*, *1*(2), 100012. https://doi.org/10.1016/j.psycom.2021.100012

McLeod, S. (2019). *Cognitive behavioral therapy.* Retrieved from Simply Psychology: https://www.simplypsychology.org/cognitive-therapy.html

Mehta, N., Clement, S., Marcus, E., Stona, A. C., Bezborodovs, N., Evans-Lacko, S., Palacios, J., Docherty, M., Barley, E., Rose, D., Koschorke, M., Shidhaye, R., Henderson, C., & Thornicroft, G. (2015). Evidence for effective interventions to reduce mental health-related stigma and discrimination in the medium and long term: Systematic review. *The British Journal of Psychiatry*, *207*(5), 377-384. https://doi.org/10.1192/bjp.bp.114.151944

Melia, R., Monahan, L., Duggan, J., Bogue, J., O'Sullivan, M., Young, K., Chambers, D., & Mcinerney, S. (2021). Exploring the experiences of mental health professionals engaged in the adoption of mobile health technology in Irish mental health services. *BMC Psychiatry, 21*, Article 412. https://doi.org/10.1186/s12888-021-03426-5

Mesibov, M. (2018). Designing experiences to improve mental health. https://www.smashingmagazine.com/2018/10/designing-experiences-improvingmental-health/

Miles, R., Rabin, L., Krishnan, A., Grandoit, E., & Kloskowski, K. (2020). Mental health literacy in a diverse sample of undergraduate students: Demographic, psychological, and academic correlates. *BMC Public Health*, *20*, Article 1699. https://doi.org/10.1186/s12889020-09696-0

Milicev, J., McCann, M., Simpson, S. A., Biello, S. M., & Gardani, M. (2021). Evaluating mental health and wellbeing of postgraduate researchers: prevalence and contributing factors. *Current Psychology.* https://doi.org/10.1007/s12144-021-02309-y

Ming, L. C., Untong, N., Aliudin, N. A., Osili, N., Kifli, N., Tan, C. S., Goh, Ng, P. W., AlWorafi, Y. M., Lee, K. S., & Goh, H. P. (2020). Mobile health apps on COVID-19 launched in the early days of the pandemic: Content analysis and review. *JMIR mHealth and uHealth*, *8*(9), e19796. https://doi.org/10.2196/19796

Mistler, L. A., Ben-Zeev, D., Carpenter-Song, E., Brunette, M. F., & Friedman, M. J. (2017). Mobile mindfulness intervention on an acute psychiatric unit: Feasibility and acceptability study. *JMIR Mental Health*, *4*(3), e34. https://doi.org/10.2196/mental.7717

Mitchell, C., McMillan, B., & Hagan, T. (2017). Mental health help-seeking behaviours in young adults. *British Journal of General Practice, 67*(654), 8-9. https://doi.org/10.3399/bjgp17X688453

Miyazaki Y., Bodenhorn N., Zalaquett C., & Ng K. (2008). Factorial structure of Brief COPE for international students attending U.S. colleges. *College Student* Journal, 42(3), 795-806. https://psycnet.apa.org/record/2008-10928-009

Mize, J. L. (2023). Depression, anxiety, and stress symptoms and coping strategies in the context of the sudden course modality shift in the Spring 2020 semester. *Current Psychology, 42*, 1-12. https://doi.org/10.1007/s12144-023-04566-5

Mngomezulu, S., Dhunpath, R., & Munro, N. (2017). Does financial assistance undermine academic success? Experiences of 'at risk' students in a South African university. *Journal of Education*, (68), 131-148. https://doi.org/10.17159/25209868/i68a05

Moghaddam, N. G., Dawson, D. L., & Gresswell, D. M. (2015). Cognitive-behavioural therapy. In D. L. Dawson, & N. G. Moghaddam (Eds.), *Formulation in action: Applying psychological theory to clinical practice* (pp. 36-59). De Gruyter Open.

Mohamed Arip, M. A., Kamaruzaman, D. N., Roslan, A., Ahmad, A., & Abd Rahman, M. R. (2015). Development, validity and reliability of student stress inventory (SSI). *The Social Sciences, 10*(7), 1631-1638. https://doi.org/10.36478/sscience.2015.1631.1638

Monteiro, N. M., Balogun, S. K., & Oratile, K. N. (2014). Managing stress: The influence of gender, age and emotion regulation on coping among university students in Botswana. *International Journal of Adolescence and Youth*, *19*(2), 153-173. https://doi.org/10.1080/02673843.2014.908784

Moodley, P., & Singh, R. J. (2015). Addressing student dropout rates at South African universities. *Alternation (Durban).* 17, 91-115

Moon, K., Brewer, T. D., Januchowski-Hartley, S. R., Adams, V. M., & Blackman, D. A. (2016). A guideline to improve qualitative social science publishing in ecology and conservation journals. *Ecology and Society*, *21*(3), 17-37. https://doi.org/10.5751/ES-08663-210317

Moore, S., & Gullone, E. (1996). Predicting adolescent risk behavior using a personalized cost-benefit analysis. *Journal of Youth and Adolescence*, *25*(3), 343-359. https://doi.org/10.1007/BF01537389

Moran-Ellis, J., Alexander, V. D., Cronin, A., Dickinson, M., Fielding, J., Sleney, J., & Thomas, H. (2006). Triangulation and integration: Processes, claims and implications. *Qualitative Research, 6*(1), 45-59. https://doi.org/10.1177/1468794106058870

Morgan, D. L. (1998). Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative Health Research, 8*(3), 362-376. https://doi.org/10.1177/104973239800800307

Morgan, D. L. (2013). *Integrating qualitative and quantitative methods: A pragmatic approach*. SAGE Publications.

Mortier, P., Cuijpers, P., Kiekens, G., Auerbach, R. P., Demyttenaere, K., Green, J. G., Kessler, R. C., Nock, M. K., & Bruffaerts, R. (2018). The prevalence of suicidal thoughts and behaviours among college students: A meta-analysis. *Psychological Medicine, 48*(4), 554-565. https://doi.org/10.1017/S0033291717002215

Moss, R. A., Gorczynski, P., Sims-Schouten, W., Heard-Laureote, K., & Creaton, J. (2021). Mental health and wellbeing of postgraduate researchers: Exploring the relationship between mental health literacy, help-seeking behaviour, psychological distress, and wellbeing. *Higher Education Research & Development*, 1-16. https://doi.org/10.1080/07294360.2021.1906210

Motala, S., and K. Menon. 2020. "In Search of the 'New Normal': Reflections on Teaching and Learning during Covid-19 in a South African University". Southern African Review of Education 26 (1): 80–99. https://hdl.handle.net/10520/ejc-sare-v26-n1-a6

Mozid, N. E. (2022). Association between psychological distress and coping strategies among students engaged in online learning. *PLoS ONE, 17*(7), e0270877. https://doi.org/10.1371/journal.pone.0270877

Mpungose, C. B. (2020). Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic. *Humanities and Social Sciences Communications, 7*(1), 1-9. https://doi.org/10.1057/s41599-020-00603-x

Msomi, N. (2022). Mental health in SA ranked among the worst in the world. *News24.* https://www.news24.com/life/archive/mental-health-in-sa-ranked-among-the-worst-in-the-world-20220315

Murtagh, L. (2010). They give us homework! Transition to higher education: the case of initial teacher training. *Journal of Further and Higher Education, 34*(3), 405-418. https://doi.org/10.1080/0309877X.2010.484057

Mushtaq, I., & Khan, S. N. (2012). Factors affecting students' academic performance. *Global Journal of Management and Business Research, 12*(9), 17-22. https://journalofbusiness.org/index.php/GJMBR/article/view/100221.

Mutinta, G. (2022). Mental distress among university students in the Eastern Cape Province, South Africa. *BMC Psychology, 10*(1), Article 204. https://doi.org/10.1186/s40359022-00903-8

Naeem, F., Gobbi, M., Ayub, M., & Kingdon, D. (2010). Psychologists experience of cognitive behaviour therapy in a developing country: a qualitative study from Pakistan. *International Journal of Mental Health Systems, 4*, 2. https://doi.org/10.1186/1752-4458-4-2

Nash, S., Sixbey, M., An, S., & Puig, A. (2017). University students' perceived need for mental health services: A study of variables related to not seeking help. *Psychological Services, 14*(4), 502-512. https://doi.org/10.1037/ser0000172

Nduna, M., Jewkes, R. K., Dunkle, K. L., Jama Shai, N. P., & Colman, I. (2013). Prevalence and factors associated with depressive symptoms among young women and men in the Eastern Cape Province, South Africa. *Journal of Child & Adolescent Mental Health, 25*(1), 43-54. https://doi.org/10.2989/17280583.2012.731410

Nduna, M., Jewkes, R. K., Dunkle, K. L., Shai, N. P., & Colman, I. (2010). Associations between depressive symptoms, sexual behaviour and relationship characteristics: a prospective cohort study of young women and men in the Eastern Cape, South Africa. *Journal of the International AIDS Society, 13*(1), 1-8. https://doi.org/10.1186/1758-2652-13-44

Neary, M., & Schueller, S. M. (2018). State of the field of mental health apps. *Cognitive and Behavioral Practice, 25*(4), 531-537. https://doi.org/10.1016/j.cbpra.2018.01.002

Newman, M. G., Szkodny, L. E., Llera, S. J., & Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for drug and alcohol abuse and smoking addiction: Is human contact necessary for therapeutic efficacy? *Clinical Psychology Review, 31*(1), 89-103. https://doi.org/10.1016/j.cpr.2010.09.008

Njoku, I. (2022, November). *What is mental illness?* Retrieved from American Psychiatric Association: https://psychiatry.org/patients-families/what-is-mental-illness

Noble, H., & Heale, R. (2019). Triangulation in research, with examples. *Evidence-Based Nursing, 22*(3), 67-68. https://doi.org/10.1136/ebnurs-2019-103145

O'Cathain, A., Murphy, E., & Nicholl, J. (2010). Three techniques for integrating data in mixed methods studies. *The BMJ, 341*. https://doi.org/10.1136/bmj.c4587

O'Dea, B., King, C., Subotic-Kerry, M., O'Moore, K., & Christensen, H. (2017). School counselors' perspectives of a web-based stepped care mental health service for schools: Cross-sectional online survey. *JMIR Mental Health, 4*(4), e55. https://doi.org/10.2196/mental.8369

Okajima I, Komada Y, Inoue Y. (2011). A meta-analysis on the treatment effectiveness of cognitive behavioral therapy for primary insomnia. *Sleep and Biological Rhythms, 9,* 24-34. https://doi.org/10.1111/j.1479-8425.2010.00481.x

O'Keeffe, P. (2013). A sense of belonging: Improving student retention. *College Student Journal, 47*(4), 605-613. https://eric.ed.gov/?id=EJ1029294

Olatunji, B. O., Kauffman, B. Y., Meltzer, S., Davis, M. L., Smits, J. A., & Powers, M. B. (2014). Cognitive-behavioral therapy for hypochondriasis/health anxiety: A meta-analysis of treatment outcome and moderators. *Behaviour research and therapy, 58,* 65-74. https://doi.org/10.1016/j.brat.2014.05.002

Olmos-Vega, F. M., Stalmeijer, R. E., Varpio, L., & Kahlke, R. (2022). A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical Teacher,* 1-11. https://doi.org/10.1080/0142159X.2022.2057287

Oryan, Z., Avinir, A., Levy, S., Kodesh, E., & Elkana, O. (2021). Risk and protective factors for psychological distress during COVID-19 in Israel. *Current Psychology*,*42*(3), 2448-2459. https://doi.org/10.1007/s12144-021-02031-9

Padesky, C. A. (1994). Schema change processes in cognitive therapy. *Clinical Psychology &*

Psychotherapy, 1(5), 267-278. https://doi.org/10.1002/cpp.5640010502

Palai, P. K., & Kumar, P. (2016). Relationship among stress, adjustment and homesickness in university students. *International Journal for Innovative Research in Multidisciplinary Field, 2*(6), 101-106. http://www.ijirmf.com/wp-content/uploads/2016/11/201606026.pdf

Palos-Sanchez, P., Saura, J. R., Velicia-Martin, F., & Cepeda-Carrion, G. (2021). A business model adoption based on tourism innovation: Applying a gratification theory to mobile applications. *European Research on Management and Business Economics, 27*(2),100149. https://doi.org/10.1016/j.iedeen.2021.100149

Paruk, S., & Karim, E. (2016). Update on adolescent mental health. *South African Medical Journal, 106*(6), 548-550. https://doi.org/10.7196/SAMJ.2016.v106i6.10943

Pather, S., Norodien-Fataar, N., Cupido, X., & Mkonto, N. (2017). First year students' experience of access and engagement at a University of Technology. *Journal of Education*(69), 161-184. https://journals.ukzn.ac.za/index.php/joe/article/view/433

Pearson. (2021). *Down in the dumps – meaning, origin and usage.* https://english-grammar-lessons.com/down-in-the-dumps-meaning/

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: Mental health problems and treatment considerations. *Academic Psychiatry, 39*(5), 503-511. https://doi.org/10.1007/s40596-014-0205-9

Peltzer, K., Pengpid, S., & Skaal, L. (2012). Prevalence of psychological distress and associated factors in urban hospital outpatients in South Africa. *South African Journal of Psychiatry, 18*(1), a304. https://doi.org/10.4102/sajpsychiatry.v18i1.304

Peng, W., Kanthawala, S., Yuan, S., & Hussain, S. A. (2016). A qualitative study of user perceptions of mobile health apps. BMC Public Health, 16, Article 1158. https://doi.org/10.1186/s12889-016-3808-0

Pillay, A. L., Ahmed, R., & Bawa, U. (2013). Clinical psychology training in South Africa: A call to action. South African *Journal of Psychology*, *43*(1), 46-58. https://doi.org/10.1177/0081246312474411

Pitt, A., Oprescu, F., Tapia, G., & Gray, M. (2017). An exploratory study of students' weekly stress levels and sources of stress during the semester. *Active Learning in Higher Education, 19*(1), 61-75. https://doi.org/10.1177/1469787417731194

Posselt, J. R., & Lipson, S. K. (2016). Competition, anxiety, and depression in the college classroom: Variations by student identity and field of study. *Journal of College Student Development, 57*(8), 973-989. https://doi.org/10.1353/csd.2016.0094.

Qwerty Digital. (2017). *The digital landscape in South Africa 2017: A data driven look at South Africa's relationship with digital.* https://qwertydigital.co.za/wp-content/uploads/2017/08/Digital-Statistics-inSouthAfrica-2017-Report.pdf.

Raeesi, A., Khajouei, R., & Ahmadian, L. (2022). Evaluating and rating HIV/AIDS mobile apps using the feature-based application rating method and mobile app rating scale. *BMC Medical Informatics and Decision Making, 22,* Article 281. https://doi.org/10.1186/s12911-022-02029-8

Rahardjo, W., Juneman, J., & Setiani, Y. (2013). Computer anxiety, academic stress, and academic procrastination on college students. *Journal of Education and Learning, 7*(3), 147-152. https://doi.org/10.11591/edulearn.v7i3.179

Ramón-Arbués, E., Gea-Caballero, V., Granada-López, J. M., Juárez-Vela, R., PellicerGarcía, B., & Antón-Solanas, I. (2020). The prevalence of depression, anxiety and stress and their associated factors in college students. *International Journal of Environmental Research and Public Health, 17*(19), 7001. https://doi.org/10.3390/ijerph17197001

Raosoft. (2004). *Sample size calculator.* Retrieved June 20, 2020, from http://www.raosoft.com/samplesize.html

Rathakrishnan, B., Bikar Singh, S. S., & Yahaya, A. (2022). Perceived social support, coping strategies and psychological distress among university students during the COVID-19 pandemic: An exploration study for social sustainability in Sabah, Malaysia. *Sustainability, 14*(6), 3250. https://doi.org/10.3390/su14063250

Reavley, N. J., McCann, T. V., & Jorm, A. F. (2012). Mental health literacy in higher education students. *Early Intervention in Psychiatry*, *6*(1), 45-52. https://doi.org/10.1111/j.1751-7893.2011.00314.x

Rehr, T. I., & Nguyen, D. J. (2022). Approach/avoidance coping among community college students and applications for student affairs professionals. *Journal of Student Affairs Research and Practice, 59*(3), 237-251. https://doi.org/10.1080/19496591.2021.1914641.

Reid, S. C., Kauer, S. D., Khor, A. S., Hearps, S. J., Sanci, L. A., Kennedy, A. D., & Patton, G. C. (2012). Using a mobile phone application in youth mental health: An evaluation study. *Australian Family Physician*, *41*(9), 711-714. https://www.researchgate.net/publication/230827352_Using_a_mobile_phone_application_in_youth_mental_health_An_evaluation_study/link/09e4150ee00f2f371d000000/download

Rice, S. M., Purcell, R., & McGorry, P. D. (2018). Adolescent and young adult male mental health: transforming system failures into proactive models of engagement. *Journal of Adolescent Health, 62*(3), S9-S17. https://doi.org/10.1016/j.jadohealth.2017.07.024

Richardson, T., Elliott, P., Roberts, R., & Jansen, M. (2017). A longitudinal study of financial difficulties and mental health in a national sample of British undergraduate students. *Community Mental Health Journal, 53*(3), 344-352. https://doi.org/10.1007/s10597-016-0052-0

Riffai, M. M. M. A., Grant, K., & Edgar, D. (2012). Big TAM in Oman: Exploring the promise of on-line banking, its adoption by customers and the challenges of banking in Oman. *International Journal of Information Management, 32*(3), 239-250. https://doi.org/10.1016/j.ijinfomgt.2011.11.007

Robertson, M. A. (2015). "Real men", "Proper ladies" and mixing in-between: A qualitative study of social cohesion and discrimination in terms of race and gender within residences at Stellenbosch University. [Doctoral dissertation]. Stellenbosch University. https://scholar.sun.ac.za/server/api/core/bitstreams/743973ea-b522-4be5-8074-67cdc1b146d3/content

Rosenberger, N. (2007). Rethinking emerging adulthood in Japan: Perspectives from long-term single women. *Child Development Perspectives, 1*(2), 92-95. https://doi.org/10.1111/j.1750-8606.2007.00021.x

Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American psychologist*, *41*(7), 813-819. https://doi.org/10.1037/0003-066X.41.7.813

Rousseau, K. L., Thompson, S., Pileggi, L. A., Henry, M., & Thomas, K. G. (2021). Trends in the prevalence and severity of depressive symptoms among undergraduate students at a South African University, 2016-2019. *South African Journal of Psychology*, *51*(1), 67-80. https://doi.org/10.1177/0081246320977759

Roy, A., Nayak, P. P., Shenoy, P. R., & Somayaji, K. (2022). Availability and content analysis of smartphone applications on conservative dentistry and endodontics using Mobile Application Rating Scale (MARS). *Current Oral Health Reports, 9,* 215-225. https://doi.org/10.1007/s40496-022-00325-w

Roystonn, K., Teh, W. L., Samari, E., Cetty, L., Devi, F., Shahwan, S., Chandwani, N., & Subramaniam, M. (2021). Analysis and interpretation of metaphors: Exploring young adults' subjective experiences with depression. *Qualitative Health Research, 31*(8), 1437-1447. https://doi.org/10.1177/10497323211004104.

Ruswa, A., & Gore, O. (2022). Student poverty in South African universities: Promoting the wellbeing and success of students. *Perspectives in Education, 40*(4), 4-18. https://doi.org/10.38140/pie.v40i4.6379

SADAG. (2022). *Depression.* [Brochures]. https://www.sadag.org/index.php?option=com_content&view=article&id=1877&Itemid=142

Sagar-Ouriaghli, I., Brown, J. S. L., Tailor, V., & Godfrey, E. (2020). Engaging male students with mental health support: A qualitative focus group study. *BMC Public Health*, *20*, Article 1159. https://doi.org/10.1186/s12889-020-09269-1

Sahu, P. K., Nayak, B. S., Rodrigues, V., & Umakanthan, S. (2020). Prevalence of psychological distress among undergraduate medical students: A cross-sectional study. *International Journal of Applied and Basic Medical Research*, *10*(4), 270-275. https://doi.org/10.4103/ijabmr.IJABMR_100_19

Salam, A., Mahadevan, R., Abdul Rahman, A., Abdullah, N., Abd Harith, A. A., & Shan, C. P. (2015). Stress among first and third year medical students at University Kebangsaan Malaysia. *Pakistan Journal of Medical Sciences, 31*(1), 169-173. https://doi.org/10.12669/pjms.311.6473

Salk, R. H., Hyde, J. S., & Abramson, L. Y. (2017). Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. *Psychological Bulletin*, *143*(8), 783-822. https://doi.org/10.1037/bul0000102

Saneka, N. E., & de Witt, M. (2019). Barriers and bridges between mother tongue and English as a second language in young children. *South African Journal of Childhood Education, 9*(1), 1-8. https://doi.org/10.4102/sajce.v9i1.516

Sanyaolu, O. O. (2017). *Access barriers to Campus Health Services among University of Venda students.* [Doctoral dissertation]. University of Venda. https://univendspace.univen.ac.za/bitstream/handle/11602/697/Dissertation-Olumide,o.%20s.-.pdf?sequence=1&isAllowed=y

Saraswathi, S. (2017). Smartphone usage among students. *International Education & Research Journal, 3*(6), 195-197.

Saplavska, J., & Jerkunkova, A. (2018, May). Academic procrastination and anxiety among students. In *19th scientific Conference. Latvia: Engineering for plural development* (pp. 23-25).

Sawhney, G., Jennings, K. S., Britt, T. W., & Sliter, M. T. (2018). Occupational stress and mental health symptoms: Examining the moderating effect of work recovery strategies in firefighters. *Journal of Occupational Health Psychology, 23*(3), 443-456. https://doi.org/10.1037/ocp0000091

Schiller, J. H., Stansfield, R. B., Belmonte, D. C., Purkiss, J. A., Reddy, R. M., House, J. B., & Santen, S. A. (2018). Medical students' use of different coping strategies and relationship with academic performance in preclinical and clinical years. *Teaching and Learning in Medicine, 30*(1), 15-21. https://doi.org/10.1080/10401334.2017.1347046

Schmeelk, S., Davis, A., Li, Q., Shippey, C., Utah, M., Myers, A., Turchioe, M. R., & Creber, R. M. (2022). Monitoring symptoms of COVID-19: A review of mobile applications. *JMIR mHealth and uHealth, 10,* Article 6. https://doi.org/10.2196/36065

Schmits, E., Dekeyser, S., Klein, O., Luminet, O., Yzerbyt, V., & Glowacz, F. (2021). Psychological distress among students in higher education: one year after the beginning of the COVID-19 pandemic. *International Journal of Environmental Research and Public Health, 18*(14), 7445. https://doi.org/10.3390/ijerph18147445

Schnall, R., Rojas, M., Bakken, S., Brown, W., Carballo-Dieguez, A., Carry, M., Gelaude, D, Mosley, J. P., & Travers, J. (2016). A user-centered model for designing consumer mobile health (mHealth) applications (apps). *Journal of Biomedical Informatics, 60,* 243-251. https://doi.org/10.1016/j.jbi.2016.02.002

Scotti, J. F. (2014). *School-based DBT skills groups for adolescent eating disorders and body image concerns: A pilot study.* [Doctoral dissertation]. University of Montana. https://scholarworks.umt.edu/etd/4408

Seboka, B. T., Hailegebreal, S., Negash, M., Mamo, T. T., Ewune, H. A., Gilano, G., Yehualashet, D. E., Gizachew, G; Demeke, A. D., Worku, A., Endashaw, H., Kassawe, C., Amede, E. S., Kassa, R., & Tesfa, G. A. (2022). Predictors of mental health literacy and information seeking behavior toward mental health among university students in resource-limited settings. *International Journal of General Medicine, 15*, 8159-8172. https://doi.org/10.2147/IJGM.S377791

Selye, H. (1974). Stress without distress. In G. Serban (Ed.), *Psychopathology of human adaptation* (pp. 137-146). Springer US.

Sezgin, E., Özkan-Yildirim, S., & Yildirim, S. (2018). Understanding the perception towards using mHealth applications in practice: Physicians' perspective. *Information Development, 34*(2), 182-200. https://doi.org/10.1177/0266666916684180

Shabani, M. B. (2012). Levels and sources of language anxiety and fear of negative evaluation among Iranian EFL learners. *Theory & Practice in Language Studies, 2*(11). 2378-2383. https://doi.org10.4304/tpls.2.11.2378-2383

Shah, M., Hasan, S., Malik, S., & Sreeramareddy, C. T. (2010). Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school. *BMC Medical Education, 10,* Article 2. https://doi.org/10.1186/1472-6920-10-2

Shambare, R., & Rugimbana, R. (2012). Financial literacy among the educated: An exploratory study of selected university students in South Africa. *Thunderbird International Business Review, 54*(4), 581-590. https://doi.org/10.1002/tie.21485

Sharp, J., & Theiler, S. (2018). A review of psychological distress among university students: Pervasiveness, implications and potential points of intervention. *International Journal for the Advancement of Counselling, 40*(3), 193-212. https://doi.org/10.1007/s10447-018-9321-7

Sharry, J., Davidson, R., McLoughlin, O., & Doherty, G. (2013). A service-based evaluation of a therapist-supported online cognitive behavioral therapy program for depression. *Journal of Medical Internet Research, 15*(6), e121. https://doi.org/10.2196/jmir.2248

Shen, X., & Tian, X. (2012). Academic culture and campus culture of universities. *Higher Education Studies, 2*(2), 61-65. https://doi.org/10.5539/hes.v2n2p61

Shirazi, M., Khan, M. A., & Khan, R. A. (2011). Coping strategies: A cross-cultural study. *Romanian Journal of Psychology, Psychotherapy and Neuroscience, 1*(2), 284302.

Skidmore, C. R., Kaufman, E. A., & Crowell, S. E. (2016). Substance use among college students. *Child and Adolescent Psychiatric Clinics of North America, 25*(4), 735-753. https://doi.org/10.1016/j.chc.2016.06.004

Sledzieski, N., Gallicano, T. D., Shaikh, S., & Levens, S. (2023). Optimizing recruitment for qualitative research: a comparison of social media, emails, and offline methods. *International Journal of Qualitative Methods, 22*, 1-10. https://doi.org/10.1177/16094069231162539

Sogari, G., Velez-Argumedo, C., Gómez, M. I., & Mora, C. (2018). College students and eating habits: A study using an ecological model for healthy behavior. *Nutrients, 10*(12), 1823. https://doi.org/10.3390/nu10121823

Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., Salazar de Pablo, G., Shin, J. I., Kirkbride, J. B., Jones, P., Kim, J. H., Kim, J. Y., Carvalho, A. F., Seeman, M. V., Correll, C. U & Fusar-Poli, P. (2022). Age at onset of mental disorders worldwide: Large-scale meta-analysis of 192 epidemiological studies. *Molecular Psychiatry*, *27*(1), 281-295. https://doi.org/10.1038/s41380-021-01161-7

Sori, L. M., Sema, F. D., & Tekle, M. T. (2022). Internalized stigma and associated factors among people with mental illness at University of Gondar Comprehensive Specialized Hospital, Northwest, Ethiopia, 2021. *International Journal of Mental Health Systems, 16*, Article 58. https://doi.org/10.1186/s13033-022-00567-2

Sorsdahl, K. R., Flisher, A. J., Wilson, Z., & Stein, D. J. (2010). Explanatory models of mental disorders and treatment practices among traditional healers in Mpumalanga, South Africa. *African Journal of Psychiatry, 13*(4), 284-290. https://doi.org/10.4314/ajpsy.v13i4.61878

Sosu, E. M., & Pheunpha, P. (2019). Trajectory of university dropout: Investigating the cumulative effect of academic vulnerability and proximity to family support. *Frontiers in Education, 4*, 6. https://doi.org/10.3389/feduc.2019.00006

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist, 45*(4), 249-257. https://doi.org/10.1080/00050067.2010.482109

Statista. (2022). *Percentage of mental health clinicians who stated select issues were the top concerns of their college student patients during the 2021-2022 academic school year*. https://www.statista.com/statistics/827374/clinician-chosen-top-mental-health concerns-for-college-students/

Statstics South Africa. (2019). *Education series volume V: Higher education and skills in South Africa, 2017.* Retrieved from Statistics South Africa: http://www.statssa.gov.za/?p=12049

Stawarz, K., Preist, C., Tallon, D., Wiles, N., & Coyle, D. (2018). User experience of cognitive behavioral therapy apps for depression: an analysis of app functionality and user reviews. *Journal of Medical Internet Research, 20*(6), e10120. https://doi.org/10.2196/10120

Stebleton, M. J., Soria, K. M., & Huesman, R. L. (2014). First-generation students' sense of belonging, mental health, and use of counseling services at public research universities. *Journal of College Counselling, 17*(1), 6-20. https://doi.org/10.1002/j.21611882.2014.00044.x.

Steinhardt, M., & Dolbier, C. (2008). Evaluation of a resilience intervention to enhance coping strategies and protective factors and decrease symptomatology. *Journal of American College Health*, *56*(4), 445-453. https://doi.org/10.3200/JACH.56.44.445-454

Sternthal, M. J., Slopen, N., & Williams, D. R. (2011). Racial disparities in health: How much does stress really matter? *Du Bois Review*, *8*(1), 95-113. https://doi.org/10.1017/S1742058X11000087

Stiawa, M., Müller-Stierlin, A., Staiger, T., Kilian, R., Becker, T., Gündel, H., Beschoner, P., Grinschgl, A., Frasch, K., Schmauß, M., Panzirsch, M., Mayer, L., Sittenberger, E.,, & Krumm, S. (2020). Mental health professionals view about the impact of male gender for the treatment of men with depression-a qualitative study. *BMC Psychiatry*, *20*(1), Article 276. https://doi.org/10.1186/s12888-020-02686-x

Stoyanov, S. R., Hides, L., Kavanagh, D. J., Zelenko, O., Tjondronegoro, D., & Madhavan, M. (2015). Mobile app rating scale: a new tool for assessing the quality of health mobile apps. *JMIR mHealth and uHealth, 3*(1), e27. https://doi.org/10.2196/mhealth.3422

Sutton, J., & Austin, Z. (2015). Qualitative research: Data collection, analysis, and management. *The Canadian Journal of Hospital Pharmacy, 68*(3), 226-231. https://doi.org/10.4212/cjhp.v68i3.1456

Tan, J., & Andriessen, K. (2021). The experiences of grief and personal growth in university students: A qualitative study. *International Journal of Environmental Research and Public Health, 18*(4), 1899. https://doi.org/10.3390/ijerph18041899.

Tanton, J., Dodd, L. J., Woodfield, L., & Mabhala, M. (2015). Eating behaviours of British university students: A cluster analysis on a neglected issue. *Advances in Preventive Medicine*, Article 639239. https://doi.org/10.1155/2015/639239.

Tashakkori, A., & Teddlie, C. (Eds.). (2010). *SAGE Handbook of mixed methods in social & behavioral research.* SAGE Publications.

Tasnim, T. (2021). *A comparative study of urban and rural university student's mental health status due to online education during Covid 19 pandemic.* [Bachelor's thesis] Brac University. https://dspace.bracu.ac.bd/xmlui/bitstream/handle/10361/15530/17146008_PHR.pdf?sequence=1

Technopedia. (2018). *Mobile application platform.* https://www.techopedia.com/definition/30688/mobile-application-platform

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE Publications.

Teresi, J. A., Yu, X., Stewart, A. L., & Hays, R. D. (2022). Guidelines for designing and evaluating feasibility pilot studies. *Medical Care, 60*(1), 95-103. https://doi.org/10.1097/MLR.0000000000001664

Terhorst, Y., Philippi, P., Sander, L. B., Schultchen, D., Paganini, S., Bardus, M., ... & Messner, E. M. (2020). Validation of the mobile application rating scale (MARS). *PloS ONE, 15*(11), e0241480.

Tesfai, A. H. (2016). *Alcohol and substance abuse among students at University of KwaZulu-Natal, South Africa: the protective role of psychological capital and health promoting lifestyle.* [Doctoral dissertation]. University of KwaZulu-Natal. https://researchspace.ukzn.ac.za/handle/10413/13202

Tesfaye Kelemu, R., Bayray Kahsay, A., & Ahmed, K. (2020). Prevalence of mental distress and associated factors among Samara university students, Northeast Ethiopia. *Depression research and treatment*, 1-7. https://doi.org/10.1155/2020/7836296

Tolin, D. F. (2010). Is cognitive–behavioral therapy more effective than other therapies?: A meta-analytic review. *Clinical Psychology Review, 30*(6), 710-720. https://doi.org/10.1016/j.cpr.2010.05.003

Torous, J., Nicholas, J., Larsen, M. E., Firth, J., & Christensen, H. (2018). Clinical review of user engagement with mental health smartphone apps: Evidence, theory and improvements. *BMJ Mental Health, 21*(3), 116-119. https://doi.org/10.1136/eb2018102891.

Torres, R., & Gerhart, N. (2019). Mobile proximity usage behaviors based on user characteristics. *Journal of Computer Information Systems, 59*(2), 161-170. https://doi.org/10.1080/08874417.2017.1320954.

Trifoni, A., & Shahini, M. (2011). How does exam anxiety affect the performance of university students? *Mediterranean Journal of Social Sciences, 2*(2), 93-100.

Trombitas, K. (2012). *Financial stress: An everyday reality for college students.* [White paper]. Inceptia. https://www.inceptia.org/PDF/Inceptia_FinancialStress_whitepaper.pdf.

UNICEF. (2017). *Annual results report 2017 HIV and AIDS.* https://www.unicef.org/media/47741/file/Annual_Results_Report_2017_HIV_And_AIDS.pdf.

UNICEF. (2021, October 5). *65 per cent of young people with mental health related issues did not seek help*. [Press release]. https://www.unicef.org/southafrica/pressreleases/65cent-young-people-mental-health-related-issues-did-not-seek-help-unicef

University of Johannesburg (2023). *Psychological services and career development.* https://findyourway.uj.mobi/your-student-journey/my-personal-journey/psycad/

Universities of South Africa (USAf). (2022). *Towards improving the mental health of students at South African universities.* https://www.usaf.ac.za/towards-improving-the-mentalhealth-of-students-at-south-african-universities/

University of the Witwatersrand. (2023a). *What is counselling/therapy?* https://www.wits.ac.za/ccdu/personal-counselling-/what-is-counselling/

University of the Witwatersrand. (2023b). *Counselling and Careers Development Unit*. https://www.wits.ac.za/ccdu/personal-counselling-/mental-health-resources/student-crisis-app/

Uys, W., Mia, A., Jansen, G. J., Van der Schyff, H., Josias, M. A., Khusu, M., ... & Samsodien, Y. (2012, May). Smartphone application usage amongst students at a South African University. In *IST-Africa 2012 Conference Proceedings* (pp. 1-11). Cape Town, South Africa: IIMC International Information Management Corporation.

van Ballegooijen, W., Cuijpers, P., van Straten, A., Karyotaki, E., Andersson, G., Smit, J. H., & Riper, H. (2014). Adherence to Internet-based and face-to-face cognitive behavioural therapy for depression: A meta-analysis. *PLoS ONE, 9*(7), e100674. https://doi.org/10.1371/journal.pone.0100674

Van Belle, S., Van Belle, J.-P., & Weimann, E. A. (2017). *A South African mHealth app for depression management and treatment: A survey and requirements analysis*. ISSN 2467-8988. Cape Town: African Conference on Information Systems & Technology (ACIST).

Vanderbilt University. (2004). *REDCap*. Retrieved from REDCap: https://www.projectredcap.org/

Varga, M. A. (2016). A quantitative study of graduate student grief experiences. *Illness, Crisis & Loss, 24*(3), 170-186. https://doi.org/10.1177/1054137315589700

Varghese, F. P., & VandenBos, G. R. (2019). Clinical apps and public service settings: Innovations, diverse applications, and limits. *Psychological Services, 16*(2), 183-187. https://doi.org/10.1037/ser0000353

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences, 39*(2), 273-315. https://doi.org/10.1111/j.15405915.2008.00192.x

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 169-332. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425-478. https://doi.org/10.2307/30036540

Visser, M., & Law-van Wyk, E. (2021). University students' mental health and emotional wellbeing during the COVID-19 pandemic and ensuing lockdown. *South African Journal of Psychology, 51*(2), 229-243. https://doi.org/10.1177/00812463211012219

Voth Schrag, R. J., & Edmond, T. E. (2018). Intimate partner violence, trauma, and mental health need among female community college students. *Journal of American College Health, 66*(7), 702-711. https://doi.org/10.1080/07448481.2018.1456443

Wadman, R., Webster, L., Mawn, L., & Stain, H. J. (2019). Adult attachment, psychological distress and help-seeking in university students: Findings from a cross-sectional online survey in England. *Mental Health and Prevention, 13*, 7-13. https://doi.org/10.1016/j.mhp.2018.11.003

Wagner, B., Horn, A. B., & Maercker, A. (2014). Internet-based versus face-to-face cognitive-behavioral intervention for depression: A randomized controlled noninferiority trial. *Journal of Affective Disorders, 152-154*, 113-121. https://doi.org/10.1016/j.jad.2013.06.032

Wangeri, T., Kimani, E., & Mutweleli, S. M. (2012). Transitional challenges facing university first year students in Kenyan public universities: A case of Kenyatta University. *Interdisciplinary Review of Economics and Management, 1*(2), 41-50.

Wentzel, J., van der Vaart, R., Bohlmeijer, E. T., & van Gemert-Pijnen, J. E. (2016). Mixing online and face-to-face therapy: How to benefit from blended care in mental health care. *JMIR Mental Health, 3*(1), e9. https://doi.org/10.2196/mental.4534

Wenze, S. J., Armey, M. F., & Miller, I. W. (2014). Feasibility and acceptability of a mobile intervention to improve treatment adherence in bipolar disorder: A pilot study. *Behavior modification, 38*(4), 497-515. https://doi.org/10.1177/0145445513518421

Westerhof, G. J., & Keyes, C. L. (2010). Mental illness and mental health: The two continua model across the lifespan. *Journal of Adult Development, 17*, 110-119. https://doi.org/10.1007/s10804-009-9082-y

Wheaton, B., & Montazer, S. (2010). Stressors, stress, and distress. In T. L. Scheid (Ed.), *A handbook for the study of mental health: Social contexts, theories, and systems* (2nd ed., pp. 171-199). Cambridge University Press.

Whitlock, J. (2021). *Assess your stress, where are you on the stress continuum?* https://accelerate.uofuhealth.utah.edu/resilience/assess-your-stress-where-are-you-on-the-stress-continuum

Wightman, P., Patrick, M., Schoeni, R. F., & Schulenberg, J. E. (2013). *Historical trends in parental financial support of young adults.* Ann Arbor, MI: Population Studies Center. https://paa2013.populationassociation.org/papers/130273

Wilks, C. R., Ang, S. Y., Wang, X., Arunagiri, V., & Ward-Ciesielski, E. F. (2019). Exploring preference to avoid or seek help in person and online among college students with suicidal ideation. *Journal of Social and Clinical Psychology, 38*(10), 811-835. https://doi.org/10.1521/jscp.2019.38.10.811

Wilks, S. E. (2008). Resilience amid academic stress: The moderating impact of social support among social work students. *Advances in Social Work, 9*(2), 106-125. https://doi.org/10.18060/51

Wilson, C., Janes, G., & Williams, J. (2022). Identity, positionality and reflexivity: relevance and application to research paramedics. *British Paramedic Journal, 7*(2), 43-49. https://doi.org/10.29045/14784726.2022.09.7.2.43

Wilson, V. (2014). Research methods: Triangulation. *Evidence Based Library and Information Practice, 9*(1), 74-75. https://doi.org/10.18438/B8WW3X.

Wong, K. P., Bonn, G., Tam, C. L., & Wong, C. P. (2018). Preferences for online and/or face-to-face counseling among university students in Malaysia. *Frontiers in Psychology, 9*(64), 1-5. https://doi.org/10.3389/fpsyg.2018.00064

World Health Organization. (2014). *Health and well-being*. https://www.who.int/data/gho/data/majorthemes/health-and-well-being

World Health Organization. (2017). *Depression and other common mental disorders: Global health estimates.* (No. WHO/MSD/MER/2017.2).. https://www.who.int/publications/i/item/depression-global-health-estimates

World Health Organization. (2018). mHealth. Use of appropriate digital technologies for public health. https://apps.who.int/gb/ebwha/pdf_files/WHA71/A71_20-en.pdf

World Health Organization. (2022). *Mental Health.* https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

World Health Organization. (2023). Mental health of adolescents. https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health

World Health Organization. (2023). Stress. https://www.who.int/news-room/questions-and-answers/item/stress

Worsley, J., Pennington, A., & Corcoran, R. (2020). *What interventions improve college and university students' mental health and wellbeing? A review of review-level evidence.* London: What Works Centre for Wellbeing. https://whatworkswellbeing.org/wpcontent/uploads/2020/03/Student-mental-healthfull-review.pdf

Wozney, L., Huguet, A., Bennett, K., Radomski, A. D., Hartling, L., Dyson, M., McGrath, P.J., & Newton, A. S. (2017). How do eHealth programs for adolescents with depression work? A realist review of persuasive system design components in internet-based psychological therapies. *Journal of Medical Internet Research, 19*(8), e266. https://doi.org/10.2196/jmir.7573

Wright, M., Reitegger, F., Cela, H., Papst, A., & Gasteiger-Klicpera, B. (2023). Interventions with Digital Tools for Mental Health Promotion among 11–18 Year Olds: a systematic review and Meta-analysis. *Journal of youth and adolescence*, *52*(4), 754-779.

Yadav, S., & Srivastava, S. K. (2020). Correlational study of academic stress and suicidal ideation among students. *Indian Journal of Public Health Research and Development, 11*(10), 56-61. https://doi.org/10.37506/ijphrd.v11i10.11108

Yamaguchi, S., Wu, S.-I., Biswas, M., Yate, M., Aoki, Y., Barley, E. A., & Thornicroft, G. (2013). Effects of short-term interventions to reduce mental health-related stigma in university or college students: A systematic review. *The Journal of Nervous and Mental Disease, 2016*(6), 490-503. https://doi.org/10.1097/NMD.0b013e31829480d

Yang, L., Zhao, Y., Wang, Y., Liu, L., Zhang, X., Li, B., & Cui, R. (2015). The effects of psychological stress on depression. *Current Neuropharmacology, 13*(4), 494-504. https://doi.org/10.2174/1570159X1304150831150507

Yilmaz, S. K., & Bohara, A. K. (2021). mHealth: Potentials and risks for addressing mental health and well-being issues among Nepali adolescents. *Frontiers in Public Health, 9*, 1-18. https://doi.org/10.3389/fpubh.2021.563515

Zita, C. T. (2018). *Mental health literacy of young people in South Africa: A study of University of KwaZulu-Natal students.* [Master's dissertation] University of KwaZulu-Natal. https://researchspace.ukzn.ac.za/bitstream/handle/10413/16676/Zita_Constance_Thulsile_2018.pdf?sequence=1&isAllowed=y

Zou, G. Y. (2012). Sample size formulas for estimating intraclass correlation coefficients with precision and assurance. *Statistics in Medicine, 31*(29), 3972-3981. https://doi.org/10.1002/sim.5466

Zvauya, R., Oyebode, F., Day, E. J., Thomas, C. P., & Jones, L. A. (2017). A comparison of stress levels, coping styles and psychological morbidity between graduate-entry and traditional undergraduate medical students during the first 2 years at a UK medical school. *BMC Research Notes, 10*(1), Article 93. https://doi.org/10.1186/s13104-017-2395-1

APPENDICES

APPENDIX A: RECRUITMENT POSTER

Department of Psychology
School of Human & Community
Development Private Bag 3, Wits, 2050
Tel: 011 717 450 Fax 011 717 4559

PARTICIPANTS NEEDED

To take part in a study exploring sources of stressors in students and the development of a mental health app for psychological distress in students.

Selection Criteria:

Students enrolled at a South African university Aged 18-24

Data Collection Methods:

- Phase 1: Online survey, group discussions, in-depth interviews (Link to access online survey: https://redcap.link/studentmentalhealth2021)
- Phase 2: In-depth interviews
- Phase 3: Questionnaire

If you are interested in participating, please email Tondani Mudau at

tondani.mudau@gmail.com or on WhatsApp at 0659698667

YOUR PARTICIPATION IS VOLUNTARY AND VALUABLE

APPENDIX B: KESSLER PSYCHOLOGICAL DISTRESS SCALE (K10)

Please tick the answer that is correct for you:	All of the time (score 5)	Most of the time (score 4)	Some of the time (score 3)	A little of the time (score 2)	None of the time (score 1)
1. In the past 4 weeks, about how often did you feel tired for no good reason?					
2. In the past 4 weeks, about how often did you feel nervous?					
3. In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?					
4. In the past 4 weeks, about how often did you feel hopeless?					
5. In the past 4 weeks, about how often did you feel restless or fidgety?					
6. In the past 4 weeks, about how often did you feel so restless you could not sit still?					
7. In the past 4 weeks, about how often did you feel depressed?					
8. In the past 4 weeks, about how often did you feel that everything was an effort?					
9. In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?					
10. In the past 4 weeks, about how often did you feel worthless?					

APPENDIX C: STUDENT STRESS INVENTORY

Directions: This inventory measures the stresses you may have experienced during your studies and in your everyday life on campus. Remember that there are no right or wrong answers. Read each statement and click on the one that best describes your experiences.

1 = Never (N)
2 = Somewhat frequent (S)
3 = Frequent (F)
4 = Always (A)

Please click one answer in each box that best describes the way you may have felt or behaved during the past semester. If you are a first-year student, click on the question that best describes the way you may have felt or behaved during this semester.

Subscale 1: Physical

No	Item	N	SF	F	A
1	Headaches	1	2	3	4
2	Back pain	1	2	3	4
3	Sleep problems	1	2	3	4
4	Difficulty breathing	1	2	3	4
5	Excessive worry	1	2	3	4
6	Stomach pain/nausea	1	2	3	4
7	Constant tiredness/fatigue	1	2	3	4
8	Sweating/sweaty hands	1	2	3	4
9	Frequent cold/flu/fever	1	2	3	4
10	Drastic weight loss	1	2	3	4

Subscale 2: Interpersonal Relationship

No	Item	N	SF	F	A
11	I found/find it difficult to meet my parents' high expectations	1	2	3	4
12	My parents treat me as a helpless person	1	2	3	4

No	Item	N	SF	F	A
13	I feel guilty if I fail to fulfil my parent's expectations	1	2	3	4
14	My parents wish only for my success	1	2	3	4
15	I find it difficult to get along with classmates in doing academic tasks	1	2	3	4
16	My friends do not care about me	1	2	3	4
17	I feel disturbed when having problems with my boyfriend/girlfriend	1	2	3	4
18	My family is not supportive	1	2	3	4
19	My lecturers/teachers are not supportive	1	2	3	4
20	I feel frustrated by the lack of faculty management	1	2	3	4

Subscale 3: Academic

No	Item	N	SF	F	A
21	I have a financial problem because of the expenses of the university	1	2	3	4
22	I find it difficult to juggle time between study and social life	1	2	3	4
23	I feel nervous before delivering class presentations	1	2	3	4
24	I feel stressed as submission deadlines approach	1	2	3	4
25	I feel stressed to sit for examination	1	2	3	4
26	I find it difficult to juggle time between study and society involvement	1	2	3	4
27	I lose interest towards courses	1	2	3	4
28	I feel the burden of academic workload	1	2	3	4
29	I feel stressed dealing with difficult modules	1	2	3	4

No	Item	N	SF	F	A
30	I experience difficulty in handling my academic challenges	1	2	3	4

Subscale 4: Environmental

No	Item	N	SF	F	A
31	I have transportation problems	1	2	3	4
32	I feel stressed about the living conditions at res	1	2	3	4
33	I feel distracted by noise in my surrounding areas	1	2	3	4
34	Messy res living conditions distract me	1	2	3	4
35	I feel frustrated about inadequate campus facilities	1	2	3	4
36	Overcrowded places made me feel uneasy	1	2	3	4
37	Waiting in a long queues makes me feel uneasy	1	2	3	4
40	I feel scared being in an unsafe place on campus	1	2	3	4

APPENDIX D: BRIEF-COPE 28

Instructions:

The following questions ask how you have sought to cope with a hardship in your life. Read the statements and indicate how much you have been using each coping style.

		I haven't been doing this at all	A little bit	A medium amount	I've been doing this a lot
1	I've been turning to work or other activities to take my mind off things.	**1**	**2**	**3**	**4**
2	I've been concentrating my efforts on doing something about the situation I'm in.	**1**	**2**	**3**	**4**
3	I've been saying to myself "this isn't real".	**1**	**2**	**3**	**4**
4	I've been using alcohol or other drugs to make myself feel better	**1**	**2**	**3**	**4**
5	I've been getting emotional support from others.	**1**	**2**	**3**	**4**
6	I've been giving up trying to deal with it.	**1**	**2**	**3**	**4**
7	I've been taking action to try to make the situation better.	**1**	**2**	**3**	**4**
8	I've been refusing to believe that it has happened.	**1**	**2**	**3**	**4**
9	I've been saying things to let my unpleasant feelings escape.	**1**	**2**	**3**	**4**
10	I've been getting help and advice from other people.	**1**	**2**	**3**	**4**
11	I've been using alcohol or other drugs to help me get through it.	**1**	**2**	**3**	**4**
12	I've been trying to see it in a different light, to make it seem more positive.	**1**	**2**	**3**	**4**
13	I've been criticising myself.	**1**	**2**	**3**	**4**
14	I've been trying to come up with a strategy about what to do.	**1**	**2**	**3**	**4**

		I haven't been doing this at all	A little bit	A medium amount	I've been doing this a lot
15	I've been getting comfort and understanding from someone.	**1**	**2**	**3**	**4**
16	I've been giving up the attempt to cope.	**1**	**2**	**3**	**4**
17	I've been looking for something good in what is happening.	**1**	**2**	**3**	**4**
18	I've been making jokes about it.	**1**	**2**	**3**	**4**
19	I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	**1**	**2**	**3**	**4**
20	I've been accepting the reality of the fact that it has happened.	**1**	**2**	**3**	**4**
21	I've been expressing my negative feelings.	**1**	**2**	**3**	**4**
22	I've been trying to find comfort in my religion or spiritual beliefs.	**1**	**2**	**3**	**4**
23	I've been trying to get advice or help from other people about what	**1**	**2**	**3**	**4**
24	I've been learning to live with it.	**1**	**2**	**3**	**4**
25	I've been thinking hard about what steps to take.	**1**	**2**	**3**	**4**
26	I've been blaming myself for things that happened	**1**	**2**	**3**	**4**
27	I've been praying or meditating	**1**	**2**	**3**	**4**
28	I've been making fun of the situation.	**1**	**2**	**3**	**4**

APPENDIX E: PSYCHOLOGICAL DISTRESS SURVEY

Department of Psychology

School of Human & Community Development

University of the Witwatersrand

Private Bag 3, Wits, 2050

Socio-demographics Questions

DIRECTIONS: Please answer each question as accurately as possible by clicking the correct checkbox or select the correct answer using the drop-down arrow.

1. **What is your age?**
   - □ 18-20
   - □ 21-23
   - □ 24
   - □ Other

2. **Which gender do you identify with?**
   - □ Female
   - □ Male
   - □ Non-binary

3. **Are you a South African citizen?**
   - □ Yes
   - □ No

4. **At which university are you currently enrolled? Select from the options below.**
   - □ University of the Witwatersrand
   - □ Other

5. **Under which faculty does your school/degree fall?**
   - □ Humanities

□ Commerce, Law & Management

□ Engineering and Built Environment

□ Science

□ Health Sciences

6. **What is your level of study?**

□ First Year

□ Second Year

□ Third Year

□ Postgraduate

7. **Have you ever used an online health app before?**

□ Yes

□ No

8. **Have you ever been diagnosed with a mental health challenge?**

□ Yes

□ No

9. **Which geographical location are you from?**

□ Urban □ Peri-urban □ Rural Area

10. **Do you own a smart-phone? If yes, please indicate the software of the smartphone.**

□ Yes

□ Apple □ Android

□ No

11. **Do you have easy access to data?**

□ Yes

□ No

APPENDIX F: FORM A – REQUEST TO CONDUCT RESEARCH AT THE UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

This form is to be completed by registered Honours/Master by Research/ PhD students and staff at Wits wishing to conduct research by using Wits student/staff data. Please email this form with your supporting documents to Research.Deputy-Registrar@wits.ac.za

First Name	**Surname:**
Tondani	**Mudau**

Staff/Student number:

1490037	

Degree currently registered:	**School:**
PhD	**School of Human and Community Development**

Research title: Mobile based psychological interventions: An exploratory study to understand the mental health care needs of university students through developing and testing the usability of a mobile based intervention for improving mental health in students."

Has ethics clearance been obtained from the University Ethics Committee/School Ethics Committee?

YES x	**NO**

(If yes, please include a copy of the ethics clearance certificate and protocol number below)

Protocol number:

H21/01/23

***PLEASE NOTE**: If an unconditionally approved ethics clearance certificate has not been obtained, you will not be granted permission to conduct your research.*

Has your Head of Department/Supervisor granted permission for the research to be conducted?

YES X	NO

(If yes please include a copy of the letter of approval)

What is the expected duration of your research and on which date do you intend submitting the research?

3 years. March 2023

Whom is the research and/or questionnaire being conducted on?

Students	**X**
Staff	**X**

(Please tick the appropriate box)

If the research will be conducted on student data, please specify year of study /Faculty or degree data will be required for:

First Year Students	**X**
Second Year Students	**X**
Third Year Students	**X**
Final Year Students	**X**
Postgraduate Students	**X**
Faculty	**All**
Degree	**All**

Section A:

How will the research be conducted?

E-Mail (please indicate if school administrators will be assisting in circulating the emails)	**The researcher will request permission from the registrar's office to send out a questionnaire to students.**
Interviews (please attach a copy of the	

interview questions)	
Other data collection (please specify lists or statistics)	**Online Questionnaire**
Focus Groups	
Venues (If using a venue for your research, please indicate venue name and ensure arrangements have been made with the venue manager)	

Section B:

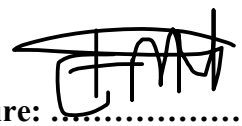
This section only needs to be completed for the circulation of questionnaires, surveys etc. by the University Registrar's Office:

Please provide the link for your questionnaire and attach a copy of the questionnaire the link will be emailed to students in order for them to complete the questionnaire)	https://redcap.link/mentalhealthappevaluation
Please provide us with a brief message that will accompany your questionnaire. This message will be sent as an e-mail to students	**Good day,** **I am Tondani Mudau, a PhD candidate at the university of the Witwatersrand.**

requesting them to complete the questionnaire.	**I would like to invite you to participate in my research study exploring the prevalence of psychological distress and the potential use of a mental health app to address psychological distress amongst university students.** **This study had three phases and this survey is part of Phase 3 which aims to test and evaluate a prototype mental health app intervention designed for university students. Before completing the survey, please download and go through the app. The APP can only be accessed on Android devices only.** **Here is the link to access the app prototype** https://my.mobiroller.com//downloadAPK/?apk=2116923381216.apk **After going through the app, please complete the survey on this link.** https://redcap.link/mentalhealthappevaluation **(This survey is also built in the app, so you can take the survey from the app).** **Your participation in the study is anonymous and voluntary. You can withdraw from the study at any point during the survey.**

	Thank you for your consideration to participate in the study. **If you have any questions, please do not hesitate to contact me or my supervisors:** **Tondani Mudau** **tondani.mudau@gmail.com** **1490037@wits.ac.za** **065 969 8667** **Dr Vinitha Jithoo** **Phone: 011 717 4523.** **Email: Vinitha.Jithoo@wits.ac.za.** **Prof Janan Dietrich** **Phone: 011 989 9700** **Email: Dietrichj@phru.co.za**

<u>NOTE</u>: If using REDCap, circulation may take place with departmental administrators within your school. You need to make the necessary arrangements with the administrator.
However, if your department/school does not use REDCap, then complete the section above.



Student signature: …… **Date: 30 November 2022**

APPENDIX G: FORM B – REQUEST TO CONDUCT RESEARCH AT THE UNIVERSITY OF THE WITWATERSRAND

This form must be completed if you wish to conduct research by using a questionnaire. The questionnaire will be e-mailed by the University to Wits staff/students. Please email form to Ashleigh.davids1@wits.ac.za

First Name	**Surname:**
TONDANI	**MUDAU**

Staff/Student number:

1490037

Degree currently registered for:	**University (If not a student at Wits):**
PhD Psychology	

Research title: Mobile based psychological interventions: An exploratory study to understand the mental health care needs of university students through developing and testing the usability of a mobile based intervention for improving mental health in students.

Has ethics clearance been obtained from Wits/ your University Ethics Committee?

YES X	**NO**

(If yes please include a copy of the ethics clearance and protocol number below)

Protocol number:

H21/01/23

Please note that if ethics clearance has not been obtained you will not be able to conduct your research until the required permission has been granted.

Please provide the link for your questionnaire and attach a copy (the link will be emailed to students in order for them to complete the questionnaire):

https://redcap.link/studentmentalhealth2021

……

……..

Please provide us with a brief message that will accompany your questionnaire. This message will be e-mailed to the students requesting them to complete the questionnaire:

Good day!

My name is Tondani Mudau, I am a PhD candidate at the University of the Witwatersrand in the Department of Psychology.

You are invited to participate in a research study exploring the development of a mental health application-based intervention. To be able to develop a relevant and meaningful mental health app for students, it is important that we interact with students to find out more about their stressors. This online survey will ask questions about your stressors, psychological distress, and coping strategies. If you decide to participate, please respond as honestly as possible.

Thank you for your time!!

Tondani

Please indicated to whom this questionnaire needs to be sent to? (Please tick the appropriate box)

Students	**X**

If the research will be conducted on students please specify the year of study and if they need to be registered for a specific degree or within a particular Faculty:

First Year Students	**X (18-24)**
Second Year Students	**X (18-24)**
Third Year Students	**X (18-24)**
Fourth Year Professional Degree Students	**X (18-24)**
Final Year Students	**X (18-24)**
Postgraduate Students	**X (18-24)**
Faculty	**ALL**
Degree	**ALL**

Student signature:  **Date: 01/03/2021**

APPENDIX H: LETTER REQUESTING PERMISSION TO CONDUCT RESEARCH

Department of Psychology
School of Human & Community Development
Private Bag 3, Wits, 2050
Tel: 011 717 4503 Fax: 011 717 4559

13 February 2021

Ms Lunsky
CCDU Building
West Campus
Gate, 9
Enoch Sontonga Avenue
Johannesburg, 200

Dear Ms Lunsky.

Re: requesting permission to conduct research with the counsellors at the CCDU

My name is Tondani Mudau, a PhD student at the University of the Witwatersrand within the School of Human and Community Development, Department of Psychology. I would like to request permission to conduct research with counsellors from the CCDU as part of my PhD study.

The research study aims to explore psychological distress amongst students and the acceptability of a mental health app among students. This project involves developing an app that is student friendly. Before developing the app, I would like to understand counsellors' perspectives on psychological distress among students and the use of mental health apps. After developing the app, I would like to understand their perceptions of the usability of the developed app. The study has three phases.

Phase 1: An online survey, focus group discussion with students and in-depth interviews with counsellors from the CCDU.

Phase 2: In-depth interviews with Students.

Phase 3: Questionnaire with students and in-depth interviews with counsellors from the CCDU.

I have applied for ethical clearance and requested permission from the registrar and they both would like to receive a permission letter from the CCDU confirming that I can recruit participants from the CCDU.

I look forward to your response.

Yours Sincerely,

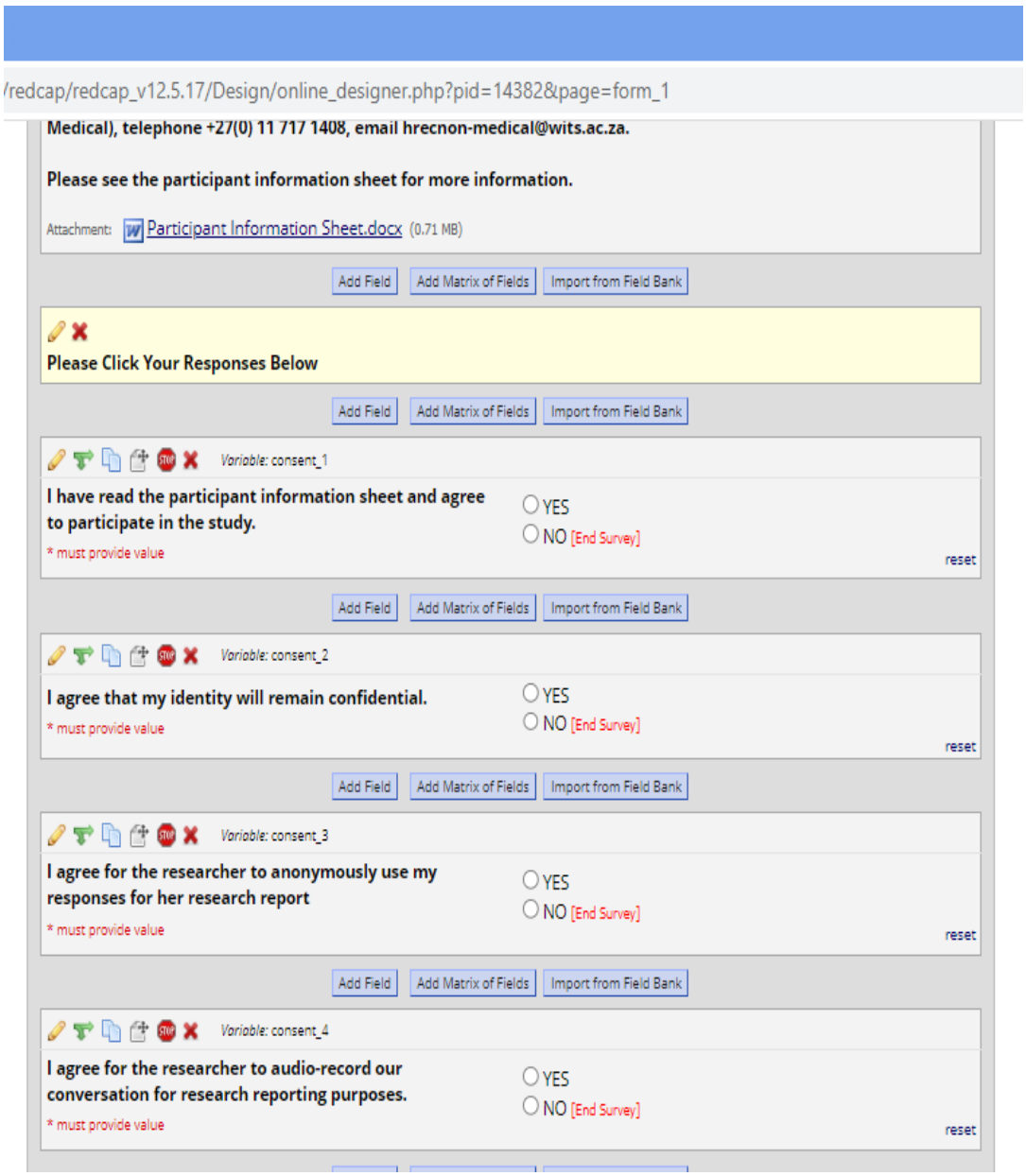
Tondani.

If you have any questions, please do not hesitate to contact me or my supervisors:

Tondani Mudau
tondani.mudau@gmail.com
1490037@wits.ac.za
065 969 8667
Dr Vinitha Jithoo
Phone: 011 717 4523.
Email: Vinitha.Jithoo@wits.ac.za.
Dr Janan Dietrich
Phone: 011 989 9700
Email: Dietrichj@phru.co.za

APPENDIX I: ONLINE CONSENT FORM FOR IDIs AND FGDs

Department of Psychology
School of Human & Community Development
Private Bag 3, Wits, 2050



APPENDIX J: QUALITATIVE INTERVIEW GUIDE FOR IN-DEPTH INTERVIEWS WITH COUNSELLORS

Psychology
School of Human & Community Development
University of the Witwatersrand
Private Bag 3, Wits, 205

Hello!

Thank you for agreeing to be part of this in-depth interview. This interview will discuss your perceptions of psychological distress and the use of a mobile application as an intervention students enrolled at the university of the Witwatersrand. The discussion will take approximately 60-90 minutes. Please feel free to ask me anything that is not clear to you regarding what we will be discussing and remember that there is no right or wrong answer.

Please tell me a little bit about yourself like your name if you want, what you do at the CCDU, how long you have been working here and what you enjoy most about your work.

Perceptions of psychological distress?

1. What kinds of psychological problems do students who use the counselling services report?
2. How do students describe their attempts to cope with these issues?

Work experience with stress and anxiety

3. What do students understand by anxiety?
4. What do students understand by stress?

5. How is anxiety and stress dealt with at CCDU?
6. What are your views on the use of mobile apps to support the mental health needs of students.
7. What behaviours should this app target?

Perception of Mental health mobile application

8. Do you think students would be willing to use a mobile app for psychological distress?
9. What would be the barriers of using a mobile app for psychological distress?

Would you be willing to use a mobile app for supporting psychological distress in students?

APPENDIX K: QUALITATIVE INTERVIEW GUIDE FOR FOCUS GROUP DISCUSSIONS

Semi-structured Schedule

Psychology
School of Human & Community Development
University of the Witwatersrand
Private Bag 3, Wits, 2050

Introduce yourself and assistant!

Thank you for agreeing to be part of this focus group discussion. The goal of this group discussion is to discuss psychological distress amongst students enrolled at South African Universities. The discussion will take approximately 60-90 minutes. Please feel free to ask me anything that is not clear to you regarding what we will be discussing.

Rules of engagement

1. **Remember your participation is voluntary**
2. **Let's respect each other's opinions (there is no right or wrong answer)**
3. **We should take turns to talk, if you want to add something, click on the raise hand icon.**
4. **Let's try and protect each other's privacy by not revealing private matter in the group or about matters discussed in the group**

Mental Health Component

Background: Students enrolled at university experience various challenges including mental health challenges. In the past few years, we have read stories of fellow students committing suicide due to unbearable life challenges. I would like to hear from you as fellow students what you understand of mental health challenges and how students in general deal with mental health challenges.

Defining Mental Health

1. What comes to mind when you hear the word psychological distress? (**Probe: What do you think are the most common mental health challenges amongst students**)
2. What are the causes of psychological distress among students?
3. Would you say students are able to differentiate between stress and anxiety?
4. What ways do you know of dealing/coping with distress?
5. What support structures within the university do you know that assist with psychological distress?
6. What do you think can be barriers to using the provided support structures at university?

Mobile App Development

University students usually consult with campus counsellors to address their mental health challenges. Counselling has been effective in the past years, but has also been criticised for lack of immediacy, poor accessibility because of waiting lists and stigma from people related to mental health help seeking. Recently, technology has found its way in addressing mental health challenges through different ways including telephonic counselling and mobile apps. For example, there are apps that help with managing mental health symptoms through meditation and journaling. I would like to hear your thoughts on the use of mental health apps amongst students to address mental health challenges.

Perceptions

1. What are your thoughts about using a mental health app to alleviate psychological distress?
2. What could be the barriers or challenges of using a mobile app for mental health?
3. What could be the benefits of using a mobile app-based intervention for psychological distress?

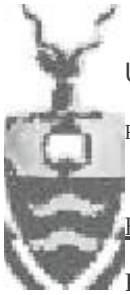
Features

4. What features would you like to see in the mobile app?
5. What support structures would you like to see on the app?
6. Which other technological platforms are there which can assist with mental health?

Outcomes

7. What should the app do to be able to benefit students?
8. If you were to use the app, how do you think the app would benefit you?
9. What result would you like to see after using the app?

APPENDIX L: ETHICAL CLEARANCE



UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

R14/49 Mudau

CLEARANCE CERTIFICATE

PROJECT TITLE

INVESTIGATOR(S) SCHOOL/DEPARTMENT DATE CONSIDERED

DECISION OF THE COMMITTEE

EXPIRY DATE

DATE 18 February 2021

PROTOCOL NUMBER: H21/01/23

Mobile based psychological interventions: An exploratory study to understand the mental health care needs of university students through developing and testing the usability of a mobile based intervention for improving mental health in students

Miss T Mudau

Human and Community Development/ 29 January 2021

Approved
Risk Level: Low

17 February 2024

CHAIRPERSON ”” ”

(Professor J Knight)

cc: Supervisor : Dr V Jithoo and Dr J Dietrich DECLARATION OF INVESTIGATORS)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10004, 1Oth Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical}

l/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and l/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to submit an amendment of the protocol to the Committee. I agree to completion of a regular progress report. For Minimal and **Low studies,** this is due annually on 31 December. For Medium and High Risk studies, this is due twice annually on 30 June and **31 December.**

_____ _____ _____ _____

Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX M: PARTICIPANT INFORMATION SHEET – STUDENTS PHASE 1

Department of Psychology
School of Human & Community Development
Private Bag 3, Wits, 2050
Tel: 011 717 4503 Fax 011 717 4559

Good day

My name is Tondani Mudau and I am a student at the University of the Witwatersrand's School of Human and Community Development in the Department of Psychology. I am working towards my PhD degree and am inviting you to participate in a research study exploring the development of a mental health application-based intervention. The study has three phases, and I will need student participants for each phase. You are not expected to participate in all phases. However, if you participate in one phase and are willing to participate in another phase you are most welcome!

In Phase1, I want to obtain insights into your understanding of mental health, and how your university experience has affected to your thoughts and emotions. I also want to find out whether you would ever consider using a mobile app to boost your sense of mental well-being while at university. Phase 1 of the study comprises an online survey and focus group discussion (FGDs).

Online Survey

The online survey will be completely confidential and anonymous. You will need to follow a link to RedCap which will lead you directly to the survey. It will take 30-45 minutes to complete the survey. No identifying questions will be asked therefore no one will be able to trace your responses to you. I will use a code for all your responses and my reporting.

FGDs

During FGDs neither confidentiality nor anonymity can be guaranteed, but participants will be encouraged not to share any information from the FGDs. To protect your information and identity, identifying information will be held securely and not disclosed to anyone else. You will be asked to use a pseudonym during the FGDs.

There will be no personal costs to you if you participate in this project, you will not receive any direct benefits from participating, there are no disadvantages or penalties if you choose to not participate. You may withdraw at any time or not answer any question if you do not want to. If you experience any distress or discomfort at any point in this process, we will stop the interview or resume another time. If you need some support or counselling services following the survey/focus group, you can contact the free counselling services shown below.

SADAG Hotline: 080 045 6789
Lifeline crisis line: 011 728 1347
Counselling Careers and Development Unit: 011 717 9140 (WITS Participants ONLY)

This study will be written up as a research report which will be available online through the university library website. The data collected from this research project will be transcribed and stored in a password protected computer and will be kept for 6 years thereafter destroyed in no publication occurs. If you are willing to participate in the next stage of the study, please share your preferred contact details with me at the end of the survey or the FGD.

Thank you for considering taking part in this research project. If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za.

If you have any questions, please do not hesitate to contact me or my supervisors:

Tondani Mudau
tondani.mudau@gmail.com
1490037@wits.ac.za
065 969 8667
Dr Vinitha Jithoo
Phone: 011 717 4523.
Email: Vinitha.Jithoo@wits.ac.za.
Dr Janan Dietrich
Phone: 011 989 9700
Email: Dietrichj@phru.co.za

APPENDIX N: ONLINE SURVEY APP EVALUATION

Department of Psychology
School of Human & Community Development
Private Bag 3, Wits, 2050

Socio-demographic Information

Which gender do you identify with?

□ **Female**

□ **Male**

□ **Non-binary**

What is your age group?

□ **18-20**

□ **21-24**

□ **Other (ends survey)**

At which university are you enrolled?

□ **University of the Witwatersrand**

□ **Other**

Under which faculty does your school/degree fall?

□ Humanities

□ Commerce, Law & Management

□ Engineering and Built Environment

□ Science

□ Health Sciences

What is your level of study?

□ First Year

□ Second Year

□ Third Year

□ Postgraduate

Did you participate in Phase 1 of the study?

□ Yes

□ No

Mobile Application Rating Scale (MARS) App Classification

The classification section is used to collect descriptive and technical information about the app.

App name: _____
Rating this version: _____
Rating all versions: _____
Developer: _____
Platform: □□ iPhone □□ iPad □□ Android
Brief description:

_____

_____

Focus: what the app targets (select all that apply) (counsellors only)

□□ Increased happiness/well-being
□□ Mindfulness/Meditation/Relaxation
□□ Reduce negative emotions
□□ Depression
□□ Anxiety/Stress
□□ Anger
□□ Relationships
□□ Physical health
□□Alcohol/substance use
□□ Goal setting
□□ Strengths-based
□□ Assessment
□□ Feedback
□□ Information/Education
□□ Monitoring/Tracking
□□ Goal setting
□□ Advice /Tips /Strategies /Skills training
□□ Relaxation
□□ Behaviour change
□□ Entertainment
□□ Gratitude

Affiliations:

□□ Unknown □□ Commercial □□ Government □□ NGO □□ University

Age group (all that apply)

□□ Children (under 12)
□□ Adolescents (13–17)
□□ Young Adults (18–24)
□□ Adults
□□ General
□□ Needs web access to function

Technical aspects of app (all that apply)

□□ Allows sharing (Facebook, Twitter, etc.)
□□ Has an app community
□□ Allows password-protection
□□ Requires login
□□ Sends reminders

APP QUALITY RATINGS

The rating scale assesses app quality according to four dimensions. All items are rated on a 5-point scale from "1 – Inadequate" to "5 – Excellent". Circle the number that most accurately represents the quality of the app component you are rating. Please use the descriptors provided for each response category.

SECTION A

Engagement – fun, interesting, customisable, interactive (e.g. sends alerts, messages, reminders, feedback, enables sharing), well-targeted to audience

1. **Entertainment: Is the app fun/entertaining to use? Does it use any strategies to increase engagement through entertainment (e.g. through gamification)?**
   1 Dull, not fun or entertaining at all
   2 Mostly boring
   3 OK, fun enough to entertain user for a brief time (< 5 minutes)
   4 Moderately fun and entertaining, would entertain user for some time (5-10 minutes total)
   5 Highly entertaining and fun, would stimulate repeat use

2. **Interest: Is the app interesting to use? Does it use any strategies to increase engagement by presenting its content in an interesting way?**
   1 Not interesting at all
   2 Mostly uninteresting
   3 OK, neither interesting nor uninteresting; would engage user for a brief time (< 5 minutes)
   4 Moderately interesting; would engage user for some time (5-10 minutes total)
   5 Very interesting, would engage user in repeat use

3. **Customisation: Does it provide/retain all necessary settings/preferences for apps features (e.g. sound, content, notifications, etc.)?**
   1 Does not allow any customisation or requires setting to be input every time
   2 Allows insufficient customisation limiting functions
   3 Allows basic customisation to function adequately
   4 Allows numerous options for customisation
   5 Allows complete tailoring to the individual's characteristics/preferences, retains all settings

4. **Interactivity: Does it allow user input, provide feedback, contain prompts (reminders, sharing options, notifications, etc.)? Note: these functions need to be customisable and**

not overwhelming in order to be perfect.

1 No interactive features and/or no response to user interaction
2 Insufficient interactivity, or feedback, or user input options, limiting functions
3 Basic interactive features to function adequately
4 Offers a variety of interactive features/feedback/user input options
5 Very high level of responsiveness through interactive features/feedback/user input options

5. **Target group: Is the app content (visual information, language, design) appropriate for your target audience?**
   1 Completely inappropriate/unclear/confusing
   2 Mostly inappropriate/unclear/confusing
   3 Acceptable but not targeted. May be inappropriate/unclear/confusing
   4 Well-targeted, with negligible issues
   5 Perfectly targeted, no issues found

A. Engagement mean score = _____

SECTION B

Functionality – app functioning, easy to learn, navigation, flow logic, and gestural design of app

6. **Performance: How accurately/fast do the app features (functions) and components (buttons/menus) work?**
   1 App is broken; no/insufficient/inaccurate response (e.g. crashes/bugs/broken features, etc.)
   2 Some functions work, but lagging or contains major technical problems
   3 App works overall. Some technical problems need fixing/Slow at times
   4 Mostly functional with minor/negligible problems
   5 Perfect/timely response; no technical bugs found/contains a 'loading time left' indicator

7. **Ease of use: How easy is it to learn how to use the app; how clear are the menu labels/icons and instructions?**
   1 No/limited instructions; menu labels/icons are confusing; complicated
   2 Useable after a lot of time/effort
   3 Useable after some time/effort
   4 Easy to learn how to use the app (or has clear instructions) 5 Able to use app immediately; intuitive; simple

8. **Navigation: Is moving between screens logical/accurate/appropriate/ uninterrupted; are all necessary screen links present?**
   1 Different sections within the app seem logically disconnected and random/confusing/navigation is difficult
   2 Usable after a lot of time/effort
   3 Usable after some time/effort
   4 Easy to use or missing a negligible link
   5 Perfectly logical, easy, clear and intuitive screen flow throughout, or offers shortcuts

9. **Gestural design: Are interactions (taps/swipes/pinches/scrolls) consistent and intuitive across all components/screens?**
   1 Completely inconsistent/confusing
   2 Often inconsistent/confusing

3 OK with some inconsistencies/confusing elements
4 Mostly consistent/intuitive with negligible problems
5 Perfectly consistent and intuitive

B. Functionality mean score = _____

SECTION C

Aesthetics – graphic design, overall visual appeal, colour scheme, and stylistic consistency

10. Layout: Is arrangement and size of buttons/icons/menus/content on the screen appropriate or Zoom-able if needed?

1 Very bad design, cluttered, some options impossible to select/locate/see/read device display not optimised
2 Bad design, random, unclear, some options difficult to select/locate/see/read
3 Satisfactory, few problems with selecting/locating/seeing/reading items or with minor screen size problems
4 Mostly clear, able to select/locate/see/read items
5 Professional, simple, clear, orderly, logically organised, device display optimised. Every design component has a purpose

11. Graphics: How high is the quality/resolution of graphics used for buttons/icons/menus/content?

1 Graphics appear amateur, very poor visual design - disproportionate, completely stylistically inconsistent
2 Low quality/low resolution graphics; low quality visual design – disproportionate, stylistically inconsistent
3 Moderate quality graphics and visual design (generally consistent in style)
4 High quality/resolution graphics and visual design – mostly proportionate, stylistically consistent
5 Very high quality/resolution graphics and visual design - proportionate, stylistically consistent throughout

12. Visual appeal: How good does the app look?

1 No visual appeal, unpleasant to look at, poorly designed, clashing/mismatched colours
2 Little visual appeal – poorly designed, bad use of colour, visually boring
3 Some visual appeal – average, neither pleasant, nor unpleasant
4 High level of visual appeal – seamless graphics – consistent and professionally designed
5 As above + very attractive, memorable, stands out; use of colour enhances app features/menus

C. Aesthetics mean score = _____

SECTION D

Information – Contains high quality information (e.g. text, feedback, measures, references) from a credible source. Select N/A if the app component is irrelevant.

13. Accuracy of app description (in App Store): Does app contain what is described?

1 Misleading. App does not contain the described components/functions. Or has no description
2 Inaccurate. App contains very few of the described components/functions

3 OK. App contains some of the described components/functions
4 Accurate. App contains most of the described components/functions
5 Highly accurate description of the app components/functions

14. Goals: Does app have specific, measurable and achievable goals (specified in App Store description or within the app itself)?

N/A Description does not list goals, or app goals are irrelevant to research goal (e.g. using a game for educational purposes)
1 App has no chance of achieving its stated goals
2 Description lists some goals, but app has very little chance of achieving them
3 OK. App has clear goals, which may be achievable.
4 App has clearly specified goals, which are measurable and achievable
5 App has specific and measurable goals, which are highly likely to be achieved

15. Quality of information: Is app content correct, well written, and relevant to the goal/topic of the app?

N/A There is no information within the app
1 Irrelevant/inappropriate/incoherent/incorrect
2 Poor. Barely relevant/appropriate/coherent/may be incorrect
3 Moderately relevant/appropriate/coherent/and appears correct
4 Relevant/appropriate/coherent/correct
5 Highly relevant, appropriate, coherent, and correct

16. Quantity of information: Is the extent coverage within the scope of the app; and comprehensive but concise?

N/A There is no information within the app
1 Minimal or overwhelming
2 Insufficient or possibly overwhelming
3 OK but not comprehensive or concise
4 Offers a broad range of information, has some gaps or unnecessary detail; or has no links to more information and resources
5 Comprehensive and concise; contains links to more information and resources

17. Visual information: Is visual explanation of concepts – through charts/graphs/images/videos, etc. – clear, logical, correct?

N/A There is no visual information within the app (e.g. it only contains audio, or text)
1 Completely unclear/confusing/wrong or necessary but missing
2 Mostly unclear/confusing/wrong
3 OK but often unclear/confusing/wrong
4 Mostly clear/logical/correct with negligible issues
5 Perfectly clear/logical/correct
6

D. Information mean score = _____ *

* Exclude questions rated as "N/A" from the mean score calculation.

APP SUBJECTIVE QUALITY

SECTION E

---

20. Would you recommend this app to people who might benefit from it?

1 **Not at all** I would not recommend this app to anyone
2 There are very few people I would recommend this app to
3 **Maybe** There are several people whom I would recommend it to
4 There are many people I would recommend this app to
5 **Definitely** I would recommend this app to everyone

21. How many times do you think you would use this app in the next 12 months if it was relevant to you?

1 **None**

2 1–2

3 3–10

4 10–50

5 >50

22. Would you pay for this app?

1 No
3 Maybe
5 Yes

23. What is your overall star rating of the app?

1 □□ One of the worst apps I've used
2 □□□□
3 □□□□□□ Average
4 □□□□□□□□
5 □□□□□□□□□□ One of the best apps I've used

SCORING App quality scores for
SECTION
A: Engagement Mean Score = _____
B: Functionality Mean Score = _____
C: Aesthetics Mean Score = _____
D: Information Mean Score = _____
App quality mean Score = _____
App subjective quality Score = _____

APP-SPECIFIC

These added items can be adjusted and used to assess the perceived impact of the app on the user's knowledge, attitudes, intentions to change as well as the likelihood of actual change in the target health behaviour.

SECTION F

---

1. **Awareness: This app is likely to increase awareness of the importance of addressing [insert target health behaviour]**
   Strongly disagree Strongly Agree
   1 2 3 4 5

2. **Knowledge: This app is likely to increase knowledge/understanding of [insert target health behaviour]**
   Strongly disagree Strongly Agree
   1 2 3 4 5

3. **Attitudes: This app is likely to change attitudes toward improving [insert target health behaviour]**
   Strongly disagree Strongly Agree
   1 2 3 4 5

4. **Intention to change: This app is likely to increase intentions/motivation to address [insert target health behaviour]**
   Strongly disagree Strongly Agree
   1 2 3 4 5

5. **Help seeking: Use of this app is likely to encourage further help seeking for [insert target health behaviour] (if it's required)**
   Strongly disagree Strongly Agree
   1 2 3 4 5

6. **Behaviour change: Use of this app is likely increase/decrease [insert target health behaviour]**
   Strongly disagree Strongly Agree
   1 2 3 4 5