https://dspace.org/

# Advancing sexual health education strategies for young African adults in the digital age

**Olamijuwon, Emmanuel**

**2021**
https://hdl.handle.net/10539/33704

Downloaded from a DSpace repository. https://dspace.org/

# Advancing Sexual Health Education Strategies for Young African Adults in the Digital Age

*By: Emmanuel Ọlámíjùwọ́n*

Schools of Public Health and Social Sciences,
Faculties of Health Sciences and Humanities,
University of the Witwatersrand, Johannesburg,
South Africa

Emmanuel O.

**Ọlámíjùwọ́n**

*1117172*

*emmanuel@olamijuwon.com*

# Advancing Sexual health Education Strategies for Young African Adults in the Digital Age

**SUPERVISOR:** Prof. Clifford Odimegwu

A DISSERTATION SUBMITTED FOR THE AWARD OF

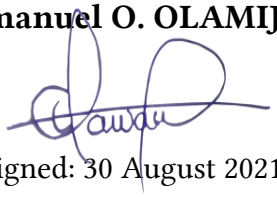
PHD IN DEMOGRAPHY AND POPULATION STUDIES

**August 2021**

# Declaration

I, Emmanuel Olawale OLAMIJUWON, declare that this thesis is my original work. It is being submitted for Doctor of Philosophy in Demography and Population Studies of the University of the Witwatersrand, Johannesburg. To the best of my knowledge, it has not been submitted before in part or in full for any degree or examination at this or any other university.

**Emmanuel O. OLAMIJUWON**



Signed: 30 August 2021

# Acknowledgements

I am grateful to God and everyone whose undying support, guidance, criticisms, and encouragements have contributed directly and indirectly to this study's success. Specifically, I am grateful to:

- My supervisor, Professor Clifford Odimegwu, for his guidance and undying support during my study in South Africa. His expertise, insight, and understanding have contributed substantially to an excellent postgraduate experience.

- My mother, Mrs Eunice Olamijuwon, for her support and motivation throughout my studies and for being an exemplary role model.

- My siblings (Jeremiah and Priscilla Olamijuwon) and fiancée (Rachael Afolami) for their love, continuous support, and motivation. Without their affection and motivation, I would not have had the energy, enthusiasm, and motivation to write this dissertation. They also served as my primary non-technical experts while piloting the survey instrument.

- Friends who read sections of my dissertation and provided me with their detailed feedback for improvement.

- The Demography and Population Studies community at the WITS University and my colleagues in the Department of Statistics and Demography at the University of Eswatini, whose unending support and input in this research have contributed significantly to this study's success.

- Research assistants, particularly Phinda Masella, Kwanele Msibi, and Phephile Masilela, helped annotate public wall posts from the Facebook group.

- Young African adults who voluntarily participated in the online survey and provided valuable responses with which I hope to inform policy and practice.

# Dedication

To God and to me.

# Abstract

**Background:** The use of social media is gaining intense interest in sexual health promotion. Simultaneously, the sexual health interventions that resonate with their audiences' needs are known to have the most significant benefits such as the widespread dissemination of health information and the possibility of understanding the complexity of sexual health issues from young people's perspectives. However, young people superficially interact with sexual health information on social media. It is also unclear how young African adults use social media to access sexual health education and the strategies that motivate the effective use of social media in sexual health promotion. Therefore, the question is: How can engagement with sexuality information on social media be increased and why should social media be an attractive platform and complement for sexual health communication?

**Theoretical Framework and Objectives:** This study evaluated social media use among young African adults for sexuality education in three distinct studies. Specifically, ***study 1*** examined how young African adults interacted with peer-generated sexual health information on social media and identified the unique properties of sexual health information associated with higher levels of engagement. ***Study 2*** adapted the unified theory of acceptance and use of technology to identify individual-level factors that predict the intention to use and interact with sexual health information on social media. Lastly, ***study 3*** explored the importance of sexual health promotion on platforms like social media that emphasise multidirectional communication. The study also examined how multidirectional engagement on social media can uncover dominant cultural attitudes and stereotypes, especially on sexuality, marriage, and family.

**Methodology:** This was a mixed-methods study that combined data from an online survey with textual data from a peer-led Facebook group that facilitates discussions about sexuality and sexual health. ***Study 1*** involved a content analysis of 3,533 public wall posts shared on the Facebook group between June 1, 2018, and May 31, 2019. The wall posts were coded into distinct categories comprising the topic classification of the messages, message strategy, and tone of communication. Multiple negative binomial

regression models were fitted on the data to delineate statistically significant differences in the levels of engagement with sexuality messages on the group based on multiple categories. To achieve the objective of ***study 2***, a structural equation model with multiple endogenous and exogenous variables was fitted on a sample of 1,190 young adults based in Kenya, Nigeria, and South Africa. Lastly, a thematic analysis was applied to a subsample of 100 public wall posts and 3,860 comments related to sexuality and marriage to uncover lay attitudes related to virginity and marital bliss in ***study 3***. Specifically, I sought to find out how virginity loss is interpreted and perceived to be beneficial for a marriage.

**Key Findings from Objective 1:** The findings from ***study 1*** showed the members of the group were more likely to superficially interact with messages on the group through likes/reactions ($\tilde{x}$ = 54) than leave a comment ($\tilde{x}$ = 10) or share posts ($\tilde{x}$ = 10) on the group. Rich message features like multimedia use, storytelling, and neutral tone predicted high engagement levels with sexuality information. Therefore, messages that included multimedia content like photos or videos were more likely to be liked [IRR: 1.76; CI: 1.61-1.92], commented on [IRR: 1.16; CI: 1.02-1.32], and propagated [IRR: 1.91; CI: 1.68 - 2.16] compared to text-only messages. The use of fear appeals was also significantly associated with few likes [IRR: 0.75; CI: 0.66-0.86] and comments [IRR: 0.81; CI: 0.67 - 0.99] compared to neutral messages.

**Key Findings from Objective 2:** Young people are amenable to sexuality education on social media. More importantly, young people in the study reported that Facebook (42%) was the most preferred platform for sexuality education while other social media platforms like Twitter (3%) and Instagram (1%) were least preferred. Consistent with the unified theory of acceptance and use of technology, individual characteristics such as performance expectancy [$\beta = 0.18$; $p < 0.05$], effort expectancy [$\beta = 0.25$; $p < 0.05$], social influence [$\beta = 0.09$; $p < 0.05$], facilitating conditions [$\beta = 0.33$; $p < 0.05$], and attitude [$\beta = 0.10$; $p < 0.05$] were significantly associated with the intention to access sexuality information on social media. These attributes, except attitudes to social media use, were also significantly associated with the intention to interact with sexual health information on social media.

**Key Findings from Objective 3:** The findings highlighted the complex multidimensional interpretation of virginity loss by members of the Facebook group. Specifically, young adults in the group interpreted virginity loss as a gift that should be given to someone "special" – particularly a marriage partner. In so doing, participants in the group identified multiple perceived cultural benefits accrued to saving sex for marriage. This included being respected and adorned by the husband and his family, greater partner trust, and marital sexual satisfaction. These interpretations of virginity loss also emphasised the sexual double standard in which a woman is expected to be a virgin while a man is not only expected to be a non-virgin but to also take girls' virginity.

**Conclusion:** Overall, this study's findings highlight the multiple features associated with interaction with sexuality information on social media. These include rich message features (like multimedia use), good messaging strategy (like storytelling), and a neutral tone of communicating sexual health messages. Individual attributes were also significantly associated with greater engagement with sexuality information on social media. Lastly, the analysis emphasises that sexual health promotion on platforms like Facebook can uncover cultural stereotypes that could put women, girls, and families at risk of poor health and wellbeing.

**Implications of Findings:** Overall, this study highlights several important considerations for advancing the sexual and reproductive health of young African adults. More importantly, it highlights that social media can be a viable complement for existing sexual health information dissemination strategies. The analysis also illuminates how social media could be effectively used in sexual health promotion. The study also highlights the importance of sexual health engagement on platforms like social media that emphasise bidirectional communication as this has the potential to uncover cultural stereotypes that are likely to affect population health, including those without internet access. Such an opportunity may help gain insights into deep-rooted stereotypical attitudes and misconceptions.

**Frontiers for Further Research:** Although this study contributes to the literature in meaningful ways, further studies are needed to identify how young people

use sexual health information they obtain from social media platforms. Furthermore, since this is the first study to identify individual attributes associated with greater engagement with sexual health information, more studies are needed to replicate this analysis in different contexts and with additional individual attributes to strengthen the evidence base and improve the predictive power of the models.

**Keywords:** Sexual Health Promotion; Social Media; Young African Adults; Sexuality Education; Facebook

# Table of Contents

**Declaration** ..... i
**Acknowledgements** ..... ii
**Dedication** ..... iii
**Abstract** ..... iv
Table of Contents ..... viii
List of Tables ..... xii
List of Figures ..... xiv
Chapter One ..... 1
Introduction ..... 1
1.1 Background of the Study ..... 1
1.2 Problem Statement ..... 6
1.3 Purpose Statement ..... 7
1.4 Scope of the Research ..... 8
1.5 Research Questions ..... 9
1.6 Aims and Objectives ..... 9
1.7 Significance of the Study ..... 10
1.8 Structure of the Thesis ..... 12
1.9 Reproducibility ..... 14
1.10 Dissemination of Findings ..... 14
Chapter Two ..... 17
Literature Review ..... 17
2.1 Use of Social Media for Sexuality Education ..... 17
2.2 Predictors of Engagement with Health Information on Social Media ..... 19
2.3 Uncovering Insights into Sexuality, Gender Roles, and Culture based on Interactions on Social Media ..... 21
*2.3.1 Sexuality education and culture* ..... 21
*2.3.2 Love, virginity, and marriage* ..... 23
2.4 Deficiencies in the Existing Literature ..... 26
2.5 Theoretical Framework ..... 29
2.6 Conceptual Framework ..... 31

2.7 Research Hypothesis – Individual-level Predictors of Social Media Engagement ..... 32
*2.7.1 Attitude to technology use and interaction with sexual health information* ..... 33
*2.7.2 Performance expectancy and interaction with sexual health information on social media.* 33
*2.7.3 Effort expectancy and interaction with sexual health information on social media* ..... 35
*2.7.4 Social influence and interaction with sexual health information on social media* ..... 36
*2.7.5 Facilitating conditions and interaction with sexual health information on social media* .... 38
2.8 Research Hypothesis - Message Properties that Predict Social Media Use ..... 39
2.9 Contribution ..... 39
Chapter Three ..... 42
Methodology ..... 42
3.1 Study 1: Strategies that Increase Interaction and Propagation of Sexual Health Information on Social Media ..... 42
*3.1.1 Group identification* ..... 42
*3.1.2 Data* ..... 44
*3.1.3 Metadata* ..... 47
*3.1.4 Coding* ..... 47
*3.1.5 Analysis* ..... 52
3.2 Study 2: Individual-Level Predictors of Engagement and Propagation of Sexual Health Information on Social Media ..... 53
*3.2.1 Research design and setting* ..... 53
*3.2.2 Survey design* ..... 54
*3.2.3 Campaign settings, reach, and costs* ..... 57
*3.2.4 Survey instrument* ..... 60
*3.2.5 Performance of advertising campaign and recruitment results* ..... 62
*3.2.6 Constructs measurement* ..... 66
*3.2.7 Formal analysis* ..... 68
3.3 Study 3: Uncovering Insights into Sexuality Issues based on Social Media Interactions ..... 70
*3.3.1 Data collection* ..... 70
*3.3.2 Data analysis* ..... 71
3.4 Ethical Approval ..... 73
Chapter Four ..... 75
Patterns of Young Adults Interaction with Peer-Led Sexual Health Information on Social Media ..... 75
4.1 Characterising Peer-Communicated Sexual Health Information by Topic, Strategy, Type, and Tone of Communication ..... 75

4.2 Interaction and Propagation of Sexual and Reproductive Health Messages ..... 78
4.3 Summary of the Chapter ..... 81
Chapter Five ..... 83
Acceptability and Use of Social Media for Sexual Health Communication among Young African Adults ..... 83
5.1 Participants Demographics ..... 83
5.2 Acceptability of Social Media for Sexual Health Communication ..... 84
5.3 Measurement Model Result ..... 89
5.4 Structural Model Result ..... 90
5.5 Supplemental Analyses ..... 91
5.6 Summary of the Chapter ..... 97
Chapter Six ..... 99
Uncovering Dominant Sexual Misconceptions based on Sexual Health Interactions among Young African Adults on Facebook ..... 99
6.1 Introduction ..... 99
6.2 Describing Virginity Loss ..... 100
*6.2.1 What is virginity?* ..... 100
*6.2.2 Interpreting virginity loss* ..... 102
6.3 The Perceived Premiums of Premarital Sexual Abstinence ..... 104
*6.3.1 Respect, honour, love* ..... 106
*6.3.2 Partner's trust* ..... 107
*6.3.3 Sexual satisfaction* ..... 110
6.4 Perceived Gendered Benefits of Saving Sex for Marriage ..... 110
6.5 Summary of the Chapter ..... 112
Chapter Seven ..... 113
Discussion of Findings ..... 113
7.1 Message Features Associated with Engagement and Interaction with Sexuality Information on Social Media ..... 113
7.2 Individual-level Predictors of Sexual Health Information Engagement ..... 118
7.3 Uncovering Insights about Sexuality from Peer-Generated Sexual Health Information on Facebook ..... 120
7.4 Strengths and Limitations of the Study ..... 126
Chapter Eight ..... 131
Conclusion and Recommendation ..... 131

8.1 Main Summary ..... 131
8.2 Theoretical Implications ..... 132
8.3 Programme Implications ..... 133
8.4 Areas for Further Research ..... 135
References ..... 136
Appendices ..... 165
A.1 Policy Brief ..... 165
A.2 Synopsis of Selected Reviewed Literature on Sexuality Education and Technology Use ..... 172
A.3 Ethical Clearance Certificate ..... 229
A.4 Text Data from Facebook Group: Formal Consent to Retrieve ..... 230
A.5 Online Survey: Participants Information Page and Consent ..... 231
A.6 Survey Question ..... 233

# List of Tables


| | | |
|---|---|---|
| **Table 1.1:** | List of conferences/invited seminars attended for the dissemination of research findings. | 15 |
| **Table 1.2:** | Publication extracts from the dissertation | 16 |
| **Table 3.1:** | A full list of keywords | 44 |
| **Table 3.2:** | Group demographics as of May 31, 2019 | 46 |
| **Table 3.3:** | Coding scheme of peer-led sexual health information on the Facebook group | 49 – 51 |
| **Table 3.4:** | Facebook's assessment of the potential reach of advertisements for young adults in Kenya, Nigeria, South Africa. | 59 |
| **Table 3.5:** | Summary of advertisement campaigns and results | 63 |
| **Table 3.6:** | Summary of advertisement performance. | 65 |
| **Table 4.1:** | Distribution of sexuality education on the peer-led Facebook group by topics, strategy, and tone of communication. | 76 |
| **Table 4.2:** | Associations between message classification. and the indices of message interaction and propagation | 80 |
| **Table 4.3:** | Summary of Hypothesis Tested | 82 |
| **Table 5.1:** | Sociodemographic characteristics of young adults in the sample | 84 |
| **Table 5.2:** | Descriptive statistics of measurement constructs | 86 – 87 |
| **Table 5.3:** | Measurement model and correlations among constructs | 88 |
| **Table 5.4:** | Summary of model fit indices and recommended values | 90 |

**Table 5.5:** Summary of structural model results 92

**Table 5.6:** Sociodemographic characteristics of young adults in the sample 93

**Table 5.7:** Summary of fit indices and recommended values for the supplementary models. 95

**Table 5.8:** Summary of Hypothesis Tested 98

# List of Figures


**Figure 2.1:** Proposed theoretical model for explaining the behavioural intention to use and interact with sexual health information on social media 32

**Figure 3.1:** Sample screenshots of Facebook advertisement 56

**Figure 3.2:** An example of wall post and comments related to marriage and sexuality in the group. 72

**Figure 4.1:** Topic classifications by strategy and **t**one of communication 77

**Figure 4.2:** Counts of message interaction and propagation 78

**Figure 5.1:** Level of acceptance and use of social media for sexual health communication 85

**Figure 5.2:** Graphical presentation of the research model based on supplemental data 96

**Figure 6.1:** Illustrative framework for interpreting virginity loss based on interactions among young adults on a peer-led Facebook group 103

# Chapter One

# Introduction

## 1.1 Background of the Study

Traditional mass media sexual health campaigns using electronic media and advertisements at popular venues are common strategies for sexual health communication in African countries (Faust & Yaya, 2018). African countries have scaled up the dissemination of sexual health information using mass media, bulk messaging platforms, and in-school training, among many others (Agbemenu & Schlenk, 2011; Agha & Van Rossem, 2004; Fonner et al., 2014; Huaynoca et al., 2014; Samuels et al., 2013; Taylor et al., 2012; Visser, 2007). These forms of media can be costly and have limited capacity to engage with young people because of their one-directional nature (Abroms & Maibach, 2008; Keller & Brown, 2002). While the current sexual health promotion strategies, including primary care clinics, may reach a large number of young people, evidence suggests that young people are reluctant to use these channels.

As a result, it has become imperative to explore new and innovative approaches to engaging young people on sexual health issues to gain a holistic insight into the issues faced by young people. The unending calls for the diversification of approaches coupled with the increasing use of the internet and popularity and accessibility of social media platforms among young African adults, have raised optimism about the potential to complement existing platforms for sexuality education with social media for young adults

who can access the internet. The use of digital innovations such as social media offer vantage points to advance the sexual and reproductive health of young African adults, primarily because they emphasises multidirectional communication and offer individual users rapid transference of ideas and opinions through a relatively low-cost and user-friendly network (Kamel Boulos & Wheeler, 2007; Moreno & Kolb, 2012; Pfeiffer et al., 2014; Vance et al., 2009). Moreover, the ongoing calls for interventions that target multiple levels of change to promote health (Golden & Earp, 2012; Kaufman et al., 2014) and the unique properties of social media necessitates its use for sexual health communication, particularly among vulnerable groups at risk of sexually transmittable infections and unplanned pregnancies (Condran et al., 2017).

Social media platforms offer new channels for health communications that can increase the success of sexual health promotion when matched to the target audience's needs and preferences (Parker, 2009). Unlike other modes of health communication, social media is ubiquitous and can reach very large audiences, enabling broad dissemination of health information and messaging that is unfettered by geography (Adams, 2010; Ahlqvist et al., 2010; Condran et al., 2017; Kamel Boulos & Wheeler, 2007; Moorhead et al., 2013). Many social media platforms also incorporate direct messaging capabilities that allow for more private sexual health engagements that may appeal to young people's needs.

Through virtual communities created on social media, young adults generate their messages, and share their knowledge and experiences with others rather than just being passive consumers of health information or viewing static websites (Gill et al., 2013; Hanson et al., 2008; Kamel Boulos & Wheeler, 2007; Thackeray & Neiger, 2009). This may be especially salient for potentially sensitive topics like sexual health, in which it may be difficult to engage young people physically (Bull et al., 2012; Young & Jaganath, 2013). Such engagements may ultimately allow for an understanding of their perspectives or

correct the misconceptions that they may have (Alber et al., 2015). Engaging with young adults on social media can also increase the likelihood of acceptance of a sexual health intervention by the target audience (Robinson & Robertson, 2010) while also reducing the work required to generate content.

Although the reach of social networking sites could be limited by internet access, the number of people with internet access in both developed and developing countries continues to grow. A vast body of literature has documented the benefits and potentials for the use of social media as a medium to communicate health information to vulnerable populations (Bull et al., 2012; Gabarron & Wynn, 2016; Huang & Hung, 2009; Jones et al., 2012; Young & Jaganath, 2013). For example, there is evidence of its benefits for improving condom use (Bull et al., 2012; Jones et al., 2012), effectively increasing HIV test uptake among the high-risk population (Young et al., 2015) and reducing chlamydia infections in the United States (Jones et al., 2012). The findings of these many studies, together with others, have highlighted that the high number of users on the platforms enables information shared to reach thousands and even millions of users and could motivate behavioural change. Likewise, existing studies have demonstrated that young people are amenable to receiving sexual health information on social media (Pfeiffer et al., 2014; Selkie et al., 2011).

Nevertheless, health information is only effective if it reaches and engages with its target audience. Interactive health promotion campaigns that leverage social media's full potential by encouraging participation and engagement rather than providing a one-way flow of information, are reported to have greater potential to enhance behaviour change (Crutzen et al., 2011; Strecher et al., 2008). This is important because engagement metrics such as reactions (favourites), comments (replies), and shares (retweets) provide rudimentary markers of health diffusion and are used by Facebook's algorithm to

determine which social media content is shown to users and those in their network (Facebook, 2020). Specifically, the interactive functions on social media such as likes and comments offer a huge potential for health information delivery (Bennett & Glasgow, 2009; Kamel Boulos & Wheeler, 2007) and determine if social media content is viewed by other users, providing continuous dissemination and propagation of messages.

While many young adults interact with messages with their families and friends on social media, a major challenge for many sexual health interventions has been the low level of interaction among young adults (Nguyen et al., 2017), perhaps because of the topics' sensitivity or the partial level of anonymity offered by these networks (Selkie et al., 2011). Some studies have shown that online users were more likely to interact with [sexual] health messages superficially through likes but unlikely to engage in other activities that required more cognitive effort like sharing a post or leaving a comment (Andrade et al., 2018; Singh, 2011).

As a result, increasing user engagement has become a primary objective of many [sexual] health promotions on social media. Many sexual health promotions on social media have attempted to increase user engagement by using paid advertisements (Andrade et al., 2018; Nguyen et al., 2013). Since paid advertisements are not cost effective and sustainable, there is an increasing need to understand the predictors of user organic (unpaid) engagement, especially for potentially sensitive topics like sexual health information.

However, there are gaps in the literature regarding the strategies that lead to greater user engagement with sexual health promotion programmes. It is equally important to identify the most effective strategies for reaching, engaging, and retaining young adults in social media-based sexual health information, and the kind of content that promotes user

interaction or engagement. It is also vital to identify the specific factors that might persuade different individuals to engage with posts, enhancing the diffusion of health information. Nevertheless, the intention to access and interact with sexual health information on social media is an understudied area, and no consensus exists on the key factors that predict engagement and interaction with sexual health information on social media. Today, a large body of scholarship has examined social media use for other purposes like tourism and e-learning, among others (Condran et al., 2017; El Ouirdi et al., 2016; Salarzadeh Jenatabadi et al., 2017).

From the preceding, there is clearly more work to be done. More high-quality research and context-specific evaluations of user engagement are needed to understand the unique individual characteristics associated with social media use for sexual health communication (Card et al., 2018; Goedel et al., 2020). This study fills the current gap in scholarship and attempts to illuminate the factors that can increase engagement in sexual health promotion programmes for young audiences via social media.

Awareness of these factors are essential, considering that campaigns addressing sensitive subjects might be uniquely constrained by users' willingness to publicly endorse or share sexual health messages, and because engagement plays a vital role in the diffusion of sexual health information. Awareness will provide valuable insights for supporting successful online health promotion campaigns and can guide the design and development of context-specific social media content and the use of features that have a high appeal for young African adults (Andrade et al., 2018). Therefore, this study is a timely piece given the increasing number of online sexual health promotions in low- and middle-income countries.

## 1.2 Problem Statement

Young people are a major priority for sexual health interventions, especially because they are at risk of sexually transmittable infections, including HIV (Samuels et al., 2013). This population group is also at risk of unplanned pregnancies, has an unmet need for family planning, and low efficacy for condom use (Ajayi & Olamijuwon, 2019; Beguy et al., 2014; MacQuarrie, 2014; Prata et al., 2013; Torrone et al., 2018; Wado et al., 2019).

About two-thirds of new infections are reported to occur in sub-Saharan Africa, with a significant proportion among adolescents and young women (Kharsany & Karim, 2016). Also, about half of all pregnancies among young women in developing countries, including sub-Saharan Africa, are unintended, resulting in a significantly high number of unintended births and unsafe abortions (Darroch et al., 2016). On the other hand, sexuality also forms an integral aspect of health and wellbeing, especially in the context of comprehensive sexuality education and unrestricted access to health services (Ford et al., 2019; Gruskin et al., 2019).

Given the magnitude of the HIV epidemic and its burden on African families and countries, there has been extensive focus on reducing the rates of infection and unplanned pregnancies among adolescents and young adults in the region (Hindin et al., 2016). The provision of sexual health education offers one vantage point to promote healthy sexual relations among young African adults (Singh et al., 2005). The provision of sexuality education can also empower young adults to abstain from or delay sexual debut and reduce sexual activity with a high risk of infection and unintended pregnancies as well as support HIV prevention efforts (Chu et al., 2015; Jones et al., 2014; Samuels et al., 2013). Throughout Africa, there are various reports on the effectiveness of sexuality education on sexual behaviours and treatment-seeking and preventive behaviours among young adults

(Fawole et al., 1999; Kalembo et al., 2013; Mba et al., 2007; Okonofua et al., 2003; Samuels et al., 2013). The challenge, however, is diversifying the existing platforms for sexual health communication so that young African adults can access sexuality information on their most preferred and convenient platform void of stigma or discrimination. In the same manner it is also important that young people find messages on the platforms useful and actually use them.

## 1.3 Purpose Statement

The purpose of this study is to motivate the use of social media for sexuality education. In doing this, I pay close attention to how researchers and programmers can effectively increase engagement with sexual health education and why it should be an attractive complement to existing sexual health promotion strategies in African countries. The study examines three distinct objectives to enrich sexuality education efforts using innovative platforms like social media. ***Study 1*** examines the unique properties of sexuality information that lead to higher levels of engagement, interaction, and propagation of sexuality information based on young people's interactions on a peer-led Facebook group that facilitates sexual health discussions. In ***study 2***, I examine the individual-level characteristics that predict the intention to use and interact with sexuality information on social media. The unified theory of acceptance and technology use was leveraged to examine these associations based on its validity in predicting the use of new technologies, as demonstrated in previous studies. ***Study 3*** highlights the importance of engaging with young adults on sexuality issues on social media. I show that leveraging platforms that offer multidirectional means of communication like social media could uncover how deep-rooted socio-cultural beliefs may put women's health and well-being at adverse risk. I demonstrate this using a case study of the conceptualisations of sexuality, gender, and the pathways through which young people believe that premarital sexual

abstinence might be beneficial for a successful marriage. This study is significant because gender roles and social identities that emerge from social interactions particularly among young people are likely to be a reflection of social inequalities that are pervasive among adults and in the broader society (Corsaro, 1992; Klein, 2012).

## 1.4 Scope of the Research

This study aims to illuminate how young adults interact with sexual health information and the unique properties associated with such engagement. As a result, the focus of the study is on young African adults who have access to the internet and are active on social media platforms. While the level of internet penetration in African countries is a significant limitation, the level is constantly growing even in rural communities. This limited scope of the study further implies that the study's findings are conditional on young people having access to the internet and having a social media presence. In other words, the findings from the study may help delineate the features that motivate high levels of interaction and engagement with sexual health information on social media among young adults who are already on social media.

Nonetheless, in study 3, I show that interacting with young African adults on social media can also uncover deep-rooted socio-cultural stereotypes experienced by all persons (including those who are offline) that may affect population health. This way, engaging with young African adults on social media may offer a pathway to addressing misconceptions identified on social media or other platforms for sexual health communication, including schools, clinics and others.

## 1.5 Research Questions

This study answers the following specific research questions:

- How do young African adults interact with peer-generated sexual health information on social media?
- What are the unique properties of sexual health information associated with higher levels of engagement [comment, like, share] with sexuality information on a peer-led Facebook group?
- What are the underlying individual-level characteristics that predict the intention to use and interact with sexual health information on social media?
- What new insights can be derived from engaging young African adults on sexual health issues on social media?

## 1.6 Aims and Objectives

This study aims to contribute to improvements in the sexual and reproductive health knowledge and attitudes of young adults in Africa. In achieving this, the study attempts to motivate the use of social media by addressing the following specific objectives:

- Evaluate how young African adults interact with peer-generated sexual health information on social media.
- Identify the unique properties of sexual health information that are associated with higher levels of engagement [comment, like, share] with sexuality information on Facebook.
- Assess the underlying individual-level properties that predict the intention to use and interact with sexual health information on social media.

- Generate new insights from sexual health interactions among young African adults for example, how sexuality, virginity, and marriage are interpreted by young people.

## 1.7 Significance of the Study

The recent increase in the adoption and use of social media makes this study a timely and essential piece. More importantly, this analysis comes when there is a pressing need to digitise health information and augment existing sexual health education strategies with digital innovations to minimise physical contact. Therefore, the findings of this study will be of immense importance to researchers and sexual health educators to ensure the effective use of social media. The findings may also guide the design and development of useful and engaging sexual health information to increase information dissemination and ultimately help young African adults make better and informed decisions about their sexual and reproductive health. Improvements in their knowledge and practices are also expected to impact the incidence of sexually transmitted infections, including HIV – all of which are perfectly aligned with the sustainable development goals 3 and 5 target (United Nations, 2015). Precisely, the government of African countries need to ensure universal access to sexual and reproductive health information, and the use of enabling technologies could help empower young adults to advance their sexual and reproductive health and rights.

The analysis of social media posts to generate new insights has the potential to uncover sexual health stereotypes in African countries where culture plays a pivotal role in sustaining gender power inequalities within relationship dynamics and often acts as a barrier to disease prevention (Harrison & O'Sullivan, 2010). My focus on the interpretations of sexual abstinence until marriage (mainly study 3) and its perceived

benefits for marital bliss expand current understandings of how deeply rooted socio-cultural beliefs might negatively affect the health of men, women, and families. Studying the stereotypical attitudes of young people, particularly those related to sexuality or sexual abstinence, can also create a better understanding of how sexual health interventions such as sexual risk avoidance programmes could pose adverse unintended risks and reinforce existing gender norms if the cultural contexts of such interventions are not carefully taken into consideration (Adato et al., 2016; Guttman & Salmon, 2004; Lenzi et al., 2019; Stoebenau et al., 2016).

An awareness of the representations of sexual abstinence in an online environment not monitored or moderated by sexual health experts or researchers would not only disrupt current societal-driven portrayals of sexual abstinence until marriage but also help in addressing adverse cultural consequences of not marrying as a virgin and enrich sexuality education efforts targeting young people. This analysis is especially crucial in sub-Saharan African settings where culture and religion play pivotal roles in sustaining gender power inequalities within relationship dynamics and often act as barriers to disease prevention (Harrison & O'Sullivan, 2010; Moyo, 2004). More precisely, almost all Africans are religious (Joshanloo & Gebauer, 2020). The levels of religious salience are also high in sub-Saharan African countries, with over 75% in every country surveyed in the region stating that religion is essential to them (Marshall, 2018). Multiple studies have also highlighted how religion constitutes the main fabric of African societies and is intertwined with their general existence, including their socio-political and economic development (Agbiji & Swart, 2015). Religion is also a crucial component of 'Africanness' and could contribute to moral, socio-political, and economic transformation (Agbiji & Swart, 2015). For example, non-formative forms of sexuality like premarital sexual activity or homosexuality are often widely considered as not only "unAfrican" but also "not Christ-

like" or "unIslamic" (Dreier et al., 2020; Ndzovu, 2016; van Klinken & Obadare, 2018). Religion has rules about conduct that guide life within a social group, and it is often organised and practised in a community instead of being an individual or personal affair.

## 1.8 Structure of the Thesis

Chapter One provided the background to the research. It started by providing a context and rationale for the study. This was followed by the specific questions that the research attempts to answer and the significance of answering these questions.

Chapter Two presents a review of research literature, summarising current knowledge, outstanding research questions and the theoretical and methodological underpinnings of the study. Succinctly, this chapter summarises what is known about the predictors of engagement and propagation of sexual health information on social media, what is left to be known in the literature, and the contribution of this study to the broader literature.

Chapter Three presents the study's methodological approach, focusing on the data sources, sampling, and analysis plan. The section closes with a description of the processes undertaken to ensure adequate compliance with ethical standards.

Chapter Four presents the findings from the content analysis of social media wall posts on a peer-led Facebook group that facilitates discussions about sexuality and sexual health among young African adults. It outlines how young African adults interact with different sexuality information and the unique properties of sexual health information on social media that predict higher engagement levels.

Chapter Five integrates the unified theory of acceptance and use of technology to develop and validate a comprehensive model for predicting the intention to interact with

sexual health information on social media. The data are drawn from participants [from Kenya, Nigeria, and South Africa] recruited through a quasi-random survey advertised on Facebook's advertising platform. The chapter extends the theoretical model's application beyond discretionary technology use to potentially sensitive subjects like sexuality information.

Chapter Six draws on the findings from the two previous chapters to illuminate the importance of leveraging platforms that offer multidirectional information communication like social media. More importantly, the chapter synthesises posts and comments of a Facebook group to generate new insights on sexuality, culture, and marriage. Specifically, I examine the interpretations of virginity loss and how it is perceived as beneficial for a marriage. The findings highlight that engaging with young African adults on social media can uncover cultural portrayals and stereotypical attitudes.

Chapter Seven draws out the study's findings and positions them in the broader body of knowledge on social media use in health promotion. The key strengths of the study findings and the limits of the research are further discussed.

Chapter Eight highlights the key findings of the study and its implications for theory and practice. The chapter also highlights recommendations for researchers and the department of health to enhance the use of social media and features that appeal to young African adults' needs. The chapter then highlights a few areas of further research.

Lastly, the appendix section presents a policy brief that is intended to be shared widely with various departments of health. The section also includes a synopsis of the literature and other supporting materials, including ethical approval and the study questionnaire.

## 1.9 Reproducibility

All the manuscript files have been written to comply with open science's standard practice, namely data and code sharing, as well as the reproducibility of results. A de-identified data that supports this study's findings and reproducible R codes [quantitative analysis] for tables, all graphs, and model outputs are available online on the project webpage (https://osf.io/4a83k/). Furthermore, the analysis script for understanding how young adults interact with sexual health information on social media, as presented in Chapter Seven, can be accessed at https://osf.io/4a83k/. The data that supports the methodological analysis can be accessed on Mendeley (Olamijuwon, 2021). Furthermore, the analysis script for fitting the structural equation model presented in Chapter Six can be accessed at https://osf.io/kxfst/.

## 1.10 Dissemination of Findings

To enhance the utilisation of this study's findings in research and practice, some of the findings from this study have been widely disseminated at both local and international conferences and workshops. Subsequently, efforts will also be made to engage with several national departments of health to ensure the good use of social media for sexual health information dissemination. Some planned strategies for reaching national health authorities include the use of news outlets such as Conversation Africa and other relevant country-specific news agencies. Sections of the dissertation have also been submitted for consideration for publication in internationally accredited peer-reviewed journals. Table 1.1 below presents an itemised list of extracts from the dissertation that have been presented at national and international conferences, while Table 1.2 presents a list of extracts from the dissertation that have been submitted for consideration for publication.

**Table 1.1: Conferences for the dissemination of research findings**

| S/N | Title of Presentation | Conferences | Conference Date |
|---|---|---|---|
| 1 | Social media as a communication tool for improving adolescents' sexual and reproductive health. | Population Association of America (PAA) Annual Meeting, Denver, USA [Scientific Programme]. | April 2018 |
| 2 | Advancing sexual health education for young African adults in the digital age: Lessons learned from the SHYAdults network. | [Virtual] Social Informatics 2019, Doha, Qatar [Scientific Programme]. | November 2019 |
| 3 | Saving sex for marriage: Understanding the complexity between sexual abstinence and marital bliss based on social media and survey data. | [Virtual] 6th International Conference on Computational Social Science, Cambridge, MA, USA [Scientific Programme] | July 2020 |
| 4 | Saving sex for marriage: Understanding the complexity between sexual abstinence and marital bliss based on social media and survey data. | [Virtual] Big Data Meets Survey Science [BigSurv20], Utrecht, The Netherlands [Scientific Programme] | November 2020 |
| 5 | Acceptability and use of social media for accessing sexual health information among young African adults: An application of the UTAUT model. | [Cancelled] European Population Conference, Padova, Italy [Scientific Programme] | June 2020 [cancelled 4/17/20 due to COVID-19] |
| 6 | Sexuality education in the digital age. | Online invited seminar talk, Max-Planck Institute for Demographic Research [Presentation Information] | March 2021 |

**Table 1.2: Publication extracts from dissertation**

| S/N | Title of Presentation | Publication Outlet | Chapter from Dissertation |
|---|---|---|---|
| 1 | Understanding how young African adults interact with peer-led sexuality information on Facebook and uncovering strategies for successful organic engagement. | BMC Public Health<br>*[Revised and Resubmitted]* | 4 |
| 2 | Characterizing Low Effort Responding Among Young African Adults Recruited via Facebook Advertising. | PlosOne [*Published*]<br>10.1371/journal.pone.0250303 | 3 |
| 3 | Modelling the acceptance and behavioural intention to interact with sexual health information on social media: An application of the modified-UTAUT model. | Sexuality Research and Social Policy *[Published]*<br>*10.1007/s13178-021-00619-1* | 5 |
| 4 | Saving sex for marriage: A thematic analysis of social media posts to understand lay attitudes towards virginity and its perceived benefit for marital bliss. | Sexuality and Culture<br>*[Under review]* | 6 |
| 5 | Saving sex for marriage: Examining associations between couple's premarital sexual experience and women's experience of intimate partner control and abuse. | Interpersonal Violence | 6 |

# Chapter Two

# Literature Review

## 2.1 Use of Social Media for Sexuality Education

The expansion of electronic technology have presented new opportunities to provide sexual health education to young adults. This is because social media offers new channels for health communication that can increase programming success when matched to the needs and preferences of the target audience (Parker, 2009). In the United States, Atkinson and colleagues found that 59% of young adults reported seeking health information online (Atkinson et al., 2009). Lenhart and colleagues also found that 31% of teens reported obtaining health information online and that 17% of teens used the internet to look up information on sensitive health topics (Lenhart et al., 2010). These researchers have demonstrated that adolescents and young adults will seek educational information on STD prevention and cures at social media sites when these are provided.

Although online educational interventions are relatively new in the health service delivery research literature, especially in Africa, several studies from the global north provide reliable evidence for the use of the internet as a medium to communicate health information to vulnerable populations (Gilbert et al., 2005; Huang & Hung, 2009; Moskowitz et al., 2009; Roberto et al., 2007). For instance, a study of young adults in the United States of America emphasised social media's effectiveness for information dissemination and the promotion of positive behaviour changes among young adults (Jones et al., 2012). They also found that personal recommendations were more powerful

than agency-based advertising to encourage friends to participate in health-promoting behaviours (Jones et al., 2012). Their findings and those of others have highlighted that the high number of users on the platform enables information shared to reach hundreds, thousands, and even millions of users.

Social media also serves as a powerful, engaging, innovative method for reaching at-risk populations, mostly where access issues may exist. There is also evidence of its benefits for improving condom use and increasing HIV testing rates (Bull et al., 2012). Their findings reported an increase in condom use during sexual encounters as a result of social media exposure. Jones and colleagues also found that access to a social media intervention on Facebook was associated with a 23% self-reported increase in condom use and approximately 54% reduction in chlamydia infections in the United States (Jones et al., 2012).

In Africa, evidence of the benefits of social media use for improving sexual health is emerging (Pfeiffer et al., 2014). For instance, young adults in Tanzania believed that social media, especially Facebook, could be better entry points for sexual and reproductive health messages (Pfeiffer et al., 2014). However, evidence for its effectiveness is very weak throughout the region. Although a recent meta-analysis of the effect of HIV educational interventions on HIV-related knowledge, condom use, and HIV incidence in sub-Saharan Africa found that peer education-based interventions were very effective in facilitating the uptake of HIV-related knowledge, particularly on transmission routes, their findings also attested to the rarity of the use of social media platforms in reaching adolescents and young adults (Faust & Yaya, 2018).

## 2.2 Predictors of Engagement with Health Information on Social Media

An important consideration for effective sexual health education on social media is increasing user engagement, especially as more interactive social media content can increase exposure and ultimately better support behaviour change (Crutzen et al., 2011; Kite et al., 2016). Recent works looking at different social media users have found that most users tend to be passive, using social media to seek information or engage casually and keeping up with others' online activities without sharing content or leaving an opinion (Singh, 2011). As a result, a vast number of studies have examined multiple pathways to increase user engagement. Perhaps the easiest way to increase user engagement is using advertisements where available, especially on platforms like Facebook and Twitter (Andrade et al., 2018; Nguyen et al., 2013; Pedrana et al., 2013). Although combined with an advertisement, Pedrana et al. (2013) found that the webisode format of video uploads and the combination of education with entertainment was an effective driver of success in delivering health information to gay men.

However, increasing user engagement using advertisements is often expensive and not sustainable (Andrade et al., 2018; Nguyen et al., 2013; Pedrana et al., 2013). Consequently, some more recent scholarships have explored opportunities to increase organic (unpaid) user engagement. Andrade et al. (2018), in their study, recommended that preventive messaging or other health promotion content should be strategically incorporated into habitual messages to keep participants connected with friends and ensure that the messages being conveyed resonate with their needs.

In a study of top user profiles with high user engagement, Veale et al. (2015) found that regular post updates directly engaging with users through individual responses and acknowledgements and encouraging interaction and conversation by posing questions

were keys to successful engagement. The authors also found that multimedia contents had significantly higher user engagement levels (Veale et al., 2015). This finding resonates with that of a prior study (Nguyen et al., 2013) and some recent studies (Card et al., 2018; Kite et al., 2016; Rus & Cameron, 2016), all of which confirmed that the use of multimedia content was positively associated with higher user engagement. Rus and Cameron (2016) studied 10 diabetes-related Facebook pages and found that the use of imagery was the strongest predictor of user engagement, including liking and sharing a post. The authors concluded that the richness of the posts was an important predictor of user engagement and consistent with the richness theory (Daft & Lengel, 1986), suggesting that richer media content engages audiences better.

Beyond activity-based efforts to increase user engagement and content types, the content of messages and the expressions conveyed have also been associated with user engagement. Posts with positive affect elicit higher engagement, perhaps reflecting the well-documented heuristic bias towards positive messaging (Dodds et al., 2015; Rus & Cameron, 2016). In a similar study of 20 Facebook health profiles, Kite et al. (2016) found that positive sentiments were significantly associated with high user engagement. Like the form of posts, the content of posts has also been documented to be associated with user engagement. A study of gay, bisexual, and other men who have sex with men found that posts about PrEP and stigma exhibited greater engagement, while posts about dating exhibited lower engagement levels (Card et al., 2018). This finding was also substantiated by a more recent study of HIV-related messages on Twitter, highlighting that fear-related language was a strong predictor of retweet counts on Twitter (Lohmann et al., 2018). On the other hand, asking a question was negatively associated with engagement (Card et al., 2018).

Furthermore, Goedel et al. (2020) found notable differences from their analysis of combined engagement compared to specific user engagement such as liking, sharing, or commenting on a post. The authors found that posts containing photos, links, and videos received higher engagement levels than posts containing status updates only (Goedel et al., 2020). After disaggregating by specific user engagement metrics, evidence from their study suggested that posts with links and photos received fewer comments than status updates, while posts with videos received higher engagement on all metrics (Goedel et al., 2020). The authors also found that direct invitation for user engagement, such as asking users to comment or share a post, was associated with increased user engagement for comments and shares but not liking a post (Goedel et al., 2020). The findings of these studies altogether emphasise the importance of increasing engagement with sexual health information on social media and the heightened need for more studies in this area.

## 2.3 Uncovering Insights into Sexuality, Gender Roles, and Culture based on Interactions on Social Media

### *2.3.1 Sexuality education and culture*

Much sexuality education solely promotes premarital sexual abstinence until marriage as a strategy for the prevention of sexually transmittable infections, while other means of safe sex practices such as condom use and non-penetrative sex are often ignored and excluded in sexuality education as a result of religious and social norms (Chirawu et al., 2014; Mukoro, 2017; Van Dyk, 2017). Nonetheless, unprotected sexual activity is never safe, whether before, during, or outside of marriage. As a result, sexual abstinence until marriage cannot adequately protect women in settings where socio-cultural norms, as observed in many African countries, propagate unbalanced sexual relationships that disadvantage women and expose them to sexually transmitted infections, including HIV

and unplanned pregnancies (Ajuwon et al., 2002; Hageman et al., 2010; Jewkes et al., 2015; Wojcicki & Malala, 2001). More importantly, the continuous emphasis on sexual abstinence until marriage means that young people have to wait until marriage, not when they want or feel empowered to have safe, healthy, and satisfying sexual relations (Berer, 2006).

Furthermore, research on public attitudes towards premarital sexual abstinence shows that it has varied meanings across African cultures (Bhana, 2016; Cinthio, 2015; Mehrolhassani et al., 2020; Mulumeoderhwa, 2018; Palit & Allen, 2019; Rudwick & Posel, 2014). In many African countries, virginity is symbolic of pride, dignity, and respect despite being heavily disputed since emphasising virginity is likely to promote and sustain stereotypical constructs of virginity. Many cultural norms that encourage virginity motivate girls to be desired and pursued if they are virgins (Bhana, 2016). A woman's virginity is also essential to attract "a good man" (Bhana, 2016). The importance of virginity and chastity are also promoted through several national, cultural, and religious programmes – an activity that could pose severe consequences for young girls and women if untamed. Simultaneously, the value of virginity and the existing discourse around it could have additional unintended consequences for the same people they intend to protect. For example, saving oneself for marriage has been a key to negotiating bridewealth in many African countries, and non-virgins may be stigmatised in the community and by their in-laws (Bhana, 2016; Rudwick & Posel, 2014). High rates of early marriage in some countries have been attributed to early traditional norms that discourage premarital sexual activity (Nour, 2009).

Today, young women are under immense pressure to remain virgins until marriage, a situation that may be difficult, given the high levels of sexual violence and sexual coercion in African countries (Jewkes & Abrahams, 2002; Yaya & Bishwajit, 2018). More

importantly, the consistent use of hymeneal blood as an indication of virginity loss may put women at risk of adverse experiences despite ample proof that "it has no scientific validity and worthless" (WHO, 2014, p. 78). The continuous emphasis on premarital sexual abstinence in African countries necessitates the need for further studies to illuminate how underlying social norms crystalise female virginity and the pathways through which saving sex for marriage may contribute to marital bliss. Despite this reality, very few scholarships have examined the conceptualisations of virginity and how it may affect marital bliss in African countries.

### *2.3.2 Love, virginity, and marriage*

Several relevant studies have focused heavily on the interpretations of virginity and shed light on the extent to which young people conceptualise its loss. Diverse studies in sub-Saharan Africa and globally have examined the motivations for premarital sexual abstinence among young adults (Abboud et al., 2015; Amuyunzu-Nyamongo et al., 2005; Izugbara, 2007). Adolescent males in rural Nigeria reported that impositions, choice, self-control, and danger were the common motivations for abstaining from sex until marriage (Izugbara, 2007). Similarly, diverse interpretations of virginity loss have been examined in the literature. In a landmark in-depth case study of young adults in the United States, Carpenter (2001) identified three cognitive frameworks for interpreting virginity loss encompassing gift, stigma, and process. Virginity has also been constructed as a sign of the intactness of a woman's honour, and it was widely held that women's sexuality should be confined to and expressed in the context of marriage (Izugbara, 2007). While these studies offer insights into the interpretations of virginity, they do not explore the meaning of virginity or provide a clear perspective of the marital benefits of saving sex for marriage.

Today, a small body of knowledge have quantitatively examined the relationship between premarital sexual experience and subsequent marital dissolution among women, men, and couples. In the United States, Teachman (2003) observed that multiple intimate premarital sexual relationships were associated with an increased risk of marital dissolution. In contrast, premarital sexual activity or cohabitation limited to a woman's husband was not associated with an elevated risk of marital disruption (Teachman, 2003). Evidence from another study of Lithuanian couples suggested no significant relationship between premarital sexual experience and marital satisfaction among men and women (Legkauskas & Stankevičienė, 2009). However, as with the previous study, multiple premarital sexual partners were associated with a lower likelihood of marital satisfaction among men in the same sample. While these studies are both in developed countries and suggest that premarital sexual activity may be associated with marital bliss, they do not offer a clear picture of the pathways through which virginity or its loss may contribute to marital bliss.

Despite the previous studies' limitations, a few common themes emerged from the literature that provide context for the current study. Chief among these is that how virginity is conceptualised or interpreted can shape how individuals respond to its loss and the marital experiences of non-virgins. In line with the gift framework proposed by Carpenter (2001), being a non-virgin may be a problem in communities where virginity is treasured. As Carpenter (2001) noted, interpreting virginity loss as a gift is a double-edged sword that can protect against unintended pregnancy or sexually transmittable infections on the one hand but also reinforce adverse consequences for women who are unable to offer the gift to their partner. In Iran and the Democratic Republic of Congo, men who interpret female virginity as a valuable gift that should be given to one's spouse may be disappointed if the wife does not bleed at the consummation of the marriage and may

result in the humiliation of the wife for the entire duration of the marriage (Mehrolhassani et al., 2020; Mulumeoderhwa, 2018).

Furthermore, virginity loss at the consummation of a marital union could help build a more meaningful connection and strengthen intimacy, a relation that may, however, be conflicted in the absence of virginity (Palit & Allen, 2019). In a recent study, young men in the United States emphasised that virginity loss in marriage is more than penetrative sexual activity and entails more emotional engagement, including love, care, trust, and feelings of respect in the presence of virginity but shame and disrespect in the absence of virginity (Palit & Allen, 2019). There are limited accounts of sexuality and virginity in Africa. In the Republic of Congo, young adults perceive girls who marry as virgins as trustworthy individuals and that virginity serves as a basis for a successful marriage (Mulumeoderhwa, 2018). Accordingly, male partners reciprocate virginity by respecting and trusting their virgin wives (Mulumeoderhwa, 2018).

These rhetoric interpretations of saving sex for marriage are rooted in hegemonic masculinities that are further perpetuated through local and national gender and cultural norms, religious beliefs, media, peer, family, and societal expectations (Blinn-Pike et al., 2004; Carpenter, 2011; Connell & Messerschmidt, 2005). This socially idealized form of masculinity shape a sense of what is "acceptable" and "unacceptable" gendered behaviour that appears natural, ordinary, and inevitable (Connell, 1995; Connell & Messerschmidt, 2005; Hanke, 1990; Messerschmidt, 2019; Speer, 2001). It perpetuates a sexual double standard that empowers a heterosexual man's entry into manhood by being non-virgins and taking girls' virginity, whether in marriage or outside of marital union (Bhana & Anderson, 2013; Mehrolhassani et al., 2020). In addition, these interpretations of virginity loss have transactional value and provide men with an opportunity to demonstrate their

dominance over women and reaffirm their honour and masculinity while controlling women's sexuality (Abboud et al., 2015; Christianson et al., 2020).

More importantly, Bhana (2016) argues that virginity could be explored from a cultural currency lens. Men who cannot harness the social prestige of marrying a virgin may punish their partner for not being a virgin until marriage (Mulumeoderhwa, 2018). In Iran, failure to provide evidence of virginity on the wedding night has been linked to neglect in marriage and infidelity (Kaivanara, 2016). Taken together, findings from the current body of literature suggest that women who marry as non-virgin may be paying heavily for not being a virgin, especially in societies where it is highly treasured. However, due to the scant research and a lack of conceptual clarity, little is known about the variety of social benefits linked with saving sex for marriage, particularly in African countries. Nonetheless, understanding how young people conceptualize this issue is critical to alleviating the unintended adverse consequences of sexuality education that solely emphasize sexual chastity until marriage.

## 2.4 Deficiencies in the Existing Literature

Having reviewed the literature systematically, I found a gap in the current literature regarding social media use for sexuality education. While the existing studies on the message properties that predict engagement offer an exciting yet diverse perspective on increasing user engagement, they are mostly limited in their coverage, approach, and analysis. First, most of the existing scholarship on the predictors of user engagement are concentrated in developed countries, while scanty evidence abounds in developing countries, including Africa. The increasing adoption of social media platforms for sexual health education in African countries necessitates an increasing need to explore the predictors of engagement with sexual health information on social media – particularly

from the perspective of young Africans since interventions addressing sensitive subjects and those targeting young people might be uniquely constrained by contexts and user willingness.

Secondly, the extant literature on social media use has focused mostly on user engagement from the professional perspective, and there is a scarcity of research that has assessed user engagement from young people's perspective. The only known perspective of young people taken from a survey suggested that social media-based sexual health interventions are more likely to work if they are humorous to reduce STI-related stigma and increase the likelihood of peer-to-peer sharing (Pfeiffer et al., 2014). However, it is also essential to understand how young adults interact with peer-led sexual health information since these are likely to increase the propagation of sexual health messages and promote health awareness. Furthermore, there are arguments that peer education can be more successful than adult-centred or didactic education in dealing with the sexual health challenges faced by young people, although this has also been contested in light of the possibility that peer education could be reproducing authoritative and didactic sexual health information (Campbell and MacPhail 2002). On the other hand, there are also examples of young people's resistance to adult-centred, authoritative approaches to sexuality education.

Beyond the limitations of previous studies in terms of coverage, most of the studies cited have also used informatics-based methodology (Card et al., 2018; Goedel et al., 2020; Lohmann et al., 2018), which may not be very effective, as these approaches are subject to measurement error or can obscure some data richness (Tufekci, 2014). The automated analysis of social media posts may only provide a partial understanding of the meanings embedded in a corpus of data and does not provide a profound insight into the context and processes that generated such discourses (Cesare et al., 2018). Other studies, on the

contrary, have utilised paid advertisements to increase user engagement (Andrade et al., 2018; Nguyen et al., 2013) or focused on a restricted audience such as the LGBTQ community (Goedel et al., 2020) or gay and bisexual men (Card et al., 2018).

In addition, many of the current studies have examined user engagement by creating an aggregate index that combines likes, shares, and comments (Card et al., 2018; Goedel et al., 2020; Veale et al., 2015). This approach implies that interaction and engagement metrics are weighted equally. However, the relative merits of each engagement could vary according to educational objectives. Furthermore, by summing up all metrics, researchers may be obscuring meaningful relationships; notably, since interaction metrics may indicate different engagement levels. For example, exposure to some messages could reap huge benefits, while for others, there may be a need to promote interaction between educators and users (Neiger et al., 2013). Liking a post requires less cognitive effort than leaving a comment or sharing a post with other people in a user's network. As a result, it is increasingly important to evaluate different metrics separately to better target different strategies based on education objectives (to increase reach, or interaction, or both). This is also important because the predictors of superficial forms of engagement, such as liking a post, might be different from those requiring more cognitive efforts, such as leaving a comment (Card et al., 2018).

Furthermore, there is silence on the individual attributes associated with the intention to access or interact with sexual health information on social media. There is increasing consensus to understand the individual-level characteristics that predict engagement and interaction with sexual health information on social media, as this may play a crucial role in the diffusion of post content (Card et al., 2018; Goedel et al., 2020). These characteristics may help to understand the specific factors that could persuade different individuals to engage with posts and enhance the diffusion of health information.

Lastly, not much is known on how social media could generate new insights into the complexity of social issues that shape the sexual and reproductive health of adolescents and young adults. As this study focuses on sexuality, marriage, and health, there is scant research and a lack of conceptual clarity about the variety of perceived social benefits associated with saving sex for marriage. Nonetheless, understanding how young people conceptualise this issue is critical to understanding dominant attitudes and alleviating the unintended adverse consequences of sexuality education that solely emphasise sexual chastity until marriage.

## 2.5 Theoretical Framework

In this study, the Unified Technology of Acceptance and Use of Technology (UTAUT) was adapted as a framework for understanding the individual factors associated with the acceptability and use of social media for sexual health communication among young adults in African countries. This theory developed by Venkatesh et al. (2003) unifies several frameworks, including the diffusion of innovation, the theory of reasoned action, technology acceptance model (TAM), the theory of planned behaviour (TPB), combined TAM-TPB, the model of PC Utilization, and the social cognitive theory (Venkatesh et al., 2003). The model identifies four key constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions as primary predictors of the intention to adopt new technology and, ultimately, the actual use of new technologies. These relationships are further hypothesised to be moderated by gender, age, experience, and voluntariness of use (Venkatesh et al., 2003).

The UTAUT model has the evidence of content validity through multiple longitudinal field studies and accounts for 70% of the variance for technology usage intention, better than any of the eight frameworks alone (Venkatesh et al., 2003). Using a large cumulative

sample size obtained from 74 empirical studies, a meta-analysis evaluating the UTAUT model has also confirmed its robustness in predicting behavioural intention to use information technology (Khechine et al., 2016). Overall, the robustness of the UTAUT model and its extensive use for analysing the adoption of technologies at an individual level makes it appropriate for this study.

Today, there have been varied applications of the model to various new technologies, including digital banking (Baptista & Oliveira, 2015; Boonsiritomachai & Pitchayadejanant, 2017; Thusi & Maduku, 2020), physical activity applications (Liu et al., 2019), virtual learning systems (Chiu & Wang, 2008; Pynoo et al., 2011), health care service delivery (Chang & Hsu, 2012; Kijsanayotin et al., 2009; Kim et al., 2016; Shiferaw & Mehari, 2019; Wannheden et al., 2017), and mobile health communication systems (Cilliers et al., 2018). The model has also been applied to study non-technological health interventions such as HIV-pre-exposure prophylaxis (Nideröst et al., 2018) and the use and acceptance of social media among health educators (Hanson et al., 2011), tourists (Herrero et al., 2017), and students (Escobar-Rodríguez et al., 2014). The UTAUT model has also been applied to understanding the acceptance and use of social media for educational purposes (Awotunde et al., 2020; Jung & Lee, 2015; Khechine et al., 2016), public relations (Al-Badi et al., 2020; Curtis et al., 2010), work-related knowledge sharing (Etemadi et al., 2019), and employee recruitment (El Ouirdi et al., 2016). The findings of these studies and others attest to the effectiveness of the UTAUT model in predicting intention and actual use of new technologies.

Based on the many limitations of the UTAUT model, there have been various adaptations of the model, including the extended unified theory of acceptance and use of technology (Venkatesh et al., 2012) which includes three additional constructs, namely hedonic motivation (HM), price value (PV), and habit (H) to improve the predictive

strength of the model. There have also been various adaptations of the model including diverse theoretical constructs (Dwivedi et al., 2019; Goncalves et al., 2018; Hossain et al., 2019; Huseynov & Özkan Yıldırım, 2019; Rana et al., 2017; Shiferaw & Mehari, 2019; Sykes et al., 2009). However, this study adapted a modified revision of the UTAUT model proposed by Dwivedi et al. (2019) based on a synthesis of 162 studies of information systems. The inclusion of attitude as a theoretical construct to predict intention to use new technology is a significant contribution of the modified UTAUT model (Dwivedi et al., 2019).

The modified UTAUT model (meta-UTAUT) was specified and modified in this study to fit the context of sexual health communication on social media. Given that the study involved using specific components within social media, intention to use social media was replaced with the intention to access sexual health communication on social media. Given that sexual health information is only successful if it resonates with the intended audience's needs, the model was also specified to include the intention to interact with sexual health information on social media. The adapted theoretical model had five different constructs modelled as technology attributes (performance expectancy and effort expectancy), contextual factors (facilitating conditions and social influence), and individual attributes (attitude to technology). Additionally, the model included demographic characteristics such as age, sex, and relationship status as covariates since they are likely to influence intention to use and interact with sexual health information on social media.

## 2.6 Conceptual Framework

The conceptual framework for understanding the individual-level predictors of engagement with sexual health information is presented in Figure 2.1 below. As

highlighted earlier, the framework is guided by the review of the relevant literature and the unified theory of acceptance and use of technology. The paths in the figure depict the direction of the associations and the pathways through which individual-level attributes are expected to influence the intention to access and interact with sexual health information on social media.

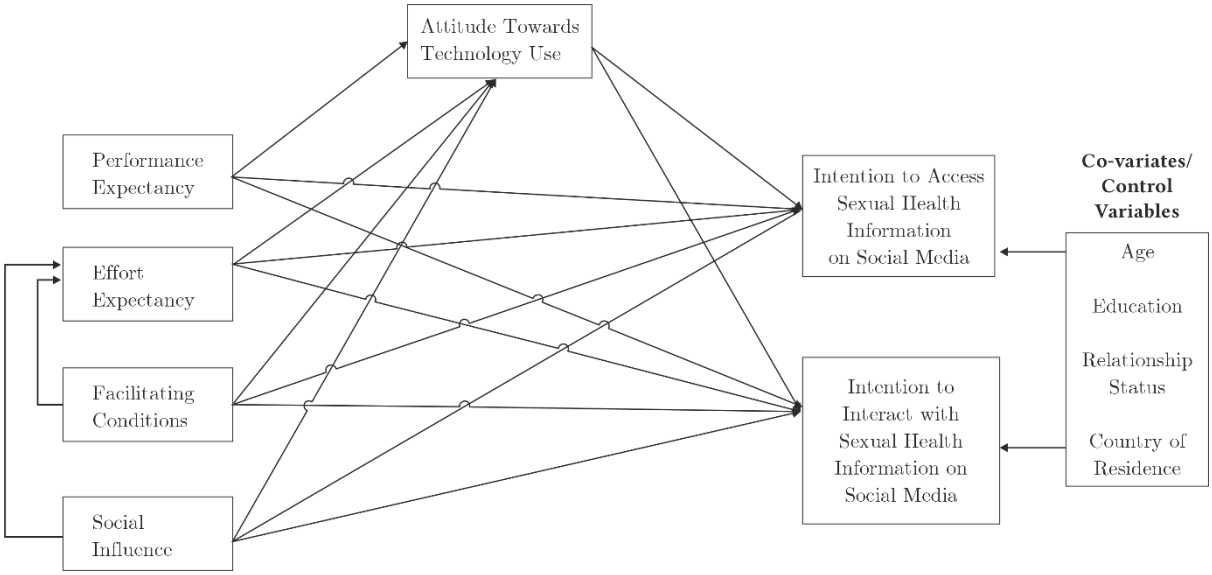



**Figure 2.1: A proposed theoretical model for explaining the behavioural intention to use and interact with sexual health information on social media**

## 2.7 Research Hypothesis – Individual-level Predictors of Social Media Engagement

The following sections present a detailed description of each of the hypothesised paths and the underlying assumptions.

### 2.7.1 *Attitude to technology use and interaction with sexual health information*

Attitude towards technology use is a significant contribution to the meta-UTAUT model. This construct is defined as an individual's positive or negative feelings about technology use and was operationalised in this study to imply feelings about using social media for sexual health communication. The role of attitude to technology use on the intention to use technology and a mediating construct has been acknowledged in several prior studies of technology use (Bobbitt & Dabholkar, 2001; Chen & Lu, 2011; Kim et al., 2016). While studying mobile electronic medical record (EMR) adoption among healthcare professionals, Kim et al. (2016) observed that attitude to technology use has a greater influence on the intention to use the EMR. Dulle and Minishi-Majanja (2011) also observed that open access publishing attitudes were significantly associated with researchers' intention towards open access usage. Based on the stated argument, this study proposed the following hypotheses:

**H1.1:** Attitude to sexual health communication on social media is associated with the intention to use social media for sexual health communication.

**H1.2:** Attitude to sexual health communication on social media is associated with the intention to interact with sexual health information on social media.

### 2.7.2 *Performance expectancy and interaction with sexual health information on social media*

Performance expectancy is defined as the degree to which an individual believes that using a system will help them attain gains in job performance (Venkatesh et al., 2003). It was depicted as an important factor to influence the behavioural intention to use

technology (Venkatesh et al., 2003). Various studies focusing on social media usage have also validated performance expectancy as a significant determinant of intention to use social media for educational use (El Ouirdi et al., 2016; Etemadi et al., 2019; Hanson et al., 2011; Yildiz Durak, 2019). Hanson et al. (2011) found that performance expectancy was positively associated with the intention to use social media for health promotion among health educators in the United States. Additional support for the association between performance expectancy and intention to use social media has also been found among recruiters (El Ouirdi et al., 2016) and construction professionals (Etemadi et al., 2019). With respect to the above literature, this study tested the following hypotheses:

**H1.3:** Performance expectancy is associated with the intention to use social media for sexual health communication.

**H1.4:** Performance expectancy is associated with the intention to interact with sexual health information on social media.

In addition, a reasonable number of studies (Kim et al., 2016; Koh et al., 2010; Pynoo et al., 2011) have examined the influence of performance expectancy on attitude to technology use. These studies' findings indicated that performance expectancy is positively associated with an individual's attitude towards adopting new technology, subsequently leading to an intention to adopt new technologies. Based on the above literature, this study tested the following additional hypothesis:

**H1.5:** Performance expectancy is associated with attitude to social media use for sexual health communication.

### *2.7.3 Effort expectancy and interaction with sexual health information on social media*

Effort expectancy refers to the ease associated with using a system (Venkatesh et al., 2003). This construct was adapted from perceived ease (TAM/TAM2), complexity (DOI and IDT), and ease of use (IDT) (Venkatesh et al., 2003). Effort expectancy was proposed as one of the direct determinants of behavioural intention to adopt new technology in the UTAUT model (Venkatesh et al., 2003). Seethamraju et al. (2018) observed that healthcare professionals were likely to use a mobile-based information technology solution for tuberculosis treatment monitoring if they perceived it easy to use.

The influence of effort expectancy on behavioural intention to use new technologies has also been supported by diverse studies, including those involving the use of social media for educational purposes (Yildiz Durak, 2019), public relations (Al-Badi et al., 2020), and employee recruitment (El Ouirdi et al., 2016). In addition, other theoretical models, such as TAM, postulate that the easier a technology is to use, the more positive one's attitude would be. In line with the above literature, this study tested the following hypotheses:

**H1.6:** Effort expectancy is associated with the intention to use social media for sexual health communication.

**H1.7:** Effort expectancy is associated with the intention to interact with sexual health information on social media.

Furthermore, this study hypothesised that effort expectancy would exert an influence on attitude to technology use. This hypothesis is supported by several studies of information systems (Dwivedi et al., 2017; Kim et al., 2016). In a meta-analysis based on

1,600 observations from 162 studies, Dwivedi et al. (2019) observed that the extent to which technology may be easy to use shapes an individual's attitude towards technology use.

**H1.8:** Effort expectancy is associated with attitude to social media use for sexual health communication.

### *2.7.4 Social influence and interaction with sexual health information on social media*

Social influence has its theoretical roots in the Theory of Reasoned Action and the Theory of Planned Behaviour, which denotes it as a subjective norm. It reflects the influence of the opinion of significant people, such as friends and family, on an individual's intention or use behaviour (Venkatesh et al., 2003). Social influence by superiors was the main predictor of teachers' acceptance to use a digital learning environment (Pynoo et al., 2011). Hanson et al. (2011) also observed that social influence was associated with the intention to use social media for health promotion among health educators in the United States. Social influence has also been identified as a predictor of intention to use social media for educational purposes (Yildiz Durak, 2019) and employee recruitment (El Ouirdi et al., 2016).

In the context of this study, social influence refers to the extent to which people whose opinions matter believe that young adults should use and interact with sexual health information on social media. This is particularly salient considering that the stigma of sexual health messaging and HIV/STI is still a key barrier to the success of social media-based sexual health promotion (Byron et al., 2013; Magee et al., 2012; Witzel et al., 2016). As a result, young adults may be hesitant about interacting with sexual health information on social media to avoid being seen by significant others as endorsing specific sexual

health messages (Magee et al., 2012; Witzel et al., 2016). Based on the review of the literature and the theoretical framework, the following hypotheses are proposed:

**H1.9:** Social influence is associated with the intention to use social media for sexual health communication.

**H1.10:** Social influence is associated with the intention to interact with sexual health information on social media.

The research also hypothesised that societal influence from the people of close proximity, such as family members, friends, and colleagues, would influence young adults' attitude toward intending to use and interact with sexual health information on social media. Dwivedi et al. (2019) highlighted that information shared by others who use a new technology may inform individuals' attitudes towards technology. Diverse studies on technology adoption have supported the association between social influence and attitudes towards technology use (Chang & Hsu, 2012; Dwivedi et al., 2019; Park et al., 2007). Among Chinese consumers, Park et al. (2007) found that social influence positively influenced consumers' attitudes toward using mobile technology. Deriving from the above empirical discussions, this study formulated the following hypotheses:

**H1.11:** Social influence is associated with attitude to social media use for sexual health communication.

**H1.12:** Social influence is associated with effort expectancy to use social media for sexual health communication.

### *2.7.5 Facilitating conditions and interaction with sexual health information on social media*

Facilitating conditions refers to the accessibility of infrastructural and technical support for users of technology (Venkatesh et al., 2003). It indicates the degree to which a person believes that there are few, if any barriers, to using new technology. Theoretically, the role of facilitating conditions on the intention to use social media has been affirmed for public relations (Al-Badi et al., 2020; Curtis et al., 2010) and learning (Jung & Lee, 2015; Khechine et al., 2016). The presence of facilitating conditions was also the greatest predictor of intention to use a mobile-based information technology solution for tuberculosis treatment monitoring in India (Seethamraju et al., 2018).

Furthermore, facilitating conditions could influence the intention to adopt new technologies through attitude (Dwivedi et al., 2017, 2019). Curtis et al. (2010) observed that the presence of facilitating conditions (such as having public relations departments) was associated with organisational acceptance and use of social media as a method of communication for public relations. Such facilitating conditions may also help individuals form positive attitudes towards a new technology (Chang & Hsu, 2012; Dwivedi et al., 2019). The findings of these studies, among others, led to proposing the following hypotheses:

**H1.13:** Facilitating conditions are associated with the intention to use social media for sexual health communication.

**H1.14:** Facilitating conditions are associated with the intention to interact with sexual health information on social media.

**H1.15:** Facilitating conditions are associated with effort expectancy to use social media for sexual health communication.

## 2.8 Research Hypothesis - Message Properties that Predict Social Media Use

Based on the review of the literature on sexual health messaging and the unique message properties that predict engagement, the following hypotheses were tested in this study:

**H2.1:** The tone of sexual health messages on social media will be significantly associated with higher engagement levels [Comment/Like/Share] with sexual health information.

**H2.2:** The strategy of sexual health communication on social media will be significantly associated with higher levels of engagement [Comment/Like/Share] with sexual health information.

**H2.3:** The type of sexual health messages on social media will be significantly associated with higher levels of engagement [Comment/Like/Share] with sexual health information.

## 2.9 Contribution

The study fills the gap in the current literature in multiple ways. Specifically, study 1 extends scholarship primarily in two ways. First, the use of multiple engagement metrics enabled me to delineate the predictors of different types of user engagement. Also, leveraging a platform where young people consume, produce, and simultaneously interact with peer-generated sexual health information provided a unique opportunity to understand the features of sexual health information that resonate with young adults and are compatible with their social media engagement habits. Secondly, the use of human annotators instead of informatic methods enhanced the identification of additional

features that predict user engagement while also considering the content and context of the messages.

Study 2 identified the individual-level characteristics associated with the intention to use and interact with sexual health information on social media. An attempt was made to adapt the unified theory of acceptance and use of technology or UTAUT (Venkatesh et al., 2003) to develop a comprehensive model for measuring successful online engagement. In so doing, this study contributes to the literature in two important ways. The first is that the literature on discretionary technology use is now updated by examining social media use and interaction among young African adults. Secondly, the study has empirically validated and generated new insights to previously asserted factors associated with social media use for a potentially sensitive subject like sexual health communication. Unlike previous studies, an assessment of the individual factors associated with interaction with sexual health information on social media has answered the pressing call for new perspectives on the predictors of engagement and propagation of sexual health information on social media.

By evaluating the content of sexuality information on a peer-led Facebook group, study 3 extends the literature on virginity and marital bliss. The study also shed light on lay definitions and underlying assumptions of virginity and how it may be beneficial for marital bliss. In understanding the conceptualisations of virginity loss, the study has addressed several shortcomings of the literature on premarital sexual activity. First, relatively little research has explored the subjective meanings of virginity loss in African countries. The preponderance of literature on sexuality and virginity has focused on its embodiments and meanings. To my knowledge, this is the first study to directly investigate how young African adults crystalise virginity and its perceived benefits for marital bliss.

Secondly, I drew on public wall posts and comments on a partially diverse peer-led Facebook group for sexuality education to reveal the relationship between saving sex for marriage and marital bliss. This opportunity allowed me to evaluate young adults' views in a natural environment without interference and without inducing social desirability. As Pascoe (2013) argued, it is critical to pay attention to the material that adolescents post and how it indicates their acceptance and replication of inequities in the social system.

Furthermore, the focus of this research on sexual abstinence until marriage and its perceived benefits for marriage expand current understandings of how deeply rooted socio-cultural beliefs might negatively affect the health of men, women, and families. Studying the stereotypical attitudes of young people to sexual health interventions can also create a better understanding of how sexual health interventions could pose adverse unintended risks and reinforce existing gender norms if the cultural contexts of such interventions are not taken into consideration (Adato et al., 2016; Guttman & Salmon, 2004; Lenzi et al., 2019; Stoebenau et al., 2016). An awareness of the representations of sexual abstinence in an online environment not monitored or moderated by sexual health experts or researchers would not only disrupt current societal-driven portrayals of sexual abstinence until marriage, but also help in addressing adverse cultural consequences of not marrying as a virgin and enrich sexuality education efforts targeting young people.

# Chapter Three

# Methodology

## 3.1 Study 1: Strategies that Increase Interaction and Propagation of Sexual Health Information on Social Media

### *3.1.1 Group identification*

In order to uncover the nuances of sexual health education strategies using social media, this study focused primarily on health information disseminated via Facebook. The study focused on Facebook data because Facebook is the most popular and frequently used social media platform by many people of various ages worldwide, including Africa (Brusse et al., 2014; Yonker et al., 2015). In order to identify a qualifying and already existing group for sexual health communication, I contacted several young adults in my network.

During the search, priority was given to groups that were peer-led and in which sexual health information on the group were user-generated without interference by experts. In addition, the Facebook group needed to have been in existence for more than a year, and have messages related to different aspects of sexual and reproductive health and rights. Membership of the group should also be open to young African adults across different African countries.

Only four groups met the inclusion criteria but efforts to get administrative rights and consent from the administrators was a little difficult especially with three of the identified Facebook groups. Only one group was willing to provide administrative rights to access

messages on the group. While this rate of consent was quite concerning, it was also understandable given the potential risks associated with granting administrative rights such as the risk of hijacking the group, hacking and others. The identified group which formed the basis of studies 1 and 3 is a peer-led public Facebook group for promoting sexual abstinence before marriage among young African adults. The Facebook group was created in 2016 and comprised more than 176,461 young adults aged 15 years and above who are resident in Africa. While the focus of the group itself is a limitation, several messages on the group focused on diverse aspects of sexuality and sexual health including power dynamics in relationships, sexual violence, contraceptive use, dating/marriage and others. A summary description of the group demographics is presented in Table 3.1.

Most of the participants live in Nigeria, and adolescents and young adults account for about 75% of the group membership. The demographic diversity of participants in the group makes it a valuable resource for studying social media use for peer communication of sexual and reproductive health information among young African adults. Another significant benefit of using data from this group is that messages on the group emerged organically without inducing social desirability that might be associated with the presence of a researcher or an expert.

**Table 3.1: Group demographics as of May 31, 2019**

| Characteristics | Number of Members | Percentages (%) |
|---|---|---|
| **Country** | | |
| Nigeria | 160,037 | 91.00% |
| Ghana | 989 | 0.56% |
| South Africa | 692 | 0.39% |
| Benin | 442 | 0.25% |
| Kenya | 434 | 0.25% |
| Other African | 2229 | 1.27% |
| Non-African | 10,835 | 6.16% |
| Country unknown | 200 | 0.11% |
| **Sex** | | |
| Women | 90,096 | 51.23% |
| Men | 85,737 | 48.75% |
| Unknown | 25 | 0.01% |
| **Age** | | |
| 13-17 | 1,812 | 1.03% |
| 18-24 | 64,978 | 36.95% |
| 25-34 | 68,853 | 39.15% |
| 35+ | 40,215 | 22.87% |
| | 175,858 | 100.0% |

*(Source: Facebook Group Insights)*

### *3.1.2 Data*

A data scrapping application (Sociograph.io) was used to download public wall posts on the Facebook group. The application was installed directly on the Facebook group (with administrative rights) to access all messages and interactions. Permission to access public wall posts on the group was obtained from the group creator after they received a detailed description of the study and its potential for sexual and reproductive health interventions. As with other studies involving the use of social media data from existing groups, it was practically impossible to obtain informed consent from all the group members (Cesare et

al., 2018). However, some conscious efforts were made to mitigate risks for the research subjects and group. First, all the data extracted contained no personal identifying characteristics, such as the content creators' names.

Some post authors on the group included their information (such as mobile number, links to other groups, names, and email addresses) in public wall posts shared on the group. These were carefully examined and removed during data coding. This strategy is in line with recommendations in the literature (Denecke et al., 2015; Zimmer, 2010). All the quotes were also rephrased in this study to minimise the identification of posts through a keyword search on the social media platform.

A total of 62,986 posts and 897,967 comments made since 2017 were retrieved from the group. The data analysis and management followed a two-stage process. In the first stage, I developed a keyword-based dictionary comprising words related to several aspects of sexual and reproductive health such as *"condom," "contracept," "rape," "virgin," "sex," and "s*x,"* among several others. A full list of the search keywords is presented in Table 3.2 below.

**Table 3.2: Full list of keywords**

| | | | | |
|---|---|---|---|---|
| erection | condom | HIV | violence | boyfriend |
| masturbat | contracep | aids | beating | girlfriend |
| sex | abort* | std | rape | dating |
| s*x | pregnant | STIs | virgin | lesbian/gay |

The keyword-based filtering looped through each corpus of messages and retained only posts that included at least one of the keywords. This approach led to the retention of 8,497 posts in which at least one or more keywords related to sexuality were identified. Although several relevant keywords including words similar to the ones included in the analysis were not included, it is unlikely that this would have led to some potentially relevant messages being ignored. This is especially because it is unlikely that any post would focus on abortion by including 'termination', without 'pregnancy' or 'sex' in the posts. Nonetheless, efforts were also made to review a random subset of all the wall posts to ensure that the filtering captured all relevant wall posts. The 8,497 posts that were identified with the keyword-based filtering were reviewed by seven research assistants who reviewed an average of 2,550 Facebook posts each over two weeks. This implied that two research assistants reviewed each post.

Each assistant was asked to classify the posts based on whether they related to a set of predefined sub-domains of sexual and reproductive health, including sexual abstinence and contraceptive use, among others. The assistants were trained extensively before the activity. About 54% of the posts were deleted if two assistants classified the posts as not relevant to the study. During this phase, the final dataset comprised 3,947 posts shared on the group between June 1, 2018 and May 31, 2019.

### 3.1.3 *Metadata*

Metadata represents supplementary information – data about the data –that is, data embedded in each Facebook post on the group and included in the corpus of data collected. These metadata include a post ID (a unique numerical identifier assigned to each Facebook post), the post date, post type (status/link/photo/video), and measures of interactions and propagation such as reactions (like/angry/haha/love), comments, and shares. In addition to coded categories, these data were used to describe the interactions with sexual and reproductive health information on the group.

### 3.1.4 *Coding*

To develop an initial coding system, I leveraged past definitions of sexuality education to identify four unique topics on sexual and reproductive health: abuse, family planning, intimate relations, and sexual abstinence (Buhi et al., 2010; Gilbert et al., 2005; Lottes, 2000; Simon & Daneback, 2013). Messages related to (not) having sexual feelings, including touching and kissing, were further classified as sexual purity after extensive literature review (Berer, 2006; Gilbert et al., 2005). Although the sexual purity and sexual abstinence messages were very close, the former (sexual purity) was used to refer to abstaining from all non-penetrative sexual activities including self-pleasure. In contrast, the latter was used to refer to abstaining from penetrative sexual activity before marriage. This description is also consistent with what is known in literature and what young adults define as sex (Remez, 2000). The final codebook included coding categories, definitions, and examples are presented in Table 3.3 on the following page.

Six of the initial research assistants were further engaged to review the 3,947 Facebook messages classified as relating to several aspects of sexual and reproductive health. All six assistants were young adults aged 20-25 years and were university students.

The assistants were re-trained and asked to classify the Facebook posts based on topic, strategy, and tone of communication.

An average of 1,315 messages was reviewed and classified by each of the six assistants during this phase. Krippendorff's alpha for topic classification, strategy, and tone of communication was above the acceptable minimum levels of reliability (Krippendorff, 2018). I also reviewed a random sample of 500 messages in the dataset to ensure consistency and data coding accuracy.

**Table 3.3: Coding scheme of peer-led sexual health information on the Facebook group**

| Classification | Description of Posts | Excerpted Exemplars of Posts |
|---|---|---|
| **TOPIC** | | |
| Abuse | Posts related to all forms of violence, including emotional violence, physical, or sexual violence. | The rates at which rape is becoming prevalent and ending the dream of some girls from being virgins till marriage is very discouraging and disturbing. Some of the wicked rapists either rape for ritual purposes or because of their lack of sexual discipline. |
| Birth Control and Abortion | Posts about the use or non-use of birth control methods and abortion to prevent/delay a marital or premarital birth. It also includes posts about all matters related to getting pregnant. | Dear sisters, just because he proposed marriage does not mean that you should begin the use of contraceptives. |
| Intimate Relations | Posts about relationships/dating/union dynamics. These also include posts about how to attract a "good" partner or the process of preparing for marriage/courtship/relationships. | Someone asked if the ladies in this group can marry a man living in a room apartment. I was shocked to see responses like "I can't." No one wishes to be poor, but if a brother approaches you and shows interest in marriage, will you refuse his advances because he is not wealthy? |
| Sexual Abstinence | Posts about sex[ual intercourse] before marriage as well as its consequences (premarital pregnancy or birth). | Dear Lord, may all singles who are planning to have sex on Valentine's Day get pregnant, let no abortion pill work for them, may all condoms tear miraculously, do not let any emergency pill work for them. |
| Sexual Purity | Posts about being decent in dressing, avoiding sexual urges/feelings, nor alternative means of sexual intimacy including masturbation, smooching, kissing, hugging, or other erotic activities but not sex. | Kissing and other foreplay prepare the body for sex. If you really do not want sex, as you claimed, stay clear until marriage! |

**Table 3.3 *(cont.)*: Coding scheme of peer-led sexual health information on the Facebook group**

| Classification | Description of Posts | Excerpted Exemplars of Posts |
|---|---|---|
| **STRATEGY** | | |
| Status Update | General status messages, usually to motivate behaviour change without telling a story, sharing an experience, or seeking an opinion. | Dear ladies, if you are in a relationship with a guy who doesn't respect you, gets into a fight with you or makes you feel less of yourself because you do not want to have sex with him before marriage, know that he is not your Mr Right! Do not continue in such a toxic relationship! It is not worth it! Leave with your head held high. |
| Experience sharing | Posts about an author's personal experience related to an identified sexual and reproductive health and rights topic. | There was a time I was struggling with masturbation, and I got very frustrated because I was really struggling spiritually. Guilt and condemnation haunted me until one day when I asked myself why I was masturbating? That day I got my freedom from masturbation. |
| Request for opinion | Posts in which the author is seeking advice about a sexual and reproductive health/rights issue or intimate relations. | Can someone be deflowered by having sex? |
| Storytelling | Posts that were telling a story – often in episodes. | "Ben raped me, how could he? I thought he was a Christian, but now I know better." Beatrice sobbed uncontrollably. She recalled the actions that led to the wanton molestation. |

**Table 3.3 *(cont.)*: Coding scheme of peer-led sexual health information on the Facebook group**

| Classification | Description of Posts | Excerpted Exemplars of Posts |
|---|---|---|
| **TONE** | | |
| Fear | Posts intended to scare members of the network from engaging in a behaviour or activity related to the identified sexual and reproductive health/rights theme. | Dear boys and girls, condoms may protect you from sexually transmitted diseases but not from Spiritual Transmitted Demons (STDs). |
| Guilt | Posts that are shared with the purpose of evoking feelings of guilt – feelings like why have/did/I done/did this. Also includes posts that blame an individual for the negative experience of another. | Young lady, do you think you are doing yourself any good by attempting to kill that innocent baby through abortion? If your mother had aborted you, would you have had the opportunity to commit that immorality that led to the unwanted pregnancy you are carrying? Don't do it. It is deadly. |
| Neutral | Posts that are conveyed in a clear manner, void of guilt, stigma, or fear. | If you have sex in the dream, it's not necessarily implying that you have a spiritual husband or wife. It's warning you to watch how much attention you give to sex and romantic thoughts. |
| Stigma | Posts shared on the group with an intention to shame or stigmatise those who engage in a behaviour. | If you are not a virgin on your wedding day, you are not supposed to hold a bouquet because you are no longer a virgin. Holding a flower is a symbol of virginity. |

### *3.1.5 Analysis*

Content analysis was used to examine the messages shared on the Facebook group to determine the sexual and reproductive health topics discussed in the group and how young adults interacted with the different message topics, and the type and tone of message communications. Quantitative content analysis involves the systemic analysis of texts or symbols of communication that have assigned numeric values based on a predefined coding scheme (Riffe et al., 2014). It also involves analysing relationships among the assigned numeric values using statistical methods to describe the communication and draw valid inferences from the texts to their context (Riffe et al., 2014).

In my investigation, several measures were adopted to answer the proposed research question. I also examined interactions and propagation of messages on the group using the three counts of engagement comprising of "reactions" (like, love, sad, and angry), "comments," and "shares," all of which are considered as aspects of "electronic word-of-mouth" and could stimulate different communication behaviours (Kim & Yang, 2017; Liu et al., 2017). I also assessed the bivariate relationships between the different topics, message strategy, and tone of communication to assess differences in the tone and strategy of messages for each topic category.

Finally, four negative binomial regression models were fitted using the **`glm.nb`** function from the **`MASS`** package in R (Venables & Ripley, 2002) to delineate statistically significant differences in young adults interacting with each message by topic, type, strategy, and tone of communication. This model was chosen because the data were highly skewed and overdispersed (Ver Hoef & Boveng, 2007). **Model 1** considered associations between the sum of all interactions and each of the message categories and metadata. **Model 2** considered the associations between the number of reactions and each of the

message categories. **Model 3** considered the association between the number of comments and each of the message categories. Finally, **Model 4** considered the association between the number of comments and each of the message categories. The interpretation of the results was made using incidence rate ratios (IRR) and 95% confidence intervals. All data analyses were conducted in R (R Core Team, 2019).

## 3.2 Study 2: Individual-Level Predictors of Engagement and Propagation of Sexual Health Information on Social Media

### *3.2.1 Research design and setting*

The health information survey was a cross-sectional survey of young adults living in Kenya, Nigeria, and South Africa. The selection of these countries was based on the availability of the internet and communicative technologies in these countries and provided representation for each sub-region in sub-Saharan Africa (Napolitano, 2010). All three countries have the largest number of internet users in the sub-Saharan African region, with as many as 126.08 million internet users in Nigeria, 46.87 million users in Kenya, and 32.62 internet users in South Africa (Statista, 2021).

The survey's overarching aim was to understand the [sexual] health information needs of young adults in African countries. Potential participants were instructed to read the information page and the associated answers to some frequently asked questions before initiating the survey. This page included information about participants' eligibility, study objectives, number of questions, incentives, and my contact information should they have required any additional information about the survey.

After reading the information statement, potential participants provided formal consent by clicking on the **"I agree to participate in this survey,**

**proceed"** button. Participants were aware that they could quit the survey at any time should they not wish to complete it. All advertisements on Facebook were reviewed[1] to ensure compliance with Facebook's guidelines for advertisements and were subsequently approved by the company. Facebook does not reveal the identity of members of the target population, and as such, it is possible to survey an anonymous sample.

### *3.2.2 Survey design*

A marketing tool that provides an opportunity to place advertisements was leveraged to reach the target population of young African adults aged 18-24 years in Kenya, Nigeria, and South Africa over two weeks (22 May - 8 June 2020). The study included young adults aged 18-24 years who were residents in either Kenya, Nigeria, or South Africa. All three countries are largely Anglophone and participants had to be English literate to be eligible for the study. Additional details about the health information survey have been published elsewhere (see Olamijuwon, 2021).

Facebook's advertising platform provides not only a recruitment tool but also a sampling frame – especially since no sampling frame of young African adults with access to the internet exists (Schneider & Harknett, 2019). Although Facebook provides several options to reach a specified audience based on brand awareness, reach, engagement, conversions, and traffic, I chose the traffic campaign objective based on evidence of effectiveness in prior studies (Schneider & Harknett, 2019). According to Facebook, this campaign's objective is to "send more people to a destination such as a website, app, or Messenger conversation."

[1] https://www.facebook.com/policies/ads/

I leveraged an existing Facebook page (Health Information Survey for Young Adults), previously created for this study, to place advertisements on the Facebook advertising platform. Using this name had the advantage of communicating the advertisements' goal, reassuring participants of the survey's legitimacy, and possibly pique the interest of potential participants. The advertisements included a show headline, a picture, and a link to the survey website (SHYad.NET). The survey website was optimised for mobile devices such as smartphones and tablets, thereby increasing accessibility for those without a computer. The survey website and all text in the advertisements were in English.

The wording of texts and images used in the survey were carefully considered as they were intended to directly motivate potential participants to participate in the survey and reduce the possibility of selection bias so that only those interested in the study were recruited. For each advertisement (see Fig. 3.1 above), I included the gender and country of the target population (Young [gender] in [country] are telling us how they would like to access health information. Participate NOW). Since the use of pictures is likely to significantly affect the performance (link clicks) of advertisements (Ramo & Prochaska, 2012), I purchased eight stock images of young adults, including the rights to use them in advertisements. Every advertisement included a headline informing participants that they could win 5GB of internet data if they participated in the survey.

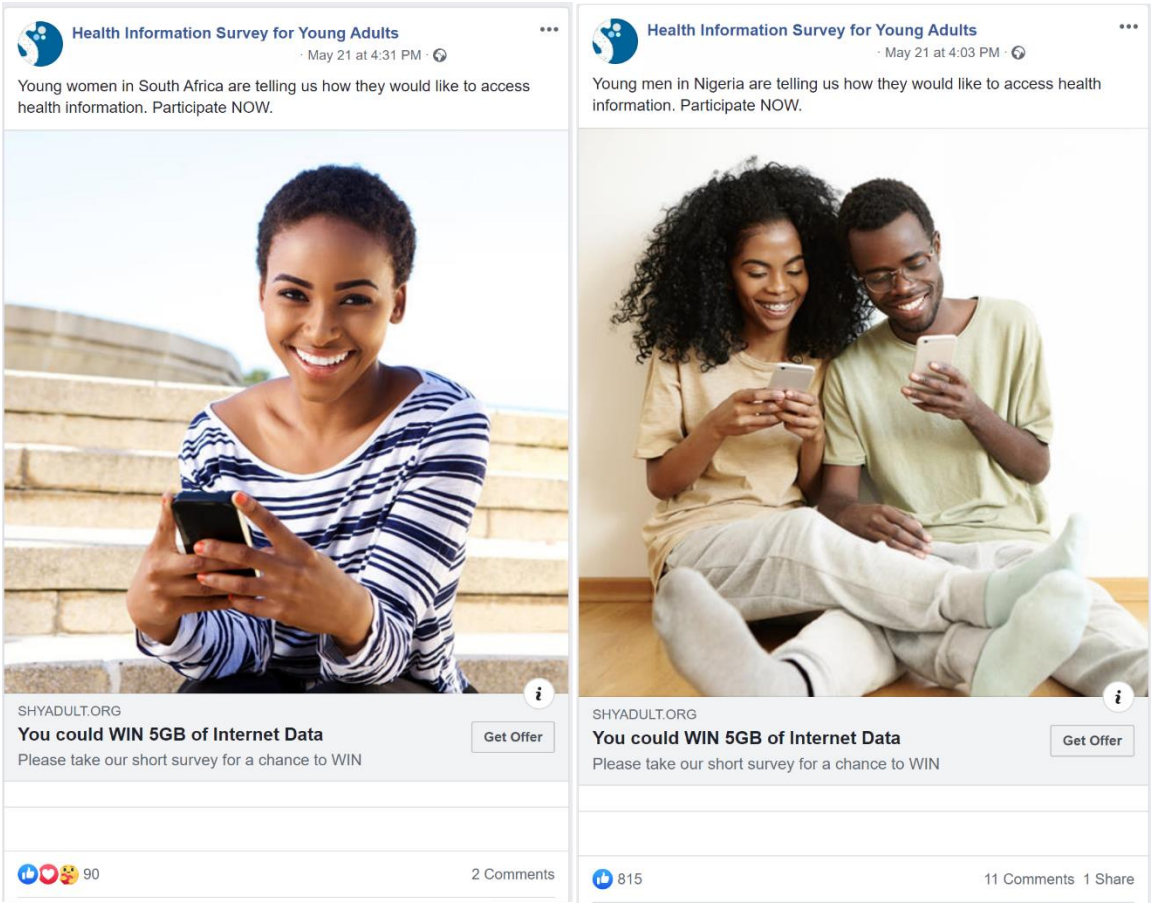



**Figure 3.1: Sample screenshots of Facebook advertisements**

Based on the Facebook algorithm for displaying advertisements, Facebook is more likely to display advertisements that receive the most clicks during the learning phases – usually after 50 link clicks. This could result in a homogenous, biased sample, particularly if users who share certain sociodemographic or cultural traits are more inclined to click on a Facebook advertisement than others if they prefer the picture or the texts used (Arcia, 2014). Furthermore, Facebook sampling tends to oversample the better educated, young, and most active potential participants of a demographic cohort (Bhutta, 2012; Rife et al., 2016). As a result, if more highly educated males in Nigeria engage in click behaviour during an advertisement's learning phase, Facebook is likely to display more

advertisements to this group and display fewer advertisements to a group that is unlikely to click on links. To avoid having a homogenous, biased sample, researchers have advised targeting diverse demographic strata, especially those for which differences are expected, with specific and separate advertisement sets (Arcia, 2014; Zhang et al., 2018). Because the Facebook population is large and the advertisement targeting well-developed, it is possible to use quota sampling to generate a sample that corresponds to the general population of one or more demographics – even those who have less than secondary education.

Since I expected that participants of different gender, educational levels, and countries of residence would exhibit differences in their willingness to interact with the survey, I generated 12 strata based on different combinations of key sociodemographic characteristics, such as country (Kenya, Nigeria, and South Africa), gender (male and female), and educational attainment (secondary education, and other levels of education). To incentivise participation, participants had a chance to win 5GB of internet data upon completing the survey. Participants who wished to be considered for the 5GB internet data were asked to provide a mobile number on which they could be contacted. Each completed survey with an associated mobile number was entered into a draw to win 5GB internet data at the end of the survey. The incentive's total cost was 1650 ZAR (US $95.60) for six winners – two drawn from each country.

### *3.2.3 Campaign settings, reach, and costs*

One of Facebook's advertising platform's unique features is the opportunity for detailed targeting of the desired population. Facebook collects detailed data on users' attributes that advertisers can use to target their campaigns quite precisely. These attributes include the standard demographics such as age, sex, education, location, interests, and behaviours. Facebook targeting options include an opportunity to define

audiences, placement, budget, and schedule. In terms of location, advertisers can target users living in or that have recently lived in a specific location, as well as people travelling to a location. Since I was more interested in a national-level analysis of young adults' responses, the location for each advertisement set was defined as people living in each of the countries under study. Age was specified as ranging from 18 to 24 years. In the demographic's category, users were targeted based on whether they were "in high school", "high school grad", "attained some high school", or were not in any of the three categories. A detailed description of the different strata and the potential reach (audience size) is provided in Table 3.4.

**Table 3.4: Facebook's assessment of the potential reach of advertisements for young adults in Kenya, Nigeria, and South Africa**

| Location | Male | | Female | |
|---|---|---|---|---|
| | Other Education [a] | Secondary Education [b] | Other Education [a] | Secondary Education [b] |
| Kenya | 1,600,000 | 310,000 | 1,200,000 | 180,000 |
| Nigeria | 4,700,000 | 710,000 | 3,500,000 | 540,000 |
| South Africa | 2,000,000 | 750,000 | 1,900,000 | 800,000 |

*Note: Variables used to define target populations:*
*Location: People living in this location*
*Age: 18-24 Years*
*Demographics >> Education >> Educational level*
*Languages: English (All)*
*[a] - Excludes those who indicated that their level of education is "high school", "high school grad", and "some high school"*
*[b] - Includes only those who indicated that their level of education is "high school", "high school grad", and "some high school"*

An automatic placement was chosen for this study, allowing advertisements to be shown to the target population on the feeds, in stories, in-stream, search, messages, in-article as well as apps and sites. Advertisements were also shown on Instagram. According to the Facebook advertising platform, Facebook delivery systems allocate the budget for each advertisement set across multiple placements based on where they are likely to perform best. Also, Facebook provides several options for optimising the delivery of advertisements. These include optimisation for landing page views, link clicks, impressions, and unique daily reach. Each option for optimising an advertisement has a different objective and although optimising for landing page view seemed more appropriate for this study, I optimised the advertisements for link clicks which delivers advertisements to those who are most likely to click on the advertisements.

At the time of this analysis, the optimisation of advertisements for landing page views involved delivering advertisements to people who were more likely to click on the advertisements' links and wait for the website or survey page to be fully loaded. However, since it was unclear how the demographics of those who were likely to click on the link or load the page may differ from those who were not in the target population, this approach might have increased selection bias. In addition, optimising the advertisements for link clicks also implied that payment is only made when a potential participant clicks on an advertisement link, rather than when an advertisement is served or seen by the target population.

The present study's total advertisement budget was 9,000 ZAR (US $521.44) divided equally across the three campaigns, that is, 3,000 ZAR (US $173.81) per recruitment site. This amount was evenly divided across the three strata (male, female, education (high school, non-high school)). An automatic budget was set for each advertisement, and the cost for each country's advertisement was automatically determined by Facebook based on biddings by other advertisers. Assuming a proportional to size sampling approach, I allocated the same budget of 900 ZAR (US $52.14) to all strata except the high school educational strata (600 ZAR (US $34.76)). This approach implied that the sample size for each stratum would be dependent on the size of the audience and the cost per link click. Participant recruitment for each stratum ceased once the budget had been exhausted. Performance metrics for each advertisement were obtained from the Facebook Ad Manager.

### *3.2.4 Survey instrument*

Survey questions were made available via the project website (SHYad.NET). The study being reported here was comprised of two sections –sociodemographic characteristics and

quality checks. The survey's sociodemographic section comprised six questions comprising of participants' demographic characteristics (age, sex) and social characteristics (country of residence, educational attainment, race/ethnicity, frequency of internet use). The survey asked participants to indicate their age at last birthday and gender (male/female). Three design elements were incorporated in this study to improve the quality of responses:

- The survey's age column was open-ended, with options as low as 13 and as high as 45 years old. The country column was the same, implying that even those who were not eligible could participate in the survey. In addition, the survey included "do not know", "prefer not to say", and "not sure" for respondents who did not wish to respond.
- A short description and purpose of the attention check questions were presented on the information page to warn the potential participants and motivate them to provide quality responses.
- I also used attention check questions as prompts to minimise careless responses. All attention checks were short to minimise misleading information (Mancosu et al., 2019) and ensure that those who failed were those who had not thoroughly read the instructions and questions.

While many of the design elements' approaches were adapted from previous studies, some were my design – the attention checks comprised of three questions attempting to gauge participants' attentiveness to the questions. The questions looked like other survey items and were randomly positioned among all survey questions so that the "smart" participants could not guess the position of the last attention check question based on the first two attempts. The checks ostensibly asked respondents to select an option that had the colour "grey", "green", or "red" (see Appendix A for exact wording of attention checks).

The design and use of multiple attention check questions were primarily because a single question had been deemed ineffective to distinguish inattentive from attentive participants (Berinsky et al., 2014) and because it permitted an assessment of variability in passage rates between subjects. Participants who selected the correct category for each question were classified as having passed the attention checks. The cumulative number of checks passed was derived from the sum of all attention check questions passed by a participant. This measure's response category ranged from 0 (failed all attention check questions) to 3 (passed all checks).

In addition, the internet protocol address of the device used in participating in the survey was logged to identify multiple responses and possible fraudulent responses that may arise as a result (Gosling et al., 2004). This was essential since some participants may be tempted to participate in the survey more than once to increase their chances of winning an incentive. In addition, the survey website logged the start and end time for each survey participant.

### *3.2.5 Performance of advertising campaign and recruitment results*

Table 3.5 presents conversion rates for advertisements across the three countries. Over two weeks (22 May-6 June 2020), the advertisement campaign reached over 900,000 young adults in Kenya, Nigeria, and South Africa based on an advertisement cost of about 9,000.00 ZAR (US $521.44). During the period, 11,711 unique clicks were observed in the advertisement campaign in all countries ranging from 2,739 link clicks in South Africa to 5,932 link clicks from young adults in Nigeria.

**Table 3.5: Summary of advertisement campaigns and results**

| | Country | | |
|---|---|---|---|
| | Kenya | Nigeria | South Africa |
| Facebook Audience Size [a] | 3400000 | 9400000 | 5400000 |
| Advertisement Reach [a] | 241598 | 493440 | 223935 |
| Unique Link Clicks [a] | 3040 | 5932 | 2739 |
| Landing Page Views [a] | 2000 | 961 | 700 |
| Survey Participants [b] | 499 | 391 | 300 |
| Eligible Participants [b] | 446 | 320 | 271 |
| Complete Responses [b] | 421 | 305 | 252 |

*Note:*
*a – Metrics obtained from Facebook ads manager*
*b – Metrics obtained from survey website (SHYad.NET)*

Data from the Facebook Pixel directly installed on the survey website revealed a 31% (3,661) conversion of those who landed on the survey website. About 32% of those who landed on the survey website further participated in the survey. About 13% (153) of those who participated in the survey were ineligible, that is, older than 24 or younger than 18 or were not living in Kenya, Nigeria, or South Africa at the time of the survey. This implied a total match rate of about 87% based on advertising target and self-reported demographic characteristics – that is, 87% of those recruited met the inclusion criteria (young and residing in Kenya, Nigeria, or South Africa).

A total of 978 completed responses (on demographic characteristics) was received during the recruitment period, implying an 82% completion rate from 1190 participants who attempted the survey and a 94% competition rate from the 1037 eligible participants. To better understand variations in each advertisement set's cost, a summary of the

advertisement performance obtained from the Ad Manager is presented in Table 3.5. The advertising cost per unique link click ranged from 0.25 ZAR among men and women with other education levels (excluding high school) in Nigeria, to about 0.75 ZAR among young women with high school education in Kenya. Overall, the advertisements' average cost was 7.56 ZAR per survey participant, 8.68 ZAR per eligible response, 9.20 ZAR per complete response, and 14.63 ZAR per attentive (passed 2+ attention checks) participant.

**Table 3.6: Summary of advertisement performance**

| Country | Ad Text | Target | Impressions | Reach | Unique links click | Cost per unique click (ZAR) | Total amount spent (ZAR) |
|---|---|---|---|---|---|---|---|
| Kenya | Young women in Kenya are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Female; Country: Kenya; Education: exc. High school | 170,300 | 102,943 | 2,069 | 0.43 | 899.44 ($52.11) |
| Kenya | Young women in Kenya are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Female; Country: Kenya; Education: High school | 98,218 | 42,511 | 799 | 0.75 | 598.53 ($34.68) |
| Kenya | Young men in Kenya are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Male; Country: Kenya; Education: exc. High school | 226,877 | 130,015 | 1,856 | 0.48 | 899.63 ($52.12) |
| Kenya | Young men in Kenya are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Male; Country: Kenya; Education: High school | 103,809 | 52,864 | 900 | 0.67 | 599.86 ($34.75) |
| Nigeria | Young women in Nigeria are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Female; Country: Nigeria; Education: exc. High school | 390,352 | 258,816 | 3,576 | 0.25 | 899.44 ($52.11) |
| Nigeria | Young women in Nigeria are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Female; Country: Nigeria; Education: High school | 194,359 | 101,057 | 1,698 | 0.35 | 598.74 ($34.69) |
| Nigeria | Young men in Nigeria are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Male; Country: Nigeria; Education: exc. High school | 360,991 | 253,375 | 3,662 | 0.25 | 899.02 ($52.09) |
| Nigeria | Young men in Nigeria are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Male; Country: Nigeria; Education: High school | 184,285 | 108,448 | 1,826 | 0.33 | 599.24 ($34.72) |
| South Africa | Young women in South Africa are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Female; Country: South Africa; Education: exc. High school | 164,245 | 100,863 | 1,761 | 0.51 | 899.73 ($52.13) |
| South Africa | Young women in South Africa are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Female; Country: South Africa; Education: High school | 108,603 | 582,56 | 853 | 0.70 | 599.39 ($34.72) |
| South Africa | Young men in South Africa are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Male; Country: South Africa; Education: exc. High school | 161,734 | 929,60 | 1,449 | 0.62 | 898.24 ($52.04) |
| South Africa | Young men in South Africa are telling us how they would like to access health information. Participate NOW. | Age: 18-24; Gender: Male; Country: South Africa; Education: High school | 101,574 | 56,192 | 827 | 0.72 | 598.78 ($34.69) |

The advertisements' descriptions did not include any information about sexual and reproductive health to minimise the risk of self-selection bias. In addition, 12 strata were created based on different combinations of key sociodemographic characteristics, such as country (Kenya, Nigeria, and South Africa), gender (male and female), and educational attainment (secondary education, and other levels of education) to minimise the risk of a homogenous biased sample whereby users who share certain sociodemographic or cultural traits are more inclined to click on the Facebook ad than others (Arcia, 2014; Zhang et al., 2018).

Multiple approaches were adopted in the survey to ensure the validity of responses. First, information on the internet protocol address of the device used in participating in the survey (Gosling et al., 2004) as well as the start and competition time for the survey was logged for each participant. The survey also included three attention check questions to filter careless responses and ensure that participants have carefully read and understood the questions (Berinsky et al., 2014). The attention checks ostensibly asked respondents to select an option that had the colour "grey", "green", or "red" (e.g. strongly ag red).

### *3.2.6 Constructs measurement*

The research model included key constructs adapted from the unified theory of acceptance and use of technology such as facilitating condition, social influence, performance expectancy, effort expectancy, attitude, and behavioural intention to use and interact with sexual health information on social media. The model also included key control variables that are perceived to influence the intention to use and interact with sexual health information on social media.

All the key constructs (except facilitating condition) were measured with multiple questionnaire items adapted from Venkatesh et al. (2003). All items were measured on a

seven-point Likert response format scale with anchors ranging from 1 (strongly disagree) to 7 (strongly agree). Items measuring social influence and attitudes to social media use were reversed-rated so that higher values (7) corresponded to strongly disagree and lower values (1) corresponded to strongly agree. The presence of facilitating conditions was measured with a single item because many of the original scale items were not relevant to the context for this research. Although the use of social media technologies would generally require a specific skill set, resources (such as internet data), and technical infrastructure (a smartphone), the use of specific components of social media among a group of people who are already on social media does not necessitate the specific use of these resources.

Given the culturally sensitive nature of sexual health information and the associated role of religious teachings and religiosity, the study included religious dynamics in the construct of social influence (Challa et al., 2018). Furthermore, the intention to interact with sexual health information was measured by three items covering the key engagement metrics (like, comment, and share) on social media.

Age was measured in single years with a question item that asked participants for their age at their last birthday. Responses to this item ranged from 18 to 24 years. Gender was a binary response item categorised as (1) for males and (0) for females. Educational attainment was measured with a questionnaire item that asked participants for the highest level of education that they have attained. Responses to this item were categorised as (1) for participants with tertiary education and (0) for participants with secondary or lower education. Relationship status was measured with the question item that asked participants if they were in any relationship or union at data collection time. Participants were categorised as “in a relationship or married" (1) if they reported being married or single but in a romantic relationship and (0) if they were single and were not in any

relationship at the time of data collection. Since this study focused on young adults aged 18-24 years, no participants reported being formerly married in the sample.

### *3.2.7 Formal analysis*

Data were checked, managed, and analysed using R. Descriptive analysis was performed to describe participants' characteristics and the choice of acceptable digital media for sexual health communication. The data were managed, analysed, and visualised using the **`tidyverse`** package in R (Wickham, 2017).

The analysis was performed in two steps. In the first step, a confirmatory factor analysis (CFA) was performed to assess the multidimensionality and validity of the measurement model. Although an attempt was made to include as many relevant theoretical items as possible and at least three items per construct, the final items for each theoretical construct were carefully retained based on their performance in terms of higher factor loadings, the extent to which items in the same factor were related to another, the significance of factor loadings, and goodness of fit. Secondly, structural equation modelling (SEM) was used to evaluate the proposed research model for explaining young adults use of social media for sexual health communication. The theoretical model was fitted in R using **`lavaan`** package (Rosseel, 2012). Parameters for both the measurement and research models were estimated using maximum-likelihood estimation with robust standard errors and a mean- and variance-adjusted test statistic (MLMVS) since it yields the best combination of accurate standard errors and Type I errors even with nonnormally distributed data and mis-specified model (Maydeu-Olivares, 2017).

Convergent validity, discriminant validity, and construct reliability were examined to assess the measurement model's quality. Two ad hoc tests for convergent validity comprising standardised factor loadings and average variance extracted were conducted

based on Anderson and Gerbing (1988). Standardised factor loadings are representative of the level of association between scale items and a single latent variable. A threshold value of 0.50 was considered for retaining factor items (Fornell & Larcker, 1981). The average variance extracted (AVE) measures the variation explained by the latent variable to random measurement error (Netemeyer et al., 1990). An AVE > 0.5 is evidence of a good fit (Fornell & Larcker, 1981).

Discriminant validity was assessed by comparing the square roots of average variance extracted to the absolute values of the correlations between the constructs (Fornell & Larcker, 1981). To pass this test, the square root of the AVE should be greater than the factor correlation between a pair of latent variables (Fornell & Larcker, 1981; Ketchen, 2013). Furthermore, the composite reliabilities indicates the internal consistency of the items measuring the same construct (Hair et al., 1992). The internal reliability was computed as recommended by Fornell and Larcker (1981). A Cronbach's alpha (α) and composite reliability close or above 0.70 provides evidence of an acceptable internal consistency (Hair et al., 1992; Joe, 1993; Nunnaly, 1978).

Hypothetically, a non-significant chi-square test would provide evidence to support that the model fits reasonably for the data as it can elucidate the sum of differences between observed and expected outcome frequencies. However, because the test is biased towards large samples (Kline, 2005), additional statistics and fit indices were used to assess the adequacy of the measurement and proposed research models. The fitness of the model was assessed by estimating the ratio of the chi-square ($\chi 2$) to the degrees of freedom. An estimated ratio between 1 and 3 was considered as evidence of a good model fit (Chin & Todd, 1995). In addition, a good model fit was evaluated based on a root-mean-square error of approximation (RMSEA) less than 0.06; standardised root mean square residual (SRMR) less than 0.08, Tucker-Lewis index (TLI), comparative fit index (CFI) (Hu & Bentler, 1999),

and a penalised normed fit index close to 0.60 (Chin & Todd, 1995; Hu & Bentler, 1999; Schreiber et al., 2006).

## 3.3 Study 3: Uncovering Insights into Sexuality Issues based on Social Media Interactions

### *3.3.1 Data collection*

To achieve this objective, I leveraged data from the peer-led Facebook group presented in ***study 1***. According to data from Facebook insights, there were 175,858 participants in the group at the time of this study. The majority of these were living in Nigeria (91%), with a lower percentage of participants from other African countries, including Ghana (0.6%), South Africa (0.4%), Kenya (0.3%), and the Republic of Benin (0.3%). About 51% of the participants were women, and about three-quarters were young adults aged 18-34 years (76%).

The demographic diversity of participants in the group made it a valuable resource for studying diverse perspectives on the pathways through which saving sex for marriage might be associated with marital bliss. In addition, all participants in the group were free to post messages and comments in the group allowing diverse perspectives from all participants. A total of 3,533 sexuality messages shared on the group between June 1, 2018, and May 31, 2019, were retrieved using a data scraping application installed directly on the group with administrative rights. Consent to retrieve and analyse the data was obtained from the group creator. This paper presents only a sample of 100 public wall posts with 3,860 comments related to sexual abstinence *(See Fig. 3.2 for a sample of messages retrieved).* All wall posts and comments were in English.

### *3.3.2 Data analysis*

All the wall posts and comments retrieved from the group were first stored in Microsoft Excel and subsequently analysed in Atlas.ti v. 8. To code and analysed the data, I relied primarily on Braun and Clarke's (2006, 2020) and Braun et al. (2019) reflexive method for thematic analysis. This analytical approach is widely used in qualitative research to identify, analyse, and report patterns (themes) within a large qualitative dataset, including social media data. One of the advantages of this reflexive approach to thematic analysis is that it is theoretically flexible and can be used within different frameworks to answer distinct types of research questions, including questions related to people's experiences which is the locus of this study. It is also a useful method for summarizing key features of a large data set and examining the perspectives of different research participants, highlighting similarities and differences, and generating unanticipated insights to produce a clear and comprehensive analysis of the problem under study (Braun & Clarke, 2006).

An inductive coding approach was used to identify emergent themes and commonalities in how posts and comments on the group conceptualise virginity and how it may be beneficial for a marriage. In my analysis, I took a critical realist perspective to features of the data. To enhance the study findings' analysis and reporting, I followed the six steps of credible thematic analysis outlined by Braun & Clarke (2006) and Nowell et al. (2017). The analysis of the data extract began with an initial familiarisation with the data that involves reading and re-reading the texts in the datasets to become deeply familiar with the texts. During this phase, I also documented reflective thoughts and ideas about the coding topic that I referred to in the subsequent phases (Sandelowski, 1995). Succinct labels that capture the entire dataset's key features were subsequently generated and revised in the second phase and as the coding process proceeded. During the production

of codes, I gave full and equal attention to each data extract, including those that diverged from the data's dominant idea.

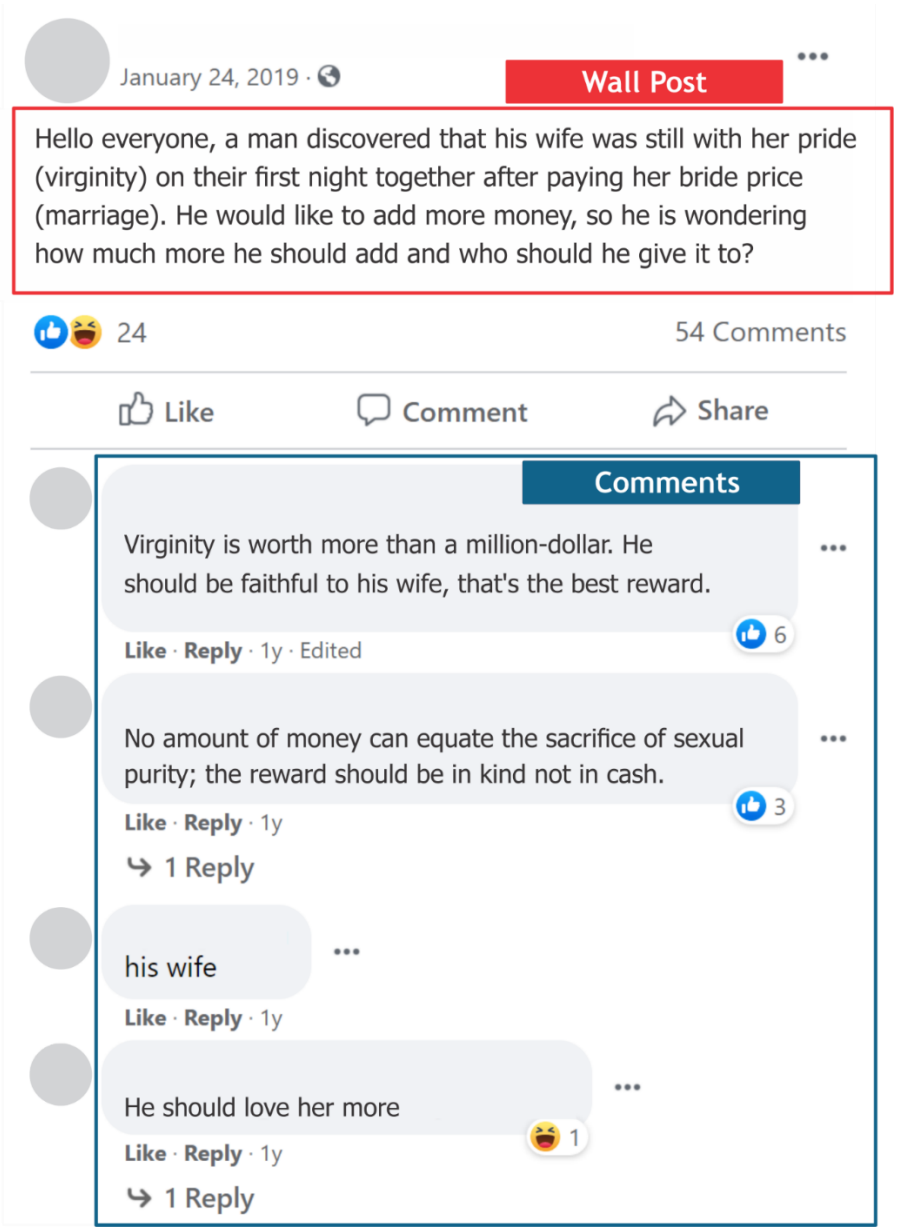



**Figure 3.2: An example of wall posts and comments related to marriage and sexuality on the group**

The generated codes were then pooled together to identify and evaluate potential themes' viability (Braun & Clarke, 2006; DeSantis & Ugarriza, 2000). The themes' creation was data-driven to produce a detailed description of the overall data (Boyatzis, 1998; Braun & Clarke, 2006). During this phase, four main themes and multiple subthemes were generated, including those that were marginally relevant for the study as they play a significant role in enriching the study (King, 2004; Nowell et al., 2017). The coded data extracts for each candidate theme were reviewed accordingly to ensure an articulate discourse pattern. This involved deleting code that substantially overlaps with other codes. The selected themes were further refined to capture a set of ideas that accurately reflect the meanings evident in the data set as a whole (Braun & Clarke, 2006). The final phases of the analysis involved the defining and naming of themes. Consideration was given to how each of the themes fits into the overall story about the textual data and the overarching aim of the study. The themes were considered final after all the data had been thoroughly read and the coding reviewed (King, 2004). During this stage, three main themes emerged with multiple subthemes. The themes were organised and ordered in a way that best reflects the data.

## 3.4 Ethical Approval

The research received approval from the University of the Witwatersrand non-medical human research ethics committee. Study 1 and study 3 used publicly available wall posts on a public Facebook group. The use of data from an online forum raises a few ethical concerns. The most significant of these is that posts and comments from the group have been used in this study without the authors' permission, since obtaining permission from every poster or author in the group is practically impossible. As a result, a waiver of consent was obtained from the ethics committee at the University of the Witwatersrand (H19/02/25). Despite this, written permission was obtained from the creator of the group

before the retrieval of data from the group. No incentive was offered to the creator of the group nor the members of the group. In addition, efforts were made to comply with all ethical standards both in retrieving and analysing the data. As an extra precautionary measure to protect the identity and enhance participants' confidentiality, all quotes used in this study were rephrased, and the data extract also does not contain any personal or identifying information of the authors. Specifically, the data presented in this report does not include the name of the Facebook group from which the data was extracted or the authors who posted on the group.

Study 2 involves an online survey posted on Facebook. Potential participants were instructed to read the information page and the associated answers to some frequently asked questions before attempting the survey. The information page included sufficient details about the survey and supplementary information that would be collected, including IP address, attention checks, and their mobile number should they wish to enter the draw for 5GB internet data. After reading the information statement, potential participants provided formal consent by clicking on an "I agree to participate in this survey, proceed" button. Participants were aware that they could quit the survey at any time should they not wish to proceed.

# Chapter Four

# Patterns of Young Adults Interaction with Peer-Led Sexual Health Information on Social Media

## 4.1 Characterising Peer-Communicated Sexual Health Information by Topic, Strategy, Type, and Tone of Communication

Table 4.1 presents a summary description of messages shared on the group by topic classification, strategy, and tone. Most of the messages on the group were about relationships and dating, while about 40% of the messages were on sexual abstinence or purity. Regarding strategy, close to one-quarter of the messages were regular status updates, while approximately 10% of the messages requested opinions and approximately 14% told a story. Finally, the tone of about one-quarter of the messages evoked fear, stigma, or guilt.

**Table 4.1: Distribution of sexuality education on the peer-led Facebook group by topics, strategy, and tone of communication**

| Classification | Freq | Percentage |
|---|---|---|
| **Topic** | | |
| Abuse | 130 | 3.70% |
| Birth Control and Abortion | 38 | 1.10% |
| Intimate Relations | 1,959 | 55.40% |
| Sexual Abstinence | 1,018 | 28.80% |
| Sexual Purity | 388 | 11.00% |
| **Strategy** | | |
| Status Update | 2,594 | 73.40% |
| Experience Sharing | 81 | 2.30% |
| Request for Opinion | 351 | 9.90% |
| Storytelling | 507 | 14.40% |
| **Tone** | | |
| Fear | 331 | 9.40% |
| Guilt | 373 | 10.60% |
| Neutral | 2,718 | 76.90% |
| Stigma | 111 | 3.10% |
| **Tone** | | |
| Test Only | 2,730 | 77.3% |
| Link | 26 | 0.7% |
| Photo or Video | 777 | 22.0% |

A cross-classification of messages on the group by topic, strategy, and tone of communication is presented in Figure 4.1. The results showed that about 46% of messages on abuse were evoked by telling a story. This is in comparison to the distribution among birth control and abortion messages (21%), intimate relations (14%), sexual abstinence

(11%), and sexual purity (12). Requests for opinions were more common among family planning messages (13%) and sexual abstinence (12%). Furthermore, topic classification across tone showed that more than half of birth control and abortion messages evoked fear (26%), stigma (5%), or guilt (21%). Similarly, 41% and 33% of sexual abstinence and purity messages evoked fear, stigma, or guilt.

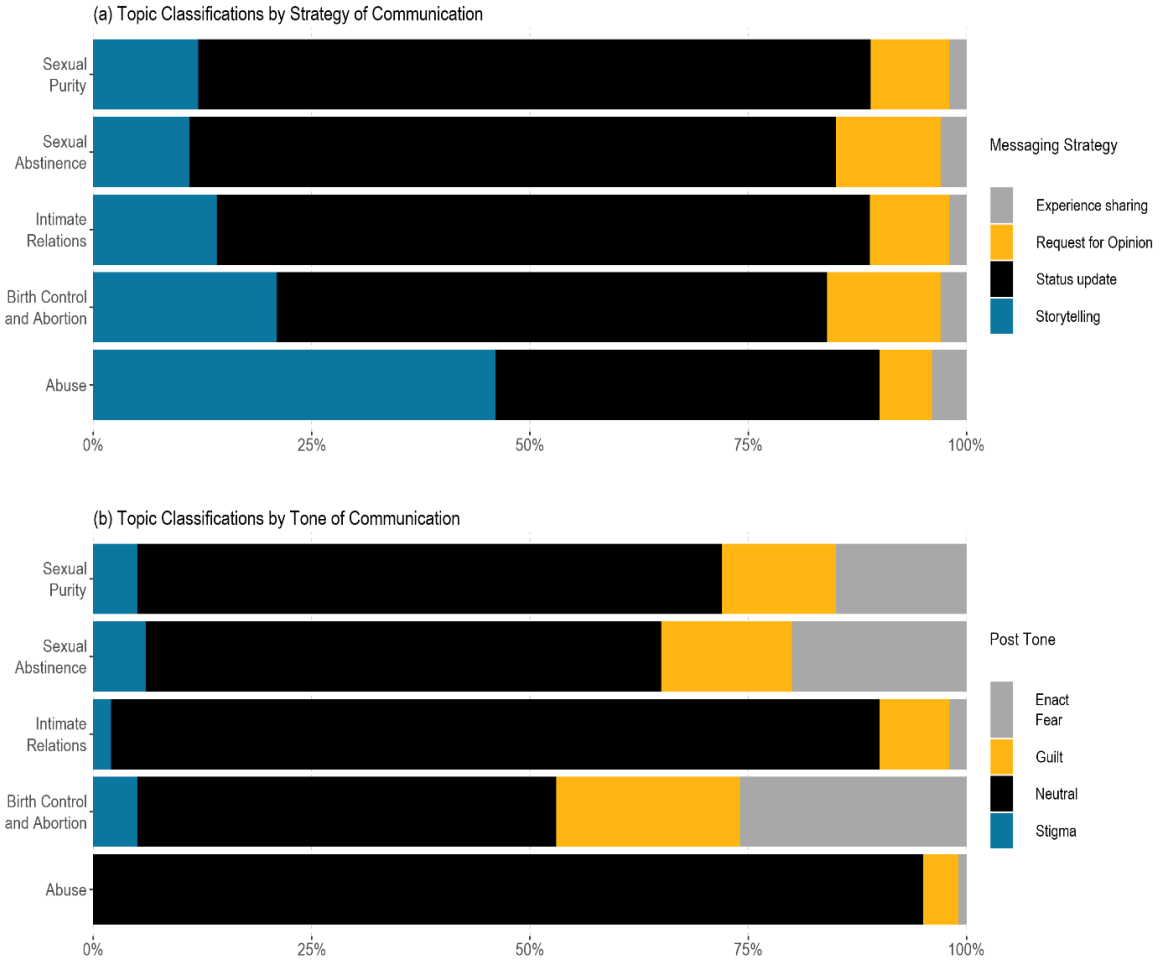



**Figure 4.1: Topic classifications by strategy and tone of communication**

## 4.2 Interaction and Propagation of Sexual and Reproductive Health Messages

The level of interaction for all sexual health information shared on the group is presented in Figure 4.2. It emerged that the median level of interaction was highest for reactions ($\tilde{x}$ = 54) and comments ($\tilde{x}$ = 10) but lower for post shares ($\tilde{x}$ = 10).

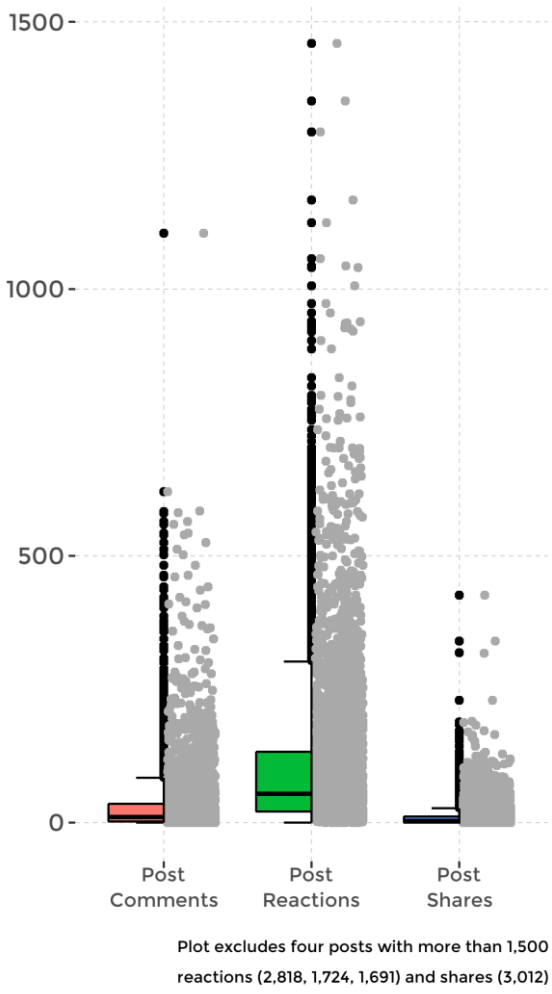



**Figure 4.2: Counts of message interaction and propagation**

The results of the multiple negative binomial regression model showed that interactions with messages on abuse were significantly different from interactions with messages on intimate relations in terms of the number of reactions and shares (see Table

4.2). Members of the group were significantly more likely to react to [IRR: 1.14, 95%CI: 1.04-1.24], and comment on [IRR: 1.26, 95%CI: 1.12-1.43], sexual abstinence-based messages compared to messages on intimate relations. Compared to messages on intimate relations, those in the group were significantly less likely to share messages on abuse [OR:0.34, 95%CI: 0.26-0.46], sexual abstinence [IRR: 0.56, 95%CI: 0.49-0.63], and sexual purity [IRR: 0.57, 95%CI: 0.48-0.69].

Messages that evoked fear [OR:0.75, 95%CI: 0.66-0.86] or guilt [OR:0.82, 95%CI: 0.72-0.92] received a significantly lower number of reactions compared to neutral messages. Messages that evoked fear [IRR: 0.81, 95%CI: 0.67-0.99] also received a significantly fewer number of comments, while stigma-based messages [IRR: 1.55, 95%CI: 1.13-2.06] received a significantly higher number of comments compared to neutral messages. No statistically significant differences were observed in the propagation (number of shares) of messages by communication tone.

Sharing an experience or telling a story were associated with a higher number of reactions and comments than counselling. Messages requesting an opinion also had a significantly higher number of comments [IRR: 4.25, 95%CI: 3.57-5.10] but a lower number of reactions [IRR: 0.48, 95%CI: 0.43-0.55] and shares [IRR: 0.13, 95%CI: 0.11-0.16] compared to counselling messages. Including a photo in messages was associated with a higher number of reactions [IRR: 1.76, 95%CI: 1.61-1.92], comments [IRR: 1.16, 95%CI: 1.02-1.32], and shares [IRR: 1.91, 95%CI: 1.68–2.16] compared to text-only messages. Including a link, on the other hand, was associated with a lower number of reactions [IRR: 0.17, 95%CI: 0.11 - 0.27], comments [IRR: 0.16, 95%CI: 0.09 - 0.31], and shares [IRR: 0.34, 95%CI: 0.19 - 0.67] compared to text-only messages.

**Table 4.2: Associations between message classification and the indices of message interaction and propagation**

| Characteristics | Total Interactions | | Number of Reactions | | Number of Comments | | Number of Shares | |
|---|---|---|---|---|---|---|---|---|
| | IRR | 95% CI | IRR | 95% CI | IRR | 95% CI | IRR | 95% CI |
| **Topic** | | | | | | | | |
| Intimate Relations | Reference | | Reference | | Reference | | Reference | |
| Abuse | 0.73** | 0.6 - 0.91 | 0.75** | 0.62 - 0.92 | 0.9 | 0.69 - 1.2 | 0.34*** | 0.26 - 0.46 |
| Birth Control and Abortion | 0.87 | 0.62 - 1.29 | 0.88 | 0.63 - 1.28 | 0.89 | 0.55 - 1.55 | 0.83 | 0.50 - 1.49 |
| Sexual Abstinence | 1.11* | 1.02 - 1.22 | 1.14** | 1.04 - 1.24 | 1.26*** | 1.12 - 1.43 | 0.56*** | 0.49 - 0.63 |
| Sexual Purity | 0.98 | 0.86 - 1.11 | 1.00 | 0.89 - 1.13 | 1.02 | 0.86 - 1.22 | 0.57*** | 0.48 - 0.69 |
| **Tone** | | | | | | | | |
| Neutral | Reference | | Reference | | Reference | | Reference | |
| Fear | 0.78*** | 0.68 - 0.9 | 0.75*** | 0.66 - 0.86 | 0.81* | 0.67 - 0.99 | 1.21 | 1.00 - 1.47 |
| Guilt | 0.84** | 0.74 - 0.95 | 0.82** | 0.72 - 0.92 | 0.94 | 0.80 - 1.12 | 0.99 | 0.83 - 1.18 |
| Stigma | 1.17 | 0.95 - 1.47 | 1.12 | 0.92 - 1.4 | 1.51** | 1.13 - 2.06 | 1.21 | 0.91 - 1.66 |
| **Strategy** | | | | | | | | |
| Status Update | Reference | | Reference | | Reference | | Reference | |
| Experience sharing | 2.22*** | 1.74 - 2.88 | 2.25*** | 1.78 - 2.89 | 2.46*** | 1.77 - 3.53 | 1.72** | 1.24 - 2.47 |
| Request for opinion | 1.10 | 0.97 - 1.26 | 0.48*** | 0.43 - 0.55 | 4.25*** | 3.57 - 5.1 | 0.13*** | 0.11 - 0.16 |
| Storytelling | 1.46*** | 1.31 - 1.63 | 1.42*** | 1.28 - 1.59 | 1.69*** | 1.45 - 1.96 | 1.5*** | 1.29 - 1.75 |
| **Type** | | | | | | | | |
| Text only | Reference | | Reference | | Reference | | Reference | |
| Link | 0.18*** | 0.12 - 0.29 | 0.17*** | 0.11 - 0.27 | 0.16*** | 0.09 - 0.31 | 0.34*** | 0.19 - 0.67 |
| Photo | 1.64*** | 1.5 - 1.8 | 1.76*** | 1.61 - 1.92 | 1.16* | 1.02 - 1.32 | 1.91*** | 1.68 - 2.16 |
| Observations | 3,533 | | 3,533 | | 3,533 | | 3,533 | |
| Log Likelihood | -21,049.05 | | -19,789.82 | | -14,468.14 | | -10,931.93 | |
| theta | 0.78*** (0.02) | | 0.84*** (0.02) | | 0.42*** (0.01) | | 0.43*** (0.01) | |
| Akaike Inf. Crit. | 42,124.09 | | 39,605.65 | | 28,962.28 | | 21,889.87 | |

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; *CI: Confidence interval; IRR: Incidence Rate Ratios*

## 4.3 Summary of the Chapter

This chapter examined the message features associated with the interaction and propagation of peer-communicated sexual health messages on social media. The data are based on peer-generated messages on a peer-led Facebook group that facilitates sexuality discussions. Table 4.3 below presents a summary of the hypotheses/relationships tested in this chapter, many of which were supported by the data.

Specifically, the number of comments, likes, and shares received by each peer-generated sexual health information differs by message topic, strategy, tone, and type in most instances. Most importantly, the use of multimedia content was significantly associated with a higher number of comments, likes, and shares. Overall, these findings could motivate the design of useful and engaging content for advancing young African adults' sexual and reproductive health. This opportunity may help empower the sexual and reproductive health rights of young African adults and reduce some of the misinformation that impedes progress.

**Table 4.3: Summary of Hypothesis Tested**

| Hypothesis | Result |
|---|---|
| Number of Reactions ⇐ Message Topic | Not Supported |
| Number of Reactions ⇐ Message Tone | Supported |
| Number of Reactions ⇐ Message Strategy | Supported |
| Number of Reactions ⇐ Multimedia Use | Supported |
| Number of Comments ⇐ Message Topic | Supported |
| Number of Comments ⇐ Message Tone | Supported |
| Number of Comments ⇐ Message Strategy | Supported |
| Number of Comments ⇐ Multimedia Use | Supported |
| Number of Shares ⇐ Message Topic | Supported |
| Number of Shares ⇐ Message Tone | Not Supported |
| Number of Shares ⇐ Message Strategy | Supported |
| Number of Shares ⇐ Multimedia Use | Supported |

***Note: All the hypotheses were tested at a 0.05 level of significance.*

*Supported – Fail to accept the null hypothesis*

*Not Supported – Accept the null hypothesis*

# Chapter Five

# Acceptability and Use of Social Media for Sexual Health Communication among Young African Adults

## 5.1 Participants Demographics

A total of 1,190 responses were received during the recruitment period. About 13% of these were excluded as they were ineligible for participation in the study. An additional 8% of the responses with missing information on demographic characteristics were also excluded from the analysis. Furthermore, I excluded multiple attempts of the survey from further analysis. This exclusion resulted in a final data sample of 936 young adults residing in Kenya, South Africa, and Nigeria.

The demographic characteristics of the study participants are presented in Table 5.1. The mean age of the participants was 20.8 years (SD = 1.90). More than half of the participants were females (57%), and about 44% of the participants resided in Kenya at the time of data collection. Most of the participants had tertiary or higher education (64%), and about half were not married nor in a romantic relationship (48%). In comparison, about 47% were not married but in a romantic relationship at the time of data collection.

**Table 5.1: Sociodemographic characteristics of young adults in the sample**

| Characteristics | Frequency (per cent) |
|---|---|
| Age | 20.8 (1.90) |
| Sex: | |
| Female | 534 (57.1%) |
| Male | 402 (42.9%) |
| Country: | |
| Kenya | 410 (43.8%) |
| Nigeria | 278 (29.7%) |
| South Africa | 248 (26.5%) |
| Education: | |
| < Tertiary | 342 (36.5%) |
| Tertiary/Higher | 594 (63.5%) |
| Relationship Status: | |
| Not married: not in relationship | 448 (47.9%) |
| Not married: in a relationship | 435 (46.5%) |
| Married/Living with Partner | 53 (5.6%) |

## 5.2 Acceptability of Social Media for Sexual Health Communication

Figure 5.1 presents the acceptability of social media for sexual health communication among the study participants. About 84% of the young adults in the sample reported that social media was acceptable for sexual health communication. Among the platforms most preferred for sexual health communication, the participants reported that social media platforms such as Facebook (40%), WhatsApp (15%), Twitter (3%), and Instagram (2%) were

the most preferred digital platforms for sexual health communication. About 20% of the young adults reported that their most preferred digital platform for sexual communication was a dedicated website.

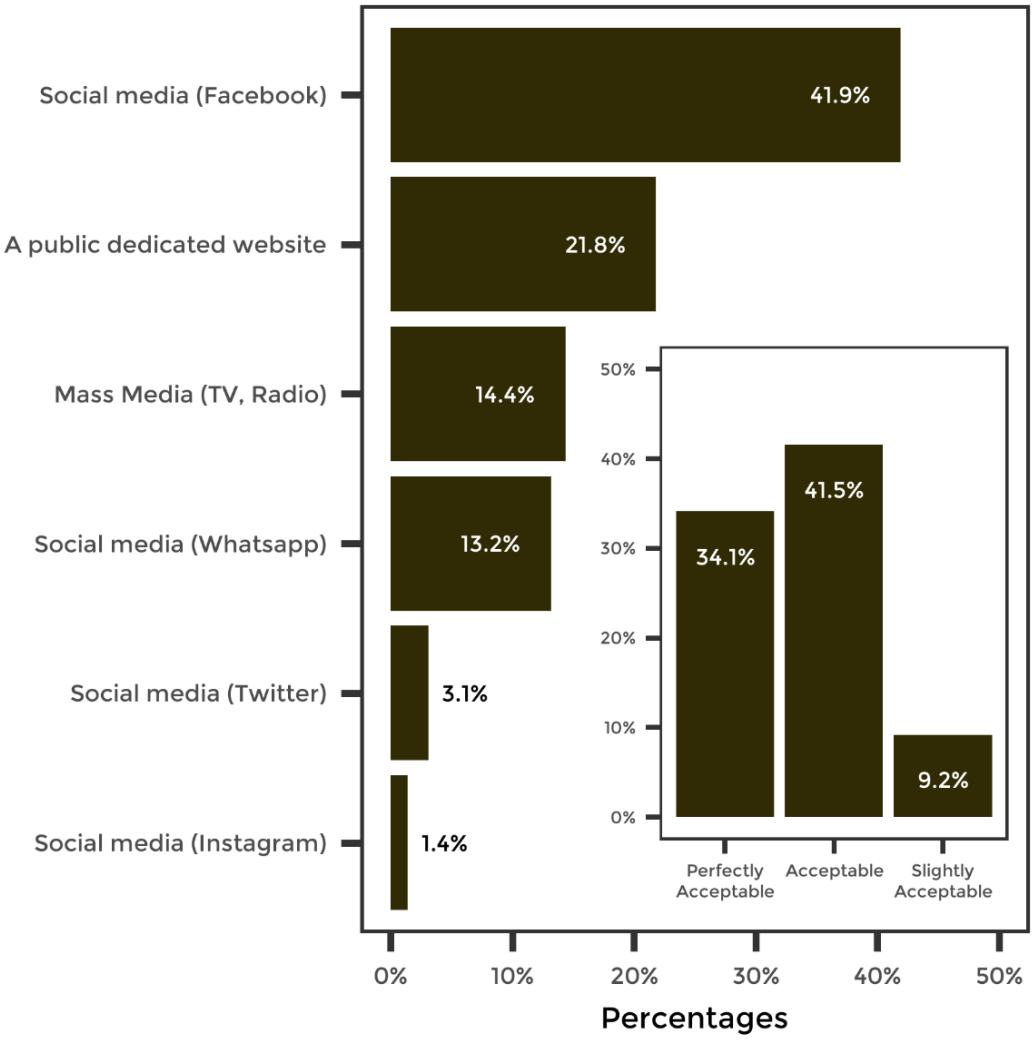



**Figure 5.1: Level of acceptance and use of social media for sexual health communication**

**Table 5.2: Descriptive statistics of measurement constructs**

| Item | Question | Standard Loading | R-squared | Mean | SD | Min | Max |
|---|---|---|---|---|---|---|---|
| **Performance Expectancy** | | | | | | | |
| PE01 | Interacting with sexual health information on a credible social media group will help me to know and improve my sexual rights. | 0.82 | 0.68 | 5.87 | 1.12 | 1 | 7 |
| PE02 | Interacting with sexual health information on a credible social media group can contribute to improvements in my sexual and reproductive health. | 0.88 | 0.77 | 5.81 | 1.12 | 1 | 7 |
| PE03 | Interacting with sexuality education on social media would help me to make better and informed decisions about my sexual health. | 0.80 | 0.65 | 5.81 | 1.07 | 1 | 7 |
| **Attitude** | | | | | | | |
| AT01 | Interacting with sexual health information on a credible social media group is a bad idea. | 0.89 | 0.79 | 4.76 | 1.43 | 1 | 7 |
| AT02 | Seeking other people's opinion about sexual health issues on a credible social media group strikes me as a poor way to seek help. | 0.68 | 0.46 | 4.41 | 1.50 | 1 | 7 |
| AT03 | Interacting with sexual health information on a credible social media group is somewhat intimidating to me. | 0.85 | 0.73 | 4.24 | 1.40 | 1 | 7 |
| **Effort Expectancy** | | | | | | | |
| EE01 | Interacting with sexual health information on a credible social media group will be easy for me. | 0.83 | 0.69 | 5.34 | 1.19 | 1 | 7 |
| EE02 | Interacting with other people in a credible social media group for sexual health information will be easy for me. | 0.84 | 0.70 | 5.17 | 1.25 | 1 | 7 |

**Table 5.2 *(cont.)*: Descriptive statistics of measurement constructs**

| Item | Question | Standard Loading | R-squared | Mean | SD | Min | Max |
|---|---|---|---|---|---|---|---|
| **Social Influence** | | | | | | | |
| SI01 | My family will disapprove of me interacting with sexual health information on a credible social media group. | 0.79 | 0.62 | 4.01 | 1.62 | 1 | 7 |
| SI02 | People who are important to me will disapprove of me interacting with sexual health information on a credible social media group. | 0.81 | 0.66 | 4.11 | 1.58 | 1 | 7 |
| SI03 | People who share the same religious belief with me will disapprove of me interacting with sexual health information on a credible social media group. | 0.84 | 0.70 | 3.93 | 1.62 | 1 | 7 |
| SI04 | My religious beliefs do not support interacting with sexual health information on public platforms like social media, even if it is by a credible organisation. | 0.70 | 0.50 | 4.44 | 1.58 | 1 | 7 |
| **Facilitating Condition** | | | | | | | |
| FC02 | Interacting with sexuality education on social media fits well with how I like to interact with other social media issues. | NA | NA | 5.03 | 1.21 | 1 | 7 |
| **Behavioural Intention to Interact** | | | | | | | |
| BII01 | If I am a member of a credible social media platform for sexual health information, I will be active and LIKE relevant posts. | 0.86 | 0.75 | 5.49 | 1.21 | 1 | 7 |
| BII02 | If I am a member of a credible social media platform for sexual health information, I will be active and COMMENT on relevant posts. | 0.88 | 0.77 | 5.42 | 1.21 | 1 | 7 |
| BII03 | If I am a member of a credible social media platform for sexual health information, I will be active and SHARE/RETWEET relevant posts. | 0.84 | 0.71 | 5.32 | 1.24 | 1 | 7 |
| **Behavioural Intention to Use** | | | | | | | |
| BIU01 | I would like to join and interact with sexuality education on social media. | 0.86 | 0.74 | 5.35 | 1.19 | 1 | 7 |
| BIU02 | If I am introduced to a credible social media group/page for sexual health education, I will join. | 0.87 | 0.76 | 5.46 | 1.20 | 1 | 7 |

**Table 5.3: Measurement model and correlations among constructs**

| Constructs | Cronbach Alpha | Composite Reliability (CR) | AVE | Correlations among the Constructs | | | | | | Discriminant Validity | Convergent Validity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Attitude | Effort Expectancy | Performance Expectancy | Social Influence | Intention to Use | Intention to Interact | | |
| Attitude | 0.81 | 0.89 | 0.65 | **0.808** | | | | | | Established | Established |
| Effort Expectancy | 0.82 | 0.82 | 0.70 | 0.162 | **0.835** | | | | | Established | Established |
| Performance Expectancy | 0.87 | 0.88 | 0.70 | 0.215 | 0.587 | **0.837** | | | | Established | Established |
| Social Influence | 0.88 | 0.83 | 0.62 | 0.576 | 0.138 | 0.092 | **0.787** | | | Established | Established |
| Intention to Use | 0.86 | 0.86 | 0.75 | 0.258 | 0.556 | 0.501 | 0.251 | **0.867** | | Established | Established |
| Intention to Interact | 0.90 | 0.90 | 0.74 | 0.222 | 0.539 | 0.467 | 0.231 | 0.789 | **0.861** | Established | Established |

## 5.3 Measurement Model Result

Table 5.2 presents the means and standard deviations for the selected items of each construct. The mean values of all constructs (except for social influence) were either close or above five, indicating that most participants responded favourably to all the constructs. However, a relatively lower mean value of around four for the items for the construct of social influence indicated that respondents did not respond positively to the items related to this construct. A relatively higher standard deviation (particularly close to 1.5 or higher) for every item of the construct of social influence indicated that responses relatively diverged across the corresponding mean values and that the respondents offered varying opinions about the questions asked of them. The factor loadings for all the items were greater than the threshold value of 0.5 and statistically significant (Fornell & Larcker, 1981).

Table 5.3 illustrates the result of the test for convergent and discriminant validity. All the constructs exhibited an acceptable level of convergent validity as exhibited in the composite reliability above 0.7, and the average variance extracted greater than 0.5. The evaluation of divergent validity indicated that the square root of the average variance extracted for each construct was greater than the correlation value for any pair of constructs. For example, the correlation between performance and effort expectancy was 0.587, which was less than the AVE's square root for both constructs (PE = 0.837, EE = 0.835). In addition, the correlation between intention to (use) access sexual health information on social media and intention to interact was 0.789, which was less than the square root of the AVE for both constructs (BII = 0.867, BIU = 0.861). The measurement model's fit indices were also above the desired minimum acceptable level providing evidence of a satisfactory model fit. Generally, the measurement model results designated that all constructs' measures confirmed acceptable values for reliability and validity.

**Table 5.4: Summary of model fit indices and recommended values**

| Fit statistics | Recommended Value | Model value |
|---|---|---|
| Chi-Square ($\chi^2$)/Degree of Freedom (DF) | ≤ 3.00 | 2.39 |
| Probability Value (p-value) | ≥ 0.05 | 0.00 |
| Root Mean Square Error Approximation (RMSEA) | ≤ 0.060 | 0.04 |
| Tucker-Lewis Index (TLI) | ≥ 0.95 | 0.97 |
| Comparative Fit Index (CFI) | ≥ 0.95 | 0.97 |
| Normed Fit Index (NFI) | ≥ 0.95 | 0.96 |
| Penalised Normed Fit Index (PNFI) | ≥ 0.60 | 0.77 |

## 5.4 Structural Model Result

The overall model fit was adequate, as can be seen from Table 5.4. All the model fit for the structural model, including RMSEA (0.04), SRMR (0.04), TLI (0.97), and CFI (0.97), were reasonably above the recommended threshold. The ratio of the chi-square ($\chi$2) to the degrees of freedom was also 2.39, which is lower than the recommended value of 3.00.

The full research model results are presented in Table 5.5. The analysis showed that performance expectancy ($\beta$ =0.18, P < 0.001), social influence ($\beta$ =0.09, P = 0.029), effort expectancy ($\beta$ =0.25, P < 0.001), facilitating conditions ($\beta$ =0.33, P < 0.001), and attitude ($\beta$ =0.10, P = 0.019) were significantly associated with the intention to access sexual health information on social media. In addition, performance expectancy ($\beta$ =0.16, P < 0.001), social influence ($\beta$ =0.10, P = 0.041), effort expectancy ($\beta$ =0.27, P < 0.001), and facilitating conditions ($\beta$ =0.30, P < 0.001) but not attitude ($\beta$ =0.07, P > 0.05), had a significant influence on young adult's intention to interact with sexual health information on social media. None of the control variables was significantly associated with the intention to use or

interact with sexual health information. Overall, the structural model results showed that about 47% of the variance in intention to use social media and 42% of the variance in social media interaction were explained by the model.

## 5.5 Supplemental Analyses

Thus far, I have examined the acceptability and use of social media for sexual health communication among young adults in African countries. In the main analysis, the models were based on data from the full sample of young adults who were eligible for participation in the survey and provided complete information on their key socio-demographics. However, prior evidence has suggested that data from non-attentive participants add noise to the data and induce both measurement and nonresponse errors (Gummer et al., 2018). Excluding non-attentive participants could also threaten the external validity and limit the generalisability of the research (Olamijuwon, 2021; Oppenheimer et al., 2009).

**Table 5.5: Summary of structural model results**

| Characteristics | Intention to Use | | | Intention to Interact | | | Attitude | | | Effort Expectancy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Estimate | p-value | Confidence Interval | Estimate | p-value | Confidence Interval | Estimate | p-value | Confidence Interval | Estimate | p-value | Confidence Interval |
| Performance Expectancy | 0.18 | 0.001 | [0.085; 0.311] | 0.16 | 0.002 | [0.068; 0.292] | 0.18 | 0.000 | [0.128; 0.361] | | | |
| Social Influence | 0.09 | 0.047 | [0.001; 0.142] | 0.10 | 0.041 | [0.003; 0.154] | 0.56 | 0.000 | [0.461; 0.652] | 0.07 | 0.067 | [-0.004; 0.111] |
| Effort Expectancy | 0.25 | 0.000 | [0.143; 0.364] | 0.27 | 0.000 | [0.173; 0.396] | -0.03 | 0.565 | [-0.155; 0.085] | | | |
| Facilitating Conditions | 0.33 | 0.000 | [0.211; 0.345] | 0.30 | 0.000 | [0.191; 0.327] | | | | 0.50 | 0.000 | [0.342; 0.467] |
| Attitude | 0.10 | 0.019 | [0.014; 0.148] | 0.07 | 0.106 | [-0.012; 0.126] | | | | | | |
| Age | -0.04 | 0.166 | [-0.058; 0.01] | -0.01 | 0.819 | [-0.038; 0.03] | | | | | | |
| Gender = Male | 0.00 | 0.965 | [-0.116; 0.111] | 0.01 | 0.680 | [-0.093; 0.142] | | | | | | |
| Relationship Status = Yes | 0.04 | 0.133 | [-0.027; 0.201] | 0.02 | 0.477 | [-0.075; 0.16] | | | | | | |
| Education = Tertiary | 0.05 | 0.067 | [-0.008; 0.237] | 0.01 | 0.657 | [-0.098; 0.155] | | | | | | |
| Country = Kenya | 0.05 | 0.073 | [-0.01; 0.225] | -0.01 | 0.636 | [-0.15; 0.091] | | | | | | |
| Model $R^2$ | 0.466 | | | 0.417 | | | 0.357 | | | 0.264 | | |

As a supplement, I, therefore, excluded participants who were believed to have provided low-quality responses based on three screener questions. This group comprised about 38% of the unique participants who failed to pass at least two attention check questions. The research model was subsequently re-specified using data from a net sample of 585 young adults in Kenya, Nigeria, and South Africa who demonstrated that they have carefully attempted the survey. Furthermore, because those who passed and those who failed the attention check differed on key sociodemographic characteristics such as age and sex, the research model was again re-specified using the same net sample of 585 young adults weighted for nonresponse.

**Table 5.6: Sociodemographic characteristics of young adults in the sample**

| Characteristics | Gross Sample | Unweighted Percentage (n = 585) | Weighted Percentage (n = 585) |
|---|---|---|---|
| **Sex** | | | |
| Female | 353 | 60.34 | 56.82 |
| Male | 232 | 39.66 | 43.18 |
| **Country** | | | |
| Kenya | 257 | 43.93 | 43.59 |
| Nigeria | 183 | 31.28 | 29.67 |
| South Africa | 145 | 24.79 | 26.73 |
| **Education** | | | |
| < Tertiary | 194 | 35.02 | 36.30 |
| Tertiary/Higher | 360 | 64.98 | 63.70 |
| **Relationship Status** | | | |
| Not married: not in relationship | 285 | 48.72 | 48.03 |
| Not married: in a relationship | 261 | 44.62 | 44.75 |
| Married/living with partner | 39 | 6.67 | 7.22 |

The nonresponse weights were created based on a combination of the key sociodemographic characteristics such as age, sex, education, and relationship status (Höfler et al., 2005; Kreuter et al., 2010). The research model for the weighted net sample was estimated using the MLMVS estimator in the **`lavaan.survey`** package (Oberski,

2014). The research model's result and the fit indices from both data (weighted and unweighted) sources were subsequently compared to the initial result from the gross sample (n = 936).

A summary descriptive profile of participants in the net sample (weighted and unweighted) is in Table 5.6 above. All the fit indices for both data sources were within the recommended threshold (see Table 5.7) and very similar to the main model results (see Table 5.5). However, most of the fit indices for the models based on the gross sample were better than the fit indices for the model based on the weighted and unweighted net sample. More importantly, the root mean squared error (RMSE) for the gross sample (0.039) was lower than the RMSE for the weighted (0.41) and unweighted sample (0.40). As Figure 5.2 illustrated, excluding non-attentive participants did not yield significantly different results (i.e., the coefficients did not change significantly), and there is evidence in support for most of the hypothesised paths. These supplemental analyses hint that the relationship between the main constructs of the research model and the intention to use and interact with sexual health information on social media did not differ significantly between the respondents who passed and those who failed to pass the attention check. To put it more precisely, I would have drawn the same conclusions from the analysis with and without inattentive respondents.

**Table 5.7: Summary of fit indices and recommended values for the supplementary models.**

| Fit statistics | Recommended Value | Weighted Net Sample (n = 585) | Unweighted Net Sample (n = 585) | Gross Sample (n = 936) |
|---|---|---|---|---|
| Chi-Square (X^2) | | 377.789 | 373.680 | 458.472 |
| Degree of Freedom (DF) | | 192.000 | 192.000 | 192.000 |
| Chi-Square (X^2)/Degree of Freedom (DF) | ≤ 3.00 | 1.968 | 1.946 | 2.388 |
| Probability Value (p-value) | ≥ 0.05 | 0.000 | 0.000 | 0.000 |
| Root Mean Square Error Approximation (RMSEA) | ≤ 0.05 | 0.041 | 0.040 | 0.039 |
| Standardised Root Mean Squared Residual (SRMR) | ≤ 0.08 | 0.051 | 0.053 | 0.043 |
| Tucker-Lewis Index (TLI) | ≥ 0.95 | 0.965 | 0.965 | 0.966 |
| Comparative Fit Index (CFI) | ≥ 0.95 | 0.972 | 0.973 | 0.973 |
| Penalised Normed Fit Index (PNFI) | ≥ 0.60 | 0.747 | 0.747 | 0.754 |

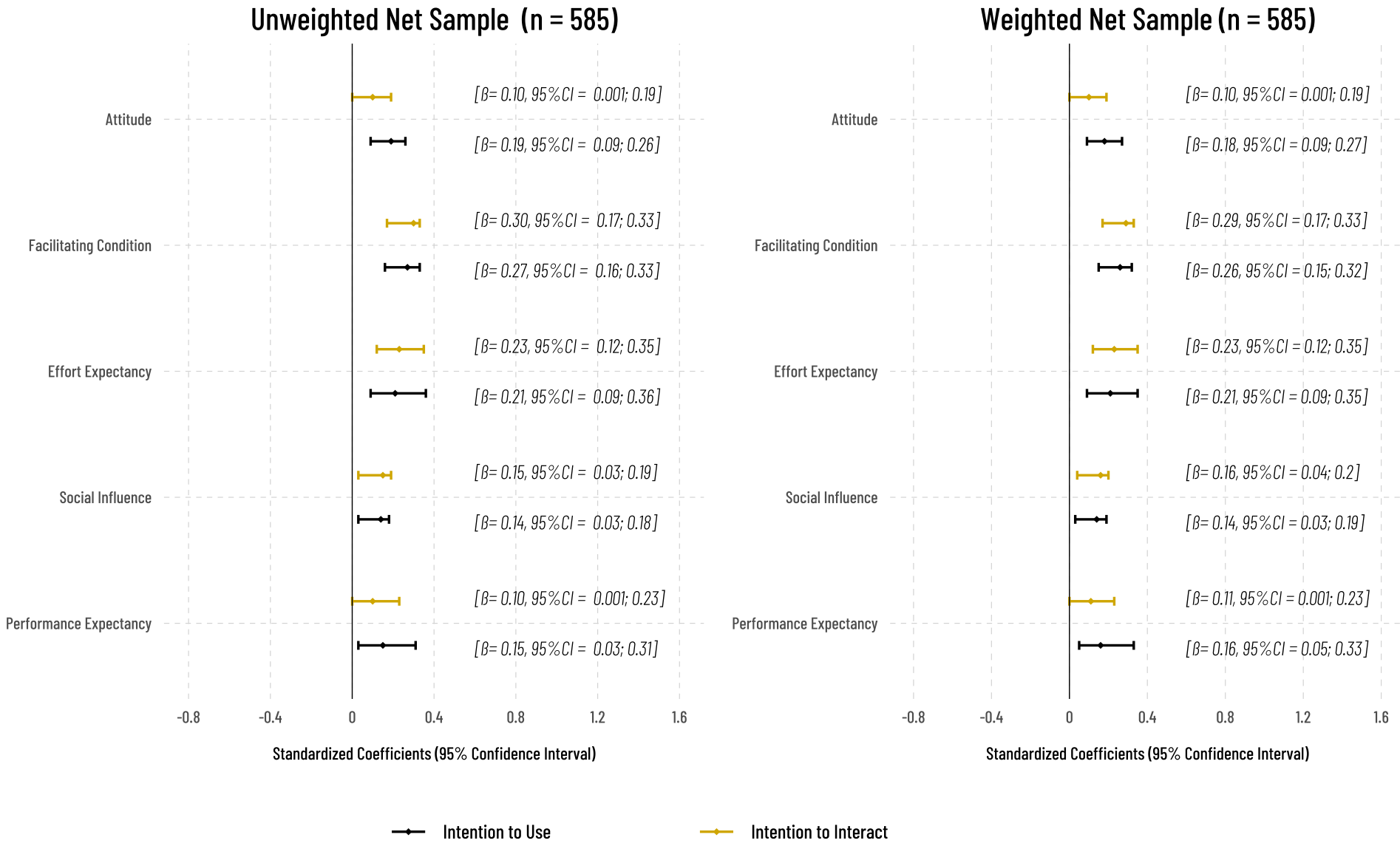



**Figure 5.2: Graphical presentation of the research model based on supplemental data**

## 5.6 Summary of the Chapter

In this chapter, I adapted the unified theory of acceptance and use of technology to predict the intention to use and interact with sexual health information on social media. The analysis is based on data obtained from young African adults who were recruited via Facebook. Table 5.8 below presents a summary of the hypothesis tested in this chapter. As highlighted, several of the hypothesised paths were supported by the data – higher ratings on the key constructs of the theoretical model are imperative for motivating the acceptance and use of social media for sexual health communication. The results show that performance expectancy, effort expectancy, social influence, facilitating conditions, and attitudes were significantly associated with the intention to use social media to access sexual health information. These constructs (except attitudes) were also significantly associated with the intention to interact with sexuality information on social media.

**Table 5.8: Summary of hypothesis tested**

| Hypothesis | Result |
|---|---|
| Effort Expectancy ⇐ Facilitating Conditions | Supported |
| Effort Expectancy ⇐ Social Influence | Supported |
| Attitude ⇐ Performance Expectancy | Supported |
| Attitude ⇐ Social Influence | Supported |
| Attitude ⇐ Effort Expectancy | Supported |
| Intention to Use Social Media ⇐ Performance Expectancy | Supported |
| Intention to Use Social Media ⇐ Social Influence | Supported |
| Intention to Use Social Media ⇐ Effort Expectancy | Supported |
| Intention to Use Social Media ⇐ Facilitating Conditions | Supported |
| Intention to Use Social Media ⇐ Attitude to Technology | Supported |
| Intention to Interact ⇐ Performance Expectancy | Supported |
| Intention to Interact ⇐ Social Influence | Supported |
| Intention to Interact ⇐ Effort Expectancy | Supported |
| Intention to Interact ⇐ Facilitating Conditions | Supported |
| Intention to Interact ⇐ Attitude to Technology | Not Supported |

***Note: All the hypotheses were tested at a 0.05 level of significance.*

*Supported – Reject the null hypothesis*

*Not Supported – Accept the null hypothesis*

# Chapter Six

# Uncovering Dominant Sexual Misconceptions based on Sexual Health Interactions among Young African Adults on Facebook

## 6.1 Introduction

Participants in the group painted a remarkably diverse picture of virginity loss and how it could be associated with marital bliss. The findings comprise three main themes: (1) describing virginity loss; (2) the perceived benefits of virginity until marriage; and (3) gendered dimension of virginity and marital bliss. The first theme describes how wall posts and comments on the group describe virginity and how they interpret its loss. This theme offers one vantage point to explore the ambiguity surrounding premarital sexual activity and how the participants crystalise virginity. Furthermore, the interpretations of virginity loss may also influence how they compensate for its loss, particularly in marriage. The second theme outlines the perception of the underlying processes through which saving sex for marriage may contribute to marital bliss, as reflected in the data extract. The theme explores the potential consequence of virginity loss for marital bliss and sexual identity. The last theme examines how the different couple's premarital sexual experiences may be associated with virginity loss. More importantly, this theme explores the sexual double

standards that emphasise virginity for women but virginity loss for men and the perceived implications of such experiences for marriage.

## 6.2 Describing Virginity Loss

### *6.2.1 What is virginity?*

Many wall posts and comments in the group describe virginity in terms of *"penetrative sexual intercourse"*, *"the absence of a hymen"*, and *"the shedding of blood"*. In like manner, some members of the group agreed that a woman could be a secondary virgin if she abstained from sexual activity after a first penetrative sexual experience. As reflected in multiple posts and comments on the group, the term *"secondary virgin"* was exclusively reserved for women who were victims of sexual abuse or those who pledged to abstain from sexual activity until marriage after a penetrative sexual activity. However, some other members of the group argued that such considerations, especially rape, could be used as an excuse to attract a lesser sanction in the marital union.

Furthermore, the lay descriptions of virginity, as highlighted earlier, emphasise the gendered aspect of virginity and the double sexual standard that emphasises chastity only for women but not their male partners. Some comments on the group suggest that male virgins could be detected based on their *"approach"* during sexual intercourse. Those with this view described male virgins as being naïve and inexperienced when it comes to sexual activity. Multiple posts and comments on the group called for a need to emphasise the importance of male chastity, while others believed that it was more important to emphasise female virginity as male virginity would not yield any significant outcomes. These descriptions are further highlighted in the comments below. More importantly, some members in the group justified the lack of emphasis on male virginity because *"men do not have a vaginal, so virginity belongs to ladies and not guys."*

*Miss/Mrs poster, must all the talks about virginity be preached only to the women? Why can it also not be preached to the male folks? You see, we are the ones making people think that only women should keep their virginity and men can lose their virginity anytime, anywhere. We should be sensible and say the fact also to the men.*

*It is good to preach virginity to the male folks, but it will not make the required impact because a man will not disvirgin a woman without her permission. Hence, the need to hit it more on the female folks.*

Another dominant description of virginity emerged in how participants in the group differentiated between virginity in terms of *penetrative sexual intercourse* and sexual purity in terms of *non-penetrative sexual activity* such as kissing, smooching, anal sex, among others. Sexual purity as reflected in the group was all gender encompassing, and many wall posts acknowledged its difference from virginity by highlighting that a young adult can be a virgin (penetrative sexual abstinence) but not sexually pure. As indicated in the comment below, some members of the group further encouraged young adults in the group to avoid *"sinning against their own body"* by being *"all-encompassing"*, that is, become a sexually pure virgin.

*Virginity goes beyond protecting only the hymen. You can be a virgin, but your breasts may have been fondled since you do not allow penetration. There is a concept of purity, which implies that a lady is a virgin and has not experienced any forms of romantic activities, and no man has accessed any part of her body. Any virgin that watches porn is not a virgin because the person is no longer sexually pure. Do not masturbate, let your boyfriend finger you or your girlfriend give you a blow job, watch porn, use sex toys. You might be a virgin and do all of these but not sexually pure.*

### *6.2.2 Interpreting virginity loss*

Members of the group interpreted virginity based on four distinct frameworks (summarised in Figure 6.1). As reflected in the comment below, many wall posts emphasised that virginity is a precious and valuable ***gift*** that should not be given to anyone, but only to one's spouse:

> *If you are still a virgin, my dearest sister, do not waste it because if you give it to your boyfriend, he will not appreciate it; but if you give it to your husband, he would never forget it for the rest of his life. As an adage says, 'virginity is a special gift to your husband on your wedding night, not a birthday present to your boyfriend.' Use your days wisely.*

Members of the group who interpreted virginity loss as a gift distinguished virgins from non-virgins in various ways. The wall posts and comments on the group used different terms to describe virginity and virgins. Virginity was described mostly in terms of a woman's pride, dignity, and a precious thing that should be given to one's husband. In like manner, virgins were described with multiple words, including being *"tear rubbers"* and *"others"*, while non-virgins were described as being *"cheap"*, *"second hand"*, *"used and dumped"*, and *"useless"*. Several wall posts in the group suggest that those who save sex for marriage have a high level of self-determination, self-will, good morals, conduct, and character. As highlighted by a comment on the group, being a virgin [female] means that, "*the lady has the **wisdom** to overcome tricks to have sex with a non-marital sexual partner, the **self-control** to resist sexual urge while being unmarried and the **discipline** to stand out in a world where many young girls are engaging in premarital sexual activity."* Among other features, the data extracts also relayed that virgins are decent, obedient, and respectful.

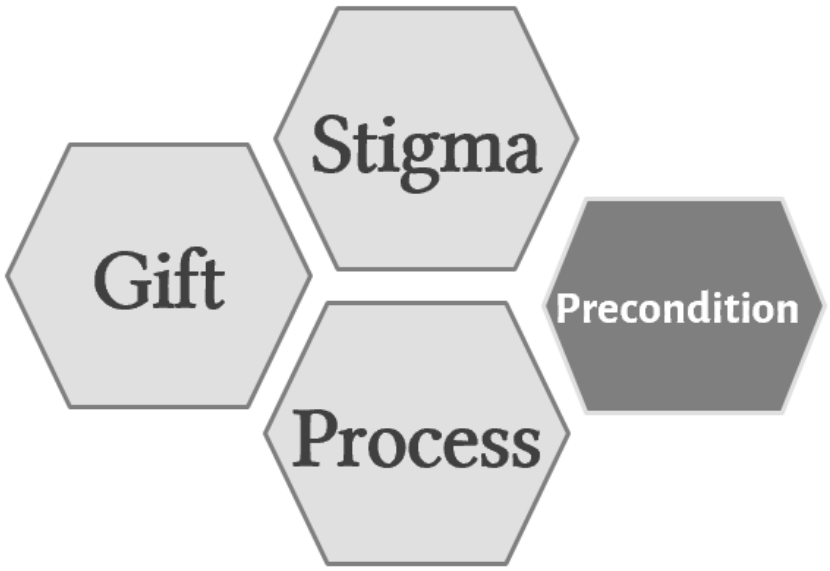



**Figure 6.1: Illustrative framework for interpreting virginity loss based on interactions among young adults on a peer-led Facebook group**

On the contrary, some group members argued that virginity should be interpreted as a ***precondition*** for marital bliss, not a gift. A group member mentioned that virginity is not a favour or benefit to any party [oneself, spouse, or their family]. Instead, couples can expect to achieve marital bliss if they fulfil a set of preconditions, including abstaining from sexual activity until marriage. As reflected in a wall post in the group:

> *Virginity is not a gift; it is a precondition. Suppose you want to get a scholarship – the usual conditions are that you must not be a recipient of another award (not have had sex). That is a precondition; you cannot say that not receiving another award (sexually abstinent) is a gift to the scholarship board (husband) or your affiliated institution (parents and in-laws). No, it is not. One thing that scholarship seeks to achieve is to alleviate the financial burden of students. So that state of not being a beneficiary of another award makes you benefit more from the award, and the*

*impact is incredibly notable. Whereas if you get the scholarship as a beneficiary of others, you are less likely to feel the same way.*

Further, virginity was also interpreted in terms of ***stigma***. Some wall posts described virgins *(more precisely male virgins)* as naïve, inexperienced, and deficient in sexual prowess – an undesirable identity which could motivate males to want to discard the status immediately. This description of virginity also coincided with those who interpreted virginity as a ***process***. To many members of the group who interpreted virginity as such, losing one's virginity *(more precisely among males)* is regarded as a process of giving one's partner some sexual satisfaction in marriage. As reflected in the comment below, some male members of the group noted that prospective sexual/marital partners (often females) avoided them because they were concerned that virgin males might not meet their sexual needs. In like manner, some wall posts and comments from some group members suggested that some females would be unwilling to marry a male virgin as he might be unable to satisfy them sexually in the marriage.

*I asked the ladies I had previously dated why they ended the relationship because none of them told me that I maltreated her or that she had a problem with my attitude. The ladies [five] made it clear that they cannot marry a virgin man because they do not know if I can satisfy them sexually since I have no experience. I will not lie to you; ladies have helped me narrow my criteria searching for a virtuous wife. I cannot lower my standards.*

## 6.3 The Perceived Premiums of Premarital Sexual Abstinence

Participants in the group were divided in their thoughts about virginity and marital bliss. Most significantly, some participants noted that character, not virginity was salient for marital bliss. Many authors of the wall posts and comments stressed that virginity

alone would not benefit marriage but also good virtues and character. Others contended that virgins are chaste but often lack respect, are timid, impolite, uncultured, aggressive, unforgiving, and deficient in essential characteristics for marital bliss. This is further reflected in a comment on one of the wall posts on the group:

> *Some ladies who brag about virginity are somewhat timid, some impolite, uncultured, and aggressive. While they brag about their virginity, that is all they have to offer, forgetting that virginity ends on the wedding night, but extra oil (good virtues) is what will keep the marriage going.*

Other participants in the group who interpreted virginity in terms of a gift nevertheless identified multiple pathways through which saving sex for marriage may contribute to marital bliss. As highlighted in the wall post and comments below, various members of the group believed that men who are gifted with their wife's virginity would be expected to reciprocate in multiple ways, including being faithful to the marriage vows, loving and respecting the wife, giving her a peace of mind among several others. All of these were perceived to be pertinent for marital bliss.

> *Hello everyone, a man discovered that his wife was still with her pride (virginity) on their first night together after paying her bride price (marriage). He would like to add more money, so he is wondering how much more he should add and to whom it should be given?*
>
> - *No amount of money can equate to the sacrifice of sexual purity; the reward should be in kind, not in cash.*
> - *Virginity is worth more than a million dollar. He should be faithful to his wife. That is the best reward.*

- *I think it should recelebrate it to encourage others.*
- *The only thing he can do is to love, trust, respect her.*
- *In a situation like this, there is nothing the man may offer the woman in life that can equate or complement the virginity than to give her peace, rest of mind, and fidelity till death do them part. The woman can also enjoy the prizes for a long time till death separates them if she has moral discipline and godliness.*

As noted by another author, *"It all boils down to the primary aim and preference of the husband."* Men who see virginity as a gift and cherish it *"will never be happy with his wife if she is not a virgin."* In describing the multiple ways in which saving sex for marriage may contribute to marital bliss, some members of the group leveraged some of the perceived features of virgins and virginity, such as self-control, discipline and others. Among many other perceived benefits of virginity, the wall posts and comments also suggested that sexual satisfaction in marriage, partners' marital fidelity, a lower likelihood of partner control and violence, among others, are some of the ways in which saving sex for marriage may contribute to marital bliss. In the sections below, a detailed explanation of each of the perceived benefits is highlighted.

### *6.3.1 Respect, honour, love*

Among several perceived benefits of saving sex for marriage, respect, honour, and love were the most mentioned. Many wall posts and comments in the group suggested that men are most likely to respect and offer *"extraordinary"* love to their virgin wives. This may especially be salient for men who treasure virginity and interpret it as a gift. As a member of the group highlighted, *"It is the dream of every man to have a tear rubber wife."*

For example, men may be more inclined to respect their wife, having exuded disciplined, self-control and wisdom to abstain from premarital sexual activity.

> *Do you think any responsible man will be happy to marry a lady that another man has already used and dumped? That is why any man that marries a non-virgin can never respect and value his wife as the one who marries a virgin.*

Women who marry as virgins are also perceived to be highly respected by their spouse and by their in-laws, and the community at large. Many wall posts accentuated that women who marry as virgins can train their children to also be abstinent while using themselves as an example in such circumstances. As a result, the male partner would respect her more. A member of the group shared an experience with a female student who was a victim of sexual abuse and punished unjustly because her mother had some premarital sexual experience and, as a result, was punished unjustly by the father:

> *Their daughter escaped rape at school by a youth Corper (teacher), but her friend was raped. When the matter was reported, the Corper denied it. The school management believed him and tagged the girls as bad girls. When the girl's father was informed about it, he sent the girl and her mother packing. He said that the girl wants to continue from where her mother stopped and that he would never accept that. If her mother had married as a virgin, all of that would not have happened because her father will trust her mother to raise her well. Imagine what the innocent girl is going through just because her mother did not marry as a virgin.*

### *6.3.2 Partner's trust*

Many wall posts and comments alluded that virginity is *"a gateway to trust that births a very strong love which results in a happy home."* As a result, women who marry as virgins

were most likely to be trusted by their partner. Trust in such circumstances include the trust that their partner will not engage in marital infidelity in the presence or absence of adversities. Considering that many wall posts in the group suggested that virgins have high discipline and self-control levels, the same is perceived to be important to abstain from infidelity in marriage. As such, men whose wives are not virgins at the time of marriage may be unlikely to trust them to not engage in marital infidelity regardless of whether they were or were not the premarital sexual partner. For example, non-virgin women who marry their premarital sexual partner may equally not be trusted as non-virgins who marry a man who was not their premarital sexual partner. Some members of the group argued that the inability of the woman to restrain her husband from sexual activity prior to marriage is an indication that she will not restrain other men.

*Sex outside marriage has a lot of adverse side effects, suspicions being one of them. Most men and women that have had sex outside marriage often find it very difficult to trust each other when they are married, even if they engaged in it with each other! There will be many suspicious and negative thoughts running through their minds, especially whenever their partners are not with them. Some men will not allow his wife to get a job involving travelling because he does not trust her to stay sexually faithful to him. Some people cannot cope with the fact that their spouse came back an hour later than usual. There would always be this inner feeling that their partner is unfaithful to them. Because of their past sexual escapades, people like these find it difficult to trust their partners. Such people hardly experience true peace even when they eventually get married because they have proven themselves to have self-control and restrain. When you are used to disciplining your appetite daily, you will not fall cheaply into sexual and emotional temptations.*

In the same way, some wall posts examined partner trust in the face of adversity. For example, a comment on the group highlighted that virginity before marriage could also

enhance trust in a marriage, especially when faced with hardships such as difficulty conceiving or illnesses:

> *Take a look at my friend's aunt. She has been married for 16 years without a child. They have done several medical check-ups, and nothing has been reported to be medically wrong with either of them. The man is still clinging to God to date to bless the womb of his wife. He also understands that the wife did not have an unsafe abortion that may have affected her reproductive ability. He encourages her every time and makes sure she does not get worried.*

Many thoughts about trusting one's marital partner emerged from the desire to own one's partner and knowing that they are the only sexual partner in their lifetime. These perceptions also result from the belief that women cannot forget their first sexual partner even after marriage. Some participants agreed that women are likely to remain attached to their first sexual partner even after marriage and may be likely to engage in marital infidelity with the same if circumstances permit *(such as living in the same city, neighbourhood or compound).*

> *My brother, any girl that does not cry and shout on her wedding night, is not a virgin. Choose wisely; do not allow them to deceive you. She will tell you that she has forgotten about her first sexual partner and cannot go back to him if you marry her. My brother, it is a lie. Nothing like first love in a woman's life and nothing will make her forget and hate the man that disvagined her. After marriage, just pray that she does not see the guy again. If not, once she sees the guy, she will sleep with him again and again, so marrying a non-virgin is like marrying someone wife, take it or leave it.*

### 6.3.3 *Sexual satisfaction*

Multiple posts and comments on the group implied that virgins report the highest level of sexual satisfaction and fidelity in marriage. Some wall posts and comments attempted to link non-virginity with a very wide vagina, resulting in sexual dissatisfaction in marriage. Some members of the group believed that as a result of past sexual experience(s), the non-virgin partner already has a *"yardstick"* and a reference point for comparison of *"sexual performance"* in marriage. Those who marry as virgins, on the other hand, are perceived to have the potential to learn how to make love together, with equal sexual strength. Likewise, a virgin that marries a man with a small-sized penis may not complain about sexual satisfaction because both will match but a woman with a wide vagina will complain because she is already *"loosed"*.

> *If you get married as a virgin, you will not compare anyone sexually to your spouse. You are content with any performance you see. Others would have to compare with more than 100 people they have slept with. If a man and a woman marry without indulging in sex until marriage, it won't be an issue even if they perform for two minutes. If she has not experienced any man, it does not matter how small your manhood is as a man; you will be enough for her. However, if she is not a virgin, no matter the size of his manhood, you cannot guarantee her to stay, keeping her or satisfying her. This can lead to extramarital affairs and, if not nipped in the bud, the collapse of the marriage.*

## 6.4 Perceived Gendered Benefits of Saving Sex for Marriage

As has been noted previously, saving sex for marriage may be beneficial in multiple ways, depending on the dynamics of a couple's premarital sexual experiences. For example, various perspectives from the group suggested that it is preferred that both

partners are virgins since both partners will have the *"joy"* of learning from each other. An example of this perception is presented in the wall post below.

> *A virgin bride and a virgin groom have the very special joy of learning together from no one except each other. On their wedding night, the groom is happy, and the wife is glad that he never had sex with other girls.*

Additionally, the adverse consequences of not marrying as a virgin may be exacerbated if the husband is a virgin and the woman is not at the union's consummation. Some comments on the group suggested that a man who marries as a virgin would never be happy with his wife if she is not a virgin, especially if he considers virginity as a gift. On the contrary, multiple wall posts and comments also suggested that a union in which only the male partner is a virgin is better than a two-partner virgin union. Some participants who interpreted virginity as a process reflected that the male partner needs to have sexual experience for the wife to be sexually satisfied in marriage. In the same way, those who interpreted virginity as a gift emphasised that a non-virgin spouse (often male) will cherish the virgin (usually female) spouse more because he receives a valuable gift that he is not able to give. In so doing, he reciprocates the gesture in kind.

> *Sometimes, when two virgins marry, they will not appreciate each other when only one partner is a virgin. There is usually high respect for one's partner when one has made a mistake by having sex before marriage but is fortunate to marry a virgin because the partner has what they lack.*

However, a common theme that emerged in all of the couple dynamics is the emphasis on the importance of female chastity until marriage. In all of the couple's dynamics, there was emphasis on the woman being a virgin, while there were mixed perspectives regarding male virginity. However, this view may be challenging considering that a non-virgin bride

may have been coerced or *"deceived to drop their guards down"* (have penetrative sexual intercourse) with a non-marital male sexual partner under many circumstances, including to keep a relationship and an expression of love in romantic relationships. In contrast, others may have been victims of sexual abuse.

> *Many ladies were deceived by men they thought will marry them; they were deceived into dropping their guard. Many guys walk away from ladies simply because the ladies refused to give them sex; some are even tempted to give away their virginity to keep the guys. No one has the right to condemn another when you do not know their stories.*

## 6.5 Summary of the Chapter

This chapter examined the conceptualisation of virginity and how it is perceived to be beneficial for a marriage. The data were drawn from public wall posts from a peer-led Facebook group that facilitated discussion about sexuality. Many of the posts analysed suggested that the group members interpret virginity loss based on four distinct frameworks encompassing a gift, stigma, process, and precondition. The group members who interpreted virginity loss from the gift framework identified multiple yet diverse pathways through which saving sex for marriage might contribute to marital bliss. These benefits included respect, honour, and love and higher partner trust and marital sexual satisfaction. The participants also painted a remarkable gender division regarding virginity loss in which virginity is treasured for females but not for males. Altogether, these findings emphasise the importance of interacting with young African adults on social media platforms that highlight bidirectional communication. As highlighted in this study, engaging with young people can uncover dominant stereotypes that are likely to put adolescents and young women at risk of adverse health outcomes.

# Chapter Seven

# Discussion of Findings

## 7.1 Message Features Associated with Engagement and Interaction with Sexuality Information on Social Media

This sub-study is one of the first to document the actual use of Facebook as a resource for peer communication of sexual health information and intimate relations among young African adults. Some notable findings from the data highlighted three critical areas of consideration in designing effective and engaging sexual and reproductive health information for young African adults. First, assessing the levels of engagement based on the different metrics suggested that young people were more likely to engage superficially with sexual health messages using reactions than engaging with comments or sharing messages with those in their network. In addition, this analysis showed that compared to messages on intimate relations, young adults were significantly less likely to share sexual abstinence and purity messages with their friends. Although this study did not explore in detail the content of the messages shared in this network, anonymity and privacy issues may likely have affected the level of propagation of these messages. This finding resonates with those of prior studies suggesting that young adults may be less likely to interact with sensitive topics such as sexual and reproductive health information to circumvent monitoring by parents and friends (Byron et al., 2013; Gammon et al., 2009; Hampton et al., 2014; Lim et al., 2014).

The analysis also revealed the use of visual content and multimedia in communicating sexual health information. Consistent with a recent study on HIV information

dissemination on Twitter, I observed that young people were more likely to interact with messages with visual or multimedia content but less likely to interact with messages with links (Lohmann et al., 2018). This finding also resonates with prior studies (Card et al., 2018; Kite et al., 2016; Nguyen et al., 2013; Rus & Cameron, 2016) and the richness theory (Daft & Lengel, 1986), all of which affirmed the positive association between the use of multimedia content and an increase in user engagement. Young adults likely find it easier comprehending messages with multimedia content and may ignore messages including a link resulting from the financial effort and time required in visiting an external webpage (Lohmann et al., 2018). Interestingly, the data revealed that young adults were more likely to interact with messages telling a story or sharing an experience. When asked for their opinions, young adults were also more likely to comment. This approach may be useful in getting young adult's perspectives about issues of importance.

Furthermore, the preponderance of messages on intimate relationships, sexual abstinence particularly until marriage, and purity-based messages on the group highlighted how sexuality messages have been reduced to diseases, danger, and a response to the HIV pandemic – a pattern that is consistent with the literature (Allen, 2005, 2011). Specifically, there is dominance of precautionary voices and language of consequences, in which young people are advised to abstain from sexual practices or 'face consequences' (Francis & DePalma, 2014; Macleod, 2009) of HIV infection, sexually transmitted infections (STIs), and pregnancy. This finding is further corroborated by the significant amount of fear-based, stigma, and guilt appeal messages. In effect, I observed that close to one-quarter of the sexuality information on the group evoked fear, stigma, or guilt, with variations as high as more than half of family planning messages and more than one-quarter of sexual abstinence and purity messages.

These patterns of fear and shame and blame tactics are of great concern given that young people who should be key in delivering comprehensive and less threatening sexuality information, are observed to be reinforcing existing dominant binary gender roles, norms, and moralistic positions on young people's sexuality. Evidence of the use of fear appeals and "scare tactics" in sexual and reproductive health messages have been observed in the African literature (Izugbara, 2008; Ngabaza et al., 2016; Ngabaza & Shefer, 2019; Shefer & Ngabaza, 2015). In one study of parent-led sexual health information, it emerged that parents deliberately misinformed their children about sexuality using fear-based appeals, stigma, and guilt – focusing on themes that depicted young people's sexual behaviours in terms of deviance, immorality, and waywardness as approaches to regulating young people's awareness and knowledge of sexual and reproductive health (Izugbara, 2008).

Sexuality education in South Africa and indeed much of Africa also appears to be dominated by negative connotations of sexuality through the narratives of sickness, danger, doomed futures, violence, and repercussions (Ngabaza & Shefer, 2019). For example, horrific depictions of sexually transmitted diseases and premarital childbearing have reportedly been used to frighten students into abstinence (Shefer & Ngabaza, 2015). These negative connotations of sexuality are primarily because of the dominant misconception that sexual health education will inspire sexual imaginations in young people (Green & Witte, 2006; Izugbara, 2008; Njue et al., 2009). These approaches of sexual health communication are further rooted in religious teachings and cultural attitudes that promote sexual abstinence – only until marriage – but which altogether do not address the sexual health challenges of young people nor are effective in motivating behavioural change (Braeken & Cardinal, 2008; Buse et al., 2016; Kirby, 2008; Mukoro, 2017; Tuyisenge et al., 2018). In essence, Bhana et al. (2019) emphasised that sexual health interventions

that emphasise ‘risk’ over ‘desire’ and ‘shame’ over ‘pleasure’, risk speaking to no one, especially young people whose bodies and experiences tell them otherwise.

Till today, the role of fear, guilt, and stigma appeals in behavioural change has yielded mixed findings and is contested both by researchers and practitioners (Brewis & Wutich, 2019; Green & Witte, 2006; Njue et al., 2009; Shelton et al., 2004; Tannenbaum et al., 2015). Some studies have shown that the use of fear appeals in messages generates strong responses and may indeed increase awareness of the hazards of unhealthy practices, influencing attitudes, intentions, and ultimately behavioural changes (Tannenbaum et al., 2015). For example, fear appeals in HIV prevention messages during the early period of the national response to the HIV epidemic are believed to have contributed to an approximate 66% decline in HIV prevalence in Uganda (Green & Witte, 2006; Shelton et al., 2004). The use of fear appeals in sexual health education has also been observed to have no adverse consequences or undesirable outcomes on the population they intend to target (Tannenbaum et al., 2015). However, other studies contest that even when fear appeals arouse the interest of those who are exposed to them, they are often not associated with health behaviour changes (Kohler et al., 2008). Others argue that by inundating young adults with fear, they fail to seek out information on how to reduce their risk or to find out whether they are infected (Izugbara, 2008; Njue et al., 2009).

Interestingly, young adults on the peer-led Facebook group were less likely to interact with messages with fear and guilt appeals, although this finding is in contrast with prior literature on the dissemination of sexual health information on social media (Brady et al., 2017; Lohmann et al., 2018; McLaughlin et al., 2016). Although most of these studies were focused on HIV prevention messages on Twitter and had a different audience compared to the present study, the low level of interaction with non-neutral messages is likely a sign

of disapproval of these messages and the hesitance to propagate the same while also leaving comments to highlight these concerns.

Finally, this study contributes to the literature in important ways, but it is not without limitations. The first is that I attempted to utilise data that was cross-cutting throughout Africa. However, about 90% of the members of the Facebook group were from Nigeria, and as a result, the discussions on the group may have been dominated by voices from Nigeria, where religion and culture are known to play pivotal roles in sexual health communication. Nonetheless, the role of religion and culture in sexual health promotion has also been observed in other African countries like South Africa and Uganda.

Furthermore, the sample was selected through convenience sampling of a Facebook group. As a result, the generalisability of the study findings is limited. Nevertheless, I found similar associations as did previous studies and identified new predictors of user engagement. While I focused on data from Facebook, I believe that many of the findings, especially those involving the use of rich messages features, will extend to other platforms, including multimedia social media sites like Instagram. While the data set is made up of a significant number of meaningful discourses about sexuality education for and by young African adults, it is worthy of note that these messages did not represent all such discourses, and as a result, relationships found in the data may not be extended to topics outside the content on the group or those analysed. It is also worthy of note that the level of interactions and propagation of messages may be influenced by author popularity. For example, young adults may interact with messages from authors who are well known in the group. However, due to privacy concerns, the data does not include author profile details, and as such, this association could not be explored in detail. Despite the limitations, this study provides insights that could be useful when considering social media for sexual health communication among young African adults.

## 7.2 Individual-level Predictors of Sexual Health Information Engagement

This study investigated the acceptability and use of social media for sexual health communication among young adults in Kenya, Nigeria, and South Africa. I integrated social media use into the unified theoretical model for social media adoption to understand individual-level factors associated with the intention to use and interact with sexual health information on social media. In so doing, the study contributes to the literature in diverse ways.

In relation to the individual-level factors associated with the intention to use social media, the results provided strong empirical support for the research model, which posits four direct determinants (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) of attitude, and multiple determinants of intention to use and interact with sexual health information on social media. Consistent with the meta-UTAUT model (Dwivedi et al., 2019; Venkatesh et al., 2012), this study suggested that attitude to social media use for sexual health communication is significantly associated with the intention to use social media. Furthermore, the attitude of young adults in the sample was influenced by performance expectancy, effort expectancy, and social influence. These findings are consistent with the literature on the use of new technologies (Chang & Hsu, 2012; Dwivedi et al., 2017, 2019; Park et al., 2007). Young people are likely to use social media for sexual health communication if they have positive attitudes toward it. In addition, understanding that the use of social media is free of effort could contribute to better sexual and reproductive health and knowing that others support its use could enable young adults to form supportive attitudes toward social media use.

The results further indicated that young adults in the study will use and interact with sexual health information on social media if it is free of effort. This finding is consistent with Venkatesh (2003), who proposed that individuals will adopt new technologies if it is free of effort. A similar pattern of association has also been identified in previous studies involving the use of social media for educational purposes (Yildiz Durak, 2019), public relations (Al-Badi et al., 2020) and employee recruitment (El Ouirdi et al., 2016). Similarly, performance expectancy was salient for young adults' intention to use and interact with sexual health information on social media. This finding is consistent with the literature on the use of social media for educational use (El Ouirdi et al., 2016; Etemadi et al., 2019; Hanson et al., 2011; Yildiz Durak, 2019). Performance expectancy has also been depicted as an important factor of intention to use new technologies (Venkatesh et al., 2003).

In addition to other significant predictors of the intention to use social media, the opinions of significant others, such as friends, family, and the religious community, emerged to be a significant predictor of intention to use and interact with sexual health information on social media. The role of social influences on sexual and reproductive health has been documented in previous studies (Challa et al., 2018; Odimegwu, 2005). Hanson et al. (2011) also observed that social influence was associated with the intention to use social media for health promotion among health educators in the United States. Social influence has also been identified as a predictor of intention to use social media for educational purposes (Yildiz Durak, 2019) and employee recruitment (El Ouirdi et al., 2016). In the context of this study, social influence refers to the extent to which people whose opinions matter believe that young adults should use and interact with sexual health information on social media. This is particularly salient considering that the stigma of sexual health messaging and HIV/STI is still a critical barrier to the success of social media-based sexual health promotion (Byron et al., 2013; Magee et al., 2012; Witzel et al.,

2016). Community norms and lay attitudes about the immorality of premarital sexual relations have been reported as salient reasons why young people prefer to keep their sexual activity and attitudes a secret (Challa et al., 2018). As a result, young people may be hesitant about interacting with specific sexual health messages to avoid being seen by significant others as endorsing specific sexuality information (Magee et al., 2012; Witzel et al., 2016), especially if such interactions could result in stigma, rejection, or punishment from their parents, society, or community.

Lastly, the results further suggested that young adults may use and interact with sexual health information on social media if such use and interaction align with the way young people interact with other issues. This finding is consistent with prior applications of the UTAUT model to various technologies, including social media. Also, Andrade et al. (2018), in their study, recommended that preventive messaging or other health promotion content should be strategically incorporated into habitual messages to keep participants connected with friends and ensure that the messages being conveyed resonate with their needs.

## 7.3 Uncovering Insights about Sexuality from Peer-Generated Sexual Health Information on Facebook

Far less is known about the pathways through which premarital sexual abstinence or virginity might be associated with marital bliss. This study is one of the first to document the representations of sexual abstinence as a plausible explanation of marital satisfaction. A key contribution of this study is its fine-grained analysis of the wall posts on a peer-led Facebook group to elucidate how interactions on social media could reflect dominant cultural narratives about gender, sexuality, and culture. Several themes emerged from the analysis, including the conceptualisation of virginity, its perceived benefit for marital bliss,

and how these interpretations of virginity loss are patterned by gender and relationship dynamics. As highlighted in this study, many ideas about virginity emphasised the gendered and double sexual standards that promote and value virginity for females but not for males (Blinn-Pike et al., 2004).

First, the wall posts and comments suggested that *"the absence of a hymen"* and *"the shedding of blood"* signified virginity loss for women while there is no such physical marker for men. This description of virginity loss is consistent with the literature (Abboud et al., 2015; Carpenter, 2011) and is rooted in the hegemonic masculinities that reinforce men's dominance over women and promotes sexual double standards, where virginity is perceived as more valuable – and more identifiable – for females than males (Connell & Messerschmidt, 2005). Only girls are often tested and celebrated in many cultural celebrations of virginity.

Connell's (1987, 1995) theory of masculinities shed light on this gendered interpretation of virginity. Accordingly, hegemonic masculinity is a dominant and socially idealised form of masculinity because they shape a sense of what is "acceptable" and "unacceptable" gendered behaviour that appears natural, ordinary, and inevitable (Connell, 1995; Connell & Messerschmidt, 2005; Hanke, 1990; Messerschmidt, 2019; Speer, 2001). This form of masculinity functions within a topography of orthodox morality and legitimises patriarchal, hierarchical gender structures via the subjugation of women and other types of masculinity in the social system (Connell & Messerschmidt, 2005; Renold, 2010).

The relationship between hegemonic masculinity and sexual behaviour has been studied extensively in the past (Currier, 2013; Dalessandro et al., 2019; Diefendorf, 2015; Duckworth & Trautner, 2019; Miller, 2016; Pascoe, 2013; Shakiba et al., 2021).

Hegemonically masculine men are deemed to have an uncontrollable and unquenchable sexual desire. At the same time, women are considered less sexual, expected to be virgins, and are policed by assessing their hymen (Wilkins, 2009). This is further evidenced in the ways that the members of the group described the gendered dimension of virginity.

Although many members of the group agreed that virginity loss was considered possible only through penile-vaginal intercourse, an expanded definition of virginity was also reflected in several wall posts on the group. Similarly, some members of the group focused on socially and subjective constructed descriptions of virginity loss that included non-penetrative sexual activity. For example, participants in this group used the term sexual purity to describe no kissing and romantic relationships – a concept that is closely related to the spiritual dimension of virginity (Palit & Allen, 2019). This description of virginity presented in the accounts of young adults is consistent with the literature. Scholars have generally described virginity both in terms of sexual and subjective dimensions (Blinn-Pike et al., 2004; Carpenter, 2002, 2011; Chambers, 2007; Medley-Rath, 2007). The participants did not consider non-penetrative sexual acts as a violation of virginity but considered it a form of impurity.

In my analysis, I also observed the multiple descriptions that participants gave virginity loss. Most notably, participants used the terms respect and discipline, among others. These descriptions are consistent with scholarship on the topic and literature on sexuality in Africa in which young people who have sex premaritally are dubbed as irresponsible, spoiled, or ungodly (Izugbara, 2007; Lenzi et al., 2019). As previously noted, premarital sexual abstinence is both rooted in cultural and religious beliefs, which dub the acts as sinful, immoral, and wrong (Izugbara, 2007). In agreement, participants used derogatory words in describing non-virgins, including that they are "sexually loose," "used-and-dumped" among others. This finding is consistent with Bhana (2016) in South

African townships in which girls described deep, internalised cultural connections between virginity, respectability, and community identity.

The interpretations of virginity and virginity loss also reflect how hegemonic masculinities motivate girls and women to be bullied when they deviate from normative sexual behaviours and feminine gender presentations such as abstaining from sexual activity until marriage (Messerschmidt, 2012; Miller, 2016). Surprisingly, young people who should be key for delivering comprehensive and less threatening sexuality information are observed to be reproducing existing dominant binary gender roles, norms, and moralistic positions on gender roles and sexuality. While this pattern of bullying may be conceptualised as a "youth problem," the patterns also indicate attitudes and ideologies that may be pervasive among adults and a reflection of social inequalities (Corsaro, 1992; Klein, 2012).

This research also painted a clearer picture of the relationship between virginity loss and marital bliss than prior studies. I found a similarity between the interpretations of virginity loss on the group and the interpretative framework of virginity and virginity loss proposed by Carpenter (2001, 2002). More importantly, the gift and process frameworks resonated with how most of the wall posts on the group interpreted virginity loss. The double sexual standard was also reflected in the way that participants in the group interpreted virginity loss. Virginity loss for women was interpreted mostly in terms of a gift but shameful for men. These findings are consistent with the literature on virginity and sexuality. Among young males in the United States, about one-third of the males viewed virginity as a gift (Carpenter, 2001). In the Republic of Congo, female participants viewed virginity as a gift that should be given to the husband (Mulumeoderhwa, 2018). A virgin female is seen as innocent and pure while a male inexperienced (Palit & Allen, 2019). Also, a few members of the group also reiterated that virginity may be a precondition to

attaining marital bliss, further confirming the main premise of this study about the possible benefits of virginity.

The members of the group diverged in their perceived marital benefits of sexual abstinence until marriage. While some wall posts on the group suggested that virginity is beneficial for marriage, others emphasised that a man can look past virginity and focus on the girl's conduct and reputation before marrying her. Among the several benefits of saving sex for marriage, the wall posts highlighted adornment of the wife, respect, trust from the marital partner, and sexual satisfaction. Women who married as virgins were perceived to be highly adorned and respected by their partners. This finding corresponds with the only study of the representations of sexual abstinence among rural Nigerian adolescent males (Izugbara, 2007). Prior studies have suggested that in settings where virginity is highly valued, the preservation of virginity until marriage is symbolic of honour (Cinthio, 2015) and prestige such as higher bridewealth. The finding that virgins are likely to be trusted is inconsistent with findings in the literature (Mulumeoderhwa, 2018). Mulumeoderhwa (2018), for example, argued that the resulting lack of trust often generates misunderstanding, arguments, and conflict between partners. Women who do not bleed during their first sexual intercourse in marriage may suffer humiliation.

Interestingly, participants in the group believed that premarital sexual experience might affect couples' marital sexual satisfaction. This perception contrasts with a study of sexual and marital satisfaction among American couples that observed that premarital sexual experience and premarital cohabitation (with each other or someone else) was not associated with husbands' and wives' self-reported sexual satisfaction (Yucel & Gassanov, 2010). There were also beliefs that low marital sexual satisfaction because of premarital sexual experience could affect couples' marital satisfaction or marital infidelity. This finding is consistent with a study of American couples, in which adults who were married

to a satisfied spouse were more likely to have higher sexual satisfaction than those married to a spouse that was dissatisfied with the current union (Yucel & Gassanov, 2010). As reflected in the quotes and a prior study, premarital sexual experience may affect marital sexual satisfaction by altering individuals' perception of sexual activity and comparisons with previous sexual partners (Legkauskas & Stankevičienė, 2009). Some prior studies have also suggested that premarital sexual experience may make marital sex less "special," in part because men tend to find their partners less physically attractive after first-time sexual intercourse (Haseltonu & Buss, 2001). Marital infidelity could also act as a cost and consequence of sexual dissatisfaction among couples (Liu, 2000; Previti & Amato, 2004; Yucel & Gassanov, 2010). For instance, using the law of diminishing returns, Liu (2000) showed that infidelity is more likely to occur among those with low sexual satisfaction, while marital infidelity could also cause sexual dissatisfaction for both spouses (Previti & Amato, 2004; Yucel & Gassanov, 2010).

These rhetoric socially constructed benefits of saving sex for marriage have transactional value and provide young men with an opportunity to demonstrate their dominance over women to reaffirm their masculinity. As it emerged from some of the wall posts, it offers a social currency through which men and their families exert power and influence. Some men are also perceived to be higher than other men, for example, men whose wife *"saved sex for marriage"*.

However, the high premium placed on virginity before marriage as demonstrated by the wall posts analysed in this study impacts the lives of unmarried young women in significant ways, particularly considering the high level of self-reported sexual activity in several African countries (Amo-Adjei & Tuoyire, 2018). These narratives also significantly influence and limit girls' sexual subjectivities, including their perception of themselves as sexual beings and their ability to make informed decisions about their sexuality and health

(Schalet, 2010). Several studies have shown how sexual double standards and other gendered discourses on sexual morality, such as slut-shaming non-virgins, impact girls' relational lives (Crawford & Popp, 2010; Kreager & Staff, 2009; Miller, 2016). Without providing young people with comprehensive sexuality education, young women may suffer grave sexual health consequences in later life even if they are sexually abstinent until marriage (Carpenter & DeLamater, 2012). For example, university students in Nigeria with some sexual experience had a higher self-efficacy for condom purchase and use than those who self-reported to be sexual abstinent (Ajayi & Olamijuwon, 2019).

Another challenge with emphasising sexual abstinence until marriage instead of comprehensive sexuality as emphasised in the narratives on the group, is that young people are not prepared nor informed and may fall victim to the very same things that they were being protected from – *"sexual temptations"*. In their study, Diefendorf (2015) found that how young Christian men negotiated their masculine identities prior to marriage tended to remain in potentially disruptive ways. The inability to fully navigate their sexuality before marriage based on informed decisions rather than denial, seeing sex as something evil or a model of temptation and accountability, positioned these men as unprepared for their sexual lives after marriage, albeit now with little support (Diefendorf, 2015).

## 7.4 Strengths and Limitations of the Study

Although the current study extends the literature in important ways, it is not without limitations. The first is that I attempted to use data from a conveniently selected peer-led Facebook group that was cross-cutting throughout Africa. However, the results may not be generalised to the entire African population since about 90% of the members are from Nigeria. Nigeria, however, is a highly cultural and religion sensitive country, both of which

may have influenced the kind of sexual health messages posted on the group. Given that the audience and group dynamics on Facebook are different from other social media platforms, the findings of these study may not be generalised beyond Facebook.

Likewise, Facebook uses an algorithm to determine specific posts that will be shown to users. Neither the group administrator nor myself had control over this algorithm, but these could have influenced the level of interaction received by posts on the group since users can only interact with the messages they see on their timeline. As such, the analysis of data from the group was restricted to identifying the predictors of engagement conditional on the posts being seen by the members of the group. Nevertheless, I found similarities between the findings of this study and previous studies. I also identified new predictors of user engagement.

Although the data set is made up of many meaningful discourses about sexuality education for and by young African adults, it is worthy of note that these messages did not represent all such discourses. As a result, relationships found in the data may not be extended to topics outside the content of the group or the contents analysed. Many of the messages on the group are user-generated or peer-generated. As a result, they may not all be evidence-driven and be an accurate source of information. Nonetheless, they serve as a rich source of peer-generated sexuality information, the kind of messages that young African adults are exposed to and how they interact with these messages.

It is also worthy of note that the level of interactions and propagation of messages may be influenced by author popularity. For example, young adults may interact with messages from authors who are well known in the group. However, due to privacy concerns, the data analysed in this study does not include author profile details, and as such, it is almost impossible to examine the effect of author attributes on the propagation

of messages on the group. Specifically, the group members might be more inclined to interact with messages by specific authors (influencers) on the group than others.

Furthermore, compared to the massive amount of message production on Facebook per second, the present sample size of 3,947 wall posts related to sexual and reproductive health was relatively small. While researchers have used the informatics approach to analyse as many messages as possible, this approach was also limited in identifying the nuanced use of language, emotion, context, and strategy (Collister, 2015). As a result, it is quite inappropriate to assume that the analysis of a large sample of sexual health information using an informatics approach or big data analytics will illuminate the features associated with the propagation of sexual health messages on Facebook better than a small sample labelled by human annotators.

As with other cross-sectional studies, the findings based on the online survey were correlations and not causal. Additionally, the direct comparison of the findings with previous studies should be tempered with caution, considering that the measure of facilitating conditions used in this study was different from what has been used in prior studies. The absence of a standardised measure of intention to interact with sexual health information resulted in a self-developed construct. Lastly, the phrasing of the survey questions focused on sexuality information provided by various national departments of health to ensure the veracity of such messages. Future studies could extend this work to sexuality education provided by reputable non-governmental organisations or reputable youth-led organisations.

Furthermore, this study focused on the use of social media for sexuality education. As a result, the relationships observed were conditional on young people having access to the internet and social media. While there is limited use of the internet in African countries,

the increasing penetration of internet services in the region and its acceptance by young African adults offers a promising opportunity for the adoption of social media for sexuality education; not as a replacement for existing approaches, but as a viable complement to existing strategies for sexuality education.

In relation to study 3, the content creators' demographics (wall posts and comments) and their virginity status would have been beneficial for this study. For example, gender differences in the interpretations of virginity loss have been reported in previous studies, wherein women were more likely to interpret virginity as a gift while men were more likely to view it as a stigma (Carpenter, 2001). In addition, analysing masculinity from women's perspective may provide a valuable insight into the contribution that women play in the construction and maintenance of these ideologies. In the past, masculinity has always been viewed as something generated and enacted by men, positioning women as mere consumers of masculinity, rather than active agents in its construction and reproduction.

However, it is also likely that women conform to and preserve components of emphasised femininity in order to attain some of the specific benefits outlined in this study such as respect and honor from their spouse and their family. Despite this reality, the anonymity of data from the group did not permit such analysis beyond the aggregated demographic data available via Facebook insights (Malesky & Ennis, 2004). However, I could still infer the gendered dimension of virginity loss from the content of the posts and comments on the group.

Another limitation of the research was the sample composition. The majority of the participants were from Nigeria, and as such, the majority of the messages and interactions on the group may have been dominated by young adults in Nigeria and may more closely

reflect the Nigerian culture. This, however, does not mean that participants from other countries or cultures were restricted from posting on the group.

Despite these limitations, this study attempted to provide a holistic evidence-driven perspective on how to increase user engagement with sexual health information. The findings from these studies also offer diverse and important considerations for advancing sexual health education strategies for young African adults in the digital age. The thematic analysis of wall posts on the group also illustrated how young people collectively interpreted virginity and virginity loss in ways that reflect and reproduce social inequalities.

# Chapter Eight

# Conclusion and Recommendation

## 8.1 Main Summary

Overall, this study attempted to illustrate the potential use of social media platforms in sexual health communication as well as strategies for increasing engagement with sexual health information on social media. Evidence that emerged from this study suggests that rich message features (like multimedia use), good messaging strategy (like storytelling), and neutral tone of communicating are significantly associated with higher levels of propagation and sharing of peer-led communicated sexual health information. At the individual level, young adults who are likely to use and interact with sexuality information on social media are those who think that such use can help them achieve high gains, is endorsed by important people like parents and religious leaders, is free of effort, aligns perfectly with the way they interact with other messages, and has a positive attitude toward the use of social media.

Furthermore, it emerged that saving sex for marriage may have some culturally sensitive benefits for marital bliss. Many of the wall posts identified diverse ways in which premarital sexual experience is perceived to be beneficial for marital satisfaction and stability, especially in terms of respect and honour, marital sexual satisfaction and others. These accounts of the perceived benefits of saving sex for marriage also reflect how dominant cultural narratives about women's sexuality circulate within the broader social structures, communities, and the media, including social media platforms.

Altogether, these findings are of immense importance for designing useful and engaging messages for advancing the sexual and reproductive health of young African adults. The findings also hold important implications for designing effective interventions for addressing deeply rooted cultural or religious beliefs that may put women, men, and families at risk of adverse sexual and reproductive health.

## 8.2 Theoretical Implications

This study's findings suggest that the unified theory of acceptance and use of technology has a strong predictive power in explaining young adults use ($R^2$ = 55%) and interaction ($R^2$ = 44%) with sexual health information on social media. To the best of my knowledge, this study is one of the first to identify the individual level predictors associated with young adults' intention to use and interact with sexual health information on social media based on theoretical concepts from UTAUT. These findings have important implications for the validity of the model in understanding the acceptability and intention to use social media for accessing sexual health information among young adults in an African sample. The findings underscore that all the proposed theoretical relationships (performance expectancy, effort expectancy, social influence, facilitating conditions, and attitudes) were significantly associated with the intention to use social media to access sexual health information.

In addition, this study extended the theoretical application of the unified theory of acceptance and use of technology beyond intention to use social media to explain about 44% of young adults' intention to interact with sexual health information on social media. In so doing, this study answers the pressing call for understanding individual-level characteristics associated with user engagement with health information on social media to increase message reach and motivate behavioural change (Card et al., 2018; Goedel et al., 2020). The study findings suggest that performance expectancy, effort expectancy,

social influence, and facilitating conditions are significant predictors of intention to interact with sexual health information on social media.

Furthermore, most studies on technology acceptance have been concentrated in developed countries. The application of the theory to data from participants recruited from Kenya, Nigeria, and South Africa answers the call for replicating the UTAUT model in different cultural contexts. Additionally, the application of the model to social media among young adults also extends the model's validity beyond new technology use to specific components within existing technologies such as social media pages/profiles/groups. Finally, this study moves the UTAUT model's application beyond the business environment to potentially sensitive subjects like sexual health communication on social media.

## 8.3 Programme Implications

The findings of this study have important implications for the design of effective and engaging sexual health information for young adults in African countries. As highlighted in this study, strengthening the key constructs of the theoretical model is imperative for motivating the acceptance and use of social media for sexual health communication. These constructs, including performance expectancy, effort expectancy, social influence, and facilitating conditions, are also important to motivate adolescents and young adults to interact with sexual health information on social media.

Specifically, there is an overarching need for young adults to see the importance of interacting with health information on social media for their sexual health and rights (performance expectancy). It is also essential that the relevant stakeholders ensure that interacting with sexual health information on social media is free of effort (effort expectancy) and aligns perfectly with how young adults interact with other information on social media (facilitating conditions). A realisation of all these, combined with other

factors, is important to boost the way young adults interact with sexual health information on social media. It is also imperative to increase the involvement of parents, religious leaders, and other important personalities in sexual health communication (social influence). This approach would help minimise some of the associated stigma associated with interacting with sexual health communication.

Evidence that emerged from this study also illustrates the potential for understanding the complexity of social issues using data from social media platforms like Facebook. As I have shown, engaging with young people can uncover dominant stereotypes in the community that may put women at risk of adverse sexual health. It appears that saving sex for marriage may have some culturally sensitive benefits, including trust and respect from the marital partner, and marital sexual satisfaction. The narratives described particularly in study 3, further highlight several issues that may be of interest to researchers and policymakers. The findings also hold important implications for designing effective interventions for addressing deeply rooted cultural or religious beliefs that may put women, men, and families at risk of adverse sexual and reproductive health. For example, the derogatory manner in which members of the group described non-virgins, calls for adequate strategies in addressing masculine ideologies that motivate for girls to be bullied for not conforming to normative sexual behaviours. Such traditional norms – in the context of high pressure to offer sex as an expression of love and in settings with high levels of sexual violence – place adolescent girls and young women in precarious situations.

As has been highlighted in this study, there is a need to be attuned to the sexual needs of young African adults. The multiplicity of views about sexual abstinence elicited by this study shows that it is unsafe to continue to endorse policies that do not support the provision of holistic knowledge about sexuality to all young people. Highly effective and culturally sensitive sexuality education is needed to help young people attain sexuality

esteem without posing adverse effects on health and wellbeing. The data derived from this analysis can be used to complement policy design data sources. This opportunity may help empower young African adults' sexual and reproductive health rights and reduce some of the misinformation that impedes progress.

## 8.4 Areas for Further Research

Several considerations emerged from this study that could be relevant for future studies. First, this study examined how young African adults interact with peer-led sexual health information but not what young adults are doing with the information, particularly those that evoke fear, guilt, or stigma. Future studies could examine this and how young adults respond to these messages.

Secondly, the phrasing of the survey questions also focused on sexual health information provided by various national departments of health to ensure the veracity of such messages. Future studies could also extend this work to sexual health information provided by reputable organisations or reputable youth-led platforms for sexual health communication.

Lastly, several perceived benefits of saving sex for marriage were identified in study 3. However, testing these perceptions is beyond the scope of this study. It is anticipated that several future studies will follow this study to provide deeper insights into the relationship between sexual abstinence before marriage and marriage bliss, especially the main pathways identified in this study using robust and nationally representative survey data.

# References


Abboud, S., Jemmott, L. S., & Sommers, M. S. (2015). "We are Arabs:" The Embodiment of Virginity Through Arab and Arab American Women's Lived Experiences. *Sexuality & Culture*, *19*(4), 715–736. https://doi.org/10.1007/s12119-015-9286-1

Abroms, L. C., & Maibach, E. W. (2008). The Effectiveness of Mass Communication to Change Public Behavior. *Annual Review of Public Health*, *29*(1), 219–234. https://doi.org/10.1146/annurev.publhealth.29.020907.090824

Adams, S. A. (2010). Revisiting the online health information reliability debate in the wake of "web 2.0": An inter-disciplinary literature and website review. *International Journal of Medical Informatics*, *79*(6), 391–400. https://doi.org/10.1016/j.ijmedinf.2010.01.006

Adato, M., Devereux, S., & Sabates-Wheeler, R. (2016). Accessing the 'Right' Kinds of Material and Symbolic Capital: the Role of Cash Transfers in Reducing Adolescent School Absence and Risky Behaviour in South Africa. *The Journal of Development Studies*, *52*(8), 1132–1146. https://doi.org/10.1080/00220388.2015.1134776

Agbemenu, K., & Schlenk, E. A. (2011). An integrative review of comprehensive sex education for adolescent girls in Kenya. *Journal of Nursing Scholarship*, *43*(1), 54–63. https://doi.org/10.1111/j.1547-5069.2010.01382.x

Agbiji, O. M., & Swart, I. (2015). Religion and social transformation in Africa: A critical and appreciative perspective. *Scriptura*, *114*(1), 1–20.

Agha, S., & Van Rossem, R. (2004). Impact of a school-based peer sexual health intervention on normative beliefs, risk perceptions, and sexual behavior of Zambian adolescents. *Journal of Adolescent Health*, *34*(5), 441–452. https://doi.org/10.1016/j.jadohealth.2003.07.016

Ahlqvist, T., Bäck, A., Heinonen, S., & Halonen, M. (2010). Road-mapping the societal transformation potential of social media. *Foresight*, *12*(5), 3–26. https://doi.org/10.1108/14636681011075687

Ajayi, A. I., & Olamijuwon, E. O. (2019). What predicts self-efficacy? Understanding the role of sociodemographic, behavioural and parental factors on condom use self-efficacy among university students in Nigeria. *PLOS ONE*, *14*(8), e0221804.

https://doi.org/10.1371/journal.pone.0221804

Ajayi, A. I., & Olamijuwon, E. O. (2019). What predicts self-efficacy? Understanding the role of sociodemographic, behavioural and parental factors on condom use self-efficacy among university students in Nigeria. *PLOS ONE*, *14*(8), e0221804. https://doi.org/10.1371/journal.pone.0221804

Ajuwon, A., McFarland, W., Hudes, E., Adedapo, S., Okikiolu, T., & Lurie, P. (2002). HIV risk-related behavior, sexual coercion, and implications for prevention strategies among female apprentice tailors in Ibadan Nigeria. *AIDS Behav*. https://doi.org/https://doi.org/10.1023/A:1019839824312

Al-Badi, A., Tarhini, A., & Al-Bolushi, H. (2020). Adoption of Social Media for Public Relations Professionals in Oman. In *ICT for an Inclusive World* (pp. 229–247). https://doi.org/10.1007/978-3-030-34269-2_17

Alber, J. M., Bernhardt, J. M., Stellefson, M., Weiler, R. M., Anderson-Lewis, C., Miller, M. D., & MacInnes, J. (2015). Designing and testing an inventory for measuring social media competency of certified health education specialists. *Journal of Medical Internet Research*, *17*(9), e221. https://doi.org/10.2196/jmir.4943

Allen, L. (2005). *Sexual Subjects: Young people, sexuality and education*. Palgrave Macmillan UK. https://doi.org/10.1057/9780230500983

Allen, L. (2011). *Young People and Sexuality Education: Rethinking Key Debates*. Palgrave Macmillan UK. https://doi.org/10.1057/9780230297630

Amo-Adjei, J., & Tuoyire, D. A. (2018). Timing of sexual debut among unmarried youths aged 15–24 years in sub-Saharan Africa. *Journal of Biosocial Science*, *50*(2), 161–177. https://doi.org/10.1017/S0021932017000098

Amuyunzu-Nyamongo, M., Biddlecom, A. E., Ouedraogo, C., & Woog, V. (2005). *Qualitative evidence on adolescents' views of sexual and reproductive health in Sub-Saharan Africa* (16.; Occasional Report).

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Andrade, E. L., Evans, W. D., Barrett, N., Edberg, M. C., & Cleary, S. D. (2018). Strategies to increase Latino immigrant youth engagement in health promotion using social media:

Mixed-methods study. *JMIR Public Health and Surveillance*, *4*(4), e71. https://doi.org/10.2196/publichealth.9332

Arcia, A. (2014). Facebook Advertisements for Inexpensive Participant Recruitment Among Women in Early Pregnancy. *Health Education & Behavior*, *41*(3), 237–241. https://doi.org/10.1177/1090198113504414

Atkinson, N. L., Saperstein, S. L., & Pleis, J. (2009). Using the internet for health-related activities: Findings from a national probability sample. *Journal of Medical Internet Research*, *11*(1), e4. https://doi.org/10.2196/jmir.1035

Awotunde, J. B., Ogundokun, R. O., Ayo, F. E., Ajamu, G. J., Adeniyi, E. A., & Ogundokun, E. O. (2020). *Social Media Acceptance and Use Among University Students for Learning Purpose Using UTAUT Model* (L. Borzemski, J. Świątek, & Z. Wilimowska (eds.); Vol. 1050, pp. 91–102). Springer International Publishing. https://doi.org/10.1007/978-3-030-30440-9_10

Baptista, G., & Oliveira, T. (2015). Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior*, *50*, 418–430. https://doi.org/10.1016/j.chb.2015.04.024

Beguy, D., Mumah, J., & Gottschalk, L. (2014). Unintended Pregnancies among Young Women Living in Urban Slums: Evidence from a Prospective Study in Nairobi City, Kenya. *PLoS ONE*, *9*(7), e101034. https://doi.org/10.1371/journal.pone.0101034

Bennett, G. G., & Glasgow, R. E. (2009). The delivery of public health interventions via the internet: Actualizing their potential. *Annual Review of Public Health*, *30*(1), 273–292. https://doi.org/10.1146/annurev.publhealth.031308.100235

Berer, M. (2006). Condoms, yes! "Abstinence", no. *Reproductive Health Matters*, *14*(28), 6–16. https://doi.org/10.1016/S0968-8080(06)28278-8

Berinsky, A. J., Margolis, M. F., & Sances, M. W. (2014). Separating the Shirkers from the Workers? Making Sure Respondents Pay Attention on Self-Administered Surveys. *American Journal of Political Science*, *58*(3), 739–753. https://doi.org/10.1111/ajps.12081

Bhana, D. (2016). Virginity and virtue: African masculinities and femininities in the making of teenage sexual cultures. *Sexualities*, *19*(4), 465–481. https://doi.org/10.1177/1363460715613298

Bhana, D., & Anderson, B. (2013). Desire and constraint in the construction of South

African teenage women's sexualities. *Sexualities*, *16*(5–6), 548–564. https://doi.org/10.1177/1363460713487366

Bhana, D., Crewe, M., & Aggleton, P. (2019). Sex, sexuality and education in South Africa. *Sex Education*, *19*(4). https://doi.org/10.1080/14681811.2019.1620008

Bhutta, C. B. (2012). Not by the Book: Facebook as a Sampling Frame. *Sociological Methods and Research*, *40*(1), 57–88. https://doi.org/10.1177/0049124112440795

Blinn-Pike, L., Berger, T. J., Hewett, J., & Oleson, J. (2004). Sexually Abstinent Adolescents. *Journal of Adolescent Research*, *19*(5), 495–511. https://doi.org/10.1177/0743558403259987

Bobbitt, L. M., & Dabholkar, P. A. (2001). Integrating attitudinal theories to understand and predict use of technology-based self-service. *International Journal of Service Industry Management*, *12*(5), 423–450. https://doi.org/10.1108/EUM0000000006092

Boonsiritomachai, W., & Pitchayadejanant, K. (2017). Determinants affecting mobile banking adoption by generation Y based on the Unified Theory of Acceptance and Use of Technology Model modified by the Technology Acceptance Model concept. *Kasetsart Journal of Social Sciences*. https://doi.org/10.1016/j.kjss.2017.10.005

Boyatzis, R. (1998). *Transforming qualitative information: Thematic analysis and code development*. Sage.

Brady, W. J., Wills, J. A., Jost, J. T., Tucker, J. A., & Van Bavel, J. J. (2017). Emotion shapes the diffusion of moralized content in social networks. *Proceedings of the National Academy of Sciences*, *114*(28), 7313–7318. https://doi.org/10.1073/pnas.1618923114

Braeken, D., & Cardinal, M. (2008). Comprehensive Sexuality Education as a Means of Promoting Sexual Health. *International Journal of Sexual Health*, *20*(1–2), 50–62. https://doi.org/10.1080/19317610802157051

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. (2020). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, 1–25. https://doi.org/10.1080/14780887.2020.1769238

Braun, V., Clarke, V., Hayfield, N., & Terry, G. (2019). Thematic Analysis. In *Handbook of*

*Research Methods in Health Social Sciences* (pp. 843–860). Springer Singapore. https://doi.org/10.1007/978-981-10-5251-4_10

Brewis, A., & Wutich, A. (2019). Why we should never do it: Stigma as a behaviour change tool in global health. *BMJ Global Health*, *4*(5), e001911. https://doi.org/10.1136/bmjgh-2019-001911

Brusse, C., Gardner, K., McAullay, D., & Dowden, M. (2014). Social media and mobile apps for health promotion in Australian indigenous populations: Scoping review. *Journal of Medical Internet Research*, *16*(12), e280. https://doi.org/10.2196/jmir.3614

Buhi, E. R., Daley, E. M., Oberne, A., Smith, S. A., Schneider, T., & Fuhrmann, H. J. (2010). Quality and accuracy of sexual health information web sites visited by young people. *Journal of Adolescent Health*, *47*(2), 206–208. https://doi.org/10.1016/j.jadohealth.2010.01.002

Bull, S. S., Levine, D. K., Black, S. R., Schmiege, S. J., & Santelli, J. (2012). Social media-delivered sexual health intervention: a cluster randomized controlled trial. *American Journal of Preventive Medicine*, *43*(5), 467–474. https://doi.org/10.1016/j.amepre.2012.07.022

Bull, S. S., Levine, D. K., Black, S. R., Schmiege, S. J., & Santelli, J. (2012). Social Media–delivered sexual health intervention. *American Journal of Preventive Medicine*, *43*(5), 467–474. https://doi.org/10.1016/j.amepre.2012.07.022

Buse, K., Hildebrand, M., & Hawkes, S. (2016). A farewell to abstinence and fidelity? *The Lancet Global Health*, *4*(9). https://doi.org/10.1016/S2214-109X(16)30138-3

Byron, P., Albury, K., & Evers, C. (2013). "It would be weird to have that on Facebook": Young people's use of social media and the risk of sharing sexual health information. *Reproductive Health Matters*, *21*(41), 35–44. https://doi.org/10.1016/S0968-8080(13)41686-5

Card, K. G., Lachowsky, N., Hawkins, B. W., Jollimore, J., Baharuddin, F., & Hogg, R. S. (2018). Predictors of Facebook user engagement with health-related content for gay, bisexual, and other men who have sex with men: Content analysis. *JMIR Public Health and Surveillance*, *4*(2), e38. https://doi.org/10.2196/publichealth.8145

Carpenter, L. M. (2001). The ambiguity of "having sex": The subjective experience of virginity loss in the united states. *The Journal of Sex Research*, *38*(2), 127–139.

https://doi.org/10.1080/00224490109552080

Carpenter, L. M. (2002). Gender and the Meaning and Experience of Virginity Loss in the Contemporary United States. *Gender & Society*, *16*(3), 345–365. https://doi.org/10.1177/0891243202016003005

Carpenter, L. M. (2011). Like a Virgin…Again?: Secondary Virginity as an Ongoing Gendered Social Construction. *Sexuality & Culture*, *15*(2), 115–140. https://doi.org/10.1007/s12119-010-9085-7

Carpenter, L. M., & DeLamater, J. D. (2012). Studying Gendered Sexualities over the Life Course: A Conceptual Framework. In *Sex for life : from virginity to Viagra, how sexuality changes throughout our lives*. New York University Press.

Cesare, N., Lee, H., McCormick, T., Spiro, E., & Zagheni, E. (2018). Promises and pitfalls of using digital traces for demographic research. *Demography*, *55*(5), 1979–1999. https://doi.org/10.1007/s13524-018-0715-2

Challa, S., Manu, A., Morhe, E., Dalton, V. K., Loll, D., Dozier, J., Zochowski, M. K., Boakye, A., Adanu, R., & Hall, K. S. (2018). Multiple levels of social influence on adolescent sexual and reproductive health decision-making and behaviors in Ghana. *Women & Health*, *58*(4), 434–450. https://doi.org/10.1080/03630242.2017.1306607

Chambers, W. C. (2007). Oral Sex: Varied Behaviors and Perceptions in a College Population. *Journal of Sex Research*, *44*(1), 28–42. https://doi.org/10.1080/00224490709336790

Chang, I.-C., & Hsu, H.-M. (2012). Predicting medical staff intention to use an online reporting system with modified unified theory of acceptance and use of technology. *Telemedicine Journal and E-Health : The Official Journal of the American Telemedicine Association*, *18*(1), 67–73. https://doi.org/10.1089/tmj.2011.0048

Chen, M., & Lu, T. (2011). Modeling e-coupon proneness as a mediator in the extended TPB model to predict consumers' usage intentions. *Internet Research*, *21*(5), 508–526. https://doi.org/10.1108/10662241111176344

Chin, W. W., & Todd, P. A. (1995). On the Use, Usefulness, and Ease of Use of Structural Equation Modeling in MIS Research: A Note of Caution. *MIS Quarterly*, *19*(2), 237. https://doi.org/10.2307/249690

Chirawu, P., Hanass-Hancock, J., Aderemi, T. J., de Reus, L., & Henken, A. S. (2014). Protect

or Enable? Teachers' Beliefs and Practices Regarding Provision of Sexuality Education to Learners with Disability in KwaZulu-Natal, South Africa. *Sexuality and Disability*, *32*(3), 259–277. https://doi.org/10.1007/s11195-014-9355-7

Chiu, C.-M., & Wang, E. T. G. (2008). Understanding Web-based learning continuance intention: The role of subjective task value. *Information & Management*, *45*(3), 194–201. https://doi.org/10.1016/j.im.2008.02.003

Christianson, M., Teiler, Å., & Eriksson, C. (2020). "A woman's honor tumbles down on all of us in the family, but a man's honor is only his": young women's experiences of patriarchal chastity norms. *Https://Doi.Org/10.1080/17482631.2020.1862480*, *16*(1). https://doi.org/10.1080/17482631.2020.1862480

Chu, S. K. W., Kwan, A. C. M., Reynolds, R., Mellecker, R. R., Tam, F., Lee, G., Hong, A., & Leung, C. Y. (2015). Promoting sex education among teenagers through an interactive game: Reasons for success and implications. *Games for Health Journal*, *4*(3), 168–174. https://doi.org/10.1089/g4h.2014.0059

Cilliers, L., Viljoen, K. L.-A., & Chinyamurindi, W. T. (2018). A study on students' acceptance of mobile phone use to seek health information in South Africa. *Health Information Management : Journal of the Health Information Management Association of Australia*, *47*(2), 59–69. https://doi.org/10.1177/1833358317706185

Cinthio, H. (2015). "You go home and tell that to my dad!" Conflicting Claims and Understandings on Hymen and Virginity. *Sexuality & Culture*, *19*(1), 172–189. https://doi.org/10.1007/s12119-014-9253-2

Collister, S. (2015). The Public Relations Power of "big Data." In *Share This Too* (pp. 295–303). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781119207993.ch33

Condran, B., Gahagan, J., & Isfeld-Kiely, H. (2017). A scoping review of social media as a platform for multi-level sexual health promotion interventions. *The Canadian Journal of Human Sexuality*, *26*(1), 26–37. https://doi.org/10.3138/cjhs.261-A1

Connell, R. (1987). *Gender and Power*. Allen and Unwin.

Connell, R. (1995). *Masculinities*. Polity Press.

Connell, R. W., & Messerschmidt, J. W. (2005). Hegemonic Masculinity: Rethinking the Concept. *Gender & Society*, *19*(6), 829–859. https://doi.org/10.1177/0891243205278639

Corsaro, W. A. (1992). Interpretive Reproduction in Children's Peer Cultures. *Social Psychology Quarterly*, *55*(2), 160. https://doi.org/10.2307/2786944

Crawford, M., & Popp, D. (2010). Sexual double standards: A review and methodological critique of two decades of research. *Http://Dx.Doi.Org/10.1080/00224490309552163*, *40*(1), 13–26. https://doi.org/10.1080/00224490309552163

Crutzen, R., de Nooijer, J., Brouwer, W., Oenema, A., Brug, J., & de Vries, N. K. (2011). Strategies to facilitate exposure to internet-delivered health behavior change interventions aimed at adolescents or young adults: A systematic review. *Health Education & Behavior*, *38*(1), 49–62. https://doi.org/10.1177/1090198110372878

Currier, D. M. (2013). Strategic Ambiguity: Protecting Emphasized Femininity and Hegemonic Masculinity in the Hookup Culture. *Http://Dx.Doi.Org/10.1177/0891243213493960*, *27*(5), 704–727. https://doi.org/10.1177/0891243213493960

Curtis, L., Edwards, C., Fraser, K. L., Gudelsky, S., Holmquist, J., Thornton, K., & Sweetser, K. D. (2010). Adoption of social media for public relations by nonprofit organizations. *Public Relations Review*, *36*(1), 90–92. https://doi.org/10.1016/j.pubrev.2009.10.003

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, *32*(5), 554–571. https://doi.org/10.1287/mnsc.32.5.554

Dalessandro, C., James-Hawkins, L., & Sennott, C. (2019). Strategic Silence: College Men and Hegemonic Masculinity in Contraceptive Decision Making: *Https://Doi.Org/10.1177/0891243219850061*, *33*(5), 772–794. https://doi.org/10.1177/0891243219850061

Darroch, J. E., Woog, V., Bankole, A., & Ashford, L. S. (2016). *Addiing it Up: Costs and Benefits of Meeting the Contraceptive Needs of Adolescents.*

Denecke, K., Bamidis, P., Bond, C., Gabarron, E., Househ, M., Lau, A. Y. S., Mayer, M. A., Merolli, M., & Hansen, M. (2015). Ethical issues of social media usage in healthcare. *Yearbook of Medical Informatics*, *24*(01), 137–147. https://doi.org/10.15265/IY-2015-001

DeSantis, L., & Ugarriza, D. N. (2000). The Concept of Theme as Used in Qualitative Nursing Research. *Western Journal of Nursing Research*, *22*(3), 351–372. https://doi.org/10.1177/019394590002200308

Diefendorf, S. (2015). After the Wedding Night: Sexual Abstinence and Masculinities over the Life Course. *Http://Dx.Doi.Org/10.1177/0891243215591597*, *29*(5), 647–669. https://doi.org/10.1177/0891243215591597

Dodds, P. S., Clark, E. M., Desu, S., Frank, M. R., Reagan, A. J., Williams, J. R., Mitchell, L., Harris, K. D., Kloumann, I. M., Bagrow, J. P., Megerdoomian, K., McMahon, M. T., Tivnan, B. F., & Danforth, C. M. (2015). Human language reveals a universal positivity bias. *Proceedings of the National Academy of Sciences*, *112*(8), 2389–2394. https://doi.org/10.1073/pnas.1411678112

Dreier, S. K., Long, J. D., & Winkler, S. J. (2020). African, Religious, and Tolerant? How Religious Diversity Shapes Attitudes Toward Sexual Minorities in Africa. *Politics and Religion*, *13*(2), 273–303. https://doi.org/10.1017/S1755048319000348

Duckworth, K. D., & Trautner, M. N. (2019). Gender Goals: Defining Masculinity and Navigating Peer Pressure to Engage in Sexual Activity: *Https://Doi.Org/10.1177/0891243219863031*, *33*(5), 795–817. https://doi.org/10.1177/0891243219863031

Dulle, F. W., & Minishi-Majanja, M. K. (2011). The suitability of the Unified Theory of Acceptance and Use of Technology (UTAUT) model in open access adoption studies. *Information Development*, *27*(1), 32–45. https://doi.org/10.1177/0266666910385375

Dwivedi, Y. K., Rana, N. P., Janssen, M., Lal, B., Williams, M. D., & Clement, M. (2017). An empirical validation of a unified model of electronic government adoption (UMEGA). *Government Information Quarterly*, *34*(2), 211–230. https://doi.org/10.1016/j.giq.2017.03.001

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model. *Information Systems Frontiers*, *21*(3), 719–734. https://doi.org/10.1007/s10796-017-9774-y

El Ouirdi, M., El Ouirdi, A., Segers, J., & Pais, I. (2016). Technology adoption in employee recruitment: The case of social media in Central and Eastern Europe. *Computers in Human Behavior*, *57*, 240–249. https://doi.org/10.1016/j.chb.2015.12.043

Escobar-Rodríguez, T., Carvajal-Trujillo, E., & Monge-Lozano, P. (2014). Factors that influence the perceived advantages and relevance of Facebook as a learning tool: An extension of the UTAUT. *Australasian Journal of Educational Technology*, *30*(2).

https://doi.org/10.14742/ajet.585

Etemadi, R., Hon, C. K. H., Murphy, G., & Manley, K. (2019). The use of social media for work-related knowledge sharing by construction professionals. *Architectural Engineering and Design Management*, 1–15. https://doi.org/10.1080/17452007.2019.1688637

Facebook. (2020). *What kinds of posts will I see in news feed on Facebook?* https://www.facebook.com/help/166738576721085

Faust, L., & Yaya, S. (2018). The effect of HIV educational interventions on HIV-related knowledge, condom use, and HIV incidence in sub-Saharan Africa: a systematic review and meta-analysis. *BMC Public Health*, *18*(1), 1254. https://doi.org/10.1186/s12889-018-6178-y

Fawole, I. O., Asuzu, M. C., Oduntan, S. O., & Brieger, W. R. (1999). A school-based AIDS education programme for secondary school students in Nigeria: a review of effectiveness. *Health Education Research*, *14*(5), 675–683. https://doi.org/10.1093/her/14.5.675

Fonner, V. A., Armstrong, K. S., Kennedy, C. E., O'Reilly, K. R., & Sweat, M. D. (2014). School based sex education and HIV prevention in low-and-middle-income countries: A systematic review and meta-analysis. *PLoS ONE*, *9*(3), e89692. https://doi.org/10.1371/journal.pone.0089692

Ford, J. V., Corona Vargas, E., Finotelli Jr., I., Fortenberry, J. D., Kismödi, E., Philpott, A., Rubio-Aurioles, E., & Coleman, E. (2019). Why Pleasure Matters: Its Global Relevance for Sexual Health, Sexual Rights and Wellbeing. *International Journal of Sexual Health*, *31*(3), 217–230. https://doi.org/10.1080/19317611.2019.1654587

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39. https://doi.org/10.2307/3151312

Francis, D. A., & DePalma, R. (2014). Teacher perspectives on abstinence and safe sex education in South Africa. *Https://Doi.Org/10.1080/14681811.2013.833091*, *14*(1), 81–94. https://doi.org/10.1080/14681811.2013.833091

Gabarron, E., & Wynn, R. (2016). Use of social media for sexual health promotion: A scoping review. *Global Health Action*, *9*(1), 32193. https://doi.org/10.3402/gha.v9.32193

Gammon, D., Christiansen, E. K., & Wynn, R. (2009). Exploring morally relevant issues facing families in their decisions to monitor the health-related behaviours of loved ones. *Journal of Medical Ethics*, *35*(7), 424–428. https://doi.org/10.1136/jme.2008.027920

Gilbert, L. K., Temby, J. R. E., & Rogers, S. E. (2005). Evaluating a teen STD prevention website. *Journal of Adolescent Health*, *37*(3), 236–242. https://doi.org/10.1016/j.jadohealth.2004.09.018

Gill, H. K., Gill, N., & Young, S. D. (2013). Online technologies for health information and education: A literature review. *Journal of Consumer Health on the Internet*, *17*(2), 139–150. https://doi.org/10.1080/15398285.2013.780542

Goedel, W. C., Jin, H., Sutten Coats, C., Ogunbajo, A., & Restar, A. J. (2020). Predictors of user engagement with Facebook posts generated by a national sample of lesbian, gay, bisexual, transgender, and queer community centers in the united states: Content analysis. *JMIR Public Health and Surveillance*, *6*(1), e16382. https://doi.org/10.2196/16382

Golden, S. D., & Earp, J. A. L. (2012). Social Ecological Approaches to Individuals and Their Contexts. *Health Education & Behavior*, *39*(3), 364–372. https://doi.org/10.1177/1090198111418634

Goncalves, G., Oliveira, T., & Cruz-Jesus, F. (2018). Understanding individual-level digital divide: Evidence of an African country. *Computers in Human Behavior*, *87*, 276–291. https://doi.org/10.1016/j.chb.2018.05.039

Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should We Trust Web-Based Studies? A Comparative Analysis of Six Preconceptions About Internet Questionnaires. *American Psychologist*, *59*(2), 93–104. https://doi.org/10.1037/0003-066X.59.2.93

Green, E. C., & Witte, K. (2006). Can fear arousal in public health campaigns contribute to the decline of HIV prevalence? *Journal of Health Communication*, *11*(3), 245–259. https://doi.org/10.1080/10810730600613807

Gruskin, S., Yadav, V., Castellanos-Usigli, A., Khizanishvili, G., & Kismödi, E. (2019). Sexual health, sexual rights and sexual pleasure: meaningfully engaging the perfect triangle. *Sexual and Reproductive Health Matters*, *27*(1), 29–40. https://doi.org/10.1080/26410397.2019.1593787

Gummer, T., Roßmann, J., & Silber, H. (2018). Using Instructed Response Items as Attention Checks in Web Surveys. *Sociological Methods & Research*, 004912411876908. https://doi.org/10.1177/0049124118769083

Guttman, N., & Salmon, C. T. (2004). Guilt, fear, stigma and knowledge gaps: ethical issues in public health communication interventions. *Bioethics*, *18*(6), 531–552. https://doi.org/10.1111/j.1467-8519.2004.00415.x

Hageman, K. M., Dube, H. M. B., Mugurungi, O., Gavin, L. E., Hader, S. L., & St Louis, M. E. (2010). Beyond monogamy: opportunities to further reduce risk for HIV infection among married Zimbabwean women with only one lifetime partner. *AIDS and Behavior*, *14*(1), 113–124. https://doi.org/10.1007/s10461-009-9603-5

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1992). *Multivariate data analysis with readings (3rd ed.)*. Macmillan Publishing Company.

Hampton, K., Rainie, L., Weixu, L., Dwyer, M., Shin, J., & Purcell, K. (2014). *Social media and the "spiral of silence."*

Hanke, R. (1990). Hegemonic masculinity in thirty something. *Critical Studies in Mass Communication*, *7*(3), 231–248. https://doi.org/10.1080/15295039009360176

Hanson, C., Thackeray, R., Barnes, M., Neiger, B., & McIntyre, E. (2008). Integrating Web 2.0 in Health Education Preparation and Practice. *American Journal of Health Education*, *39*(3), 157–166. https://doi.org/10.1080/19325037.2008.10599032

Hanson, C., West, J., Neiger, B., Thackeray, R., Barnes, M., & McIntyre, E. (2011). Use and Acceptance of Social Media Among Health Educators. *American Journal of Health Education*, *42*(4), 197–204. https://doi.org/10.1080/19325037.2011.10599188

Harrison, A., & O'Sullivan, L. F. (2010). In the Absence of Marriage: Long-Term Concurrent Partnerships, Pregnancy, and HIV Risk Dynamics Among South African Young Adults. *AIDS and Behavior*, *14*(5), 991–1000. https://doi.org/10.1007/s10461-010-9687-y

Haseltonu, M. G., & Buss, D. M. (2001). The affective shift hypothesis: The functions of emotional changes following sexual intercourse. *Personal Relationships*, *8*(4), 357–369. https://doi.org/10.1111/j.1475-6811.2001.tb00045.x

Herrero, Á., San Martín, H., & Garcia-De los Salmones, M. del M. (2017). Explaining the adoption of social networks sites for sharing user-generated content: A revision of the UTAUT2. *Computers in Human Behavior*, *71*, 209–217.

https://doi.org/10.1016/j.chb.2017.02.007

Hindin, M. J., Kalamar, A. M., Thompson, T.-A., & Upadhyay, U. D. (2016). Interventions to Prevent Unintended and Repeat Pregnancy Among Young People in Low- and Middle-Income Countries: A Systematic Review of the Published and Gray Literature. *Journal of Adolescent Health*, *59*(3), S8–S15. https://doi.org/10.1016/j.jadohealth.2016.04.021

Höfler, M., Pfister, H., Lieb, R., & Wittchen, H.-U. (2005). The use of weights to account for non-response and drop-out. *Social Psychiatry and Psychiatric Epidemiology*, *40*(4), 291–299. https://doi.org/10.1007/s00127-005-0882-5

Hossain, A., Quaresma, R., & Rahman, H. (2019). Investigating factors influencing the physicians' adoption of electronic health record (EHR) in healthcare system of Bangladesh: An empirical study. *International Journal of Information Management*, *44*, 76–87. https://doi.org/10.1016/j.ijinfomgt.2018.09.016

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Huang, Y. W., & Hung, C. H. (2009). The effect of health education through the internet on university female students' hepatitis B knowledge and cognition. *Journal of Clinical Nursing*. https://doi.org/10.1111/j.1365-2702.2009.02907.x

Huaynoca, S., Chandra-Mouli, V., Yaqub Jr., N., & Denno, D. M. (2014). Scaling up comprehensive sexuality education in Nigeria: From national policy to nationwide application. *Sex Education*, *14*(2), 191–209. https://doi.org/10.1080/14681811.2013.856292

Huseynov, F., & Özkan Yıldırım, S. (2019). Online Consumer Typologies and Their Shopping Behaviors in B2C E-Commerce Platforms. *SAGE Open*, *9*(2), 215824401985463. https://doi.org/10.1177/2158244019854639

Izugbara, C. O. (2007). Representations of sexual abstinence among rural Nigerian adolescent males. *Sexuality Research and Social Policy*, *4*(2), 74–87. https://doi.org/10.1525/srsp.2007.4.2.74

Izugbara, C. O. (2008). Home-Based Sexuality Education. *Youth & Society*, *39*(4), 575–600. https://doi.org/10.1177/0044118X07302061

Jewkes, R., & Abrahams, N. (2002). The epidemiology of rape and sexual coercion in South Africa: an overview. *Social Science & Medicine*, *55*(7), 1231–1244. https://doi.org/10.1016/S0277-9536(01)00242-8

Jewkes, R., Dunkle, K., Jama-Shai, N., & Gray, G. (2015). Impact of exposure to intimate partner violence on CD4+ and CD8+ T cell decay in HIV infected women: longitudinal study. *PloS One*, *10*(3), e0122001. https://doi.org/10.1371/journal.pone.0122001

Joe, H. (1993). Multivariate dependence measures and data analysis. *Computational Statistics & Data Analysis*, *16*(3), 279–297. https://doi.org/10.1016/0167-9473(93)90130-L

Jones, K., Baldwin, K. A., & Lewis, P. R. (2012). The potential influence of a social media intervention on risky sexual behavior and chlamydia incidence. *Journal of Community Health Nursing*. https://doi.org/10.1080/07370016.2012.670579

Jones, K., Eathington, P., Baldwin, K., & Sipsma, H. (2014). The impact of health education transmitted via social media or text messaging on adolescent and young adult risky sexual behavior. *Sexually Transmitted Diseases*, *41*(7), 413–419. https://doi.org/10.1097/OLQ.0000000000000146

Joshanloo, M., & Gebauer, J. E. (2020). Religiosity's Nomological Network and Temporal Change. *European Psychologist*, *25*(1), 26–40. https://doi.org/10.1027/1016-9040/a000382

Jung, I., & Lee, Y. (2015). YouTube acceptance by university educators and students: a cross-cultural perspective. *Innovations in Education and Teaching International*, *52*(3), 243–253. https://doi.org/10.1080/14703297.2013.805986

Kaivanara, M. (2016). Virginity dilemma: Re-creating virginity through hymenoplasty in Iran. *Culture, Health & Sexuality*, *18*(1), 71–83. https://doi.org/10.1080/13691058.2015.1060532

Kalembo, F. W., Zgambo, M., & Yukai, D. (2013). Effective Adolescent Sexual and Reproductive Health Education Programs in Sub-Saharan Africa. *Californian Journal of Health Promotion*, *11*(2), 32–42. https://doi.org/10.32398/cjhp.v11i2.1529

Kamel Boulos, M. N., & Wheeler, S. (2007). The emerging Web 2.0 social software: An enabling suite of sociable technologies in health and health care education. *Health*

*Information & Libraries Journal*, *24*(1), 2–23. https://doi.org/10.1111/j.1471-1842.2007.00701.x

Kaufman, M. R., Cornish, F., Zimmerman, R. S., & Johnson, B. T. (2014). Health Behavior Change Models for HIV Prevention and AIDS Care. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *66*, S250–S258. https://doi.org/10.1097/QAI.0000000000000236

Keller, S. N., & Brown, J. D. (2002). Media interventions to promote responsible sexual behavior. *Journal of Sex Research*, *39*(1), 67–72. https://doi.org/10.1080/00224490209552123

Ketchen, D. J. (2013). A Primer on Partial Least Squares Structural Equation Modeling. *Long Range Planning*, *46*(1–2), 184–185. https://doi.org/10.1016/j.lrp.2013.01.002

Kharsany, A. B. M., & Karim, Q. A. (2016). HIV Infection and AIDS in Sub-Saharan Africa: Current Status, Challenges and Opportunities. *The Open AIDS Journal*, *10*, 34–48. https://doi.org/10.2174/1874613601610010034

Khechine, H., Lakhal, S., & Ndjambou, P. (2016). A meta-analysis of the UTAUT model: Eleven years later. *Canadian Journal of Administrative Sciences / Revue Canadienne Des Sciences de l'Administration*, *33*(2), 138–152. https://doi.org/10.1002/cjas.1381

Kijsanayotin, B., Pannarunothai, S., & Speedie, S. M. (2009). Factors influencing health information technology adoption in Thailand's community health centers: applying the UTAUT model. *International Journal of Medical Informatics*, *78*(6), 404–416. https://doi.org/10.1016/j.ijmedinf.2008.12.005

Kim, C., & Yang, S.-U. (2017). Like, comment, and share on Facebook: How each behavior differs from the other. *Public Relations Review*, *43*(2), 441–449. https://doi.org/10.1016/j.pubrev.2017.02.006

Kim, S., Lee, K.-H., Hwang, H., & Yoo, S. (2016). Analysis of the factors influencing healthcare professionals' adoption of mobile electronic medical record (EMR) using the unified theory of acceptance and use of technology (UTAUT) in a tertiary hospital. *BMC Medical Informatics and Decision Making*, *16*, 12. https://doi.org/10.1186/s12911-016-0249-8

King, N. (2004). Using templates in the thematic analysis of text. In G. (Eds. . Cassell, C., Symon (Ed.), *Essential guide to qualitative methods in organizational research* (pp. 257–

270). Sage.

Kirby, D. B. (2008). The impact of abstinence and comprehensive sex and STD/HIV education programs on adolescent sexual behavior. *Sexuality Research & Social Policy 2008 5:3*, *5*(3), 18–27. https://doi.org/10.1525/SRSP.2008.5.3.18

Kite, J., Foley, B. C., Grunseit, A. C., & Freeman, B. (2016). Please like me: Facebook and public health communication. *PLOS ONE*, *11*(9), e0162765. https://doi.org/10.1371/journal.pone.0162765

Klein, J. (2012). *The bully society*. University Press.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*. (2nd ed.). The Guilford Press.

Koh, C. E., Prybutok, V. R., Ryan, S. D., & Wu, Y. A. (2010). A Model for Mandatory Use of Software Technologies: An Integrative Approach by Applying Multiple Levels of Abstraction of Informing Science. *Informing Science: The International Journal of an Emerging Transdiscipline*, *13*, 177–203. https://doi.org/10.28945/1326

Kohler, P. K., Manhart, L. E., & Lafferty, W. E. (2008). Abstinence-Only and Comprehensive Sex Education and the Initiation of Sexual Activity and Teen Pregnancy. *Journal of Adolescent Health*, *42*(4), 344–351. https://doi.org/10.1016/j.jadohealth.2007.08.026

Kreager, D. A., & Staff, J. (2009). The Sexual Double Standard and Adolescent Peer Acceptance: *Http://Dx.Doi.Org/10.1177/019027250907200205*, *72*(2), 143–164. https://doi.org/10.1177/019027250907200205

Kreuter, F., Olson, K., Wagner, J., Yan, T., Ezzati-Rice, T. M., Casas-Cordero, C., Lemay, M., Peytchev, A., Groves, R. M., & Raghunathan, T. E. (2010). Using proxy measures and other correlates of survey outcomes to adjust for non-response: examples from multiple surveys. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *173*(2), 389–407. https://doi.org/10.1111/j.1467-985X.2009.00621.x

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. SAGE PublicationsSage CA: Los Angeles, CA.

Legkauskas, V., & Stankevičienė, D. (2009). Premarital Sex and Marital Satisfaction of Middle Aged Men and Women: A Study of Married Lithuanian Couples. *Sex Roles*, *60*(1–2), 21–32. https://doi.org/10.1007/s11199-008-9497-0

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). *Social Media & Mobile Internet Use among Teens and Young Adults. Millennials.*

Lenzi, R., Packer, C., Ridgeway, K., Moon, T. D., Green, A. F., González-Calvo, L., & Burke, H. M. (2019). Exploring intersections of localised gender norms and unanticipated effects of a sexual and reproductive health intervention: implications of respect and being a "good girl" in Zambézia Province, Mozambique. *Culture, Health & Sexuality*, *21*(5), 575–590. https://doi.org/10.1080/13691058.2018.1498540

Lim, M. S., Vella, A., Sacks-Davis, R., & Hellard, M. E. (2014). Young people's comfort receiving sexual health information via social media and other sources. *International Journal of STD & AIDS*, *25*(14), 1003–1008. https://doi.org/10.1177/0956462414527264

Liu, C. (2000). A Theory of Marital Sexual Life. *Journal of Marriage and Family*, *62*(2), 363–374. https://doi.org/10.1111/j.1741-3737.2000.00363.x

Liu, D., Maimaitijiang, R., Gu, J., Zhong, S., Zhou, M., Wu, Z., Luo, A., Lu, C., & Hao, Y. (2019). Using the Unified Theory of Acceptance and Use of Technology (UTAUT) to Investigate the Intention to Use Physical Activity Apps: Cross-Sectional Survey. *JMIR MHealth and UHealth*, *7*(9), e13127. https://doi.org/10.2196/13127

Liu, J., Li, C., Ji, Y. G., North, M., & Yang, F. (2017). Like it or not: The Fortune 500's Facebook strategies to generate users' electronic word-of-mouth. *Computers in Human Behavior*, *73*, 605–613. https://doi.org/10.1016/j.chb.2017.03.068

Lohmann, S., White, B. X., Zuo, Z., Chan, M.-P. S., Morales, A., Li, B., Zhai, C., & Albarracín, D. (2018). HIV messaging on Twitter: An analysis of current practice and data-driven recommendations. *AIDS*, *32*(18), 2799–2805. https://doi.org/10.1097/QAD.0000000000002018

Lottes, I. (2000). New perspectives on sexual health. In I. Lottes & O. Kontula (Eds.) (Eds.), *New views on sexual health: The case of Finland* (pp. 7–29). Population Research Institute.

Macleod, C. (2009). Danger and Disease in Sex Education: The Saturation of 'Adolescence' with Colonialist Assumptions. *Https://Doi.Org/10.1177/097206340901100207*, *11*(2), 375–389. https://doi.org/10.1177/097206340901100207

MacQuarrie, K. (2014). Unmet need for family planning among young women: Levels and trends. In *DHS comparative reports no.34*.

Magee, J. C., Bigelow, L., DeHaan, S., & Mustanski, B. S. (2012). Sexual Health Information Seeking Online. *Health Education & Behavior*, *39*(3), 276–289. https://doi.org/10.1177/1090198111401384

Malesky, L. A., & Ennis, L. (2004). Supportive Distortions: An Analysis of Posts on a Pedophile Internet Message Board. *Journal of Addictions & Offender Counseling*, *24*(2), 92–100. https://doi.org/10.1002/j.2161-1874.2004.tb00185.x

Mancosu, M., Ladini, R., & Vezzoni, C. (2019). 'Short is Better'. Evaluating the Attentiveness of Online Respondents Through Screener Questions in a Real Survey Environment. *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique*, *141*(1), 30–45. https://doi.org/10.1177/0759106318812788

Marshall, J. (2018). *The world's most committed Christians live in Africa, Latin America – and the U.S.* https://www.pewresearch.org/fact-tank/2018/08/22/the-worlds-most-committed-christians-live-in-africa-latin-america-and-the-u-s/

Maydeu-Olivares, A. (2017). Maximum Likelihood Estimation of Structural Equation Models for Continuous Data: Standard Errors and Goodness of Fit. *Structural Equation Modeling: A Multidisciplinary Journal*, *24*(3), 383–394. https://doi.org/10.1080/10705511.2016.1269606

Mba, C. I., Obi, S. N., & Ozumba, B. C. (2007). The impact of health education on reproductive health knowledge among adolescents in a rural Nigerian community. *Journal of Obstetrics and Gynaecology*, *27*(5), 513–517. https://doi.org/10.1080/01443610701478991

McLaughlin, M. L., Hou, J., Meng, J., Hu, C.-W., An, Z., Park, M., & Nam, Y. (2016). Propagation of information about pre-exposure prophylaxis (PrEP) for HIV prevention through Twitter. *Health Communication*, *31*(8), 998–1007. https://doi.org/10.1080/10410236.2015.1027033

Medley-Rath, S. R. (2007). "Am I Still a Virgin?": What Counts as Sex in 20 years of Seventeen. *Sexuality and Culture*, *11*(2), 24–38. https://doi.org/10.1007/s12119-007-9002-x

Mehrolhassani, M. H., Yazdi-Feyzabadi, V., Mirzaei, S., Zolala, F., Haghdoost, A.-A., & Oroomiei, N. (2020). The concept of virginity from the perspective of Iranian adolescents: a qualitative study. *BMC Public Health*, *20*(1), 717. https://doi.org/10.1186/s12889-020-08873-5

Messerschmidt, J. W. (2012). Engendering Gendered Knowledge: Assessing the Academic Appropriation of Hegemonic Masculinity. *Http://Dx.Doi.Org/10.1177/1097184X11428384*, *15*(1), 56–76. https://doi.org/10.1177/1097184X11428384

Messerschmidt, J. W. (2019). The Salience of "Hegemonic Masculinity." *Men and Masculinities*, *22*(1), 85–91. https://doi.org/10.1177/1097184X18805555

Miller, S. A. (2016). "How You Bully a Girl": Sexual Drama and the Negotiation of Gendered Sexuality in High School. *Http://Dx.Doi.Org/10.1177/0891243216664723*, *30*(5), 721–744. https://doi.org/10.1177/0891243216664723

Moorhead, S. A., Hazlett, D. E., Harrison, L., Carroll, J. K., Irwin, A., & Hoving, C. (2013). A New Dimension of Health Care: Systematic Review of the Uses, Benefits, and Limitations of Social Media for Health Communication. *Journal of Medical Internet Research*, *15*(4), e85. https://doi.org/10.2196/jmir.1933

Moreno, M. A., & Kolb, J. (2012). Social Networking Sites and Adolescent Health. *Pediatric Clinics of North America*, *59*(3), 601–612. https://doi.org/10.1016/j.pcl.2012.03.023

Moskowitz, D. A., Melton, D., & Owczarzak, J. (2009). PowerON: The use of instant message counseling and the Internet to facilitate HIV/STD education and prevention. *Patient Education and Counseling*, *77*(1), 20–26. https://doi.org/10.1016/J.PEC.2009.01.002

Moyo, F. L. (2004). Religion, spirituality and being a woman in Africa: gender construction within the African religio-cultural experiences. *Agenda*, *18*(61), 72–78. https://doi.org/10.1080/10130950.2004.9676045

Mukoro, J. (2017). The need for culturally sensitive sexuality education in a pluralised Nigeria: But which kind? *Sex Education*, *17*(5), 498–511. https://doi.org/10.1080/14681811.2017.1311854

Mulumeoderhwa, M. (2018). Virginity Requirement Versus Sexually-Active Young People: What Girls and Boys Think About Virginity in South Kivu, Democratic Republic of Congo. *Archives of Sexual Behavior*, *47*(3), 565–575. https://doi.org/10.1007/s10508-017-1038-x

Napolitano, C. M. (2010). "MXing it up": How African adolescents may affect social change through mobile phone use. *New Directions for Youth Development*, *2010*(128), 105–113.

https://doi.org/10.1002/yd.380

Ndzovu, H. J. (2016). Un-Natural, Un-African and Un-Islamic: The Three Pronged Unslaught Undermining Homosexual Freedom in Kenya. In A. van Klinken & E. Chitando (Eds.), *Public Religion and the Politics of Homosexuality in Africa* (pp. 78–91). Routledge.

Neiger, B. L., Thackeray, R., Burton, S. H., Giraud-Carrier, C. G., & Fagen, M. C. (2013). Evaluating social media's capacity to develop engaged audiences in health promotion settings. *Health Promotion Practice*, *14*(2), 157–162. https://doi.org/10.1177/1524839912469378

Netemeyer, R. G., Johnston, M. W., & Burton, S. (1990). Analysis of role conflict and role ambiguity in a structural equations framework. *Journal of Applied Psychology*, *75*(2), 148–157. https://doi.org/10.1037/0021-9010.75.2.148

Ngabaza, S., & Shefer, T. (2019). Sexuality education in South African schools: deconstructing the dominant response to young people's sexualities in contemporary schooling contexts. *Https://Doi.Org/10.1080/14681811.2019.1602033*, *19*(4), 422–435. https://doi.org/10.1080/14681811.2019.1602033

Ngabaza, S., Shefer, T., & Catriona, I. M. (2016). "Girls need to behave like girls you know": the complexities of applying a gender justice goal within sexuality education in South African schools. *Reproductive Health Matters*, *24*(48), 71–78. https://doi.org/10.1016/j.rhm.2016.11.007

Nguyen, A. H., Giuliano, A. R., Mbah, A. K., & Sanchez-Anguiano, A. (2017). HIV/sexually transmitted infections and intimate partner violence: Results from the Togo 2013-2014 Demographic and Health Survey. *International Journal of STD & AIDS*, *28*(14), 1380–1388. https://doi.org/10.1177/0956462417705970

Nguyen, P., Gold, J., Pedrana, A., Chang, S., Howard, S., Ilic, O., Hellard, M., & Stoove, M. (2013). Sexual health promotion on social networking sites: A process evaluation of the facespace project. *Journal of Adolescent Health*, *53*(1), 98–104. https://doi.org/10.1016/j.jadohealth.2013.02.007

Nideröst, S., Gredig, D., Hassler, B., Uggowitzer, F., & Weber, P. (2018). The intention to use HIV-pre-exposure prophylaxis (PrEP) among men who have sex with men in Switzerland: testing an extended explanatory model drawing on the unified theory of acceptance and use of technology (UTAUT). *Zeitschrift Fur Gesundheitswissenschaften*

= *Journal of Public Health*, *26*(3), 247–259. https://doi.org/10.1007/s10389-017-0869-1

Njue, C., Nzioka, C., Ahlberg, B.-M., Pertet, A. M., & Voeten, H. A. C. M. (2009). "If you don't abstain, you will die of AIDS": AIDS education in Kenyan public schools. *AIDS Education and Prevention*, *21*(2), 169–179. https://doi.org/10.1521/aeap.2009.21.2.169

Nour, N. M. (2009). Child marriage: a silent health and human rights issue. *Reviews in Obstetrics & Gynecology*, *2*(1), 51–56. http://www.ncbi.nlm.nih.gov/pubmed/19399295

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, *16*(1), 160940691773384. https://doi.org/10.1177/1609406917733847

Nunnaly, J. (1978). (1978). *Psychometric theory*. McGraw-Hill.

Oberski, D. (2014). lavaan.survey : An R Package for Complex Survey Analysis of Structural Equation Models. *Journal of Statistical Software*, *57*(1). https://doi.org/10.18637/jss.v057.i01

Odimegwu, C. (2005). Influence of Religion on Adolescent Sexual Attitudes and Behaviour among Nigerian University Students: Affiliation or Commitment? *African Journal of Reproductive Health*, *9*(2), 125. https://doi.org/10.2307/3583469

Okonofua, F. E., Coplan, P., Collins, S., Oronsaye, F., Ogunsakin, D., Ogonor, J. T., Kaufman, J. A., & Heggenhougen, K. (2003). Impact of an intervention to improve treatment-seeking behavior and prevent sexually transmitted diseases among Nigerian youths. *International Journal of Infectious Diseases*, *7*(1), 61–73. https://doi.org/10.1016/S1201-9712(03)90044-0

Olamijuwon, E. (2021). *Health Information Survey of Young African Adults*. https://doi.org/10.17632/nmnd5dpxdk

Olamijuwon, E. O. (2021). Characterizing low effort responding among young African adults recruited via Facebook advertising. *PLOS ONE*, *16*(5), e0250303. https://doi.org/10.1371/journal.pone.0250303

Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology*, *45*(4), 867–872. https://doi.org/10.1016/j.jesp.2009.03.009

Palit, M., & Allen, K. R. (2019). Making meaning of the virginity experience: young men's

perceptions in the United States. *Sexual and Relationship Therapy*, *34*(2), 137–152. https://doi.org/10.1080/14681994.2016.1237771

Park, D.-H., Lee, J., & Han, I. (2007). The Effect of On-Line Consumer Reviews on Consumer Purchasing Intention: The Moderating Role of Involvement. *International Journal of Electronic Commerce*, *11*(4), 125–148. https://doi.org/10.2753/JEC1086-4415110405

Parker, B. T. (2009). A comparison of brand personality and brand user-imagery congruence. *Journal of Consumer Marketing*, *26*(3), 175–184. https://doi.org/10.1108/07363760910954118

Pascoe, C. J. (2013). Notes on a Sociology of Bullying: Young Men's Homophobia as Gender Socialization. *QED: A Journal in GLBTQ Worldmaking*, 87. https://doi.org/10.14321/qed.0087

Pedrana, A., Hellard, M., Gold, J., Ata, N., Chang, S., Howard, S., Asselin, J., Ilic, O., Batrouney, C., & Stoove, M. (2013). Queer as F**k: Reaching and engaging gay men in sexual health promotion through social networking sites. *Journal of Medical Internet Research*, *15*(2), e25. https://doi.org/10.2196/jmir.2334

Pfeiffer, C., Kleeb, M., Mbelwa, A., & Ahorlu, C. (2014). The use of social media among adolescents in Dar es Salaam and Mtwara, Tanzania. *Reproductive Health Matters*, *22*(43), 178–186. https://doi.org/10.1016/S0968-8080(14)43756-X

Prata, N., Weidert, K., & Sreenivas, A. (2013). Meeting the need: Youth and family planning in Sub-Saharan Africa. *Contraception*, *88*(1), 83–90. https://doi.org/10.1016/j.contraception.2012.10.001

Previti, D., & Amato, P. R. (2004). Is Infidelity a Cause or a Consequence of Poor Marital Quality? *Journal of Social and Personal Relationships*, *21*(2), 217–230. https://doi.org/10.1177/0265407504041384

Pynoo, B., Devolder, P., Tondeur, J., van Braak, J., Duyck, W., & Duyck, P. (2011). Predicting secondary school teachers' acceptance and use of a digital learning environment: A cross-sectional study. *Computers in Human Behavior*, *27*(1), 568–575. https://doi.org/10.1016/j.chb.2010.10.005

R Core Team. (2019). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. https://www.r-project.org/

Ramo, D. E., & Prochaska, J. J. (2012). Broad reach and targeted recruitment using Facebook for an online survey of young adult substance use. *Journal of Medical Internet Research*, *14*(1), 1–10. https://doi.org/10.2196/jmir.1878

Rana, N. P., Dwivedi, Y. K., Lal, B., Williams, M. D., & Clement, M. (2017). Citizens' adoption of an electronic government system: towards a unified view. *Information Systems Frontiers*, *19*(3), 549–568. https://doi.org/10.1007/s10796-015-9613-y

Remez, L. (2000). Oral sex among adolescents: Is it sex or is it abstinence? *Family Planning Perspectives*, *32*(6), 298. https://doi.org/10.2307/2648199

Renold, E. (2010). Learning the "Hard" Way: Boys, hegemonic masculinity and the negotiation of learner identities in the primary school. *Http://Dx.Doi.Org/10.1080/01425690120067980*, *22*(3), 369–385. https://doi.org/10.1080/01425690120067980

Rife, S. C., Cate, K. L., Kosinski, M., & Stillwell, D. (2016). Participant recruitment and data collection through Facebook: the role of personality factors. *International Journal of Social Research Methodology*, *19*(1), 69–83. https://doi.org/10.1080/13645579.2014.957069

Riffe, D., Lacy, S., & Fico, F. G. (2014). *Analyzing media messages: Using quantitative content analysis in research, 3rd ed.* Lawrence Erlbaum Associates Publishers. https://doi.org/https://doi.org/10.4324/9780203551691

Roberto, A. J., Zimmerman, R. S., Carlyle, K. E., Abner, E. L., Cupp, P. K., & Hansen, G. L. (2007). The Effects of a Computer-Based Pregnancy, STD, and HIV Prevention Intervention: A Nine-School Trial. *Health Communication*, *21*(2), 115–124. https://doi.org/10.1080/10410230701306990

Robinson, M., & Robertson, S. (2010). Young men's health promotion and new information communication technologies: illuminating the issues and research agendas. *Health Promotion International*, *25*(3), 363–370. https://doi.org/10.1093/heapro/daq022

Rosseel, Y. (2012). lavaan : An R Package for Structural Equation Modeling. *Journal of Statistical Software*, *48*(2). https://doi.org/10.18637/jss.v048.i02

Rudwick, S., & Posel, D. (2014). Contemporary functions of ilobolo (bridewealth) in urban South African Zulu society. *Journal of Contemporary African Studies*, *32*(1), 118–136. https://doi.org/10.1080/02589001.2014.900310

Rus, H. M., & Cameron, L. D. (2016). Health communication in social media: Message features predicting user engagement on diabetes-related Facebook pages. *Annals of Behavioral Medicine*, *50*(5), 678–689. https://doi.org/10.1007/s12160-016-9793-9

Salarzadeh Jenatabadi, H., Moghavvemi, S., Wan Mohamed Radzi, C. W. J. B., Babashamsi, P., & Arashi, M. (2017). Testing students' e-learning via Facebook through Bayesian structural equation modeling. *PloS One*, *12*(9), e0182311. https://doi.org/10.1371/journal.pone.0182311

Samuels, F., Kivela, J., Chetty, D., Herat, J., Castle, C., Ketting, E., & Baltussen, R. (2013). Advocacy for school-based sexuality education: lessons from India and Nigeria. *Sex Education*, *13*(2), 204–213. https://doi.org/10.1080/14681811.2012.711247

Sandelowski, M. (1995). Qualitative analysis: What it is and how to begin. *Research in Nursing & Health*, *18*(4), 371–375. https://doi.org/10.1002/nur.4770180411

Schalet, A. (2010). Sexual Subjectivity Revisited: The Significance of Relationships in Dutch and American Girls' Experiences of Sexuality. *Http://Dx.Doi.Org/10.1177/0891243210368400*, *24*(3), 304–329. https://doi.org/10.1177/0891243210368400

Schneider, D., & Harknett, K. (2019). What's to Like? Facebook as a Tool for Survey Data Collection. *Sociological Methods and Research*. https://doi.org/10.1177/0049124119882477

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting Structural Equation Modeling and Confirmatory Factor Analysis Results: A Review. *The Journal of Educational Research*, *99*(6), 323–338. https://doi.org/10.3200/JOER.99.6.323-338

Seethamraju, R., Diatha, K. S., & Garg, S. (2018). Intention to Use a Mobile-Based Information Technology Solution for Tuberculosis Treatment Monitoring – Applying a UTAUT Model. *Information Systems Frontiers*, *20*(1), 163–181. https://doi.org/10.1007/s10796-017-9801-z

Selkie, E. M., Benson, M., & Moreno, M. (2011). Adolescents' Views Regarding Uses of Social Networking Websites and Text Messaging for Adolescent Sexual Health Education. *American Journal of Health Education*, *42*(4), 205–212. https://doi.org/10.1080/19325037.2011.10599189

Shakiba, S., Ghaderzadeh, O., & Moghadam, V. M. (2021). Women in Iranian Kurdistan:

Patriarchy and the Quest for Empowerment: *Https://Doi.Org/10.1177/08912432211029205*, *35*(4), 616–642. https://doi.org/10.1177/08912432211029205

Shefer, T., & Ngabaza, S. (2015). 'And I have been told that there is nothing fun about having sex while you are still in high school': Dominant discourses on women's sexual practices and desires in Life Orientation programmes at school | Perspectives in Education. *Perspectives in Education*, *32*(2), 63–76. https://journals.ufs.ac.za/index.php/pie/article/view/1906

Shelton, J. D., Halperin, D. T., Nantulya, V., Potts, M., Gayle, H. D., & Holmes, K. K. (2004). Partner reduction is crucial for balanced "ABC" approach to HIV prevention: Fig 2. *BMJ*, *328*(7444), 891–893. https://doi.org/10.1136/bmj.328.7444.891

Shiferaw, K. B., & Mehari, E. A. (2019). Modeling predictors of acceptance and use of electronic medical record system in a resource limited setting: Using modified UTAUT model. *Informatics in Medicine Unlocked*, *17*, 100182. https://doi.org/10.1016/j.imu.2019.100182

Simon, L., & Daneback, K. (2013). Adolescents' use of the internet for sex education: A thematic and critical review of the literature. *International Journal of Sexual Health*, *25*(4), 305–319. https://doi.org/10.1080/19317611.2013.823899

Singh, S. (2011). Influencing behavioral change by customer engagement amongst youth. *Adolescent Health, Medicine and Therapeutics*, 123. https://doi.org/10.2147/AHMT.S17856

Singh, S., Bankole, A., & Woog, V. (2005). Evaluating the need for sex education in developing countries: sexual behaviour, knowledge of preventing sexually transmitted infections/HIV and unplanned pregnancy. *Sex Education*, *5*(4), 307–331. https://doi.org/10.1080/14681810500278089

Speer, S. A. (2001). *Psychology, Conversation Analysis and Participants' Orientations Reconsidering the Concept of Hegemonic Masculinity: Discursive.* https://doi.org/10.1177/0959353501011001006

Statista. (2021). *Number of internet users in selected countries in Africa as of June 2019, by country*. https://www.statista.com/

Stoebenau, K., Heise, L., Wamoyi, J., & Bobrova, N. (2016). Revisiting the understanding of

"transactional sex" in sub-Saharan Africa: A review and synthesis of the literature. *Social Science & Medicine (1982)*, *168*, 186–197. https://doi.org/10.1016/j.socscimed.2016.09.023

Strecher, V., McClure, J., Alexander, G., Chakraborty, B., Nair, V., Konkel, J., Greene, S., Couper, M., Carlier, C., Wiese, C., Little, R., Pomerleau, C., & Pomerleau, O. (2008). The role of engagement in a tailored web-based smoking cessation program: Randomized controlled trial. *Journal of Medical Internet Research*, *10*(5), e36. https://doi.org/10.2196/jmir.1002

Sykes, Venkatesh, & Gosain. (2009). Model of Acceptance with Peer Support: A Social Network Perspective to Understand Employees' System Use. *MIS Quarterly*, *33*(2), 371. https://doi.org/10.2307/20650296

Tannenbaum, M. B., Hepler, J., Zimmerman, R. S., Saul, L., Jacobs, S., Wilson, K., & Albarracín, D. (2015). Appealing to fear: A meta-analysis of fear appeal effectiveness and theories. *Psychological Bulletin*, *141*(6), 1178–1204. https://doi.org/10.1037/a0039729

Taylor, M., Dlamini, N., Khanyile, Z., & Mpanza, L. (2012). Exploring the use of role play in a school-based programme to reduce teenage pregnancy. *South African Journal of Education*. https://doi.org/10.15700/saje.v32n4a663

Teachman, J. (2003). Premarital Sex, Premarital Cohabitation, and the Risk of Subsequent Marital Dissolution Among Women. *Journal of Marriage and Family*, *65*(2), 444–455. https://doi.org/10.1111/j.1741-3737.2003.00444.x

Thackeray, R., & Neiger, B. L. (2009). A multidirectional communication model: Implications for social marketing practice. *Health Promotion Practice*, *10*(2), 171–175. https://doi.org/10.1177/1524839908330729

Thusi, P., & Maduku, D. K. (2020). South African millennials' acceptance and use of retail mobile banking apps: An integrated perspective. *Computers in Human Behavior*, *111*, 106405. https://doi.org/10.1016/j.chb.2020.106405

Torrone, E. A., Morrison, C. S., Chen, P.-L., Kwok, C., Francis, S. C., Hayes, R. J., Looker, K. J., McCormack, S., McGrath, N., van de Wijgert, J. H. H. M., Watson-Jones, D., Low, N., & Gottlieb, S. L. (2018). Prevalence of sexually transmitted infections and bacterial vaginosis among women in sub-Saharan Africa: An individual participant data meta-analysis of 18 HIV prevention studies. *PLOS Medicine*, *15*(2), e1002511.

https://doi.org/10.1371/journal.pmed.1002511

Tufekci, Z. (2014). "Big questions for social media big data: Representativeness, validity and other methodological pitfalls. *Eighth International AAAI Conference on Weblogs and Social Media.*

Tuyisenge, G., Hategeka, C., & Alba Aguilera, R. (2018). Should condoms be available in secondary schools? Discourse and policy dilemma for safeguarding adolescent reproductive and sexual health in Rwanda. *Pan African Medical Journal*, *31*. https://doi.org/10.11604/pamj.2018.31.173.16549

Van Dyk, A. C. (2017). How do clergy in the Afrikaans-speaking churches deal with sexuality and HIV prevention in young people? Is the message clear? *Verbum et Ecclesia*, *38*(1). https://doi.org/10.4102/ve.v38i1.1762

van Klinken, A., & Obadare, E. (2018). Christianity, sexuality and citizenship in Africa: critical intersections. *Citizenship Studies*, *22*(6), 557–568. https://doi.org/10.1080/13621025.2018.1494900

Vance, K., Howe, W., & Dellavalle, R. P. (2009). Social internet sites as a source of public health information. *Dermatologic Clinics*, *27*(2), 133–136. https://doi.org/10.1016/j.det.2008.11.010

Veale, H. J., Sacks-Davis, R., Weaver, E. R., Pedrana, A. E., Stoové, M. A., & Hellard, M. E. (2015). The use of social networking platforms for sexual health promotion: identifying key strategies for successful user engagement. *BMC Public Health*, *15*(1), 85. https://doi.org/10.1186/s12889-015-1396-z

Venables, W. N., & Ripley, B. D. (2002). *Modern applied statistics with S* (Fourth). Springer US. http://www.stats.ox.ac.uk/pub/MASS4

Venkatesh, Morris, Davis, & Davis. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425. https://doi.org/10.2307/30036540

Venkatesh, Thong, & Xu. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, *36*(1), 157. https://doi.org/10.2307/41410412

Ver Hoef, J. M., & Boveng, P. L. (2007). Quasi-Poisson vs. negative binomial regression: How should we model overdispersed count data. *Ecology*, *88*(11), 2766–2772. https://doi.org/10.1890/07-0043.1

Visser, M. (2007). HIV/AIDS prevention through peer education and support in secondary schools in South Africa. *SAHARA-J: Journal of Social Aspects of HIV/AIDS*, *4*(3), 678–694. https://doi.org/10.1080/17290376.2007.9724891

Wado, Y. D., Sully, E. A., & Mumah, J. N. (2019). Pregnancy and early motherhood among adolescents in five East African countries: a multi-level analysis of risk and protective factors. *BMC Pregnancy and Childbirth*, *19*(1), 59. https://doi.org/10.1186/s12884-019-2204-z

Wannheden, C., Hvitfeldt-Forsberg, H., Eftimovska, E., Westling, K., & Ellenius, J. (2017). Boosting Quality Registries with Clinical Decision Support Functionality. *Methods of Information in Medicine*, *56*(04), 339–343. https://doi.org/10.3414/ME16-02-0030

WHO. (2014). *Health care for women subjected to intimate partner violence or sexual violence: A clinical handbook*. https://www.who.int/reproductivehealth/publications/violence/vaw-clinical-handbook/en/

Wickham, H. (2017). tidyverse: Easily install and load "Tidyverse" packages. In *R package version 1.2.0*.

Wilkins, A. C. (2009). Masculinity dilemmas: Sexuality and intimacy talk among Christians and goths. *Signs*, *34*(2), 343–368. https://doi.org/10.1086/591087

Witzel, T. C., Guise, A., Nutland, W., & Bourne, A. (2016). It Starts With Me: Privacy concerns and stigma in the evaluation of a Facebook health promotion intervention. *Sexual Health*, *13*(3), 228. https://doi.org/10.1071/SH15231

Wojcicki, J. M., & Malala, J. (2001). Condom use, power and HIV/AIDS risk: sex-workers bargain for survival in Hillbrow/Joubert Park/Berea, Johannesburg. *Social Science & Medicine*, *53*(1), 99–121. https://doi.org/10.1016/S0277-9536(00)00315-4

Yaya, S., & Bishwajit, G. (2018). Regional Prevalence, Patterns and Correlates of Sexual Coercion Among Women in Sub-Saharan Africa: A Multi-Country Population-Based Study. *International Journal of Sexual Health*, *30*(2), 224–235. https://doi.org/10.1080/19317611.2018.1491924

Yildiz Durak, H. (2019). Examining the acceptance and use of online social networks by preservice teachers within the context of unified theory of acceptance and use of technology model. *Journal of Computing in Higher Education*, *31*(1), 173–209.

https://doi.org/10.1007/s12528-018-9200-6

Yonker, L. M., Zan, S., Scirica, C. V, Jethwani, K., & Kinane, T. B. (2015). "Friending" teens: Systematic review of social media in adolescent and young adult health care. *Journal of Medical Internet Research*, *17*(1), e4. https://doi.org/10.2196/jmir.3692

Young, S. D., Cumberland, W. G., Nianogo, R., Menacho, L. A., Galea, J. T., & Coates, T. (2015). The HOPE social media intervention for global HIV prevention in Peru: a cluster randomised controlled trial. *The Lancet HIV*, *2*(1), e27–e32. https://doi.org/10.1016/S2352-3018(14)00006-X

Young, S. D., & Jaganath, D. (2013). Online social networking for HIV education and prevention: a mixed-methods analysis. *Sexually Transmitted Diseases*, *40*(2), 162–167. https://doi.org/10.1097/OLQ.0b013e318278bd12

Yucel, D., & Gassanov, M. A. (2010). Exploring actor and partner correlates of sexual satisfaction among married couples. *Social Science Research*, *39*(5), 725–738. https://doi.org/10.1016/j.ssresearch.2009.09.002

Zhang, B., Mildenberger, M., Howe, P. D., Marlon, J., Rosenthal, S. A., & Leiserowitz, A. (2018). Quota sampling using Facebook advertisements. *Political Science Research and Methods*, 1–7. https://doi.org/10.1017/psrm.2018.49

Zimmer, M. (2010). "But the data is already public": On the ethics of research in Facebook. *Ethics and Information Technology*, *12*(4), 313–325. https://doi.org/10.1007/s10676-010-9227-5

# Appendices

## A.1 Policy Brief[2]

# Sexuality Education in the Digital Age: Reflections on the Use of Social Media for Sexual Health Education

Emmanuel **Olamijuwon** *(University of the Witwatersrand, South Africa)*

*Ensuring universal access to sexual and reproductive health (SRH) and reproductive rights by 2030 (SDG 5.6) is one of the critical agenda for sustainable development adopted by all United Nations Member States, including those on the African continent. To achieve this, the government of the various African countries need to ensure that by 2030, there is universal access to sexual and reproductive healthcare services, including family planning, information and education, and the integration of reproductive health into national strategies and programmes (SDG 3.7). The use of enabling technology such as social media could contribute to the empowerment of young African adults to advance their sexual and reproductive health and rights (SDG 5.B).*

## Social media as a resource for communicating sexual and reproductive health information

Adolescents and young adults are a major priority for sexual health interventions. This is especially because the population subgroup is at risk of sexually transmittable infections, including HIV (Samuels et al., 2013). Adolescents and young adults are also at risk of

[2] To be shared via major news websites like TheConversations as well as the Ministry/Department of Health in various African countries

Social media is a power innovation that can be used to inform and empower young African adults to advance their sexual and reproductive health and that of future generation. Messages on such platforms need to resonate with the needs of young people, the society and should be free of effort.

unplanned pregnancies, have an unmet need for family planning, and low efficacy for condom use (Ajayi & Olamijuwon, 2019; Beguy et al., 2014; MacQuarrie, 2014; Prata et al., 2013; Torrone et al., 2018; Wado et al., 2019). As a result, more effective sexual health education approaches are needed to reduce misinformation, increase knowledge, attitudes and awareness of sexual and reproductive health rights, thereby supporting HIV prevention effort (Chu et al., 2015; Jones et al., 2014; Samuels et al., 2013). While several African countries have scaled up sexual health education efforts using mass media, bulk messaging platforms, in-school training, among many others (Samuels et al., 2013; Taylor et al., 2012), the increasing explosion and expansion of digital technologies like social media have presented new opportunities for sexual health promotions particularly for young adults who have access to the internet and are receptive to such use.

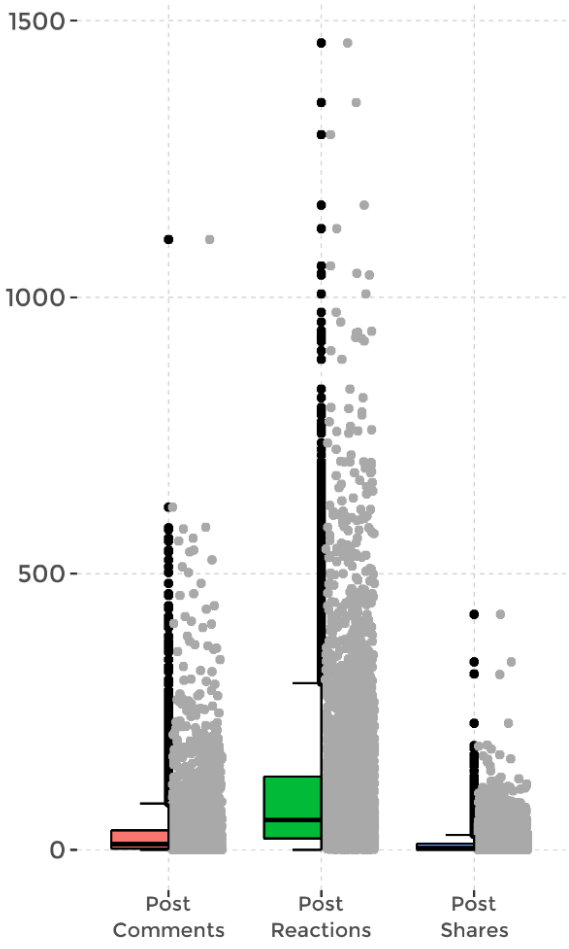
More importantly, social media offers new channels for health communication that, when matched to the needs and preferences of the target audience, can increase the chances of programming success mainly because they are relatively low-cost and user-friendly (Parker, 2009; Pfeiffer et al., 2014; Vance et al., 2009). It also serves as a powerful, engaging, innovative method for reaching at-risk populations, mainly where access issues may exist. While there is limited use of the internet in African countries, the increasing mobile internet coverage even rural sites in many African countries now allow young people to connect anywhere with a reception (Pfeiffer et al., 2014). The acceptance of social media for sexual health communication by young African adults also offers a promising opportunity to adopt social media for sexuality education not as a replacement for existing approaches but as a viable complement to existing strategies for sexuality education.

While several young African adults are already on social media and interact with messages on the platform, a key limitation for sexual health promotion is the low levels of engagement and interaction with sexual health information on social media platforms like Facebook. This is particularly because

such interaction may be misinterpreted as endorsing certain sexuality information, especially in settings where talks about sex and sexuality are prohibited for young unmarried adults. Nonetheless, such interactions are crucial for the success of sexual health promotion because it determines the reach and acceptance of such messages. Drawing from insights from an online survey and interactions on Facebook, this policy brief documents the unique properties of messages and individuals associated with higher levels of engagement with sexual health information on social media. An attempt is also made to show how such interactions and engagements can uncover dominant stereotypes that possibly affects online and offline populations.

## What message features determine engagement and propagation of sexual health messages on social media?

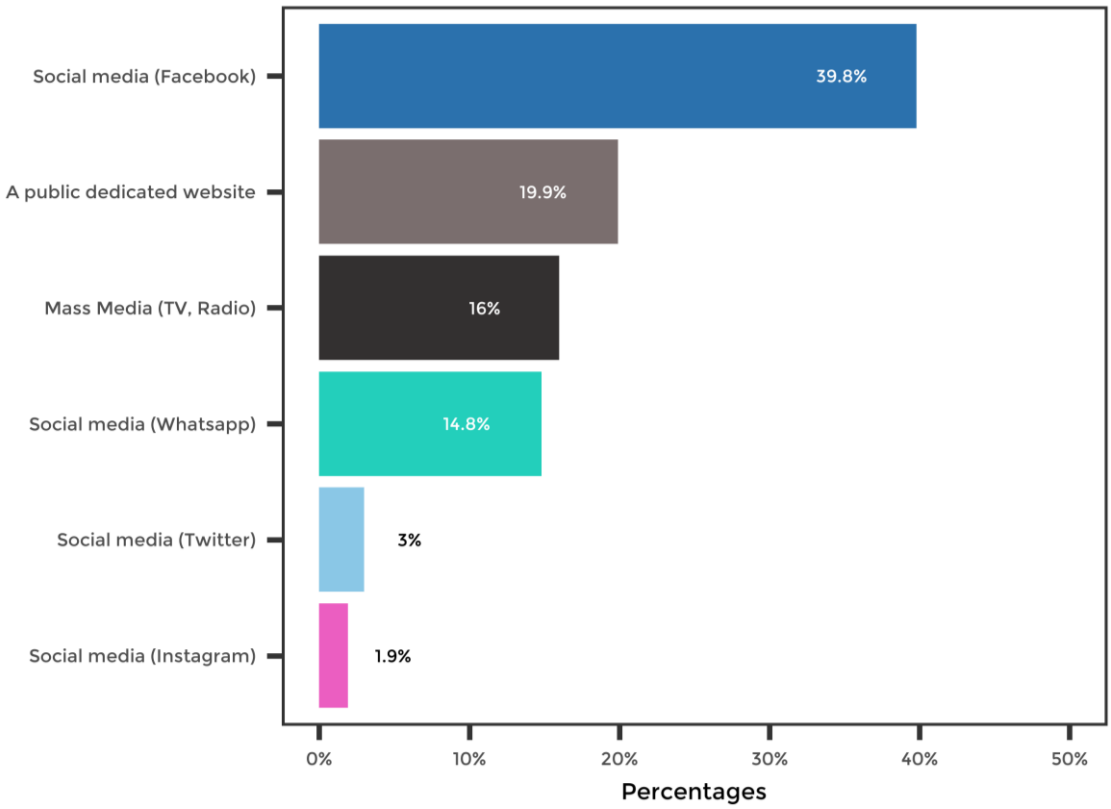
To better understand the message features that determine engagement and propagation of sexual health messages, I used data from a public peer-led Facebook group that facilitates discussions about sexuality. The group comprises more than




Plot excludes four posts with more than 1,500 reactions (2,818, 1,724, 1,691) and shares (3,012)

175,000 young Africans aged 15+ years and contains several messages relating to intimate relationships, sexual abstinence and family planning. As presented in the figure below, the group members were more likely to superficially interact with messages on the group through likes than leave a comment on share posts on the group.

Generally speaking, messages that evoked fear received significantly fewer reactions and comments than neutral messages. Sharing an experience or telling a story was also associated with a higher number of reactions and comments than giving an opinion. The members of the group were generally open about sharing their experience when asked. This is evident in the levels of comments received by posts requesting an opinion. Lastly, the inclusion of multimedia such as photos or videos in messaging was associated with a higher level of engagement on all metrics such as likes, comments and shares. The inclusion of external links, on the other, was associated with lower engagement levels on all the metrics compared to text-only messages.



## What individual attributes determine engagement and propagation of sexual health messages on social media

Using data from an online survey of young adults in Kenya, Nigeria, and South Africa, I found that individual attributes that were positively associated with the intention to use and interact with sexual health information on social media are: performance expectancy, effort expectancy, social influence, facilitating conditions, and attitudes were significantly associated with the intention to use social media to access sexuality information on social media. Specifically, the use of social media for sexuality education is associated with whether such use is free of effort, endorsed by society, align with their engagements with other messages, and helps them achieve improvement in their sexual and reproductive health. Multiple studies have supported these findings, including those related to the use of new technologies in health systems delivery, education, and information management.

## How can engaging young people on social media platform uncover dominant perceptions in sexual and reproductive health

A significant benefit of engaging with young people on sexuality issues on a platform like social media is the potential for bidirectional communication and engagement. Through this approach, young people are not just passive consumers but also creators of sexual health messaging. Such engagements could uncover dominant stereotypes that may be of particular interest, primarily where such attitudes affect the health and well-being of the very same populations they are intended to protect.

Using data from the Facebook group discussed previously, I examined the interactions of members of the group, particularly how they interpret sexuality, virginity loss, love and marriage. This is especially important because studies in diverse settings have highlighted the premiums of virginity and the enormous pressure for young girls to remain virgins until marriage. Even more so in Sub-

Saharan African settings where culture and religion play a pivotal role in sustaining gender power inequalities within relationship dynamics and often hinder disease prevention (Harrison & O'Sullivan, 2010; Moyo, 2004).

> *Many ladies were deceived by men they thought will marry them; they were deceived into dropping their guard. A lot of guys walk away from ladies simply because the ladies refused to give them sex; some are even tempted to give away their virginity to keep the guys. No one has the right to condemn another when you don't know their stories.*

In their descriptions, young adults in the group use many terms to describe virginity loss, including "penetrative sexual intercourse", "the absence of a hymen", and "the shedding of blood". These descriptions emphasise the gendered nature of the interpretation of virginity loss. Interestingly, virgins were described with multiple words, including being "tear rubber" and "others", while non-virgins were described as being "cheap", "second hand", "used and dumped", and "useless".

Similar interpretations of virginity loss as described by Carpenter (2001) were observed in the group. Specifically, participants interpreted virginity as a gift that should be given to someone special, a process to a desirable outcome and a stigma for males. The group members who interpreted virginity as a gift also identified various perceived culturally benefits of virginity that move beyond honour and respect to more complex social benefits like trust in a union, sexual satisfaction and intimate partner control and ultimate satisfaction in marriage.

These interpretations of virginity have enormous implications for the health and wellbeing of adolescents and young women. As Carpenter (2001) notes, interpreting virginity loss as a gift is a double-edged sword that can protect against unintended pregnancy or sexually transmittable infections on the one hand but also reinforce adverse consequences for women who are unable to offer the gift to their partner. Specifically, the concept of virginity until marriage and the stigma

associated with its loss emphasises how women may be forced to remain in a violent non-marital or marital union because of the fear of remaining single, especially considering that virginity and marriage are important constructs in the identity formation of African women.

## Conclusions

- There is a window of opportunity to engage with young adults on sexuality on social media platforms.
- The use of fear appeals is linked with fewer engagements while multimedia use was linked with higher levels of engagement with sexuality information.
- Sexuality information on social media should be free of effort, endorsed by the society, align with engagements with other messages, and help youths achieve improvement in their sexual health.

# A.2 Synopsis of Selected Reviewed Literature on Sexuality Education and Technology Use

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 1. | Card et al. (2018) | Predictors of engagement with health information on social media | Five years of posts shared across 10 Facebook pages administered by Vancouver-based community-based organisations promoting the health and well-being of gay and bisexual men. Content analyses were conducted using informatics-based approaches, and hierarchical negative binomial regression models were used to identify meaningful covariates of engagement. Network analysis assessed basic | The dependent variable for this study was the engagement score estimated directly by Facebook's algorithm. According to Facebook's API, the number is calculated as the combined total number of reactions, shares, and comments on each Facebook post. | Higher user engagement was positively associated with positive sentiment, sharing multimedia, and posting about pre-exposure prophylaxis, stigma, and mental health. Engagement with posts was negatively associated with asking questions, posting about dating, and sharing posts during or after work (versus before). | A key limitation of the study is its sampling approach. The Facebook pages of CBOs were not selected using a randomised approach. As a result, it is difficult to say whether the findings are generalisable to all Facebook-based health |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | indicators of network structure. | | | promotion efforts. The analysis is also prone to measurement error because of the use of an informatics-based approach. Lastly, the study examined engagement metrics based on a composite index. Future studies are needed to elicit the type of participation that will best |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | promote health awareness. |
| 2. | Crutzen et al. (2011) | Strategies to facilitate exposure to internet-delivered health behaviour change interventions aimed at adolescents or young adults: A systematic review | A systematic review of the literature resulting in 838 studies based on title selection, of which 26 studies met the eligibility criteria. | | The study identified multiple strategies used to facilitate exposure to existing internet-delivered interventions. Some of the strategies identified include supporting participants, either through professionals (e.g., ask-the-expert; six interventions) or peers (six interventions). Peer support was enabled through the sharing of information (e.g., personal experiences with behaviour change) or direct communication with other peers. Other strategies include the use of the discussion board or forum and the use of interactive approaches in content delivery. Generally, the | The studies included were limited to original articles published in peer-reviewed English-language journals. As a result of these strict criteria, several valuable non-English studies could have been discarded. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | patterns of effective strategies observed include the combination of tailored communication and the use of reminders and incentives. | |
| 3. | Magee et al. (2012) | Sexual health information seeking online: A mixed-methods study among lesbian, gay, bisexual, and transgender young people | The study was a community-based qualitative interview with a sample of ethnically diverse 32 LGBTs between the ages of 16 and 24 years. The participants were recruited through multiple sources, including flyers posted in community locations frequented by LGBT individuals *(e.g., restaurants, coffee shops, agencies serving LGBT young people).* The participants were also recruited through word of mouth from LGBT peers who | | The internet was widely used to seek sexual health information, particularly information about STIs/HIV among a diverse sample of LGBT young people. LGBT young people appeared to be motivated to search for sexual health information largely either because of a sense of personal relevance *(i.e., having symptoms of infection or perceiving a pressing need to know information for the future)* or because of school projects. Unfortunately, many young people reported reasons for not accessing sexual health | The number of participants was insufficient to make strong inferences about group differences. Furthermore, future studies are needed to evaluate many of the group differences, gender, race, and age differences in |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | had participated in another study. Four interviewers conducted qualitative interviews, which lasted approximately 60 to 90 minutes. | | information online, including fear of stigma, a sense of low personal relevance, disinterest, and mistrust of online information. Notable significant differences in the relative endorsement of themes and subthemes were observed across the categories of gender, race, and age. | preference for sexual health information. |
| 4. | Nguyen et al. (2013) | Sexual health promotion on social networking sites: A process evaluation of the FaceSpace project | A quantitative analysis of online usage statistics from Facebook and online surveys of young adults aged 16 - 29 years in Victoria, Australia. | Usage statistics from Facebook and YouTube were used to measure reach and engagement. The Facebook data included the demographics (gender, age group, the country where the page was accessed) of the fans and daily usage data (such as | Increases in the audience size were associated with the three recruitment drives such as text messaging, promotion, and campaigns via Facebook advertising and posting photos of audiences on the network. Higher levels of interactions were also observed during the recruitment period and when videos were posted. Results from the online | The study could not accurately measure the number of unique fans across five pages; thus, reach was likely to be overestimated. Eligible fans |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | unique page views, photo views, total interactions [wall posts, comments, "likes"]. | survey suggest that about 74% of the participants noticed an update from the project on their Facebook newsfeed at least monthly. More participants used the "like" function (14%) than posting a comment (9%) on the characters' Facebook pages. | self-selected to complete the surveys and may not be representative of all fans. |
| 5. | Pedrana et al. (2013) | Queer as F**k: Reaching and engaging gay men in sexual health promotion through social networking sites | A quantitative analysis of 32 webisodes posted on the Queer as F**k (QAF) Facebook [with 1320 fans] and YouTube pages between April 2010 to April 2011. Insight statistics were downloaded from Facebook and YouTube on a weekly basis and monitored throughout the project. | Project reach was measured as the level of engagement and interaction (degree of fan interest and interaction) using repeat measures over time of website insight statistics. | The webisodes on the network attracted over 30,000 views, ranging from 124-3092 views per individual episode. The participants supported the balance of education and entertainment. They endorsed the narrative "soap opera" format as an effective way to deliver sexual health messages in an engaging, informative, and accessible manner that encouraged online peer discussion of sexual | Usage data were not always complete nor provided as raw data, thus limiting further data manipulation, analysis, or comparisons across social networking |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | health and promoted community engagement. | sites or across other interventions. |
| 6. | Byron et al. (2013) | "It would be weird to have that on Facebook": young people's use of social media and the risk of sharing sexual health information | A two-phase focus group discussion with young people urban and regional New South Wales, Australia. In the first phase, 22 young adults broadly discussed their uses of social media and possible ways to engage with sexual health via social network sites. Two focus groups were held in each location (Sydney and a regional site in New South Wales) and divided by age to determine whether there were distinctions between levels of SNS and mobile phone usage for those | | The findings point to the complex ways in which young people use social media and the unlikelihood of traditional take-home sexual health messages having traction in social media spaces. Five key aspects that emerged were: the participatory culture of social network sites; the stigma of sexual health, especially sexually transmitted infections (STIs); young people's careful presentations of self; privacy concerns; and the importance of humour in sexual health messaging. Fears of bullying and gossip (or 'drama') were also likely | This was a small-scale qualitative study, and the findings are non-representative nor generalisable to the perspective of all young adults in the study setting. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | who were still in high school and those no longer at school. In the second phase, two follow-up focus groups of returning participants of mixed sex and age (16–22 years) took place in each location. The participants were then asked to devise delivery strategies for hypothetical sexual health campaigns for young people using social media. | | to prevent the dissemination of sexual health messages in this environment. However, humorous online videos were noted by participants as a significant way to avoid stigma and enable the sharing of sexual health information. The young people in the study were interested in sexual health information but did not want to access it at the cost of their own sense of comfort and belonging in their social networks. | |
| 7. | Pfeiffer et al. (2014) | The use of social media among adolescents in Dar es Salaam and Mtwara, Tanzania | A mixed-methods study involving a structured survey with 60 adolescents and in-depth interviews with eight students aged 15 to 19 years in Dar es Salaam and Mtwara, Tanzania. | | Findings show that youth in Dar es Salaam and Mtwara access the internet mainly through mobile phones. Facebook is also the most popular internet site. Adolescents highlighted their interest in reproductive and sexual health | Adolescents in the study were selected purposively, and the findings may not be generalisable to |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | messages and updates being delivered through humorous posts, links, and clips, as well as by youth role models like music stars and actors that are entertaining and reflect up-to-date trends of modern youth culture. | the population of adolescents in Dar es Salaam or Mtwara. |
| 8. | Veale et al. (2015) | The use of social networking platforms for sexual health promotion: identifying key strategies for successful user engagement | A quantitative analysis of top 60 Facebook and 40 Twitter profiles undertaking sexual health promotion. | The measure of 'engagement' combined the size of the user base (reach) and the level of interaction of the users. The reach and interaction ranks for each profile were subsequently summed and the ranked these sums again to calculate an overall engagement success ranking. | Social media profiles that were able to successfully engage large numbers of users were more active and had higher levels of interaction per user than lower-ranked profiles.<br><br>Frequent posting patterns, individualised interaction with users, and encouraging interaction and conversation by posing questions were common strategies used by the top ten ranked profiles. Other strategies include uploading | The rapidly evolving functionality and features of Facebook and Twitter mean that other, more novel strategies may currently be in use to increase the reach and interaction on |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | multimedia materials and highlighting celebrity involvement. | these platforms. For example, the Facebook 'Share' feature was not utilised by all profiles examined. This feature, among several others, has also changed considerably since the time of this publication. |
| 9. | Kite et al. (2016) | Please like me: Facebook and public health communication | A cross-sectional quantitative analysis of 20 Facebook pages of Australian public health organizations. | The outcome variables in this study comprised the key engagement metric, including likes, comments, and shares. In addition, total reach, and | Posts that include multimedia content had higher levels of engagement than those without. However, this finding is prone to bias from the Facebook algorithm that amplifies the propagation of | The analysis only considered pages with 10,000 or more fans, which was an arbitrary cut |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | impressions, as well as fan-reach and fan impressions, were included as offsets in the models. The number of post consumers was used as an outcome variable as another way of operationalising engagement. | multimedia contents than other post types. Posts that featured a positive emotional appeal or provided facts attracted higher levels of user engagement, while conventional marketing elements, such as sponsorships and the use of persons of authority, generally discouraged user engagement, except for posts that included a celebrity or sportsperson. | point. Pages with fewer fans may be operated in significantly different ways than the pages with more fans, thus limiting the generalisability of the findings. Statistics about the features of the pages were also available for less than half the pages eligible for the study, limiting the analysis of these fine-grained |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | measures. Lastly, the focus of the study on Facebook pages also limits the ability to infer the findings to other social media platforms. |
| 10. | Rus & Cameron, (2016) | Health communication in social media: Message features predicting user engagement on diabetes-related Facebook pages | A content analysis of 500 Facebook posts within ten diabetes-related Facebook pages. | Each of the engagement metrics was treated as a distinct, independent variable given the different steps necessary for performing each method. For example, liking a post involves clicking the Like button located beneath the post. | Messages with images had higher rates of liking and sharing relative to messages without images. Diabetes consequence information and positive identity predicted higher sharing while negative affect, social support, and crowdsourcing predicted higher commenting. Negative affect, crowdsourcing, and use of external | The study focused on diabetics related messages on Facebook. However, message features could influence user engagement |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | Commenting involves typing a message in a comment box beneath the post while to share a post, one clicks the Share button, which opens a window prompting for the location of the share (either on one's own timeline or on the timeline of a selected friend). | links predicted lower sharing while positive identity predicted lower commenting. The presence of imagery weakened or reversed the positive relationships of several message features with engagement. Diabetes control information and negative affect predicted more likes in text-only messages but fewer likes when these messages included illustrative imagery. Similar patterns of imagery's attenuating effects emerged for the positive relationships of consequence information, control information, and positive identity with shares and for positive relationships of negative affect and social support with comments. | with other health topics or other social media platforms in different ways. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 11. | Witzel et al. (2016) | It starts with Me: Privacy concerns and stigma in the evaluation of a Facebook health promotion intervention | A purposive sample of 40 individuals targeted by the *"It Starts with Me"* intervention was recruited for in-depth interviews. Data collection was in two phases. In the first phase, individuals were sampled based on previous engagement with online health interventions in general, while in the second phase, all individuals were sampled based on engagement with the intervention. | | The study identifies the motivations and barriers to engagement with a Facebook-based sexual health intervention as they relate to privacy and online safety. Privacy concerns related to the ecology of social networking sites, issues with implied disclosure and discrimination, as well as uncertainty over control of data. These concerns limited the organic reach of the intervention by confining the intervention to those who already held the norms diffused through it and by discouraging participants from sharing and commenting on content. | The upper age range of the sample is slightly higher than the target demographic of ISWM project. As a result, it is likely that the magnitude of privacy concerns may be overestimated given this older age range. Furthermore, the patterns of engagement with health promotion |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | differs greatly, and each metric could offer a unique benefit for information diffusion. Some individuals would have passively engaged with content drawing useful information from the interventions without 'liking' and commenting. However, the successes of interventions such as ISWM, |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | are predicated on active engagement to increase the information reach. Lastly, being a qualitative study, the findings are better considered indicative rather than representative. |
| 12. | Kim & Yang (2017) | Like, comment, and share on Facebook: How each behavior | A content analysis of Facebook posts by 20 companies. A total of 10 companies in the sample were drawn from the Fortune list of | Three behavioural metrics comprising of like, comment, and share were used as dependent variables. All the metrics | The findings showed several distinctive relationships between message features and three Facebook behaviours. Posts created with photos and stimulating any of | The companies from which text data were retrieved were selected using a |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | differs from the other | Most Admired Companies *(Shaughnessy, 2013)* and another ten from the 24/7 Wall Street list of Most Hated Companies in America (McIntyre & Sauter, 2013). A total of 30 posts was collected for each corporate Facebook page (N = 600), capturing the most recent posts before 1 November 2013 in reverse chronological order. | were subsequently log-transformed due to their skewed nature. | the five senses were more likely to encourage Facebook users to click the like. Users were more likely to comment on messages that solicit responses and have logical information. In contrast, posts with photos were less likely to receive comments. Lastly, posts created with photos or videos and using the ration or the sensory strategies were more likely to trigger people to share, whereas those using the ego strategy were less likely to be shared. | convenience sampling technique, and this may limit the generalisability of the findings. Second, compared to the enormous scale of message production on Facebook, up to about 41,000 posts per second, the present sample size of wall posts is relatively small. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 13. | Andrade et al. (2018) | Strategies to increase Latino immigrant youth engagement in health promotion using social media: Mixed-methods study | A mixed-methods analysis of 871 wall posts on Adelante -a Facebook-branded primary prevention program to address risk factors for co-occurring substance use, sexual risk, and interpersonal violence among 743 Latino immigrant adolescents aged 12 to 19 years in a Washington, DC suburb. | Metrics for reach were number of page fans, number of posts, total reach, organic reach, and paid reach.<br><br>A composite indicator of engagement was also derived by summing post clicks, reactions, comments, and shares. | Posts on the page had a total of 34,318 clicks, 473 comments, 9,080 likes or reactions, and 617 shares. Message categories that were significantly associated with post engagement were frequent updates; showcasing youth achievements; news links, social marketing campaign posts, and prevention topic (such as substance abuse, safe sex, sexually transmitted disease prevention, and violence or fighting. Post features that were significantly associated with post engagement comprised the inclusion of photos, Spanish or bilingual posts, and portrayal of youths of both sexes. | A sizeable proportion of Adelante Facebook fans were known participants in the program, while some fans were not. As a result, it is likely that some of the audiences were not from the target audience in terms of geographic location, exact age group, or ethnicity. Likewise, |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | engagement on the page may have been driven by the members being familiar with the project rather than organic engagements. |
| 14. | Card et al. (2018) | Predictors of Facebook user engagement with health-related content for gay, bisexual, and other men who have sex with | A content analysis of 5 years of activity [n = 14,071 posts] across ten Facebook pages administered by Vancouver-based community-based organizations (CBOs) promoting gay and bisexual men's health | Facebook's engagement score was used because this is presumably an important variable used in determining what is shown on the user's News Feed. According to Facebook's API, the number is calculated as the combined total | There was a moderate correlation between the number of posts and the number of CBOs users engaged with. Higher user engagement was positively associated with positive sentiment, sharing multimedia, and posting about pre-exposure prophylaxis, stigma, and mental health. Engagement was negatively associated with asking questions, | The analysis is subject to measurement error due to the use of informatics-based analytic approaches in classifying and coding posts. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | men: Content analysis | | number of reactions, shares, and comments on each post | posting about dating, and sharing posts during or after work (versus before). | The aggregation of engagement metrics possibly obscures important patterns since the indices may have varying benefits in health promotion.<br><br>The authors further emphasise the importance of individual-level factors in understanding how specific user characteristics |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | may shape user engagement. |
| 15. | Lohmann et al. (2018) | HIV messaging on Twitter: An analysis of current practice and data-driven recommendations | A quantitative analysis of 20,201 HIV-related tweets posted between 2010 and 2017 from 37 HIV experts on Twitter | Study outcome focused on retransmission of HIV-related health information measured using retweet counts for publicly available tweets on Twitter. | Fear-related language, longer messages, and the use of multimedia (e.g., photos, gif, or videos) were the strongest predictors of retweet counts. These findings were similar for messages authored by HIV experts and messages retransmitted by experts but created by nonexperts (e.g., celebrities or politicians). | The use of informatics approach/machine learning algorithms for classifying the content of posts render the results subject to measurement error, as the selection of key terms may limit the accuracy of content classification. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 16. | Goedel et al. (2020) | Predictors of user engagement with Facebook posts generated by a national sample of lesbian, gay, bisexual, transgender, and queer community centers in the United States: Content analysis | A quantitative analysis of 32,014 posts generated by the LGBTQ community centres on Facebook in the United States. | User engagement was derived from the combined total number of reactions, shares, and comments on each post | Posts with multimedia contents such as photos and videos as well as those that contained a direct invitation for engagement, expressed a positive sentiment and contained content related to stigma, mental health, and politics received higher levels of engagement than posts in the corresponding comparison group. | The analysis is subject to measurement error or misclassification due to the keyword-based method for classifying the content of posts. |
| **Love, virginity, and marriage** | | | | | | |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 17. | Carpenter (2001) | The ambiguity of "Having Sex": The subjective experience of virginity loss in the United States. | An in-depth case study of 61 women and men who lived in the greater Philadelphia between 1997 and 1998 | | The study identified three primary interpretations of virginity loss comprising - as a gift, stigma, or part of a process which were also patterned by gender and sexual orientation. These interpretations were also associated with distinctive presentations of self, choices of virginity-loss partners, and contraceptive practices. Different definitions and interpretations of virginity loss gave distinctive shape to individuals choices about the transitions from virgin to nonvirgin identity. | A better understanding of the many potential meanings of virginity loss is important in developing a comprehensive picture of adolescent sexuality on which sex education, research, and adolescents themselves depend. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | |
| 18. | Carpenter (2002) | Gender and the Meaning and Experience of Virginity Loss in the Contemporary United States. | An in-depth case study of 61 women and men who lived in the greater Philadelphia between 1997 and 1998 | | Although women and men tended to assign different meanings to virginity, those who shared an interpretation reported similar virginity-loss encounters. Each interpretation of virginity—as a gift, stigma, or process—featured unequal roles for virgin and partner, which interacted with gender differences in power to produce interpretation-specific patterns of gender subordination, only one of which consistently gave men power over women. | The sampling approach and sample demographics limit the generalizability of the findings to young Americans overall. Poor and rural Americans were under-represented in the sample, as were gay men and lesbians who conceal |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | their sexual identity. The findings may, therefore, only reflect beliefs common to economically secure women and men living in metropolitan areas. |
| 19. | Teachman (2003) | Premarital sex, premarital cohabitation, and the risk of subsequent marital dissolution among women. | A quantitative analysis of 1995 National Survey of Family Growth comprising of 6,577 ever-married women who were first married between 1970 and 1995. | | The findings suggest that neither premarital sex nor premarital cohabitation by itself indicates either pre-existing characteristics or subsequent relationship environments that weaken marriages. Specifically, premarital sex or premarital cohabitation that is limited to a woman's husband is | The study focused on premarital sex and cohabitation in the U.S. population. Also, the focus was on marital |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | not associated with an elevated risk of marital disruption. However, women who have more than one intimate premarital relationship have an increased risk of marital dissolution. | dissolution, and other potential benefits of saving sex for marriage are unknown. |
| 20. | Izugbara (2007) | Representations of sexual abstinence among rural Nigerian adolescent males | An ethnographic analysis of ideas, expectancies, and informal cultures of sex, sexuality, relationships, and sexual risk conducted among 120 rural adolescent males in eight rural Ngwa communities in the Obi-Ngwa local government area of Abia State, Nigeria | | Sexual abstinence occupied a variable position in the lives and minds of these youth: Beliefs about sexual abstinence being moral and healthy and signifying decency, propriety, and decorum existed alongside narratives depicting it both as dangerous and unhealthy and as an imposition and a sign of disempowerment and powerlessness. | The study focused on the perspectives of only young males and relied on data from only rural areas. Studying narratives of sexual abstinence circulating among both rural and urban |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | adolescent males and females in Nigeria may furnish richer insights into the construction of virginity in this population. |
| 21. | Legkauskas & Stankevičienė (2009) | Premarital Sex and Marital Satisfaction of Middle-Aged Men and Women: A Study of Married Lithuanian Couples | 41 heterosexual married adult couples living in two Lithuanian cities and three rural areas | | There was no significant relationship between the experience of premarital sexual intercourse and marital satisfaction of men or women. However, men who had more premarital partners and cohabitation experience were less satisfied with their marriages. For women, an early onset of sexual activity and a larger number | The second limitation concerns the small size of the sample. While permitting to detect significant relationships between variables, the |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | of premarital partners was related to lower marital satisfaction. | size of the sample demands a caution against any overgeneralizations. Furthermore, small size of the sample prevented us from conducting any meaningful statistical analysis on the level of couples. Indeed, this left some interesting questions unexplored, for example, |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | whether a difference between spouses in the extent of their premarital sexual experiences had any impact on their marital satisfaction. These issues represent an interesting line of research for future studies. |
| 22. | Carpenter (2011) | Like a Virgin…Again? : Secondary Virginity as an | A qualitative analysis of in-depth interviews with 61 young adults from diverse | | Respondents who endorsed the concept of secondary virginity were disproportionately White conservative Christian women | |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | Ongoing Gendered Social Construction | backgrounds in the contemporary U.S. | | born after 1972. Secondary virginity reveals the social construction of gendered sexuality and the heterosexual imaginary as it reinforces privilege along with gender, racial, religious, and sexual dimensions. | |
| 23. | Bhana & Anderson (2013) | Desire and constraint in the construction of South African teenage women's sexualities | A qualitative evaluation of In this article, the focus is specifically on one focus group interview conducted with eight young school-going coloured women in Wentworth. The focus-group interview (with eight participants) lasted approximately two hours and was conducted in an available room at the school. A semi-structured interview schedule | | Agency was evident in the expression of sexual desire and pleasure and the ability to act on same-sex relations. Agency was ambiguous, however, and constrained by the need to protect sexual reputations, complicity in violent gender relations and the use of alcohol and drugs which serves to advance male sexual opportunities and power. The article demonstrates the need to work with young women as sexual | |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | was used during the focus-group discussions to probe meanings around sexuality, gender, and relationships. | | agents, constrained by unequal relations of power, understanding, and reflecting on their complicity in the reproduction of inequalities as well as taking heed of the diverse contexts within which gender relations are produced in South Africa. | |
| 24. | Abboud et al. (2015) | "We are Arabs:" The Embodiment of Virginity Through Arab and Arab American Women's Lived Experiences | A face-to-face in-depth interview with ten Arab and Arab American women aged 18 - 35 years who were living in Philadelphia, Pennsylvania. A qualitative phenomenological approach, informed by the philosophy of Maurice Merleau-Ponty, was used to conduct in-depth interviews with ten women | | participants went through a disembodied virginity process, reflecting society's perceptions and values of virginity related to the anatomical presence of a hymen and society's honour. "We are Arabs" describes the ways women identified with the Arab ethnic identity as a shared overall identification, but differed from one lived experience to another, and influenced how participants | The homogeneity in educational level and social class limited the perspectives of the life stories and meanings of virginity to a group of well-educated middle and |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | embodied virginity. The study participants provided a better understanding of the diverse meanings of virginity that move beyond the binary of virginity and virginity loss, and into a spectrum of embodied meanings. | upper-middle-class women |
| 25. | Bhana (2016) | Virginity and virtue: African masculinities and femininities in the making of teenage sexual cultures | A qualitative analysis of nine focus-group discussions with teenagers at Inanda high school in the province of KwaZulu-Natal. Six of the focus groups were single-sex (three with teenage men and three with teenage women) and three were mixed-sex group discussions. There were six teenagers in each focus group, which ran for approximately 90 minutes. | | Teenagers' defence of virginity is grounded in and inspired by deep cultural connections and is an important resource to claim respectability, status and identity. Both teenage men and women centred on idealised virginity and respect. In doing so, their meanings weave into gendered patterns of inequalities. | A further limitation to the research in this article was that the sample was small and drawn from only one geographical area. However, the article does not seek to generalise but rather to report |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | on teenage sexuality within a specific context, which informs a broader project on teenage sexuality in South Africa. The dynamics of the group There are certain limitations with focus group discussions that may preclude discussions diverging from the socially accepted direction |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | governed by the group's own dynamics |
| 26. | Kaivanara (2016) | Virginity dilemma: Re-creating virginity through hymenoplasty in Iran | A qualitative analysis of 24 in-depth, semi-structured interviews with young girls and boys in Tehran from diverse socioeconomic backgrounds, each of which took one hour on average. Additionally, I conducted in-person interviews with a midwife and a gynaecologist in their clinics. The participants ranged in age from 18 years to early-30s | | virginity, a culturally constructed symbol of purity for unmarried girls, which functions as a mechanism to monitor and control female sexuality, has been strongly medicalised in Iran. women who engage in premarital sex and subsequent hymenoplasty, use their bodies as a mark of resistance to the state and its hierarchies. Women in this study defy dominant punitive rules by renegotiating their feminine identities in complex new social realities (Ahmadi 2015) and through the embodiment of their resistance employing sexuality to | The study tries to understand how Iranian women negotiate between dominant models of gender and their more contextually situated subjective experiences. The authors emphasise that further research |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | promote their power. On the other hand, through their narrations, I have aimed to show how some young girls challenge this idea, believing that hymenoplasty and recreating fake virginity reinforce the existing power relations that make 'being virgin' a requirement of marriage. Through hymenoplasty and related procedures, women do not erode the cultural mores surrounding virginity. Paradoxically, they unintentionally and covertly reinforce the existing prevailing patriarchal discourse demanding and highlighting pre-marital virginity | into women's attitudes and motivations taking into account contextual, cultural and historical differences, will help elucidate whether hymenoplasty is best regarded as a mechanism of resistance or a mark of compliance with a gendered order. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 27. | Mulumeoderhwa (2018) | Virginity requirement versus sexually active young people: What girls and boys think about virginity in South Kivu, Democratic Republic of Congo | A qualitative approach was used to collect data from 56 boys and girls aged 16–20 years old. Eight focus group discussions and 40 individual interviews were conducted among participants from two urban and two rural high schools in South Kivu province. | | The study findings suggest that most male and female participants believe in the traditional norm of virginity as a key to a successful marriage. In fact, most male and female participants perceived girls who were virgins as trustworthy individuals. Men are disappointed when they marry non-virgin girls. In addition, the absence of a girl's virginity is believed to bring shame to her family. However, some female participants clearly dissociate from societal views or norms about virginity and remark that virginity itself is not the key to a successful household nor a guarantee for remaining faithful after marriage. | The findings may not represent the wider population's view or description; as such, it would be inappropriate to generalise the findings. Given that the participants were selected by the school's principal and one teacher, the latter was not likely to select a random selection. Such |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | approach, as well as the presence of a female teacher as a moderator of focus groups and individual interviews in one of the four schools undoubtedly, could influence the answers provided by girls in relation to their sexuality. |
| 28. | Palit & Allen (2019) | Making meaning of the virginity | A qualitative grounded theory approach was used to analyse 34 narratives from young men | | The authors found that virginity is a multidimensional concept, with two distinct dimensions: the | The sample included male participants |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | experience: Young men's perceptions in the United States | about their experience of retaining, losing, or giving away their virginity, where seven said they were virgins, 26 said they were non-virgins, and one did not mention his virginity status. | | experiential and the developmental. The experiential dimension highlights young men's perception and understanding of their virginity in four overlapping areas: physical, spiritual, relational, and emotional. The developmental dimension on the contrary highlights young men's perception of their underlying sexual identity growth processes and the gendered and sexual double standards that influence this understanding | from only one university. Students submitted narratives as an extra credit voluntary assignment, which may have influenced how they recounted their sexual experiences. The findings also need to be interpreted with caution and cannot be generalised to the general population due to limitations |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | associated with the sampling strategy and size.. |
| 29. | Mehrolhassani et al. (2020) | The concept of virginity from the perspective of Iranian adolescents: As qualitative study | This was a qualitative study with a phenomenological approach. The research team visited public places, including parks and coffee shops, and interviewed adolescents aged 15-19 years old. The data were collected using in-depth interviews with semi-structured questions and analysed using thematic analysis method. | | Several themes emerged from the analysis that describes the ways in which adolescents describe virginity. This includes virginity as the lack of emotional relationship with the opposite sex, lack of physical contact, nonpenetrative relationship, virginity as a myth, virginity as a commitment, having an intact hymen, and not knowing the meaning of virginity, were extracted from the data. More importantly, some of the adolescents reported that it was important for them to have a hymen because of Iran social | The findings offer some compelling yet diverse descriptions of virginity among Iranian adolescents. As the cultural context in Iran may be different from that of Africa, more studies are needed to explore the |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | norms, but it did not mean that they did not have other forms of non-vaginal or penetrative sexual relationship. | conceptualization of virginity in African countries. In addition, the study examined how virginity is defined but did not explore in detail how these interpretations intersect with marital bliss and satisfaction. |
| **Theoretical Framework** | | | | | | |
| 30. | Venkatesh et al. (2003) | User Acceptance of Information | The study used data from four organizations over a six-month period with three | Behavioural intention to use the system was measured using a three- | The eight models explained between 17 per cent and 53 per cent of the variance in user | Based on findings from the multiple |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | Technology: Toward a Unified View | points of measurement. Longitudinal field studies were conducted at four organizations among individuals being introduced to new technology in the workplace. To help ensure that the results are robust across contexts, they sampled for heterogeneity across technologies, organizations, industries, business functions, and nature of use (voluntary vs mandatory) | item scale adapted from Davis et al. (1989) and extensively used in much of the previous individual acceptance research. Seven-point scales were used for all of the aforementioned constructs' measurements, with 1 being the negative end of the scale and 7 being the positive end of the scale. | intentions to use information technology. Next, a unified model called the Unified Theory of Acceptance and Use of Technology (UTAUT) was formulated, with four core determinants of intention and usage and up to four moderators of key relationships. UTAUT was then tested using the original data and found to outperform the eight individual models (adjusted R2 of 69 per cent). UTAUT was then confirmed with data from two new organizations with similar results (adjusted R2 of 70 per cent). UTAUT thus provides a useful tool for managers needing to | studies that have validated the model, it has become expedient to analyse which attributes or advantages of SNS lead to higher performance expectancy, better effort expectancy, and more fun in the use of new technologies like social media to share user-generated content. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 31. | Hanson et al. (2011) | Use and acceptance of social media among health educators | A random sample of certified health education specialists (N = 503) completed an online survey consisting of items related to the unified theory of acceptance and use of technology (UTAUT). | The behavioural intention was assessed with three questions as to whether the health educator intended, predicted, or planned to use social media tools within the next 12 months. | The findings revealed that health educators mostly used social networking sites, podcasts, and media sharing sites within their organizations. Social influence and performance expectancy were both positively associated with increased behavioural intentions to use social media for health promotion. Reasons for lack of use included employers monitoring or blocking social media, the difficulty of use among older health educators, and the belief that social media would not enhance job performance. | The response rate for this study was relatively low (18%), potentially impacting the representativeness of the sample and the generalizability of the findings. In this study, more women (89.7%) completed the online survey than men (10.3%) and thus may not be applicable in |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | other settings with a higher proportion of male CHES. Finally, because most respondents were younger in terms of age and years working in the profession, the results may not reflect the view of all health educators. |
| 32. | Venkatesh, Thong, & Xu. (2012) | Consumer acceptance and use of information | The study was a two-stage web-based survey of residents in Hong Kong through a popular web portal that | Technology use was measured as a formative composite index of both variety and frequency of | Aside from finding strong support for the theoretical constructs in the UTAUT model, the results also suggest that compared to UTAUT, | The first limitation of the study relates to its |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | technology: Extending the unified theory of acceptance and use of technology. | provides residents with a wide range of e-government services such as filing tax returns, booking public facilities, checking traffic information, among several others. Information about the theoretical constructs, including the intention to use mobile internet, was collected from 4,127 respondents during the first stage, while information about the actual use of the internet was collected from 2,220 respondents in the second stage, which was four months after the first survey. During data analysis, respondents with no prior experience of mobile internet were excluded from the analysis leading to a | mobile Internet use. A list of six popular mobile Internet applications in Hong Kong was provided, and respondents were asked to indicate their usage frequency for each application. Responses to the questions were rated on a seven-point Likert scale with anchors ranging from “never” to “many times. | the extensions proposed in UTAUT2 produced a substantial improvement in the variance explained in behavioural intention and technology use. | generalizability. As the study was conducted in Hong Kong, which has a very high penetration rate for mobile phones, the findings may not apply to African countries or countries that are less technologically advanced. Second, the sample is skewed, with a mean age around 31. As a |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | final analytic sample of 1,512 consumers (601 women). | | | result, the findings may not apply to those who are significantly older. Future research can be expected to build on the study by validating the theoretical applications of UTAUT2 in different countries, different age groups, and different technologies. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 33. | Escobar-Rodríguez et al. (2014) | Factors that influence the perceived advantages and relevance of Facebook as a learning tool: An extension of the UTAUT | A quantitative that targeted 1,200 students between 15 October and 14 December 2012. The participants completed 1,034 (86.17%) questionnaires, 956 (79.67%) of which were collected for data analysis, after eliminating some unusable responses. | Items for behavioural intention were adapted from Terzis, Moridis & Economides (2012) and Venkatesh et al. (2012). The participants were asked to rate whether they intend to use Facebook in their studies when it is available, as often as it is needed, or in the future. | The findings show that the perceived advantages and perceived relevance of Facebook as a social media platform were significant predictors of students' behavioural intention and use of social media platforms. Additionally, the six constructs adapted from the UTAT were significantly associated with students' intention to use Facebook in their studies. | The students recruited into the study were in the Business Administration program at a Spanish public university. This sample of students was not randomly selected, and as a result, the findings cannot be generalised to all students at the selected university or all students in Spain. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 34. | Jung & Lee (2015) | YouTube acceptance by university educators and students: A cross-cultural perspective | Five hundred and sixty-nine students (90 from the USA and 479 from Japan) and 56 educators (27 from the USA and 29 from Japan) responded to the survey. Four versions of the survey (English or Japanese for both educators and students) were created | Behavioural intention was measured by three items to judge YouTube acceptance and the degree to which an educator or student had consciously planned to create or watch YouTube videos for his/her teaching or learning. | The findings show that the four key UTAUT's predictors three (performance expectancy, social influence and facilitating conditions) were significantly associated with YouTube acceptance for educators and/or students in the two countries. The impact of social influence on behavioural intention was stronger for the students than the educators. Culture also had a significant impact on all four predictor variables and behavioural intention. However, its influence on each predictor variable appears to vary according to the type of technology involved and the role of the technology user. | A primary limitation of the study is the representativeness of the sample and disparities in sociodemographic characteristics between the two countries. Around 30% of the USA students were below 25 years old, whereas 97.5% of the Japanese students were below the age of |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | 25. Furthermore, several new features have been added to YouTube since the data collection in 2010. This includes channel service, which enables viewers to access educational channel and make their own playlist, and YouTube Analytics, which provides information regarding which |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | parts of, and where videos are being watched. Further studies on YouTube should take account of these new features as they may affect YouTube acceptance. |
| 35. | El Ouirdi et al. (2016) | Technology adoption in employee recruitment: The case of social media in Central and Eastern Europe | Data were collected between March and June 2014, by an international human resources consulting firm, as part of a large research project on social recruiting. An email invitation to participate in the study was | Behavioural intention was measured with one item, "I intend to use social media in the next 12 months". Usage behaviour, on the other hand, was measured in different ways. | The results showed that the core hypotheses of the UTAUT were supported. This includes the positive association of performance expectancy, effort expectancy, and social influence with behavioural intention, as well as the positive impact of facilitating conditions | A key limitation of the study was that the size of the sample was relatively small. A larger and randomised sample of |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | sent to the firm's database of recruiters. A total of 224 complete answers of recruiters from 10 Central and Eastern European countries, including Poland, Hungary, and Slovenia, were retained for this study | Respondents were asked whether they used social media in the recruitment process for eight purposes, namely: employer branding, advertising jobs, receiving job applications, checking the accuracy of an applicant's CV, checking an applicant's network, checking content posted by an applicant, and checking references of an applicant. Responses to all the nine UTAUT items were rated on a 7-point scale ranging from "I strongly disagree" = 1 to "I strongly agree" = 7. | and behavioural intention on usage behaviour. As expected, the recruiters' characteristics triggered many interaction effects, but none of them impacted facilitating conditions. | participants in future research will be more representative of the population under study. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| 36. | Herrero et al. (2017) | Explaining the adoption of social networks sites to share user-generated content: A revision of the UTAUT2 | A quantitative study based on 537 valid responses from tourists with a personal profile on Facebook who were above 18 years of age and visiting a Spanish destination. Because the size of this target population was unknown, and there was no census available, the survey sample was selected using a non-random sampling procedure. Data collection was conducted through a personal survey, which was conveniently administered during the summer season at an International Airport and at the most important tourist attractions. | Data collection was carried out using a questionnaire, where the variables of the model were operationalised using multi-item measures adapted from the original instrument proposed by Venkatesh et al. (2012). The main outcome variable was behavioural intention to use social networking sites for sharing tourism experiences, which was measured with three items covering the intention and actual use of SNS S to publish tourism experiences during the current trip. The | Performance expectancy, hedonic motivation, and habit were the main drivers of users' intentions to use social network sites to publish content about their travel experiences. On the contrary, three of the factors studied *(i.e., facilitating conditions, social influence, and privacy concerns)* were not associated with the intention to use social network sites to share tourism experiences. | A key limitation of the study is that the dependent variable *(i.e., intention to use SNS to share user-generated content)* was subjectively measured by capturing users' perceptions in relation to their future behaviour. Another limitation of this study is the use of a non-random |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | participants were asked to rate their responses using a seven-point Likert scale. | | sampling procedure, which could limit the generalization of the empirical results. |
| 37. | Cilliers et al. (2018) | A study on students' acceptance of mobile phone use to seek health information in South Africa | A cross-sectional survey approach was used to collect information from a convenience sample of 202 students (58 males; 104 females) at the University of the Eastern Cape, South Africa. | Behavioural intention to seek health information was evaluated based on the participants' responses to three questions. The questions include the student's expectation and intention to use mobile device features to search for medical information [both in the future and frequently]. All the questions were measured | The research model explained about 36% of the variance in behavioural intention to use mobile devices to search for health-related information. Perceived usefulness emerged as the largest contributor to the model and the largest predictor of behavioural intention to use mobile devices to search for health-related information. Other significant predictors of intention to use mobile devices for health- | The findings are not generalizable to a larger population nor a sample of university students in South Africa due to the convenience sampling approach. |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | on a 5-point Likert-scale ranging from strongly disagree (1) to strongly agree (5) | related information were mobile experience, social influence, and attitude to technology. | Furthermore, the study focused on health information broadly; thus, associations identified in the study may not be effective for the context of promoting protective sexual behaviours. |
| 38. | Dwivedi et al. (2019) | Re-examining the Unified Theory of Acceptance and Use of | A meta-analysis based on 1,600 observations and 21 relationships coded from 162 prior studies on IS/IT acceptance and use. The | The primary outcome variables for the study are the intention to use information systems/technology and | The findings showed that attitude played a central role in the acceptance and use of IS/IT innovations. More precisely, attitude partially mediates the | The meta-analysis is limited to studies that reported *Pearson* |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | Technology (UTAUT): Towards a revised theoretical model | studies were unique, empirical, and correlation-based in nature. The search spanned the period from 2003 to 2012. The 162 studies included comprised of 96 articles from journals, 49 conference proceedings, 16 dissertations, and one book chapter | the actual use of information systems/ technology. | effects of performance expectancy, effort expectancy, facilitating conditions, and social influence on behavioural intention, and has a direct effect on usage behaviour. Attitude towards technology use also exerted a direct influence on usage behaviour and was influenced by facilitating conditions and social influence. | correlations or other statistics that may be converted to Pearson correlations while regression-based studies were excluded from the meta-analysis. In addition, the values for relevant statistics such as reliabilities means among others were imputed for studies in which they were not |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | reported. Such treatments may partially affect the meta-analytic and MASEM results. Lastly, the research model did not include the four moderators (i.e., gender, age, experience, and voluntariness) in the original UTAUT model and has a result, could not examine the original UTAUT |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | | | model in its entirety. |
| 39. | Etemadi et al. (2019) | The use of social media for work-related knowledge sharing by construction professionals | Survey questionnaires were sent to 900 potential participants from 26 key professional associations in Australia. The Survey data were collected from 124 construction professionals in Australia, out of which complete data from 120 professionals were analysed. The survey questions targeted the use of Facebook, LinkedIn, and blogs. | Knowledge sharing referred to contributing or seeking knowledge on social media and was measured based on the active (*Active Knowledge Contribution – [AKC], Active Knowledge Seeking [AKS]*) or passive (*Passive Knowledge Seeking [PKS or Lurking]*) nature of the users' online behaviour. Two questions each were used to capture the user's active knowledge contribution (AKC) and sharing (AKS) through posting and commenting | Performance expectancy and knowledge sharing self-efficacy were positively associated with the construction professionals' intention to use social media. Behavioural intention to use social media and facilitating conditions also had a positive direct relationship with the use of social media for work-related knowledge sharing. | Although the sample size met the data requirements for the application of structural equation models, the findings of the study are not generalizable to the Australian population or the population of professionals in the country. As a result, |

| S/N | Author (Year) | Title | Study Description | Measure of outcome | Results/Findings | Evaluation |
|---|---|---|---|---|---|---|
| | | | | under existing posts, while one item was used to measure PKS. The survey participants were asked to indicate the frequency of their AKC, AKS and Lurking on Facebook, LinkedIn, and blogs in the three months preceding the survey. | | more studies with larger samples are needed to strengthen the evidence base. |

# A.3 Ethical Clearance Certificate

Research Office

**HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)**
R14/49 Olamijuwon

| | |
|---|---|
| **CLEARANCE CERTIFICATE** | **PROTOCOL NUMBER: H19/02/25** |
| **PROJECT TITLE** | Advancing sexual health education for African young adults in the digital age |
| **INVESTIGATOR(S)** | Mr E Olamijuwon |
| **SCHOOL/DEPARTMENT** | Social Sciences/ |
| **DATE CONSIDERED** | 15 February 2019 |
| **DECISION OF THE COMMITTEE** | Approved |
| **EXPIRY DATE** | 16 April 2022 |

**DATE** 17 April 2019 **CHAIRPERSON**

(Professor J Knight)

cc: Supervisor : Professor C Odimegwu

**DECLARATION OF INVESTIGATOR(S)**

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

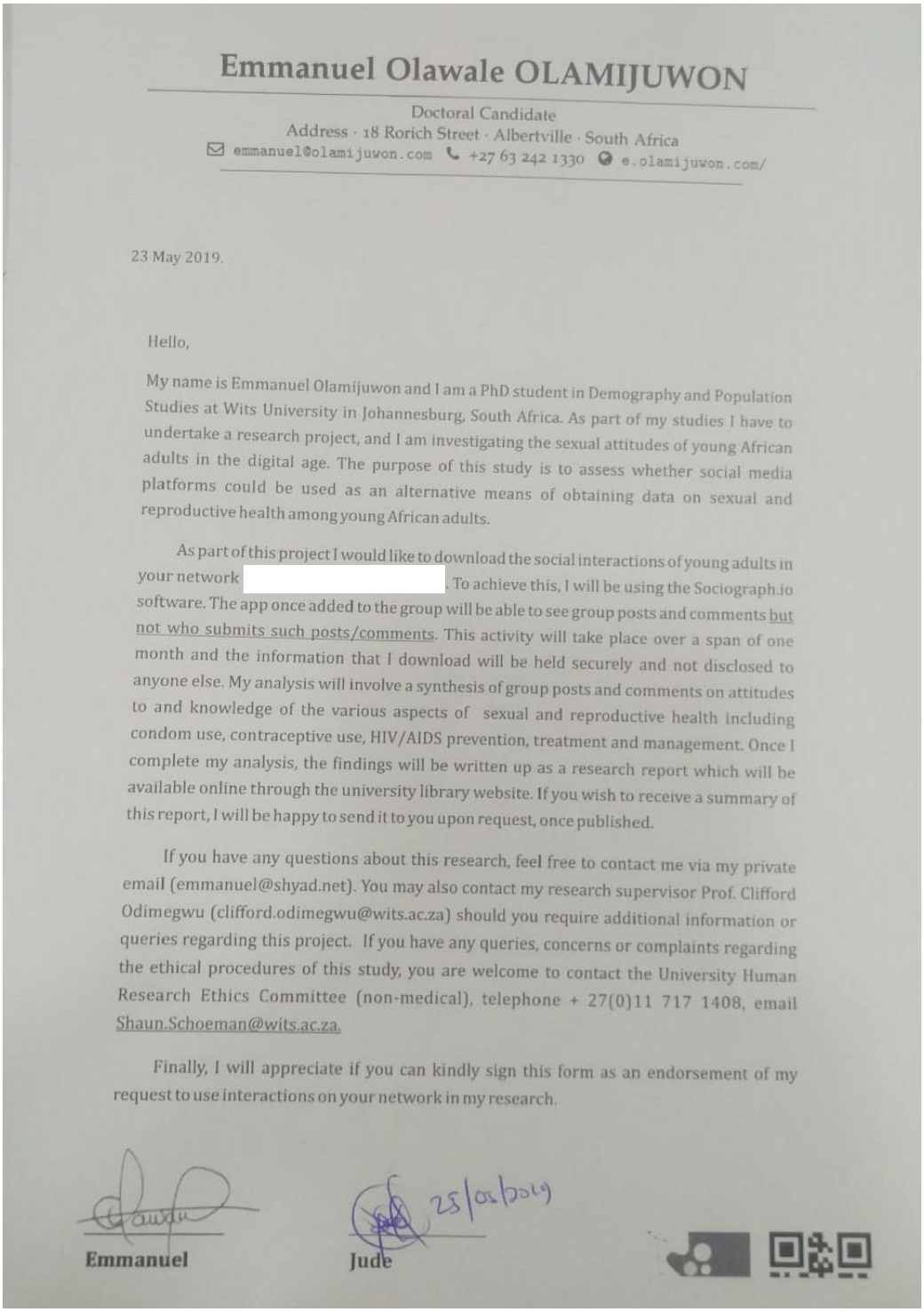
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature

24 / April / 2019
Date

**PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES**

# A.4 Text Data from Facebook Group: Formal Consent to Retrieve




**Emmanuel Olawale OLAMIJUWON**

Doctoral Candidate
Address · 18 Rorich Street · Albertville · South Africa
emmanuel@olamijuwon.com +27 63 242 1330 e.olamijuwon.com/


23 May 2019.

Hello,

My name is Emmanuel Olamijuwon and I am a PhD student in Demography and Population Studies at Wits University in Johannesburg, South Africa. As part of my studies I have to undertake a research project, and I am investigating the sexual attitudes of young African adults in the digital age. The purpose of this study is to assess whether social media platforms could be used as an alternative means of obtaining data on sexual and reproductive health among young African adults.

As part of this project I would like to download the social interactions of young adults in your network [redacted]. To achieve this, I will be using the Sociograph.io software. The app once added to the group will be able to see group posts and comments but not who submits such posts/comments. This activity will take place over a span of one month and the information that I download will be held securely and not disclosed to anyone else. My analysis will involve a synthesis of group posts and comments on attitudes to and knowledge of the various aspects of sexual and reproductive health including condom use, contraceptive use, HIV/AIDS prevention, treatment and management. Once I complete my analysis, the findings will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you upon request, once published.

If you have any questions about this research, feel free to contact me via my private email (emmanuel@shyad.net). You may also contact my research supervisor Prof. Clifford Odimegwu (clifford.odimegwu@wits.ac.za) should you require additional information or queries regarding this project. If you have any queries, 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 Shaun.Schoeman@wits.ac.za.

Finally, I will appreciate if you can kindly sign this form as an endorsement of my request to use interactions on your network in my research.

**Emmanuel**

25/05/2019

**Jude**

# A.5 Online Survey: Participants Information Page and Consent

## THANK YOU FOR YOUR INTEREST IN THIS SURVEY

Below are just a few pieces of information before you begin the survey. Please read carefully and do not hesitate to get in touch if you have questions.

**1. What is the purpose of this survey?**

You have been invited to participate in this survey to share your perspective about how social media could be an alternative platform for health education considering the current outbreak and the urgent need to adopt digital innovation in health education. Your responses can help policymakers in the development of useful and engaging sexual and reproductive health information for young African adults.

**2. Who can participate in the research? What is the expected duration of my participation? What is the duration of this research?**

You have been invited to participate in this survey because your profile on Facebook matches that of a young African adult. We expect that you will kindly complete the 53-item e-questionnaire, which is estimated to take approximately 10-15 minutes. The survey will be conducted over two weeks, and we will proceed with the analysis and reporting afterwards. There are also a few attention-check questions to gauge your attentiveness to the survey. Please look out for them.

**3. Can I participate in this survey more than once?**

Please do not participate in the survey more than once. Our website tracks and logs multiple attempts by a user, and multiple responses will be discarded. However, you may find some questions that are similar to another that you answered before the month of May. These do not count as replication, and you could still participate as new.

**4. What is the approximate number of research participants involved?**

We hope to gather at least 1,760 complete responses from young Adults in four major African countries. You can help us achieve this target by sharing the survey link with your friends and families. A button to share the survey is provided at the end of the survey.

**5. What will be done if I take part in this research study?**

The findings derived from this survey will be written up as a report which will be available online via this network. If you wish to receive a summary of this report, we will be happy to send it to you after we have

e analysis of the data.

**my privacy and the confidentiality of my research records be protected?**

We will not collect any personal data beyond those you provide in the survey. All responses collected will be kept under the University of the Witwatersrand Research Data Management Policy. A summary of your responses is provided on the last page of the survey. You can review your responses and edit if you want before submitting the survey. You could also take a screenshot of your responses if you want.

**7. What are the possible benefits to me and to others?**

There is no direct benefit to you by participating in this research study. However, we have a budget to offer 5GB of free data to some randomly selected participants to be announced at the end of the survey. You may and may not win one of this, but if you would like to be considered for this free data, please enter your mobile number on the last page of the survey. We will not use your mobile number or email address for any other purpose apart from this research.

**8. Can I refuse to participate in this research?**

Yes, you can. Although we strongly encourage you to complete the survey, your decision to participate is entirely voluntary and up to you. You can also withdraw from the research at any time without giving any reasons, by exiting the survey. If you do not want to answer any personal question, please feel free to use the *"Not Sure" or "Prefer not to say"* option.

**9. Whom should I contact if I have any questions or problems?**

You can send us an email via talk2us@shyad.net if you have any questions or queries. You can also use the contact us (/../contact) form to submit a direct email, and we will respond promptly.

**10. Do we have your permission to proceed with the survey?**

Lastly, by clicking on the button below, you confirm that you understand what this survey entails and what your participation will involve; you agree to participate in this survey; you understand that once submitted the information you provide cannot be retracted. However, you can use the back button to edit responses before you submit.

I AGREE TO PARTICIPATE IN THIS SURVEY, PROCEED (HTTPS://SHYADULT.C

# Our Coverage

A summary description of where participants are from

# A.6 Survey Question

(https://facebook.com/shyadnet)
+27 63 242 1330 (tel:+27632421330)
info@shyadult.org (mailto:info@shyadult.org)

(/)

# Health Information Survey for Young Adults

**Completed:** 0 of 56

**How old were you at your last birthday?** Flag

--Select an option--

**Gender:** Flag

Male

Female

**In what country are your residing?** Flag

--Select an option--

**What is your race or ethnicity?** Flag

Black/African

White

Coloured/Mixed Race

Indian/Asian

Other Option

**How religious or non-religious are you?** Flag

Extremely religious

Very religious

Moderately religious

Slightly religious

Not at all religious

Prefer Not to Say

**What is Your Current Relationship Status?** Flag

--Select an option--

**How often do you use the internet?** Flag

Rarely - Less than once per week

Occasionally - At least once a week

Sometimes - in about 50% of the chances when I could have

Everyday and Every time

Not Sure

**What is the highest level of education that you have attained?** Flag

Higher/Tertiary

Secondary

Primary

Never attended school

Prefer Not to Say

**Have you had sex with someone you did not really want to in the last four weeks?** Flag

Yes

No

Prefer Not to Say

**Have you had any unprotected sexual intercourse that could have resulted in pregnancy/ STIs in the last four weeks?**

Flag

No

Yes

Prefer Not to Say

**How concerned are you that you might impregnate someone or get pregnant in the next four weeks?**

Flag

Never had sex in the last four weeks

Not at all Concerned

Slightly Concerned

Moderately Concerned

Somewhat Concerned

Extremely Concerned

Prefer Not to Say

**Have you experienced any difficulty in accessing contraceptives methods (if you need) in the last four weeks, and how does that compare with months ago (Jan-Feb)?**

Flag

No need to access a modern contraceptive in the last four weeks

Not at all difficult

A bit less difficult

No difference

Very much difficult than before

A bit difficult than before

Prefer Not to Say

**Have you sought information online about how to prevent pregnancy/STIs in the last four weeks, and how does that compare with months ago (Jan-Feb)?**

Flag

Never searched online for sexuality information

Much less than I do

A bit less than I do

About the same as I do

A bit more than I do before

Much more than I do before

Prefer Not to Say

**How much information about COVID-19 have you received on social media, mass media or via text messages that you did not solicit, request or search for?**

Flag

A Great Deal

Very Much

Somewhat

Little

Never received information on COVID-19

Not Sure

**How much information on sexuality education, pregnancy/STIs prevention have you received on social media, mass media or via text messages in the last four weeks that you did not solicit, request or search for?**

Flag

A Great Deal

Very Much

Somewhat

Little

Never received any sexuality information in the last four weeks

Not Sure

**What is your preferred digital platform for receiving sexuality education** Flag

Social media (Facebook)

Social media (Twitter)

Social media (Instagram)

Social media (Whatsapp)

A public dedicated website

Mass Media (TV, Radio)

Not Sure

**What do you think about receiving sexuality education on social media platforms like Facebook?**

Flag

Perfectly Acceptable

Acceptable

Slightly acceptable

Neutral

Slightly Unacceptable

Unacceptable

Totally Unacceptable

Not Sure

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with sexual health information on a credible social media group will help me to know and improve my sexual rights**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with sexual health information on a credible social media group can contribute to improvements in my sexual and reproductive health.**

Fl

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with sexuality education on social media would help me to make better and informed decisions about my sexual health.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that this question is an attention checker to gauge that you are not distracted.***

**This question is an attention checker. You should select the option that has "red" to confirm that you are attentive to the questions.**

Flag

Very Strongly Agree

Strongly Ag red

Agree

Neutral

Disagree

Disagree

Strongly Disagree

Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**I could avoid problems in my relationship by learning from other people's experience in a a credible group for sexuality education on social media.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**If I interact with sexual health information on a credible social media group, it will enhance my confidence in communicating with my partner (or future partner) about my sexual needs.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your*

***here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with sexual health information on a credible social media group can be easy for me.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with other people in a credible group for sexual health information on social media will be easy for me.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Sexual and reproductive health information on a credible group on social media can be accurate and reliable and do not require me to verify further.**

Flag

- Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Sexuality health information on a credible social media group will be clear and easily comprehensible for me.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Accessing sexuality education on social media is more comfortable than searching other internet sources like Google**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**I know how to use social media and interacting with sexual health information on a credible social media group will not require much effort.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with sexual health information on a credible group on social media is a bad idea.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with sexual health information with other people in a credible group on social media is interesting.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**I will want to get help on a credible social media group if I am worried about any aspect of my sexual and reproductive health.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Seeking other people's opinion about sexuality health issues on a credible social media group strikes me as a poor way to seek help.**

Flag

- Very Strongly Agree
- Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that this question is an attention checker to gauge that you are not distracted.***

**You should only select the option that has "green" to confirm that you're attentive to the questions.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disa green

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**A person should work out his or her sexual health problems privately. Getting help on a credible group for sexual health on social media should be a last resort.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**Interacting with sexual health information on a credible group on social media is somewhat intimidating to me.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**Other people will think of me as being "sexually loose" if I am very active on a credible social media group for sexual health education.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**I will hesitate to interact with sexual health information on a credible social media group to avoid creating an impression that I cannot correct.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**I am worried that the information I share on a credible social media group for sexual health information might get into the wrong hands.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**My family will disapprove of me interacting with sexual health information on a credible group on social media.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**People who are important to me will disapprove of me interacting with sexual health information on a credible social media group.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**People who share the same religious belief with me will disapprove of me interacting with sexual health information on credible social media group.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible***

*here refers to a group/page/platform managed by a reputable organization in your country.*

**My religious beliefs do not support interacting with sexual health information on public platforms like social media even if its by a credible organization**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**I can afford to buy data bundles to interact with sexual health information on a credible social media.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**I can be in total control of whom and what I interact with on sexuality health issues in a credible group for sexual health education on social media.**

Flag

- Very Strongly Agree

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that this question is an attention checker to gauge that you are not distracted.***

**This question is an attention checker. You should only select the option that has "grey" as your response.**

Flag

Very Strongly Agree

Strongly Agree

A grey

Neutral

Disagreen

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**Interacting with sexuality education on social media fits well with the way I like to interact with other issues on social media.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Strongly Disagree

Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**If I ever experience any assault in a credible social media group/page for sexuality education, the administrators will be very helpful with addressing the difficulties.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**Although it might be helpful, interacting with sexuality education on a credible social media group is not compulsory.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

*To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.*

**I would like to join and interact with sexuality education on social media.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**If I am introduced to a credible social media group/page for sexual health education, I will join.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
- Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**If I am a member of a credible social media platform for sexual health information, I will be active and LIKE relevant posts.**

Flag

- Very Strongly Agree
- Strongly Agree
- Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**If I am a member of a credible social media platform for sexual health information, I will be active and COMMENT on relevant posts.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

***To what extent do you agree or disagree with the statement below? Note that credible here refers to a group/page/platform managed by a reputable organization in your country.***

**If I am a member of a credible social media platform for sexual health information, I will be active and SHARE/RETWEET relevant posts.**

Flag

Very Strongly Agree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Very Strongly Disagree

**Are you currently a fan/member of a credible social media platform for sexual health education?**

Flag

Yes

No

**Please enter your mobile number in the box below if you would like to enter the draw for 5GB of internet data. You can enter NA if you do not want to be considered for the draw:**

Flag

Enter your answer

VOTE

ABOUT SHYAD.NET

Our network uses the most interactive strategies to help adolescents and young African adults, make better and informed decisions about their sexual and reproductive health.

SUBSCRIBE NOW

Let's build a SEXUALLY HEALTHY space for YOUNG AFRICAN ADULTS together.

Type your email

SUBSCRIBE

© 2018 SHY Adult Network. All Rights Reserved. Designed By Emmanuel Olamijuwon (https://e.olamijuwon.com)