Assessing the attitudes of medical students in their fourth year of study towards psychiatry and mental illness

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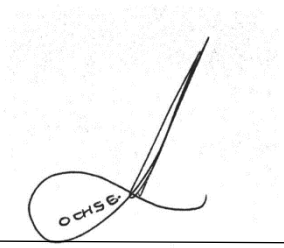
A research report (in the format of a "submissible" paper) submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg in fulfilment for the requirements of the degree of Master of Medicine (Psychiatry), 2020

DECLARATION

I, **Stacey Leigh Ochse**, hereby declare that this research is of my own, unaided work. I am submitting this research report for the degree Master of Medicine in Psychiatry (in submissible format with my protocol) in the medical speciality of Psychiatry at the University of the Witwatersrand, Johannesburg. This research report has not been submitted before for any degree or examination at this or any other university.



Stacey Leigh Ochse

(signature of candidate)

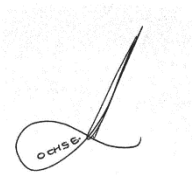
02.12.2020

Date

Contribution of the candidate to the paper

Declaration: Student's contribution to article(s) and agreement of co-author(s)

I, Stacey Leigh Ochse, student number 0702706J, declare that this Research Report is my own work and that I have contributed significantly towards the research finding presented in the paper intended for publication below.



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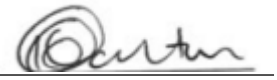
Signature of Primary Supervisor  **Date:** 02.12.2020

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Article Title: Assessing the attitudes of medical students in their fourth year of study towards psychiatry and mental illness

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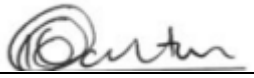
2nd author	Dr Karishma Lowton		**02.12.2020**

Comments by primary supervisor:

_____

DEDICATION

This research article is dedicated to psychiatric patients who have suffered at the hands of stigmatisation and the negative perceptions around mental illness that drive this. May this help to highlight the impact of stigmatisation of the mentally ill as well as on recruitment of doctors into this extremely important medical speciality.

Abstract:

Background: Existing research revealed a high prevalence of negative attitudes towards psychiatry and mental illness amongst medical students preceding formal psychiatric education. Anti-stigma interventions aimed at the level of medical students have been postulated to be most efficacious in reducing the risk of negative attitudes, which may drive stigmatisation and confer risk for poor medical care of psychiatric patients and reduced recruitment of junior doctors into psychiatry training posts.

Aim: This study aimed to determine the prevalence of negative attitudes towards psychiatry and mental illness in a sample population of fourth-year medical students prior to formal psychiatric teaching. It also sought to ascertain whether other sociodemographic factors had bearing on their attitudes in this regard.

Setting: The University of the Witwatersrand fourth-year medical student class of 2019.

Methods: A cross-sectional, quantitative, descriptive study was conducted using the Mental Illness: Clinicians' Attitudes Scale 2 questionnaire (a validated scale for assessing negative attitudes of medical students towards psychiatry and mental illness) and a socio-demographic questionnaire.

Results: Of the total scores, 97.2% fell below the median potential score of 56, reflecting a low prevalence of stigmatising attitudes. The African cohort expressed less interest in psychiatry (80%), compared to other race cohorts (ranging from 92.1% to 100%).

Conclusion: This study revealed a low prevalence of negative and stigmatising attitudes towards psychiatry and mental illness. Of statistical significance, was a relative difference in attitudes towards psychiatry and mental illness in different race cohorts (p=0.0017), however all race cohorts showed a low prevalence of negative and stigmatising attitudes towards psychiatry.

Keywords: MICA-2 scale, stigmatising attitudes, negative attitudes, medical students, medical education

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I am extremely grateful to my supervisor, Dr Karishma Lowton, for her ongoing support, advice, teaching and insightful reviews throughout the course of this research report.

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Thank you to the postgraduate psychiatry committee as well as Professor Szabo who provided extremely helpful insights during the review of the initial protocol.

Thank you to my wonderful husband, Michael Ochse, who has not only been a huge support throughout this research process but who also assisted with the statistical analysis.

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ABBREVIATIONS

MICA-2: Mental Illness: Clinicians' Attitudes Scale 2

UK: United Kingdom

Assessing the attitudes of medical students in their fourth year of study towards psychiatry and mental illness

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The authors declare that there are no conflicts of interest

Introduction

Studies exploring the attitudes of medical students towards psychiatry and mental illness have revealed an impact on treatment of psychiatric patients and the decision of junior doctors to specialise in psychiatry. This has called into question the influential, educational factors that may play a role in this process.[1-15]

Internationally there is a relative paucity of medical students wishing to pursue a career in psychiatry.[1] Pertinent contributing factors include a perceived lack of scientific basis to pathology, ability to confidently engage with the difficult patient, poor prognosis of psychiatric illnesses and stigma towards psychiatry.[1, 16] The UK has termed this a recruitment crisis whereby only 3.6% (as opposed to the required 6%) of British medical graduates pursue a career in psychiatry.[1] Significant research has been conducted in the UK with regards to barriers as well as facilitators of recruitment into psychiatry. Institutions such as King's College in London have launched several initiatives to improve recruitment into psychiatry however, it remains an unpopular choice among doctors mostly due to persisting stigma and negative attitudes towards psychiatry.[1,3] The Royal College of Psychiatrists employed a five-year recruitment policy in 2011 to address the recruitment crisis. It addressed several barriers to recruitment and targeted scholars, medical students as well as foundation doctors in their interventions.[4] It has been noted that the number of consultant psychiatrists in the United Kingdom has increased by more than 50% since the year 2000 [17] possibly due to the recruitment campaign of the Royal College of Psychiatrists.

Additionally, research conducted in the Czech Republic found that medical psychology and communication training in the non-adherent or psychotic patient assisted with students' feeling of competency. It was speculated that this increased tolerant attitudes of medical students towards both psychiatry and mental illness.[6] However, the most prominent barrier noted in the research remains stigma, dating back two centuries with the anti-psychiatry movement in the 18th century.[18] In the 1960's, the movement forced the practice and theory of psychiatry to be revised in terms of protecting the rights of mentally ill patients, thus contributing to the evolution and restructuring of psychiatry as a profession. With the movement, focus was placed on holistic care and the importance of mental, spiritual and somatic aspects of human existence.[18] Although a drastic and much needed process, stigmatising views of the profession still permeate social and cultural views today.[18] Contributing to this are media based depictions of outdated treatments such as lobectomies

and the incorrect portrayal of electroconvulsive therapy, which further impact on society's perception and potentially affects the choice of specialising in psychiatry.[4]

Stigma as conceptualized in the Annual Review of Sociology by Bruce G. Link and Jo C. Phelan in 2001, is defined as, "The co-occurrence of its components, labelling, stereotyping, separation, status loss and discrimination in a situation where power is exercised".[19] In the context of social work literature, it is noted that James R. Dudley in 2000, conceptualised stigma as being negative views assigned to a person or to a group of people when their behaviours and features are considered to differ from societal norms.[20] Stigma may be differentiated into externalized or experienced stigma and internalized or self-stigma.[8] There is a complex interplay between externalized and internalized stigma with both having an extensive impact on economic, social and psychological realms regarding patients with mental illness. This may further exacerbate social disengagement and marginalization.[21]

The anticipated negative and stigmatising attitudes of healthcare professionals towards the mentally ill, may influence help seeking behaviour and quality of medical and psychiatric care received.[6,22] A systematic review conducted by Janouskova et al., indicated compromise of the patient-doctor relationship resulting in premature termination of treatment.[6] Stigma has been linked to diagnostic overshadowing whereby a patient's physical symptoms are incorrectly attributed to their mental illness resulting in delays in diagnosis and treatment.[23,24] This was further illustrated in a UK study that showed significant disparities in the health of patients with and without mental illness due to poor communication and stigma.[25]

Existing research suggests that it may be more efficacious to employ anti-stigma interventions at the level of medical students before clinicians become more resistant to change over time.[5] Ultimately, recruitment of doctors may be improved by a dedicated movement or community working to promote psychiatry within the medical community and the general public domain.[4]

Due to the lack of research in this area, it would be important to examine the prevalence and variables influencing stigma amongst medical students in the South African context. Research conducted at the Stellenbosch University in South Africa pertaining to medical students' attitudes towards mental illness but not psychiatry specifically, revealed that clinical exposure to psychiatry tended to yield an improvement in attitudes towards mental illness, however overall their attitude towards mental illness remained negative.[9]

A questionnaire-based research study at the University of Western Australia examined the attitudes towards mental illness and psychiatry of fourth year medical students before and after a psychiatry clerkship. The clerkship itself was found to have a modest impact on stigma, attitudes towards psychiatry and consideration of psychiatry as a future career. An integration of strategies in the pre-clinical teaching years was postulated to prepare students for clerkship and reduce stigma and negative attitudes towards psychiatry and mental illness.[7]

Mental Illness Clinicians' Attitudes Scale 2 (MICA-2)[26] is a validated, reliable scale for assessing attitudes of medical students towards people with mental illness as well as psychiatry as a profession.[26] The MICA-2 scale defines mental illnesses as conditions for which an individual would be seen by a psychiatrist.[26]

Objectives

This study aimed to ascertain the prevalence of negative and stigmatizing attitudes towards mental illness and psychiatry using the MICA-2 in a sample population of fourth year medical students. It also aimed to compare demographic data as well as additional information (interest in and perceived knowledge of psychiatry, interest in psychiatry as a career and personal exposure to psychiatric illness) in relation to the results of the MICA-2 scale.

Research methods and design

Study Design

A cross-sectional, quantitative, descriptive study was conducted on the fourth-year medical students at the University of the Witwatersrand using the MICA-2 questionnaire prior to the commencement of formal clinical teaching in psychiatry.

Participants

The sample population comprised of consenting fourth-year medical students who had only been exposed to theoretical teaching in general medicine and the basic sciences. This study thus reflected their perceptions around psychiatry and mental illness prior to formal academic and clinical teaching in psychiatry.

A non-probability convenience sample was selected with the goal of ensuring a sample size as close to the sample population as feasible. The fourth-year medical student class comprised of 332 students. In total, 187 students completed the questionnaire and 7

questionnaires were excluded due to missing answers or errors, rendering them invalid. The total response rate was 56.3% which fell within the desired range of 55-60%.

Procedure

The questionnaires were distributed in February 2019 after an academic lecture. The lecturer assisted in distributing the surveys to avoid students perceiving duress by the psychiatry doctor to complete the survey due the potential of the investigator assisting with medical student examinations. The students were given an information sheet and were verbally informed of the purpose of the study and that anonymity and voluntary participation were ensured.

Consenting participants completed the questionnaire and answered questions pertaining to demographics, their interest in the field of psychiatry, their confidence in their knowledge of psychiatry and whether they would consider this as a future career path. The demographic questions included age, gender, race, whether they entered their medical degree directly or via the graduate entry medical programme. The University of the Witwatersrand Medical School has a graduate entry programme whereby applicants may apply to enter directly into the third year of medicine if they have a previous degree. Differentiating such students allowed for the opportunity to distinguish if prior exposure to psychiatry in a previous degree or qualification impacted on a difference in attitudes towards psychiatry and mental illness. All students were asked to place the questionnaire into boxes placed at the exit of the lecture venue, at the end of the lecture.

Adjunct Professor of the Health Sciences Teaching and Learning Office as well as the Adjunct Professor and Director of the Unit for Undergraduate Medical Education assisted in choosing an appropriate time to distribute the questionnaires.

Questionnaire

The MICA scale was developed at the Health Services and Population Research Department as a part of Aliya Kassam's PhD at the Institute of Psychiatry, King's College London. The MICA-2 version was used in this study as it is specifically adapted for medical students.[27]

The sixteen questions of the MICA-2 scale use a six-point Likert scale where the set of possible answers comprises of strongly agree, agree, somewhat agree, somewhat disagree, disagree and strongly disagree. The total score is used to determine if the participant has a less negative attitude or a more negative attitude towards psychiatry and mental illness. The

minimum total score is 16 and the maximum is 96 with a lower score indicating a less negative or stigmatizing attitude and a higher score indicating a more negative and stigmatising attitude towards mental illness and psychiatry.[27] If the MICA-2 questionnaire was completed by a neutral individual, i.e. they would select half somewhat agree and half somewhat disagree, they would achieve a score of 56. Thus, any score below 56 infers a non-stigmatising attitude (or less negative attitude) whilst any score above 56 infers a more stigmatising (more negative attitude), towards psychiatry and mental illness.

Data Analysis

The ordinal data was captured in Excel and non-parametric statistical tests were performed as distributional assumptions could not be made due to the ordinal nature of the data.

When comparing two cohorts, the Mann–Whitney U test and Wilcoxon signed-rank test were performed, whilst the Kruskal Wallis Test was performed for tests including more than two cohorts. Box Whisker Plots were included for completeness. All p-values are two sided and were shown to at least three decimals. The critical significance level used was $P < 0.050$.

Ethical Considerations

Ethics approval was obtained from the Human Research Ethics Committee of the University of the Witwatersrand (reference number: M180947). Permission to conduct this study was obtained from the Post Graduate Medical Faculty Registrar and the Unit for Undergraduate Medical Education.

Results

The 180 completed questionnaires, comprised 116 (64.4%) female respondents and 64 (35.6%) male respondents, whilst the students' ages (years) ranged from 20 to 34 with 74.4% of applicants being between 21 and 23. The race cohorts consisted of 65 (36.1%) African, 63 (35.0%) Caucasian, 38 (21.1%) Indian medical students and for statistical purposes 14 (7.8%) other. The 'other' cohort consisted of 6 Coloured students, 3 Asian students and 5 respondents who selected 'other'.

Of the completed questionnaires, 112 (62.2%) were by students who entered the medicine degree directly, whilst the most common prior degree of students who entered through the Graduate Entry Programme was a Bachelor of Health Sciences degree consisting of 29 students (16.1% of the total student cohort who completed questionnaires). There is no clinical exposure to psychiatry in the Bachelor of Health Sciences degree.

The results showed that 160 (88.9%) respondents found psychiatry to be an interesting field and 24 (13.3%) respondents felt confident in their knowledge in psychiatry which was expected given that most of the medical students would not have received formal teaching in psychiatry before the surveys were distributed. It is possible that postgraduate students who entered medicine via the graduate entry medical programme may have had some degree of theoretical teaching in psychiatry prior to when the surveys were distributed. A total of 79 (43.9%) respondents would consider it as a future career path of which 54 (68.4%) were female.

Figure 1 below shows the relationship between an interest in Psychiatry and the consideration of a career in psychiatry by gender. It is interesting to note that whilst females are more likely to have an interest in psychiatry (93% of females versus 81% of males), the proportion of respondents (49.1% female versus 48.1% male) considering it as a career path were similar. There was one female respondent who did not have an interest in psychiatry but would consider a career in psychiatry and thus the graph shows 53 and not 54 as expected.

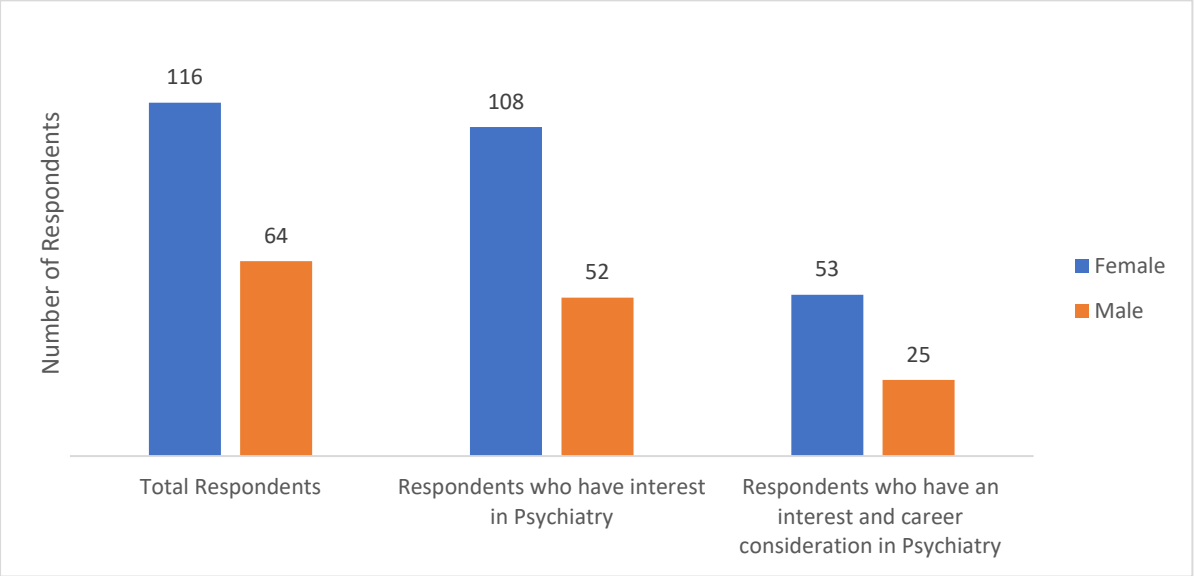

Figure 1: The relationship between an interest in psychiatry and the consideration of a career in psychiatry by gender

Figure 2 below shows the relationship between an interest in psychiatry and the consideration of a career in psychiatry by race, where the percentages calculated are of the total numbers per race group. Analysis of the data showed that the African cohort expressed the least interest in psychiatry with 52/65 respondents (80%) compared to 35/38 (92.1%) Indian

participants, 59/63 (93.7%) Caucasian participants and 14/14 (100%) participants in the category classified as other. Additionally the African cohort had the lowest proportion of respondents considering it as a career path given their expressed interest in psychiatry illustrated by 23/52 (44.2%) African participants, 27/59 (45.8%) Caucasian participants, 19/35 (54.3%) Indian participants and 9/14 (64.3%) participants in the other category. Although the African cohort expressed less interest in psychiatry compared to other race cohorts, it is noteworthy that the 80% illustrated is still significantly high.

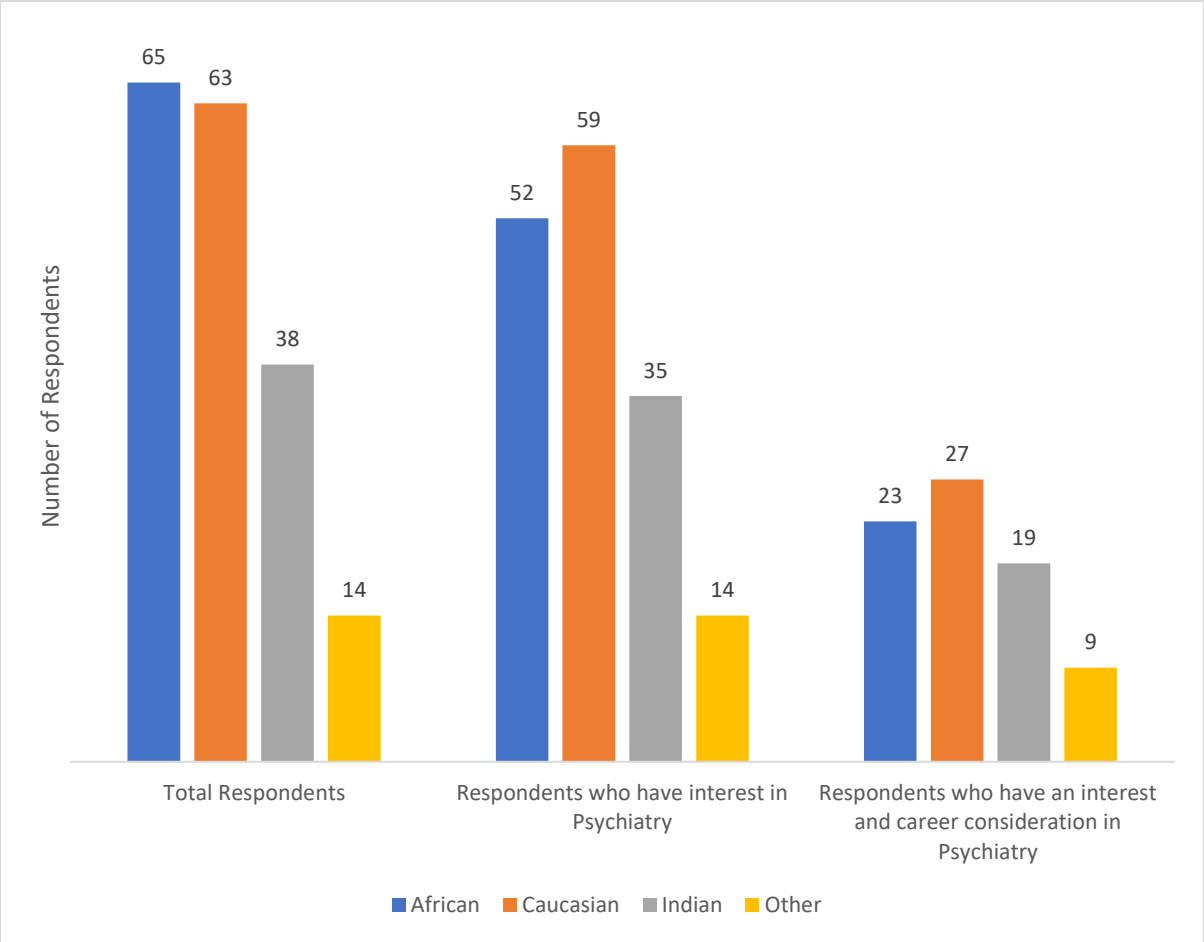

Figure 2: The relationship between an interest in psychiatry and the consideration of a career in psychiatry by race

Figure 3 shows the results of the questionnaire by the frequency of the MICA-2 score. As no student scored above 61 of the possible 96 points on the scale and 175(97.2%) of the total scores fell below the median score of 56, the results indicate a low prevalence of negative and stigmatizing attitudes towards mental illness and psychiatry in the sample population. Only 4 (2.2%) of the total number of participants scored above 56.

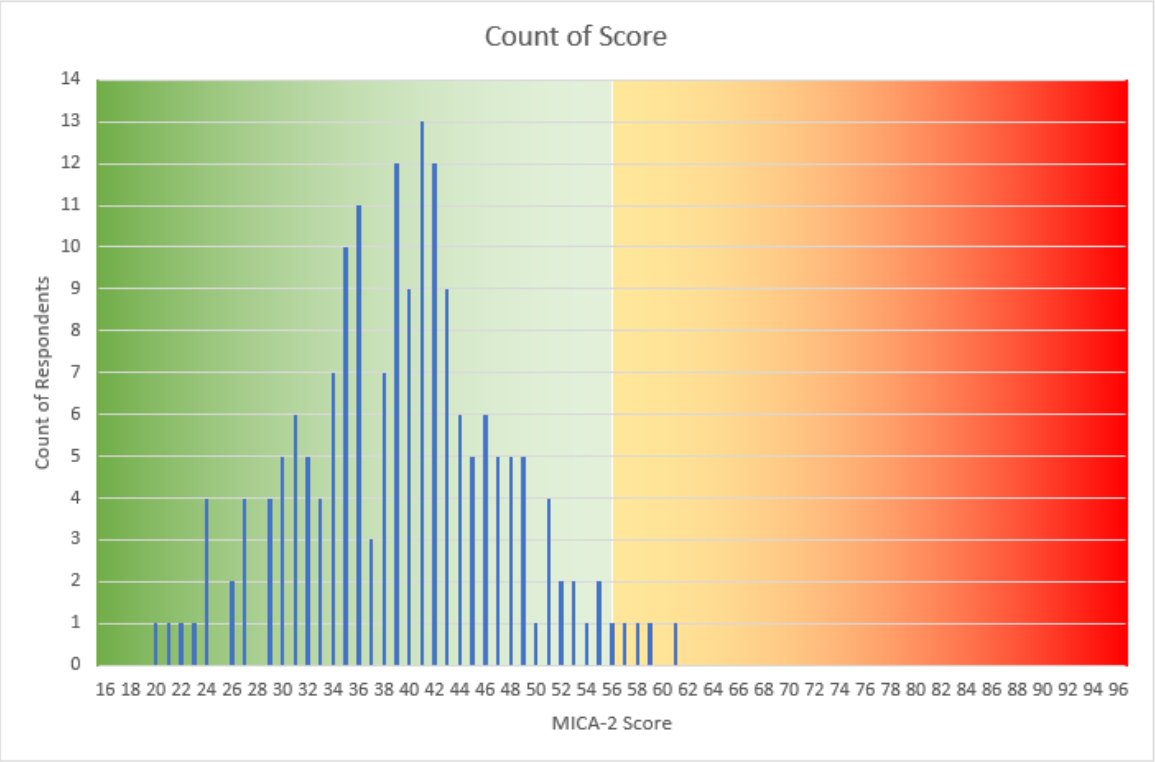

Figure 3: Frequency of MICA-2 scores in respondents

The results of the statistical tests were split into the tests where two categorical variables were tested (Table 1) and where multiple categorical variables were tested (Table 2).

Table 1: P-values and significance thereof for both Mann Whitney U Test and Wilcoxon Sign Ranked Test.

	Mann Whitney U Test		**Wilcoxon Sign Ranked Test**	
Categorical variables	**P-Value**	**Significant**	**P-Value**	**Significant**
Would you consider psychiatry as a future career path?	0.0000	Yes	0.0019	Yes
Do you find psychiatry to be interesting field of study at medical school?	0.0000	Yes	0.0070	Yes
Do you personally know someone who suffers from a mental illness?	0.0008	Yes	0.1147	No
Do you feel confident in your knowledge of psychiatry?	0.0215	Yes	0.3083	No
Gender	0.2922	No	0.7604	No
What degree if entered by the graduate entry programme?	0.4084	No	0.0825	No

From Table 1 it can be concluded that there is a significant difference in the stigmatising attitudes towards mental illness and psychiatry in participants who expressed both an interest and who would consider psychiatry as a future career compared to those that expressed no interest in the field of psychiatry or in pursuing a career in psychiatry. Gender and whether they entered medicine directly or via the Graduate Entry Programme had no material impact.

As both the confidence of a student's knowledge of psychiatry and personally knowing someone who suffers from a mental illness achieved different results in the two tests performed, a conclusion cannot be made on the impact of these two categorical variables on the prevalence of negative and stigmatizing attitudes towards mental illness and psychiatry.

Figures 4 and 5 show the Box Whisker Plots for the two significant test results pertaining to the consideration of psychiatry as a future career path and interest in psychiatry.

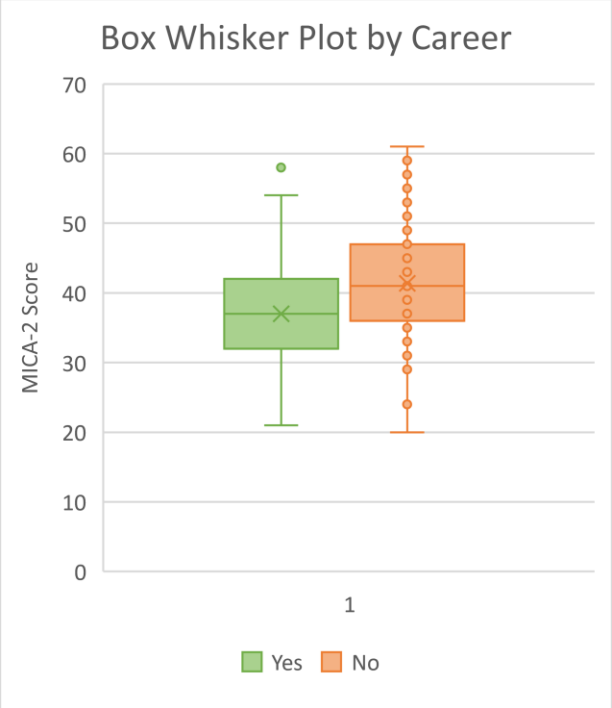

Figure 4: Box Whisker plot by career

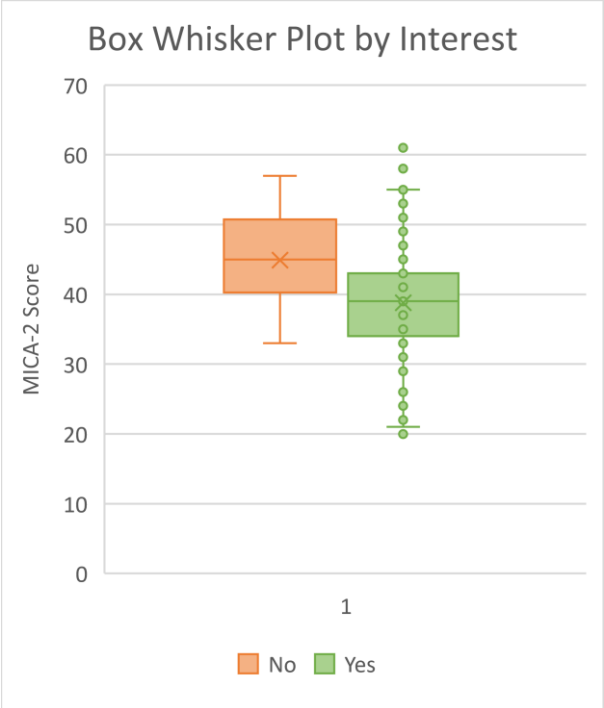

Figure 5: Box Whisker plot by interest

Table 2: P-value and significance thereof for the Kruskal Wallis Test.

Categorical variables	Kruskal Wallis Test	
	P-Value	**Significant**
Race	0.0017	Yes
Age (years)	0.5229	No

From Table 2 it can be concluded that there is a significant difference in the stigmatizing attitudes towards mental illness and psychiatry between different race cohorts whilst age had no material impact.

Figure 6 shows the Box Whisker Plots for the race questionnaire results. Care needs to be taken when analysing the other cohort as the data volume is low.

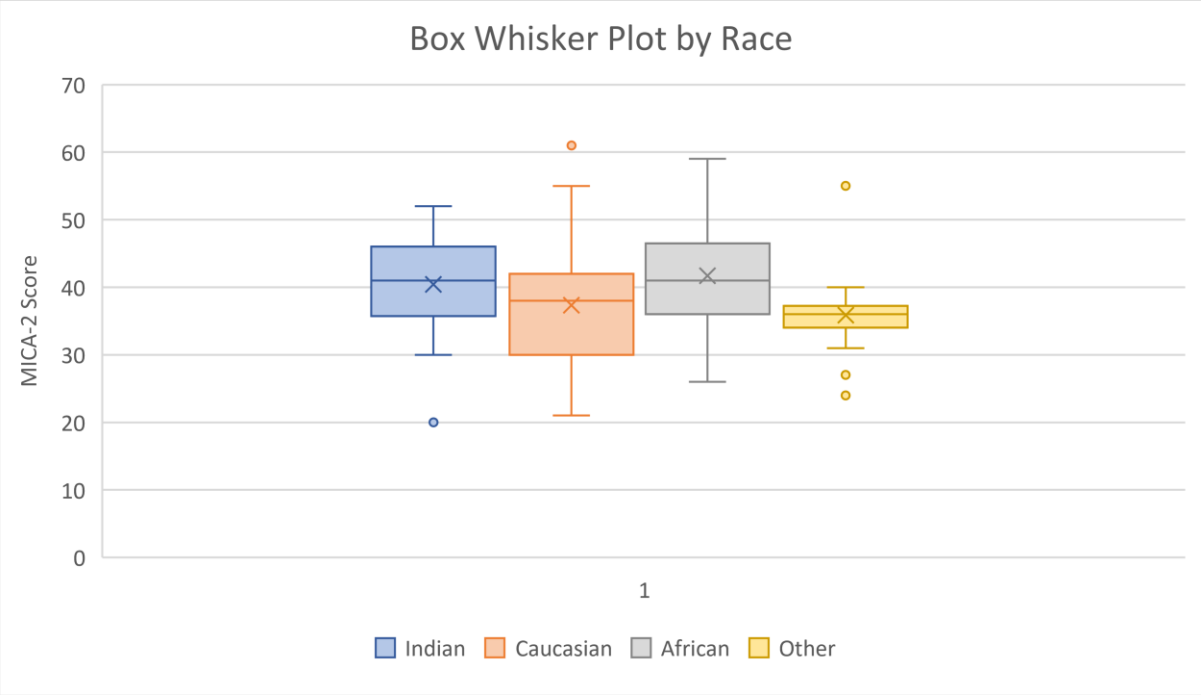

Figure 6: Box Whisker Plot by race

Discussion:

This study revealed a low prevalence of negative and stigmatizing attitudes towards psychiatry and mental illness in the sample population of the 2019 fourth year medical students at the University of the Witwatersrand, given that 97.2% of the total scores of the MICA-2 scale fell below the median potential score of 56. This differs from international

research which shows a predominant negative attitude of the medical students towards psychiatry and mental illness.[9, 11-14]

De Witt et al. conducted research in 2016 which revealed that most students had a negative attitude towards mental illness before the clinical psychiatric rotation and despite there being an improvement in attitudes after the rotation, the students were still deemed to have an overall negative attitude towards mental illness.[9] This study was conducted on final year medical students and confounding variables such as structure of clinical rotations or differing educational styles may be considered. Their study focused on attitudes towards mental illness alone and not specifically psychiatry, whereas the MICA-2 scale in our study encompassed both these entities. Perhaps stigma towards psychiatry as a profession may be considered less than towards mental illness alone. Further research in this regard is needed to clarify this as there is no existing South African literature on the topic.

Another important difference between this study and that conducted by De Witt et al., was the timing and severity of the Life Esidimeni tragedy in Gauteng which coupled with the media attention it received, may have had bearing on students' attitudes towards mental illness and psychiatry. By October 2017 it was noted that 144 lives had been lost after mental health care users were transferred from Life Esidimeni Institutions to non-governmental organisations. After investigations, human rights violations against the mentally ill were discovered bringing to the forefront the impact of stigma and negative attitudes on the care of the mentally ill.[28] This tragedy may have affected the views and perceptions of medical students at the University of the Witwatersrand.

It was suggested by De Witt et al. that further studies pertaining to the attitudes of medical students, should seek to assess the impact of ethnic differences on the prevalence of stigmatising attitudes towards mental illness.[9] Of significance in this study, was the difference revealed in stigmatizing attitudes towards mental illness and psychiatry in different race cohorts. The African cohort of students expressed less interest in psychiatry compared to other cohorts (80 % versus 92.1% and above) and was also noted to have the lowest proportion of respondents considering it as a future career path when they had expressed an interest in psychiatry (p value 0.0017). However, 80% was still noted to be a high percentage of interest in this profession.

This study established baseline data pertaining to the prevalence of negative attitudes in various ethnic groups in the medical student cohort at the University of the Witwatersrand.

Although the average score of the MICA-2 in the African cohort was relatively higher than in all other race cohorts, the African cohort was still noted to exhibit a low prevalence of stigmatising attitudes towards psychiatry and mental illness overall. There is no other South African data pertaining to this and it is of importance given the ethnic diversity in South Africa and related perceptions around mental illness and psychiatry.

A study conducted by the Psychiatry Department at the University of Cape Town in 2010 highlighted the presence of low mental health literacy as well as stigmatising attitudes in a South African community towards mental illness.[29] Low mental health literacy, stigmatising attitudes and variations in cultural explanations of mental illness are important to consider as it has been postulated that medical students may share these views and perceptions prior to formal psychiatric teaching.[9,29]

Certain South African and Sub-Saharan African studies postulated the cultural explanations of mental illness being related to bewitchment (in the Xhosa culture) or of a supernatural or of a religio-magical explanatory model (in the Sub-Saharan cultures).[30,31] Given the results, it would be interesting to consider differences in attitudes towards mental illness in medical students, that could potentially be governed by cultural beliefs, given the cultural diversity of the South African population. This study appears to be the first study on South African medical students that begins to explore the concepts of ethnic differences in relation to perceptions of psychiatry and mental illness.

Agyapong et al. conducted a study on Ghanaian medical students to determine influential factors and gender differences among medical students considering psychiatry as a specialisation. South Africa is considered a middle-income African country and thus it is of interest to compare the results of these studies. It was revealed that more male medical students considered stigma as an important factor preventing them choosing psychiatry as a future specialisation (42.7% v. 29.7% female medical students).[15] Overall however there were no gender-based differences in considering psychiatry as a potential future speciality.[15] In comparison, this study did not reveal statistically significant results regarding levels of stigmatisation towards psychiatry and mental illness based on the gender of the medical students ($P = 0.5229$). The proportionally larger number of female medical students (64.4%) may have influenced the findings.

Results comparing students knowing another person with mental illness and stigma or negative attitudes related to psychiatry and mental illness were not significant. There is

however research suggesting social contact as an effective anti-stigma intervention in adults in the short-term and this warrants further investigation.[32]

Studies have addressed stigmatisation pertaining to either mental illness or psychiatry as a profession but there are few examining both these variables in the same sample population.

This study provided baseline information pertaining to the attitudes of medical students towards psychiatry and mental illness before they were exposed to formal academic and clinical teaching in this regard. International research has shown that medical education plays the most critical role in reducing negative and stigmatising attitudes towards mental illness and psychiatry.[33,34] Outside of the traditional university curriculum, it is imperative to consider extraneous variables that influence the baselines and evolving attitudes of the medical students towards psychiatry and mental illness. Both the news media and social media have a significant role to play in this as revealed by a systematic review by Ross et al. in 2019.[35] This showed that positive social media posts and news media publications about mental illness, lead to a reduction in stigmatising attitudes towards mental illness. Ross et al. also demonstrated the converse of this to be true, in that more negative social media reports or news media publications resulted in a significant increase in stigmatising attitudes.[35]

The limitations identified in this study include that it was not representative of all South African fourth-year medical students or medical students in other years of study. It was susceptible to self-selection bias as students who have strong positive or negative views towards psychiatry were more likely to participate in the questionnaire. It is important to note that anonymity counteracts students being less truthful in an effort not to be perceived in a certain way.

This study design was of a cross-sectional quantitative descriptive nature and thus was unable to measure a change in attitudes over time. This study may be repeated in 2021, when this group of students are in their final year of study, to examine for a change in attitudes after having exposure to formal psychiatric teaching. This study only represented 56.32% of the fourth-year medical school population of the University of the Witwatersrand in 2019 and thus was not entirely representative of this class.

Conclusion:

Contrary to existing local and international research, this study revealed relatively low levels of stigmatising attitudes towards psychiatry and mental illness in a sample population of

fourth year medical students prior to formal clinical and academic exposure to psychiatric teaching at the University of the Witwatersrand. It is important to consider the possible impact of the Life Esidimeni tragedy on the attitudes of medical students and how this and the influences of the media may have contributed to different levels of stigmatisation compared to local studies prior to this event. Stigmatisation of patients with mental illness and the deleterious effects thereof have been highlighted in quite a devastating manner in the context of the Life Esidimeni tragedy and it is likely that this contributes to attitudes towards mental illness and psychiatry in society today, especially in the South African setting.

This study has provided baseline data on the attitudes of medical students towards psychiatry and mental illness and highlighted that stigmatising attitudes may differ to a degree in various race cohorts. In this study the African cohort expressed the least interest in psychiatry and also had the lowest proportion of respondents considering it as a career path given, they expressed interest in psychiatry. This was deemed a statistically significant finding. However, overall, all race cohorts including the African cohort, had a low prevalence of negative and stigmatising attitudes towards psychiatry and mental illness.

This study highlighted the need to examine cultural explanations of mental illness and how this may potentially affect perceptions of psychiatry and the mentally ill. It is encouraging to identify that the levels of stigmatisation towards mental illness and psychiatry in medical students prior to formal psychiatric teaching may not be as high as shown in other local and international studies but it is important to consider this finding in the context of the limitations of this study

Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Disclaimer

This is to verify that the views expressed in the submitted article are our own and not an official position of the institution or funder.

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Appendix A: MICA-2: Mental Illness Clinicians' Attitudes Scale 2

DREAM Instrument

The instrument within this Critical Synthesis Package was included with permission from its developer.

Please use the following information when referencing the MICA:

The developers of the scale ask that you complete a short registration form at:
https://www.surveymonkey.com/s/stigmascalesregistration.

Permission to use the scale is granted on condition that:
-No changes are made to the wording or format of the scale.
-Translations into different languages are done using Back Translation (e.g. as detailed in the appendix of the DISC manual).
-You are willing to share any translated versions(s) with others who may wish to use it / them.
-The copyright information in the footer of the scale is included when the scale is used.
-The full reference (see below) to the key paper describing the scale is included in the footer when it is used and cited in any publication using the measure.
-The scale is not passed on to a third party.
-You make no financial charge for your version of our scales.

Additional information about the MICA may be located at:
http://www.sapphire.iop.kcl.ac.uk/SAPPHIRE%20Resources.html#SCALES

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Mental Illness: Clinicians' Attitudes Scale (Medical student version) MICA-2

Note to researchers distributing this scale: please only use after reading instructions in "Manual for Researchers".

Instructions: for each of questions 1-16, please respond by **ticking one box only**. Mental illness here refers to conditions for which an individual would be seen by a psychiatrist.

		Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
1	I just learn about psychiatry because it is in the exam and would not bother reading additional material on it.						
2	People with a severe mental illness can never recover enough to have a good quality of life.						
3	Psychiatry is just as scientific as other fields of medicine.						
4	If I had a mental illness, I would never admit this to any of my **friends** because I would fear being treated differently.						
5	People with a severe mental illness are dangerous more often than not.						
6	Psychiatrists know more about the lives of people treated for a mental illness than do family members or friends.						
7	If I had a mental illness, I would never admit this to my **colleagues** for fear of being treated differently.						
8	Being a psychiatrist is **not** like being a real doctor.						
9	If a consultant psychiatrist instructed me to treat people with a mental illness in a disrespectful manner, I would **not** follow their instructions.						

We would like to thank Aliya Kassam for her major contribution to the development of this scale.
Contact: Professor Graham Thornicroft. Email: graham.thornicroft@kcl.ac.uk

Kassam A., Glozier N., Leese M., Henderson C., Thornicroft G. (2010) Development and responsiveness of a scale to measure clinicians' attitudes to people with mental illness (medical student version). Acta Psychiatrica Scandinavica 122(2), 153-161.

Mental Illness: Clinicians' Attitudes Scale (Medical student version) MICA-2

Note to researchers distributing this scale: please only use after reading instructions in "Manual for Researchers".

Instructions: for each of questions 1-16, please respond by **ticking one box only**. Mental illness here refers to conditions for which an individual would be seen by a psychiatrist.

		Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
10	I feel as comfortable talking to a person with a mental illness as I do talking to a person with a physical illness.						
11	It is important that any doctor supporting a person with a mental illness also assesses their physical health.						
12	The public does **not** need to be protected from people with a severe mental illness.						
13	If a person with a mental illness complained of physical symptoms (such as chest pain), I would attribute it to their mental illness.						
14	General practitioners should **not** be expected to complete a thorough assessment for people with psychiatric symptoms because they can be referred to a psychiatrist.						
15	I would use the terms 'crazy', 'nutter', 'mad' etc. to describe people with a mental illness who I have seen in my work.						
16	If a colleague told me they had a mental illness, I would still want to work with them.						

Thank you very much for your help.

We would like to thank Aliya Kassam for her major contribution to the development of this scale.
Contact: Professor Graham Thornicroft. Email: graham.thornicroft@kcl.ac.uk

Kassam A., Glozier N., Leese M., Henderson C., Thornicroft G. (2010) Development and responsiveness of a scale to measure clinicians' attitudes to people with mental illness (medical student version). Acta Psychiatrica Scandinavica 122(2), 153-161.

Appendix B: Approved research protocol with appendices

ASSESSING THE ATTITUDES OF MEDICAL STUDENTS IN THEIR FOURTH YEAR OF STUDY TOWARDS PSYCHIATRY AND MENTAL ILLNESS

Candidate for MMed Psychiatry (Wits): Stacey Ochse 0702706J

Supervisor: Dr K. Lowton, Specialist Psychiatrist: MBBCh(Wits); FC Psych (SA)

1. INTRODUCTION AND BACKGROUND

Medical students' attitudes towards psychiatry and mental illness may impact on the number of medical students choosing to specialize in this field. This may influence how these students interact with and treat psychiatric patients when they become junior doctors. This has called into question the impact of the medical students' educational environment on their attitudes towards a career in psychiatry and their perception of and interaction with the mentally ill.

Internationally there appears to be a relative paucity of medical students wishing to pursue a career in psychiatry. Pertinent contributing factors such as a perceived lack of scientific basis, poor prognosis of the patients and stigma towards psychiatry as a profession have been identified.[1] This has been termed a recruitment crisis in the UK whereby only 3.6% of British medical graduates pursue a career in Psychiatry and it is projected that 6% are needed.[1] Significant research has been conducted in the UK with regards to barriers to as well as facilitators of recruitment into psychiatry. This research has revealed persisting stigma and negative attitudes towards psychiatry. This in turn generates questions around the

psychiatric teaching and training of medical students and how to improve recruitment into this specialty, as well as improving competitiveness for psychiatric training posts.[1] The central research findings suggest that enrichment activities help to facilitate recruitment into psychiatry more than the amount of time that the students spend in a psychiatry rotation.[1]

A questionnaire-based research study at the University of Western Australia examined the attitudes towards mental illness and psychiatry of fourth year medical students before and after a psychiatry clerkship. The clerkship itself was found to have a modest impact on stigma, attitudes towards psychiatry and consideration of psychiatry as a future career. It was postulated that perhaps an integration of strategies so as to overcome stigma associated with mental illness as well as psychiatry as a profession, may need to occur in the pre-clinical teaching years so as to prepare students for clerkship and reduce stigma towards psychiatry and mental illness.[2]

Another questionnaire based prospective study in China examined the changes in attitudes towards mental illness and psychiatry during a psychiatry rotation or clerkship and concluded that training may improve medical students' attitudes towards mental illness and psychiatry but did not necessarily influence their consideration of psychiatry as a future career.[3]

International research shows the prominent role of stigmatizing attitudes towards psychiatry impacting on medical students' willingness to pursue psychiatry as a future career. However, a broader concern may be the role of medical school curricula in contributing to the attitudes of future doctors towards patients with mental illness. Research conducted in the medical faculty of the Czech Republic suggested that educators should place an emphasis on the role of medical psychology and communication training relating to interactions with the non-

adherent patient or acutely psychotic patient, as this was found to improve students' feelings of competency during their psychiatric rotations. It was speculated that this was the variable that increased tolerant attitudes of medical students towards both psychiatry and mental illness.[4]

Stigmatizing attitudes of healthcare professionals towards the mentally ill has far reaching consequences in terms of the access and quality of care received. Anticipated stigma from healthcare providers has been shown to be a barrier to health-seeking behaviour. It has also been shown to compromise the patient-doctor relationship resulting in premature termination of treatment.[4] Stigmatization of the mentally ill has also been shown to result in poorer physical medical care for these patients. This has been largely attributed to a phenomenon known as diagnostic overshadowing whereby a patient's physical symptoms are incorrectly attributed to their mental illness resulting in delays in diagnosis and treatment.[5,6]

Medical education has been shown to contribute to the attitudes of medical students towards psychiatry and mental illness, which in turn may be postulated to impact on the number of medical students choosing to pursue a career in psychiatry. Additionally, these stigmatizing attitudes may also affect the care of mentally ill patients with comorbid general medical conditions. Due to the lack of research in this area, it would be important to examine the prevalence and variables influencing stigma amongst medical students in the South African context.

Stigma as conceptualized in the Annual Review of Sociology by Bruce G. Link and Jo C. Phelan in 2001, is said to be defined as, "The co-occurrence of its components- labelling,

stereotyping, separation, status loss and discrimination in a situation where power is exercised".[7] There are also considered to be different categories of stigma namely externalized or experienced stigma and internalized or self-stigma.[8] There is a complex interplay between both externalized and internalized stigma with both having an extensive impact on economic, social and psychological realms regarding patients with mental illness. This may further exacerbate social disengagement and marginalization.[9]

It is important that stigma amongst medical students and young doctors is identified so that targeted initiatives may seek to reduce stigma towards psychiatry and those with mental illness. This is imperative in the context of a growing global burden of mental illness, given that this directly impacts on patients' care and is recognized as a barrier to treatment.[1]

Psychiatry is a vital part of the practice of medicine and despite which medical specialty a doctor may choose to pursue, it is imperative that there is a focus on stigma reduction initiatives so as to prevent diagnostic overshadowing.[1,5] Research has shown that implementation of changes in training and continuing education for health care providers has the potential to influence attitudes in a positive manner in the clinical setting. Scales such as the Opening Minds Stigma Scale for Health Care Providers, has shown satisfactory internal consistency and has the ability to detect changes in attitudes post anti-stigma interventions.[10]

Another responsiveness scale has also been developed and tailored for use in medical students specifically and this scale is known as the Mental Illness Clinicians' Attitudes Scale 2 (MICA-2). It has been found to be reliable and valid with good responsiveness in assessing attitudes towards people with mental illness as well as psychiatry as a profession. The MICA-

2 scale defines mental illnesses as conditions for which an individual would be seen by a psychiatrist[11].

With the prevalence and incidence of mental disorders being expected to rise in decades to come, the global burden of disease with regards to mental illness is expected to rise[1]. This furthermore substantiates the importance of stigma reduction in the care of these patients.

Interventions aimed at reducing stigma could potentially be more efficacious in the context of medical education or while medical students are still undergoing training[11]. It has been found that clinician's attitudes become more resistant to change over time and thus targeted interventions with regards to medical students relating to stigma reduction, may be more successful than those implemented amongst already qualified clinicians[12].

It is therefore very important to identify the prevalence of stigma in medical schools so as to ascertain the need for anti-stigma interventions and to adapt medical education in psychiatry accordingly. There is no existing data in this regard in the South African context.

2. HYPOTHESIS:

1. The prevalence of negative and stigmatizing attitudes towards psychiatry and mental illness is significant in a fourth-year medical student population sample.

3. RESEARCH QUESTION

1. What is the prevalence of negative and stigmatizing attitudes towards psychiatry and mental illness in a fourth year (GEMP II) medical student sample population?

4. AIM:

1. To determine the prevalence of negative and stigmatizing attitudes of medical students who are in their fourth year of study (GEMP II), towards psychiatry and mental illness.

5. OBJECTIVES

1. To ascertain the prevalence of negative and stigmatizing attitudes towards mental illness and psychiatry in a sample population of medical students in their fourth year of study.
2. To compare demographic data (age, gender and race) as well as additional information (pertaining to interest in and perceived knowledge of psychiatry as well as possible future aspirations to pursue psychiatry as a medical specialisation and personal exposure to psychiatric illness) within the fourth year medical student population in relation to the MICA-2 scale.

6. METHOD:

6.1 Study design:

This study will be a cross-sectional quantitative descriptive study whereby questionnaire surveys will be distributed to all fourth year medical students at the University of the Witwatersrand.

6.2 Study setting:

This study will be conducted at the University of the Witwatersrand Parktown Health Sciences Campus and will be directed at fourth year medical students enrolled at the University of the Witwatersrand.

6.3 Sample population

The study sample population will comprise of the fourth year medical students enrolled at the University of the Witwatersrand. This sample population will comprise of students of various age, race and prior qualifications. The fourth year medical students have primarily theoretical psychiatric teaching in the format of academic lectures.

6.3.1 Inclusion Criteria

All consenting medical students in their fourth year of study at the University of the Witwatersrand.

6.3.2 Exclusion Criteria

Medical students studying through another academic institution or university other than the University of the Witwatersrand.

6.3.3 Sample size:

The sample will comprise all fourth-year medical students from The University of the Witwatersrand that are willing to participate. The University of the Witwatersrand Medical School also has a graduate entry programme whereby applicants may apply to enter directly into the third year of medicine if they have a previous degree. Graduates entering the

programme in this way will be in their second year of study in a fourth-year medical school class along with students who entered medicine directly from the first year with no previous degree.

A non-probability convenience sample will be selected with the goal of ensuring a sample size as close to the sample population as feasible. The estimated size of the fourth-year medical student class is 300 students and based on approximate response rate of 55-60% the projected sample size will likely be in the region of 165 to 180 participants.

6.3.4 Sample collection

Surveys will be distributed to fourth year medical students at the beginning of the year in 2019, prior to the commencement of their formal academic curriculum in psychiatry. Distribution of the surveys will occur after an academic lecture ensuring that all the students will be located in one venue. This allows the opportunity for students to voluntarily participate in an anonymous manner. The lecturer will be asked to assist in distributing the surveys. This is to avoid students perceiving a certain pressure to complete the survey as they may be viewed as subordinate to the psychiatry registrar conducting the study. This is because of the potential for psychiatry registrars to assist in examining medical students in their oral exams.

Adjunct Professor of the Health Sciences Teaching and Learning Office as well as the Adjunct Professor and Director of the Unit for Undergraduate Medical Education have agreed to assist in arranging a time that would be suitable to distribute the surveys to the students pending a successful ethics application.

6.4 Methods and Techniques

6.4.1 Measurement Instrument

A survey comprising of a scale developed to assess medical students' attitudes towards people with mental illness and psychiatry as a profession will be utilized. This scale was originally developed by King's College London. This scale is known as the Mental illness Clinicians attitudes scale (MICA Scale) and for the purpose of this study, version 2 of this scale will be utilized (MICA-2) as this is tailored towards medical students specifically.

King's College London requires that a survey be completed so as to attain permission to use the MICA-2 Scale. The MICA-2 scale is freely available for use however the developers require a short survey to be completed such that they may keep a record of where their scale is being utilized.

Permission to use the scale is granted on certain conditions. These conditions include that no changes are made to the wording or format of the scale, translations into different languages are done using Back Translation (as detailed in the appendix of the DISC manual), you are willing to share any translated versions with others who may wish to use it and that the copyright information in the footer of the scale is included when the scale is used. The full reference to the key paper describing the scale must be included in the footer when it is used and is cited in any publication using the measure. The scale is not to be passed on to a third party and no financial charge should be made for this study's version of the original scale developed by King's College London.

Professor Lyons (Assistant Professor of the Division of Psychiatry affiliated with the Medical School of the University of Western Australia) was also consulted as Professor Lyons completed her PHD in medical students' attitudes towards mental illness and psychiatry using the MICA-2 scale. Professor Lyons suggested the inclusion of demographic questions as

well as questions around the likelihood of choosing psychiatry as a career and current level of interest and knowledge in psychiatry.

Thus in addition to the MICA-2 scale itself, there will be demographic questions such as age, race, gender, year of study at medical school, whether the student entered medicine via the graduate entry program or started medicine from the first year of study as well as ascertaining the students' interest in psychiatry, perceived knowledge of psychiatry and whether it would be considered a potential career choice. It will also be ascertained if the medical students personally know someone suffering from mental illness.

6.4.2 Variables

Categorical and outcome variables will be considered.

Categorical variables will include age, race, sex, year of study in the medical field, whether the individual entered the medical programme via the graduate entry programme, interest in psychiatry, perceived knowledge in psychiatry, consideration of a career in psychiatry and whether they personally know someone who suffers from a mental illness.

The outcome variable is the type of attitude towards people with mental illness and psychiatry as measured by the MICA-2 scale.

7. STATISTICAL ANALYSIS

Statistical assistance will be provided by Michael Ochse, who is a qualified Actuary and Fellow Member of the Actuarial Society of South Africa.

The MICA score for an individual completing the questionnaire is calculated as follows:

- Items 3, 9, 10, 11, 12, and 16 items are scored as follows: Strongly agree = 1, Agree = 2, Somewhat agree = 3, Somewhat disagree = 4, Disagree = 5, Strongly disagree = 6.

- The other items (1, 2, 4, 5, 6, 7, 8, 13, 14, 15) are reverse scored as follows: Strongly agree = 6, Agree = 5, Somewhat agree = 4, Somewhat disagree = 3, Disagree = 2, Strongly disagree = 1.

A high summation of the responses indicates a more negative (stigmatizing) attitude. The minimum total score is 16 and the maximum is 96. A lower score indicates a less stigmatizing attitude towards mental illness psychiatry[13].

The Data will be captured in an Excel based model and statistical analysis relevant to a Likert scale will be performed. Non-parametric statistical tests including the Mann–Whitney U test and Wilcoxon signed-rank test will be performed on the ordinal data and based on an assessment of the collected data, parametric statistical methods may be used if appropriate.

8. LIMITATIONS

The limitations of a self-report questionnaire survey are that results depend on the accuracy and truthfulness with which the students complete the surveys. The sample size will also be directly related to the number of students who are willing to complete the questionnaire.

The study is confined to The University of the Witwatersrand fourth year medical students thus the results may not be entirely representative of all South African fourth year medical students.

9. ETHICS

The feasibility and ethics of this study was assessed by The University of the Witwatersrand Department of Psychiatry's assessor group on 11 July 2018. Revisions to the protocol were resubmitted in November 2018.

The protocol was submitted to the University of Witwatersrand Human Research Ethics Committee on the 7th of September 2018 and an ethics clearance certificate was issued for unconditional approval of the study on the 22nd of November 2018. Revisions to protocol were submitted to the Human Research Ethics Committee in December 2018. Approval for

amendments was obtained thereafter. The ethics clearance reference number obtained was M180947.

Participation in this study and completion of the questionnaire will be both voluntary and anonymous.

Permission to conduct this study will also be requested from the Post Graduate Medical Faculty Registrar as well as the Unit for Undergraduate Medical Education.

10. TIMELINE:

Data collection will proceed after approval of the revisions to the study has been obtained from the Human Research Ethics Committee as well as the University of the Witwatersrand's Psychiatry assessor group.

Research Time Line Graph:

		Lit Review	Protocol Prep	Protocol Assessment	Ethics Application	Data Collection	Data Analysis	Writing Up
2018	MAY							
	JUN							
	JUL							
	AUG							
	SEP							
	OCT							
	NOV							
	DEC							
2019	JAN							
	FEB							
	MAR							

11. FUNDING

An application will be made to the Psychiatry research committee for funding. The proposed cost of stationery and photocopying is approximately R4000.

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(13) Foster A. Mental Illness: Clinician's Attitudes scale (MICA) Manual for Researchers [homepage on the Internet]. c2015 [updated 2013 January; cited 2015 March 23]. Available from https://www.researchgate.net/publication/273901334_MICA_Manual.

Appendix One:

i. MICA-2 Scale
ii. Medical student demographic data and additional questions
iii. Information sheet
iv. Mental Illness: Clinician's Attitudes Scale Manual for Researchers
v. Questionnaire to register the use of the Kings College London Stigma and Discrimination Scales

Appendix two:

i. Permission letter from the director of the Medical School of the University of the Witwatersrand
ii. Title approval

DREAM Instrument

The instrument within this Critical Synthesis Package was included with permission from its developer.

Please use the following information when referencing the MICA:

The developers of the scale ask that you complete a short registration form at:
https://www.surveymonkey.com/s/stigmascalesregistration.

Permission to use the scale is granted on condition that:
-No changes are made to the wording or format of the scale.
-Translations into different languages are done using Back Translation (e.g. as detailed in the appendix of the DISC manual).
-You are willing to share any translated versions(s) with others who may wish to use it / them.
-The copyright information in the footer of the scale is included when the scale is used.
-The full reference (see below) to the key paper describing the scale is included in the footer when it is used and cited in any publication using the measure.
-The scale is not passed on to a third party.
-You make no financial charge for your version of our scales.

Additional information about the MICA may be located at:
http://www.sapphire.iop.kcl.ac.uk/SAPPHIRE%20Resources.html#SCALES

References:

Kassam A., Glozier N., Leese M., Henderson C., Thornicroft G. (2010). Development and responsiveness of a scale to measure clinicians attitudes to people with mental illness (medical student version) Acta Psychiatrica Scandinavica. Volume 122,2:153-161

Gabbidon J., Clement S., Nieuwenhuizen AV., Kassam A., Brohan E., Norman I., Thornicroft G. (2013). Mental illness: clinicians' attitudes (MICA) scale. Psychometric properties of a version for students and professionals in any healthcare discipline. Psychiatry Research 206:81-87

Mental Illness: Clinicians' Attitudes Scale (Medical student version) MICA-2

Note to researchers distributing this scale: please only use after reading instructions in "Manual for Researchers".

Instructions: for each of questions 1-16, please respond by **ticking one box only**. Mental illness here refers to conditions for which an individual would be seen by a psychiatrist.

		Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
1	I just learn about psychiatry because it is in the exam and would not bother reading additional material on it.						
2	People with a severe mental illness can never recover enough to have a good quality of life.						
3	Psychiatry is just as scientific as other fields of medicine.						
4	If I had a mental illness, I would never admit this to any of my **friends** because I would fear being treated differently.						
5	People with a severe mental illness are dangerous more often than not.						
6	Psychiatrists know more about the lives of people treated for a mental illness than do family members or friends.						
7	If I had a mental illness, I would never admit this to my **colleagues** for fear of being treated differently.						
8	Being a psychiatrist is **not** like being a real doctor.						
9	If a consultant psychiatrist instructed me to treat people with a mental illness in a disrespectful manner, I would **not** follow their instructions.						

We would like to thank Aliya Kassam for her major contribution to the development of this scale.
Contact: Professor Graham Thornicroft. Email: graham.thornicroft@kcl.ac.uk

Kassam A., Glozier N., Leese M., Henderson C., Thornicroft G. (2010) Development and responsiveness of a scale to measure clinicians' attitudes to people with mental illness (medical student version). Acta Psychiatrica Scandinavica 122(2), 153-161.

Mental Illness: Clinicians' Attitudes Scale (Medical student version) MICA-2

Note to researchers distributing this scale: please only use after reading instructions in "Manual for Researchers".

Instructions: for each of questions 1-16, please respond by **ticking one box only**. Mental illness here refers to conditions for which an individual would be seen by a psychiatrist.

		Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
10	I feel as comfortable talking to a person with a mental illness as I do talking to a person with a physical illness.						
11	It is important that any doctor supporting a person with a mental illness also assesses their physical health.						
12	The public does **not** need to be protected from people with a severe mental illness.						
13	If a person with a mental illness complained of physical symptoms (such as chest pain), I would attribute it to their mental illness.						
14	General practitioners should **not** be expected to complete a thorough assessment for people with psychiatric symptoms because they can be referred to a psychiatrist.						
15	I would use the terms 'crazy', 'nutter', 'mad' etc. to describe people with a mental illness who I have seen in my work.						
16	If a colleague told me they had a mental illness, I would still want to work with them.						

Thank you very much for your help.

We would like to thank Aliya Kassam for her major contribution to the development of this scale.
Contact: Professor Graham Thornicroft. Email: graham.thornicroft@kcl.ac.uk

Kassam A., Glozier N., Leese M., Henderson C., Thornicroft G. (2010) Development and responsiveness of a scale to measure clinicians' attitudes to people with mental illness (medical student version). Acta Psychiatrica Scandinavica 122(2), 153-161.

Thank you for choosing to participate in this study.

Kindly complete the following questionnaire. Please tick the appropriate option or complete the information required in the blank space provided.

Demographic Details:

Age: _____

Sex:

Male	Female

Race:

African	Asian	Caucasian	Coloured	Indian	Other

Additional questions:

If you entered medicine via the graduate entry programme, please specify your previous degree or qualification:

_____

Do you find psychiatry to be an interesting field of study at medical school?

Yes	No

Do you feel confident in your knowledge of psychiatry?

Yes	No

Would you consider psychiatry as a future career path?

Yes	No

Do you *personally know* someone who suffers from a mental illness?

Yes	No

Dear Medical Students

Please take a moment of your time to read the document below.

My name is Stacey Ochse and I am a psychiatry registrar at The University of the Witwatersrand. I am currently conducting research as part of my MMed and the topic I have chosen to investigate is:

ASSESSING THE ATTITUDES OF MEDICAL STUDENTS IN THEIR FOURTH YEAR OF STUDY TOWARDS PSYCHIATRY AND MENTAL ILLNESS

I invite you to take part in this study by completing the questionnaire attached. The questionnaire comprises largely of tick box questions and would not take longer than 5 minutes to complete.

The questionnaire is comprised of a series of demographic questions, questions relating to your education in psychiatry as well as your interest in psychiatry as a career. The remainder of the questionnaire focuses on your attitude towards psychiatry and towards patients with mental illness.

Participation is voluntary and participants may withdraw from the study at any point. There are no risks, benefits or incentives involved in taking part in this research questionnaire. All questionnaires will be completed anonymously and thus confidentiality is ensured.

Please place the questionnaires into the demarcated boxes at the exits of the lecture venue if you choose to participate.

Thank you in advance for your time and assistance.

If you have any queries related to this study please do not hesitate to contact me at staceyr2510@gmail.com or on 079 886 0436.This study is being supervised by Dr K. Lowton (Specialist Psychiatrist) who may be contacted at the following email address: kmaharaj13@yahoo.com

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg. A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research. If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Many thanks,

Dr Stacey Ochse

November 2018

Mental Illness: Clinician's Attitudes Scale (MICA)

Manual for Researchers

(updated January 2013)

1. Background

The MICA scale was developed at the Health Services and Population Research Department, Institute of Psychiatry, King's College London. The development of the scale was part of Aliya Kassam's PhD at the Institute of Psychiatry. Psychometric validation of the scale was undertaken as part of the SAPPHIRE National Institute for Health Research (NIHR) Programme on Stigma and Discrimination in Mental Health.

2. How to use

The MICA scale is self- administered and usually requires about 5 minutes to complete it. This scale should be used in accordance with Good Clinical Practice and IRB / ethical committee approval. Under no circumstances should any changes be made without the authors' permission, nor should this scale be used for profit. Psychometrics for this scale will be posted when they are known. We currently provide two versions of this scale, described below.

3. Versions

MICA v1 is the whole set of items before reduction to produce the first validated scale (v2). A third version (v3) was created for use specifically with student nurses in the Perspectives Exploratory trial. In the Perspectives Main trial, v4 was used which is intended to be suitable for most health and social care professional groups. V4 has been used with a large nursing student sample and a paper on its psychometric properties has been published.

We recommend use of version 2 for medical students, trainee psychiatrists and psychiatrists and version 4 for students and qualified staff across a range of health and social care professions, and these are the versions we currently provide.

4. Scoring the MICA

A person's MICA score is the sum of the scores for the individual items. For items 3, 9, 10, 11, 12, and 16 items are scored as follows: Strongly agree = 1, Agree = 2, Somewhat agree = 3, Somewhat disagree = 4, Disagree = 5, Strongly disagree = 6. All other items (1, 2, 4, 5, 6, 7, 8, 13, 14, 15) are reverse scored as follows: Strongly agree = 6, Agree = 5, Somewhat agree = 4, Somewhat disagree = 3, Disagree = 2, Strongly disagree = 1. The scores for each item are summed to produce a single overall score. A high overall score indicates a more negative (stigmatising) attitude.

5. Conditions of use

Permission to use the MICA is granted on condition that:
1) No changes are made to the MICA. (Minor word changes are acceptable when the MICA is being used in contexts where these are the equivalent terms). Please inform authors of any such changes.
2) Translations into different languages are done using Back Translation[1] and a copy of the translated version is sent to Sarah Clement (email below) to avoid duplication.

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[1] Sartorius N, Kuyken J. Translation of Health Status Instruments. In: Orley J, Kuyken J, editors. Quality of Life Assessment in Health Care Settings. Volume 1. Berlin: Springer-Verlag; 1994.

3) The copyright information in the footer is included
4) The MICA is not passed on to a third party

6. Psychometric properties and references

The main papers describing the development and psychometric properties of the MICA scale are:

Aliya Kassam, Nick Glozier, Morven Leese, Claire Henderson & Graham Thornicroft (2010) Development and responsiveness of a scale to measure clinicians' attitudes to people with mental illness (medical student version). Acta Psychiatrica Scandinavica, 122: 153-161

Gabbidon, J., Clement, S., et al. (2012). Mental illness: clinicians' attitudes (MICA) scale. Psychometric properties of a version for healthcare students and professionals. Psychiatry Research, Epub ahead of print.

7. Contacts

For permission to use the MICA or requests to collaborate, please contact Professor Graham Thornicroft (graham.thornicroft@iop.kcl.ac.uk cc sarah.clement@kcl.ac.uk and jheanell.gabbidon@kcl.ac.uk).

For information and queries about the MICA and to share feedback about any of your experiences using the MICA please contact Sarah Clement (email above) or Jheanell Gabbidon (jheanell.gabbidon@kcl.ac.uk).

KING'S College LONDON
University of London

Questionnaire to register use of the the KCL stigma and discrimination measures

Permission to use the scales

If you work or study in a university or health setting the scales are freely available for you to use subject to the conditions below. Otherwise please contact Professor Graham Thornicroft at graham.thornicroft@kcl.ac.uk.

Permission to use the measures is granted provided that these steps are followed:

1. Complete this registration questionnaire.
2. When any measure is used and is cited in any publication, the full reference to the key paper describing the scale must be included in the footer.
3. Do not pass the scale on to a third party (instead please direct them to the website).

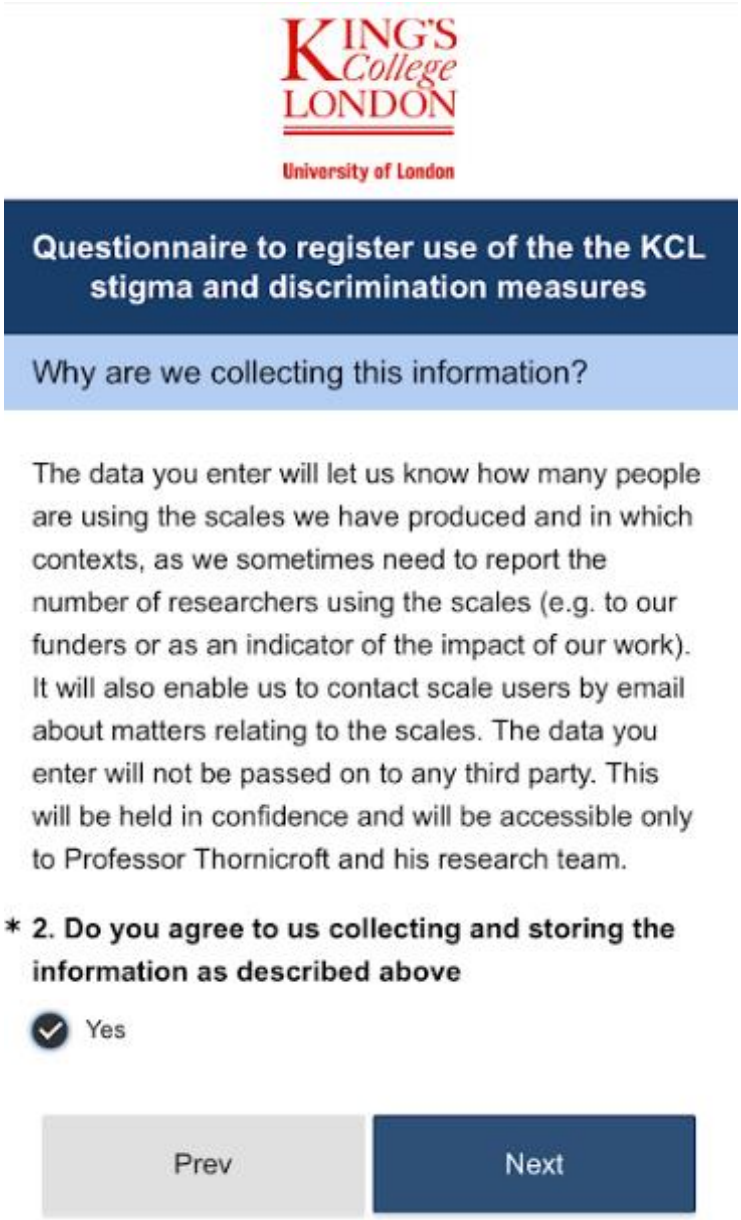
For translations:

1. Translations into different languages should be done using Back Translation (e.g. as detailed in the Translation Guidelines available on the website).
2. Include the copyright information in the footer of the scale.
3. Any translated versions(s) must be made available to others who wish to use them. Send your translated versions to Maria Milenova (maria.milenova@kcl.ac.uk) and Dr Sara Evans-Lacko (sara.evans-lacko@kcl.ac.uk)
4. No financial charge may be made for your version of our scales.

*** 1. Do you accept these conditions**

◯ Yes

Next


KING'S College LONDON
University of London
Questionnaire to register use of the the KCL stigma and discrimination measures
Why are we collecting this information?
The data you enter will let us know how many people are using the scales we have produced and in which contexts, as we sometimes need to report the number of researchers using the scales (e.g. to our funders or as an indicator of the impact of our work). It will also enable us to contact scale users by email about matters relating to the scales. The data you enter will not be passed on to any third party. This will be held in confidence and will be accessible only to Professor Thornicroft and his research team.
* 2. Do you agree to us collecting and storing the information as described above
Yes
Prev
Next

KING'S College LONDON
University of London

Questionnaire to register use of the the KCL stigma and discrimination measures

About you

3. Title

- ( ) Professor
- (•) Dr
- ( ) Ms
- ( ) Mrs
- ( ) Miss
- ( ) Mr

Other (please specify)

4. What is your first name?

Stacey

5. What is your surname?

Ochse

6. What is your email address?

staceyr2510@gmail.com

*** 7. Where are you based?**

University or institution	University of the Witwatersrand
City or region	Johannesburg
Country	South Africa

8. Other key researchers in your team e.g. supervisor / chief investigator (if applicable).

1)	Dr Karishma Lowton
2)	
3)	
4)	

Prev Next

KING'S College LONDON
University of London

Questionnaire to register use of the the KCL stigma and discrimination measures

Use of measures

DISC, QUAD, MICA, BACE and CODA were developed or finalised in the Sapphire Programme on Stigma and Discrimination in Mental Health. For further details see www.sapphire.iop.kcl.ac.uk

MAKS and RIBS were originally developed for the evaluation of England's Time to Change anti-discrimination programme. For further details contact sara.evans-lacko@kcl.ac.uk

*** 9. Which scales(s) have you used / are you using / are you planning to use? (please tick all that apply)**

- [ ] DISC (Discrimination and Stigma Scale)
- [ ] QUAD (Questionnaire on Anticipated Discrimination)
- [x] MICA v2 (Mental Illness: Clinicians' Attitudes scale – for medical students)
- [ ] MICA v4 (Mental Illness: Clinicians' Attitudes scale – for other health & social care students and professionals)
- [ ] BACE (Barriers to Accessing Care Evaluation)
- [ ] CODA (Costs of Discrimination Assessment)
- [ ] MAKS (Mental Illness Knowledge Scale)
- [ ] RIBS (Reported and Intended Behaviour Scale)

10. How did / will participants complete the scales? (please select all that apply)

- [ ] By face-to-face interview
- [ ] By telephone interview
- [ ] Self-complete online
- [x] Self-complete on paper

*** 11. Have you, or are you, planning to translate the measure(s)?**

- [x] No , I am using the original English version(s)
- [ ] Yes, I am planning to translate it / them
- [ ] Yes I have translated it / them
- [ ] No, I am using an existing translated version

Prev Next

Questionnaire to register use of the the KCL stigma and discrimination measures

12. Are you planning to do, or have you done, any validation or psychometric testing of the scale(s) for the context you are using them in? NB This is not essential

- [x] No
- [ ] Yes

Prev Next

KING'S College LONDON
University of London

Questionnaire to register use of the the KCL stigma and discrimination measures

Your research

13. Is the research that you undertook / are undertaking with the scale(s) part of ...?: (please select all that apply)

- [ ] The INDIGO schizophrenia research study
- [ ] The INDIGO depression research study
- [ ] The ASPEN study
- [ ] The FEDORA study
- [ ] Another research study
- [ ] A PhD
- [x] A Masters degree

Other (please specify)

14. What is your research question or aim? What were / are you trying to find out?

Assessing the attitudes of medical students in their fourth year of study towards psychiatry and mental illness

15. What is your study design? e.g. survey, intervention study.

Cross-sectional quantitative descriptive study

16. Where did / will your study take place?

Country	South Africa
City or region	Johannesburg

17. What type of participants are taking part / will take part in your study? e.g. general public, medical students, people who have received mental health care in the past year etc

Medical students

18. Approximately how many people do you have / hope to have in your sample?

180-200

19. What stage are you currently at with this research?

- (•) Planning stage
- ( ) Set up
- ( ) Data collection stage
- ( ) Analysis
- ( ) Write up
- ( ) Completed
- ( ) Published

KING'S College LONDON
University of London

Questionnaire to register use of the the KCL stigma and discrimination measures

Thank you for completing our survey!

To access the scales:
Return to http://www.indigo-group.org/stigma-scales/
Select the scale you wish to use
Enter the password scalescmh

Please make a note of this password, and do not share it with anyone whose details have not been entered into this survey.
For any queries, please contact Maria Milenova at maria.milenova@kcl.ac.uk

Done

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

UUME
Unit for Undergraduate Medical Education

29 Nov 2018

To: Dr Penny

Chair: Human Research Ethics Committee (Medical)

Faculty of Health Sciences

University of the Witwatersrand

RE: Study title: ASSESSING THE ATTITUDES OF MEDICAL STUDENTS IN THEIR FORTH YEAR OF STUDY TOWARDS PSYCHIATRY AND MENTAL ILLNESS.

I have reviewed the protocol and plan for this study and support the project. The results will provide valuable information in re our students. I have no ethical concerns.

This letter, therefore, serves to confirm that the above project has received my permission and support.

I look forward to the outcome of this study.

Yours sincerely,

Adj Prof FHS Schoeman

Director: UUME (Wits Medical School)

MBChB (Stell), M.MEd (Medical Education) (Dundee, UK), PhD (Health Professions Education) (UFS), FHEA (UK)

Director - Unit for Undergraduate Medical Education | Wits Medical School | Faculty of Health Science
Private Bag 3, Wits, 2050, South Africa | **T**: +27 11 717 2756 | **E**: scarpa.schoeman@wits.ac.za | **M**: +27 82 378 7333
3rd floor, Wits Medical School, 7 York Road, Parktown, 2193, South Africa |
www.wits.ac.za/health

UNIVERSITY OF THE
WITWATERSRAND
JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

03 January 2020
Person No: 0702706J
PAG

Dr SL Ochse
9 Atherstone Road
219 Troon Gardens
Illovo
2196
South Africa

Dear Dr Stacey Ochse

Master of Medicine: Approval of Title

We have pleasure in advising that your proposal entitled *Assessing the attitudes of medical students in their fourth year of study towards psychiatry and mental illness* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

Appendix C: Ethics clearance certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research & Post Graduate Affairs)

TO: Dr S Ochse
School of Clinical Medicine
Department of Psychiatry
Medical School
University

E-mail: staceyr2510@gmail.com

CC: Supervisor: Dr K Lowton <kmaharaj13@yahoo.com>
and <HREC-Medical.ResearchOffice@wits.ac.za>

FROM: Iain Burns
Human Research Ethics Committee (Medical)
Tel: 011 717 1252

E-mail: Iain.Burns@wits.ac.za

DATE: 16/11/2018

REF: *R14/49*

PROTOCOL NO: **M180947** *(This is your ethics application study reference number. Please quote this reference number in all correspondence relating to this study)*

PROJECT TITLE: *Assessing the attitudes of medical students in their fourth year of study towards psychiatry and mental illness*

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to the Government funding of the University.

MSWorks2000/Iain0007/Clearscan.wps

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

R14/49 Dr S Ochse

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M180947

NAME: (Principal Investigator)	Dr S Ochse
DEPARTMENT:	School of Clinical Medicine Department of Psychiatry Medical School University
PROJECT TITLE:	Assessing the attitudes of medical students in their fourth year of study towards psychiatry and mental illness
DATE CONSIDERED:	28/09/2018
DECISION:	Approved unconditionally
CONDITIONS:	Title change noted 18 January 2019
SUPERVISOR:	Dr K Lowton
APPROVED BY:	Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	16/11/2018

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on 3rd floor, Phillip V Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date of the meeting when the study was initially reviewed. In this case, the study was initially reviewed in **September** and will therefore reports and re-certification will be due early in the month of **September** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix D: Turn-it-in Report for research report paper in the 'submissible' format

Submission date: 04-May-2020 08:55PM (UTC+0200)
Submission ID: 1315843497
File name: -9c71-47ee-8940-5d556752f587_turn-it-in_submission_ammended.docx (85.89K)
Word count: 4217
Character count: 23648

00658018:turn-it-in_submission_ammended.docx

ORIGINALITY REPORT

14%	3%	9%	10%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Rishi Desai, Bharat Panchal, Ashok Vala, Imran Jahangirali Ratnani, Sneha Vadher, Pushpa Khania. "Impact of clinical posting in psychiatry on the attitudes towards psychiatry and mental illness in undergraduate medical students", General Psychiatry, 2019 Publication	2%
2	bmcmededuc.biomedcentral.com Internet Source	1%
3	Submitted to Middlesex University Student Paper	1%
4	Submitted to Manchester Metropolitan University Student Paper	1%
5	Submitted to University of Birmingham Student Paper	1%
6	Caro De Witt, Inge Smit, Esmè Jordaan, Liezl Koen, Dana J. H. Niehaus, Ulla Botha. "The impact of a psychiatry clinical rotation on the attitude of South African final year medical	1%

	students towards mental illness", BMC Medical Education, 2019 Publication	
7	Submitted to University of Derby Student Paper	1%
8	Lyons, Zaza, and Aleksandar Janca. "Impact of a psychiatry clerkship on stigma, attitudes towards psychiatry, and psychiatry as a career choice", BMC Medical Education, 2015. Publication	1%
9	Yidong Shen, Huixi Dong, Xiaoduo Fan, Zhanchou Zhang, Lehua Li, Hailong Lv, Zhimin Xue, Xiaofeng Guo. "What Can the Medical Education Do for Eliminating Stigma and Discrimination Associated with Mental Illness among Future Doctors? Effect of Clerkship Training on Chinese Students' Attitudes", The International Journal of Psychiatry in Medicine, 2014 Publication	1%
10	Submitted to National University of Ireland, Galway Student Paper	1%
11	Submitted to University of Witwatersrand Student Paper	1%
12	sajo.org.za Internet Source	<1%

13	Submitted to The University of Manchester Student Paper	<1%
14	S. M. Pillay, F. Sundram, D. Mullins, N. Rizvi, T. Grant, M. Boohan, K. C. Murphy. "Non-graduate and graduate entry medical students attitudes to psychiatry", Irish Journal of Psychological Medicine, 2013 Publication	<1%
15	medassocthai.org Internet Source	<1%
16	cvi.asm.org Internet Source	<1%
17	Submitted to Curtin University of Technology Student Paper	<1%
18	Submitted to Cardiff University Student Paper	<1%
19	Submitted to Monash University Student Paper	<1%
20	Submitted to Bellarmine University Student Paper	<1%
21	Buhari, OIN, AD Yussuf, PO Ajiboye, BA Issa, and OA Adegunloye. "Attitudes of Medical Students to Psychiatry in a Nigerian University", Nigerian Journal of Psychiatry, 2011. Publication	<1%

22	K. O' Connor, D. Brennan, K. O' Loughlin, L. Wilson, D. Pillay, M. Clarke, P. Casey, K. Malone, A. Lane. "Attitudes towards patients with mental illness in Irish medical students", Irish Journal of Medical Science, 2013 Publication	<1%
23	Submitted to Queen Mary and Westfield College Student Paper	<1%
24	www.jstage.jst.go.jp Internet Source	<1%
25	academypublication.com Internet Source	<1%
26	Submitted to University of Leicester Student Paper	<1%
27	O. Kuhnigk, M. Hofmann, A.M. Böthern, C. Haufs, M. Bullinger, S. Harendza. "Influence of educational programs on attitudes of medical students towards psychiatry: Effects of psychiatric experience, gender, and personality dimensions", Medical Teacher, 2009 Publication	<1%
28	Miroslava Hejdova, Vladimir Palicka, Zdenek Kucera, Jiri Vlcek. "Effects of Alendronate and Calcitonin on Bone Mineral Density in Postmenopausal Osteoporotic Women. An Observational Study", Pharmacy World &	<1%

	Science, 2005 Publication	
29	Submitted to Imperial College of Science, Technology and Medicine Student Paper	<1%
30	Submitted to University of Keele Student Paper	<1%
31	Submitted to Higher Education Commission Pakistan Student Paper	<1%
32	Submitted to University of Leeds Student Paper	<1%
33	Zaza Lyons. "Impact of the Psychiatry Clerkship on Medical Student Attitudes Towards Psychiatry and to Psychiatry as a Career", Academic Psychiatry, 2014 Publication	<1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

Signature of Primary Supervisor_____ **Date:** 02.12.2020

Appendix E: Guidelines for authors submitting to the South African Journal of Psychiatry

Original Research Article full structure

Title: The article's full title should contain a maximum of 95 characters (including spaces).

Abstract: The abstract, written in English, should be no longer than 250 words and must be written in the past tense. The abstract should give a succinct account of the objectives, methods, results and significance of the matter. The structured abstract for an Original Research article should consist of six paragraphs labelled Background, Aim, Setting, Methods, Results and Conclusion.

- Background: Summarise the social value (importance, relevance) and scientific value (knowledge gap) that your study addresses.
- Aim: State the overall aim of the study.
- Setting: State the setting for the study.
- Methods: Clearly express the basic design of the study, and name or briefly describe the methods used without going into excessive detail.
- Results: State the main findings.
- Conclusion: State your conclusion and any key implications or recommendations.

Do not cite references and do not use abbreviations excessively in the abstract.

Introduction: The introduction must contain your argument for the social and scientific value of the study, as well as the aim and objectives:

- Social value: The first part of the introduction should make a clear and logical argument for the importance or relevance of the study. Your argument should be supported by use of evidence from the literature.
- Scientific value: The second part of the introduction should make a clear and logical argument for the originality of the study. This should include a summary of what is already known about the research question or specific topic, and should clarify the

knowledge gap that this study will address. Your argument should be supported by use of evidence from the literature.

- Conceptual framework: In some research articles it will also be important to describe the underlying theoretical basis for the research and how these theories are linked together in a conceptual framework. The theoretical evidence used to construct the conceptual framework should be referenced from the literature.
- Aim and objectives: The introduction should conclude with a clear summary of the aim and objectives of this study.

Research methods and design: This must address the following:

- Study design: An outline of the type of study design.
- Setting: A description of the setting for the study; for example, the type of community from which the participants came or the nature of the health system and services in which the study is conducted.
- Study population and sampling strategy: Describe the study population and any inclusion or exclusion criteria. Describe the intended sample size and your sample size calculation or justification. Describe the sampling strategy used. Describe in practical terms how this was implemented.
- Intervention (if appropriate): If there were intervention and comparison groups, describe the intervention in detail and what happened to the comparison groups.
- Data collection: Define the data collection tools that were used and their validity. Describe in practical terms how data were collected and any key issues involved, e.g. language barriers.
- Data analysis: Describe how data were captured, checked and cleaned. Describe the analysis process, for example, the statistical tests used or steps followed in qualitative data analysis.
- Ethical considerations: Approval must have been obtained for all studies from the author's institution or other relevant ethics committee and the institution’s name and permit numbers should be stated here.

Results: Present the results of your study in a logical sequence that addresses the aim and objectives of your study. Use tables and figures as required to present your findings. Use quotations as required to establish your interpretation of qualitative data. All units should conform to the **SI convention** and be abbreviated accordingly. Metric units and their international symbols are used throughout, as is the decimal point (not the decimal comma).

Discussion: The discussion section should address the following four elements:

- Key findings: Summarise the key findings without reiterating details of the results.
- Discussion of key findings: Explain how the key findings relate to previous research or to existing knowledge, practice or policy.
- Strengths and limitations: Describe the strengths and limitations of your methods and what the reader should take into account when interpreting your results.
- Implications or recommendations: State the implications of your study or recommendations for future research (questions that remain unanswered), policy or practice. Make sure that the recommendations flow directly from your findings.

Conclusion: Provide a brief conclusion that summarises the results and their meaning or significance in relation to each objective of the study.

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Also provide the following, each under their own heading:

- Competing interests: This section should list specific competing interests associated with any of the authors. If authors declare that no competing interests exist, the article will include a statement to this effect: *The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.* Read our **policy on competing interests**.

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