Implicit and Explicit Attitudes of Medical Students Towards Mental Illness:

A Randomized Controlled Pilot Trial of Service User Videos to Reduce Stigma in Nepal

by

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Thesis submitted in partial fulfillment of
the requirements for the degree
of Master of Science in the Duke Global Health Institute
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ABSTRACT

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Abstract

Background: Many health providers worldwide stigmatize people living with mental illness, creating a barrier to providing quality mental health services. Interventions aiming to reduce stigma during medical school have utilized education and contact-based methods to improve student attitudes towards mental illness. However, the effectiveness of these methods has never before been compared in medical schools in low-income countries. The aim of this study was to evaluate a video featuring a mental health service user with depression in a randomized controlled pilot trial among medical students in Nepal. Methods: In a three-armed randomized controlled pilot trial, participants were randomized to one of three conditions: a didactic video lecture based on the mental health Gap Action Programme Implementation Guide depression module, a service user testimonial video about living with depression, and a condition with no video presentation. Participants were 94 second and third year medical students in Nepal. All of the measures were collected post-intervention. The primary outcome was explicit attitudes measured on the Social Distance Scale (SDS). Additional outcomes were implicit attitudes on two Implicit Association Tests (IAT), diagnostic accuracy, treatment knowledge, and symptom knowledge. Results: Both the didactic lesson (SDS mean score, M = 33.32; standard deviation, SD = 9.57) and the service user videos (M= 30.13; SD= 9.16) had lower explicit stigma after the video

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presentations compared to the control (M= 39.10; SD= 11.14) ($F_{2,91}$= 6.37, p= 0.003, R^2= 0.12), but there was no difference between the two intervention conditions ($F_{1,61}$= 1.55, p= 0.23, R^2= 0.02). There were no significant differences on implicit associations (IAT d score), depression diagnosis, treatment knowledge, and symptom knowledge.

Conclusions: Prerecorded videos (whether didactic or service user testimonials) are scalable learning tools that have potential to reduce explicit stigma among medical students in low resources settings. Additional research is necessary to explore the differences between both didactic education and service user testimonial interventions, as well as the potential outcomes when the videos are combined. A full scale randomized controlled trial will be conducted based on these findings.

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1. Introduction

1.1 Burden of depression

Depression is a growing health crisis that currently impacts more than 300 million people globally (World Health Organization, 2017a). Based on data from the 2010 Global Burden of Disease study, depression is now the second leading cause of disability (Ferrari et al., 2013). People suffering from depression are at higher risk of suicide, which is the second leading cause of death for people between the ages of 15 and 29 (World Health Organization, 2014).

The World Health Organization reported that South-East Asia, a region encompassing countries on the Indian subcontinent, experiences disproportionately high rates of suicide (World Health Organization, 2014). Suicidal ideation in two of the countries in this region, India and Nepal, was reported in about 10% of patients who entered the primary health care setting (Jordans et al., 2017). The burden of depression was found to be especially high in Nepal following two earthquakes in 2015; symptoms of depression were identified in one third of Nepali adults (Kane et al., 2017).

1.2 Stigma associated with depression

Evidence suggests stigmatizing views of mental illness might be more common in low and middle-income countries than high-income countries (Stefanovics et al., 2016). Depression, in particular, was found to be more stigmatized by Sri Lankan

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medical students than medical students in the United Kingdom (Fernando, Deane, & McLeod, 2010). There are multiple consequences when health providers have negative attitudes towards mental illness. Stigma about mental illness held by providers reduces help seeking behavior of people living with mental illness (Corrigan et al., 2014). When comparing hypothetical patients diagnosed with a physical illness and a mental illness, Malaysian health providers scored lower on the quality of care and higher on stigmatizing attitudes for the patient with mental illness (Minas et al., 2011). Additionally, it has been demonstrated that patients experiencing comorbid mental and physical illnesses receive inadequate care from health providers for their physical ailments because they inaccurately attribute symptoms to mental conditions (Jones, Howard, & Thornicroft, 2008). Studies in the United States have found that people living with mental illness were less likely to receive a mammogram (Koroukian et al., 2012), less likely to be admitted to the hospital after visiting the emergency department for a diabetic complication (Sullivan et al., 2006), and less likely receive coronary revascularization procedures following acute myocardial infarctions (Druss et al., 2000).

Stigma towards people with mental illnesses has been identified in health providers as early as medical school (Suwalska et al., 2016; Thornicroft, Rose, & Kassam, 2007). In South Asia, the majority of Indian students in one study held negative views of depression and did not consider it a real illness (Economou et al., 2017). There is evidence that student attitudes toward mental illness, including depression, remain

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mostly unchanged throughout medical school (Economou et al., 2017; Korszun et al., 2012). After psychiatry rotation in the later years of education, student attitudes towards mental illness sometimes improved (Lyons & Janca, 2015; Poreddi et al., 2015; Tharyan et al., 2001), were not improved at all (Economou et al., 2017; Korszun et al., 2012), or worsened (Giasuddin et al., 2015). When comparing the attitudes of hospital staff and clinicians, staff held more positive views of mental illness despite the lack of medical training (Aydin et al., 2003). These studies suggest that formal medical education in its current form is, at its best, unreliably improving attitudes towards mental illness and, in some cases, may even perpetuate stigma (Aydin et al., 2003; Economou et al., 2017; Giasuddin et al., 2015). As a consequence of the prevailing stigma towards mental illness in medical institutions, fewer students may be choosing to specialize in psychiatry (Thornicroft, Rose, & Kassam, 2007).

In Nepal, a low-income, landlocked nation in South Asia (World Bank, n.d.), there only are 0.22 psychiatrists per 100,000 in the population (Luitel et al., 2015). In contrast, there are 12.40 psychiatrists per 100,000 in the United States (World Health Organization, 2015). In addition to human resource barriers in Nepal, stigma has also been identified as a major barrier to treating mental health problems in the community (Luitel et al., 2015). People living with mental illness in Nepal are stigmatized by their communities as well as their health care providers (Adhikari, Pradhan, & Sharma, 2008; Kisa et al., 2016; Petersen et al., 2017). To date, no research has been conducted in Nepali

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medical institutions to improve attitudes of medical students towards mental illness or incorporate strategies to increase the number of health providers specializing in psychiatry.

1.3 Stigma interventions

Education-based and contact-based interventions are the two most common methods used to address mental health stigma (Griffiths et al., 2014). In randomized controlled trials (RCT), direct contact with mental health service users improved attitudes among health care students (Clement et al., 2012; Pattern et al., 2012). Specific studies conducted with medical students, however, did not find a statistically significant effect on changing attitudes towards mental illness with one-time contact (Kassam et al., 2011; Papish et al., 2013). A more recent study of pre-clinical medical students found that both video and face-to-face contact were effective at reducing stigma when both conditions were coupled with education programs (Fernandez et al., 2016). Studies in South Asia have found that the medical curriculum unreliably improves attitudes. Two studies in India found that attitudes towards people living with mental illness improved after psychiatry rotation (Poreddi et al., 2015; Tharyan et al., 2001), but another study in Bangladesh found that stigma increased (Giasuddin et al., 2015). Two of these studies found that completing mental health training did not significantly increase interest in psychiatry as a career (Giasuddin et al., 2015; Tharyan et al., 2001). Contradictory findings warrant the need for additional research on this subject. Previous reviews

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found that high-quality RCTs evaluating stigma reduction interventions were non-existent in low-income countries (Griffiths et al., 2014; Mehta et al., 2015). Semrau et al. (2016) found that there was also no evidence of service user involvement in mental health research in any low and middle-income countries (LMIC).

In a study of six LMIC mental health systems, including Nepal, stigma and inadequate pre-service training of health providers contributed to insufficient human resources for mental health services in primary health care settings (Petersen et al., 2017). Changes to pre-service health curricula and introduction of service users into stigma reduction activities were recommended, but there was no specific mention of involving mental health patients during pre-service medical education. Although stigmatizing beliefs toward mental illness have been identified within the Nepali health care system (Adhikari, Pradhan, & Sharma, 2008; Kisa et al., 2016; Petersen et al., 2017), the investigators could not find any interventions targeting the medical education curriculum.

Indirect contact was found to be as effective at reducing stigma about mental illness as direct contact in two RCTs (Clement et al, 2012; Reinke et al., 2004). An advantage of using video is that it is more cost-effective than direct contact interventions (Clement et al., 2012), which makes it a valuable option in resource constrained areas like Nepal. Research in Nepal on video assisted mental health trainings demonstrated that pre-recorded presentations can be complementary tools to educate providers about

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mental health in rural low-income settings (Acharya et al., 2017). However, additional research is required to evaluate the efficacy of using video-based trainings with a comparison group.

1.4 Rationale

Despite the success of contact-based interventions to reduce stigma (Clement et al., 2012; Pattern et al., 2012, Reinke et al., 2004), the researchers could not find evidence of service user involvement during medical education in low-income countries. Mental health care is already scarce in LMICs due to limited resources, and stigma is likely exacerbating existing barriers in the health system (Saxena et al., 2007). A major barrier is the shortage of mental health specialists (Saxena et al., 2007). Addressing stigma early on during medical education could possibly encourage more students to specialize in psychiatry. The investigators proposed to fill this gap in research with a stigma pilot intervention targeting medical students in Nepal. This university-based intervention utilized a video testimonial of a service user rather than in-person interactions, which also expanded upon the literature regarding video trainings in low resource settings. Successful completion of the pilot will inform the implementation of a full stigma reduction intervention at two Nepali medical institutions.

1.5 Objectives and hypotheses

The primary objective of this pilot study was to evaluate whether a didactic video based on the mental health Gap Action Programme Implementation Guide

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(mhGAP-IG) module or a service user testimonial video was associated with improved explicit (conscious) and implicit (unconscious) attitudes towards mental illness and increased diagnostic and treatment knowledge among Nepali medical students, compared to a control group without a video (World Health Organization, 2017b). Secondary objectives were to examine the association between explicit and implicit attitudes towards mental illness, to identify if either or both explicit and implicit attitudes towards mental illness predict the diagnostic and treatment knowledge within medical students, and to explore subjective experiences in medical school education, attitudes towards mental illness and psychiatry, and participation in video interventions via qualitative interviews.

It was hypothesized that Nepali medical students who participated in either intervention condition would have improved explicit and implicit attitudes, compared to the control group without a video. It was additionally hypothesized that the service user testimonial video would be associated with better explicit and implicit attitudes than the didactic lecture video.

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2. Methods

2.1 Setting and collaborators

Research was conducted at Tribhuvan University's Institute of Medicine (TU-IOM), an urban public medical institute located in Kathmandu, Nepal. Data were collected between July and August in 2017.

International collaborators at TU-IOM and Transcultural Psychosocial Organization (TPO) Nepal jointly supervised this study. TPO Nepal has been a leading mental health organization in Nepal since 2005 (Transcultural Psychosocial Organization, n.d.). The organization aims to promote psychosocial well-being and mental health of children and families in conflict affected and other vulnerable communities. TPO Nepal prioritizes knowledge and innovation to make an impact in areas afflicted by violence and poverty.

2.2 Design

This study was a three-armed, parallel group pilot RCT. Participants (n=94) were randomized to one of three conditions (didactic video based on the mhGAP-IG module for depression; a service user-involved video with personal testimonials from a mental health service user with depression; or a no-treatment control). Data were collected from each participant once at post-intervention. In addition, qualitative interviews were conducted with six participants to explore student attitudes towards mental illness and

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psychiatry, medical education curriculum about mental illness, and perceptions about the intervention videos.

2.3 Intervention videos

The didactic and service user video conditions were designed to match each other in core content about depression, including symptoms, diagnosis, treatments, and recovery. Each video was eight minutes long.

2.3.1 Didactic lecture

The didactic video was adapted from existing mhGAP-IG materials in the Programme for Improving Mental Healthcare (PRIME), a program used to evaluate the implementation of mental health in primary care in five countries, including Nepal (Jordans et al., 2016). PRIME is a comprehensive training package, so the investigators in the current study reduced the amount of content to deliver an overview of information regarding depression in eight minutes. The original PRIME materials were already adapted to use common Nepali language, so the investigators did not alter core content or language. The investigators collaborated with a Nepali psychiatrist to create and record a narration to accompany each presentation slide.

2.3.2 Service user testimonial

A person seeking care for depression, referred to as a service user, was identified among service users who had participated in the Reducing Stigma among Healthcare Providers (RESHAPE) program in Chitwan, Nepal. RESHAPE is a program in which

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service users who have been treated through PRIME are trained in PhotoVoice participatory techniques to develop recovery narratives, which they use to co-facilitate mental health trainings for primary care workers (Kohrt et al., 2018; Rai et al., 2018). A service user who had taken the initiative to create her own YouTube video about living with mental illness, expressed through song, was selected for the video because she was open to public disclosure of her illness. Investigators approached the service user to explain the purpose of the video testimonials in research. The service user was offered compensation for sharing her story. The script for the video was based on the narrative prepared by the service user for her PhotoVoice testimonial. Additional perspectives from a health worker who diagnosed her and a counselor who treated her were interwoven with the testimonial. Videos were filmed and edited by a local professional film crew.

2.4 Participants

Participants were randomly selected from second and third year pre-clinical cohorts of the Bachelor of Medicine, Bachelor of Surgery (MBBS) program at TU-IOM. The MBBS program is a five year undergraduate program. As part of their medical training, students undertake formal education and clinical practice in psychiatry in either their fourth or fifth years of education; therefore, the participants in this study had limited clinical and theoretical training in mental health. Since this study aimed to evaluate the best educational format for improved mental health attitudes and higher

diagnostic and treatment accuracy of individuals with mental health distress, participants who had limited exposure to mental health training were preferred. Participants were excluded if they had completed their psychiatric clinical rotation or if they were international students.

2.5 Procedures

The researchers coordinated with faculty collaborators at TU-IOM to schedule classroom-based orientations to describe the research activities to students. At these research orientations, student contact information was collected from the classes. The participants were stratified by grade level, so there would be an equal distribution from each cohort. The researchers then individually called students in random order to invite them to participate. Each contacted participant was individually randomized to one of the conditions using a computer-generated random order prior to the scheduled data collection session. During recruitment and data collection, students were not made aware of the true purpose of the intervention in order to avoid biased responses on the attitude measures.

The intervention session times were offered outside of normal class time in both the morning and evening. In small groups of three to four, participants attended a one-hour long session. At the beginning of each session, written consent was gathered from each participant. Data were collected using paper for the demographics, laptops for Implicit Associate Tests (IAT), and electronic tablets for all other measures. Data on the

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laptops and tablets were collected once at post-intervention. After providing consent and filling out the demographic forms, participants allocated to intervention groups watched either the didactic or service user videos with headphones on the laptops. Participants allocated to the control group immediately started on the evaluation tools. The participants were supervised by an investigator to minimize distractions during videos and data collection. At the end of the evaluations, researchers asked participants if they would like to participate in follow-up interviews. Participants were selected for interviews based on scheduling availability and interest expressed by the student. Interviews occurred within one week of participation. The flow of research activities is described in Figure 1.

Participants were not compensated for their participation in the research activities. After participation, the researchers emailed a mental health resource list to participants if they had further questions, concerns, or interest in mental health services. Researchers created a referral network through the local institutions for participants who sought or were in need of mental health services, but we did not identify any participants in need of a referral during the study. The procedure for this study was approved by the ethical review boards at Duke University (E0078), TU-IOM (380), and the Nepal Health Research Council (146/2017) prior to data collection.
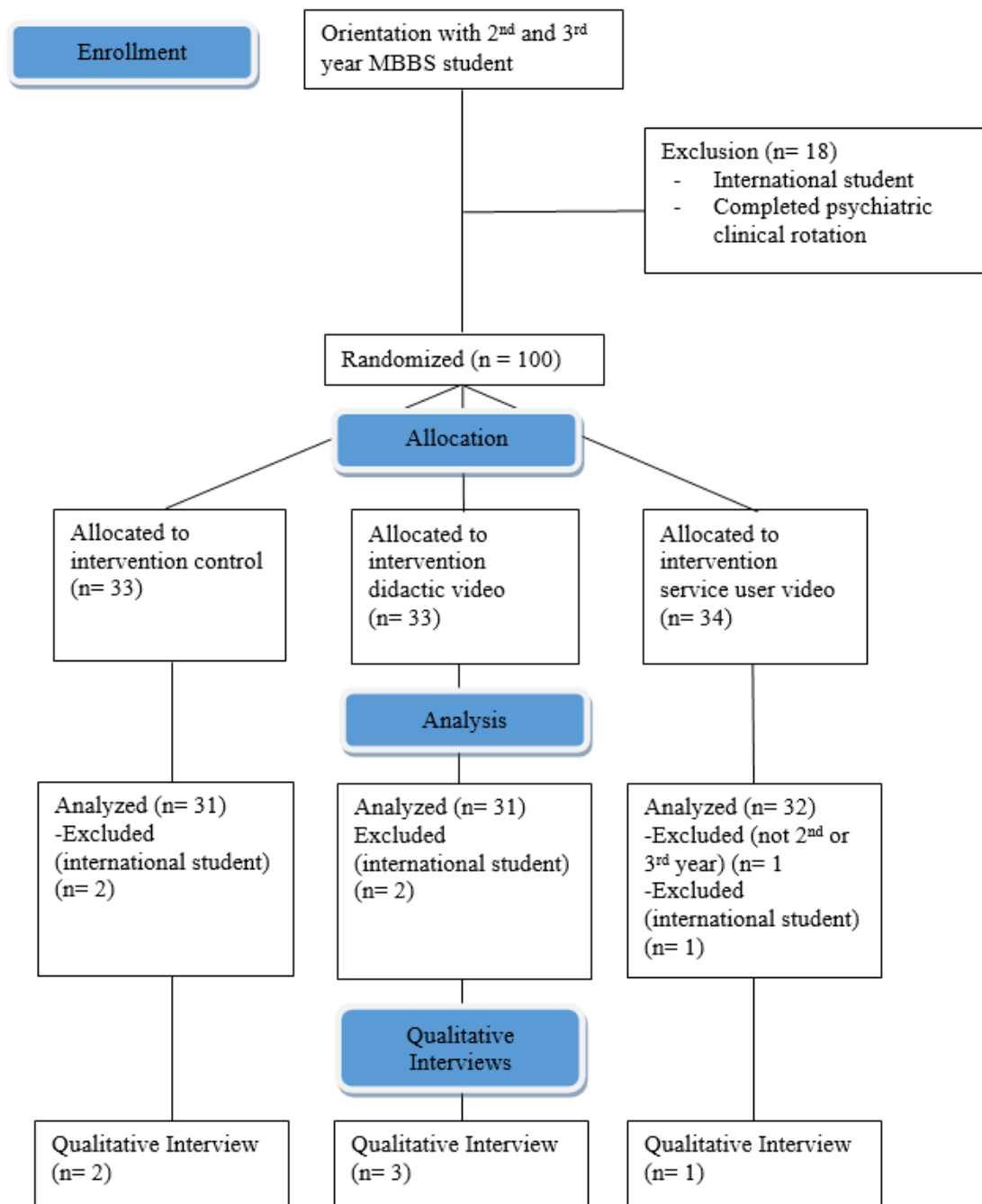
Figure 1: Flow diagram for research procedures.

Note. Some students presented themselves as eligible participants in the research who did not meet inclusion criteria (n=6). These students were subsequently identified based on demographic questions and excluded before analyses.

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2. 6 Measures and outcomes

All of the tools used in data collection, including the demographic form, were created in English and translated into Nepali. The Social Distance Scale (SDS), IATs, and vignette were previously adapted and translated for prior research conducted in Nepal. All quantitative outcomes were measured post-intervention. The qualitative interviews were conducted in English because it was the primary language used in the medical school curriculum.

2.6.1 Explicit attitudes

The primary outcome was explicit stigma on the SDS, a Likert rating scale with items referring to willingness to interact with people who have mental illness. The multiple items are summed for a continuous value ranging from 12 to 72. Higher scores indicate greater social distance. The SDS was an adapted tool used in similar studies in Nepal. The SDS adapted for use in Nepal is a 12-item tool comprised of sections from the Stigma in Global Context – Mental Health Study (Olafsdottir & Pescosolido, 2011; Pescosolido, 2009; Pescosolido, Medina, Martin, & Long, 2013). The internal consistency of SDS in PRIME was demonstrated to be high (α=0.80).

2.6.2 Implicit attitudes

Another source of stigmatizing beliefs towards mental illness is implicit attitudes held by health professionals (Peris, Teachman, & Nosek, 2008). Even small trends of implicit bias among individuals can foreshadow societal-level discrimination against

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biased groups (Greenwald, Banaji, & Nosek, 2015). One frequently utilized method to evaluate implicit attitudes is an IAT, which is a computer-based response-latency test (Greenwald, McGhee, & Schwartz, 1998). A participant receives a continuous *d* score for each IAT. Scores farther from zero in either negative or positive directions represent greater implicit preference for or against a group. Secondary outcomes were IAT scores on two Nepali adapted tests that assessed mental or physical illness on attributes of violence and burdensomeness. The order of the IATs was randomized to reduce potential biases.

2.6.3 Diagnostic and treatment accuracy of depression

Diagnostic and treatment accuracy were assessed using a patient vignette, or hypothetical patient story, which has been used to measure the effect of negative attitudes on patient care (Link et al., 2004). Acharya et al. previously used clinical vignettes in the Nepali video-assisted training study, in addition to mhGAP-IG evaluation instruments, to assess applied knowledge (2017). The current study included a previously adapted Nepali vignette of a person suffering from depression (Jordans et al., 2015). A series of open-ended and multiple choice questions evaluated treatment knowledge and attitudes towards the person in the vignette. Diagnostic accuracy of depression was an open-ended response that was then coded as a binomial variable for correct or incorrect. Treatment accuracy was assessed in two different ways. In the first, participants responded to a multiple choice question to recommend which treatments

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would benefit the patient in the vignette. Four of the treatments were deemed to be appropriate therapies: counseling, psychoeducation, family support, and medication. Four of the treatments were inappropriate therapies: work, isolation, diet change, and nothing. Traditional healer and meditation were neutral values, and they were not included in the analysis. The researchers applied +1 point for indicating a correct treatment, -1 point for indicating an incorrect treatment, and 0 for not selecting the therapy. A continuous value ranging from -4 to +4 represented treatment accuracy. A second method to measure treatment accuracy was writing in the correct medicines to prescribe the person in the vignette. A researcher then coded each correct medicine as a +1 and an incorrect medicine as a -1 to create a continuous variable that ranged from -2 to +7. Correct diagnosis and treatment recommendations of the patient in the vignette were secondary outcomes.

2.6.4 Symptom knowledge

The researchers developed and piloted a novel questionnaire that assessed symptom accuracy for different mental illnesses. The questionnaire had ten questions that listed prototypical symptoms of specific mental illnesses including depression, psychosis, post-traumatic stress disorder, epilepsy, and alcohol use disorder. There was only one correct answer per symptom. During the pilot, the researchers added more answers to increase response variability. The answers choices were depression, psychosis, post-traumatic stress disorder, autism spectrum disorder, intellectual

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disability (mental retardation), obsessive-compulsive disorder, more than one of the above, or none of the above. To receive a perfect score out of ten, participants had to identify the four symptoms of depression and reject the six symptoms of other illnesses. A continuous value with a potential range from -10 to +10 of depression symptom accuracy was a secondary outcome.

2. 7 In-depth interviews

To understand student perspectives about their medical education, attitudes towards mental health, and evaluation of the intervention videos, we conducted in-depth interviews with a subset of the participants. The interviews provided an opportunity for participants to share personal experiences and subjective evaluations of their curriculum to enhance mental health education. Qualitative interviews were conducted by the investigator and research assistant in English. Interviews followed a semi-structured guide, including questions about how mental health should be taught in medical school, what attitudes people have towards mental health patients, and why students do not pursue psychiatry. Participants allocated to one of the two intervention conditions were also asked to evaluate the videos.

2. 8 Data collection and management

There were three methods of data collection: hard copy paper, laptops, and electronic tablets. Consent and demographics were collected on paper copies that contained the only identifiable information. On laptops, participants completed two

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IATs. The remaining measures were collected in survey format on tablets using the SurveyCTO application (SurveyCTO, n.d.). Survey responses were uploaded to an encrypted server. Demographics were manually entered into a spreadsheet and double checked by a second investigator. Qualitative interviews were recorded electronically and transcribed. Transcriptions were de-identified and stored on an encrypted cloud-based server, Box.

2. 9 Analysis

2.9.1 Quantitative data

The data were analyzed using STATA 14 (STATA, n.d.). Descriptive statistics summarized the characteristics of the participants. Computer literacy was a demographic characteristic used to separate students as frequent and infrequent users for IAT analysis. For IAT analyses, only frequent computer users were included.

The primary inferential analyses evaluated between group differences in explicit and implicit attitudes as well as diagnostic and treatment accuracy. The investigators used linear regressions for continuous measures to investigate the effects of the interventions compared to a control group with no exposure. A logistical regression was used for analyses of depression diagnostic accuracy on the vignette. Two regressions were run for each measure: a) comparing both intervention conditions to the control and b) comparing the two intervention conditions. Regressions were also utilized to examine if explicit or implicit attitudes predicted diagnostic and treatment knowledge. To

identify relationships between implicit and explicit attitudes, Pearson correlations were conducted within subjects. Multiple regressions were conducted to examine if demographic factors predicted any of the outcomes (SDS, IAT for harmfulness, IAT for burdensomeness, diagnostic accuracy, treatment accuracy for all therapies, treatment accuracy for medications, and symptom accuracy). All analyses were performed with a significance level of 0.05.

2.9.2 Qualitative data

Interviews were audio recorded and transcribed for analysis. Data management and coding were facilitated using QSR NVivo 11 software (QSR International, n.d.). A coding framework was developed using a content analysis strategy (Hsieh & Shannon, 2005) and based on the primary research objective to qualitatively explore attitudes about mental illness, education about mental illness, barriers preventing students from becoming psychiatrists, and evaluation of the videos. Independent reviewers developed a codebook by memoing all of the transcripts and identifying invivo themes (n=6). The codebook was then applied to all of the transcripts, and discrepancies were discussed by the coders until consensus was reached. Since the two coders discussed all of the discrepancies together, they did not establish a formal inter-rater reliability. Coding material was reviewed and the principal investigator wrote thick descriptions of the emergent themes and selected representative quotes.

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3. Results

3.1 Description of sample

One hundred students were recruited to participate, but six were subsequently removed from analysis for not meeting study eligibility criteria, resulting in a total sample of 94 (Figure 1). Participants were excluded for being international students (n= 5) and belonging to a different year in medical school (n= 1). The majority of participants were male (n= 71; 76%), which reflects the gender distribution of Nepali medical undergraduates. Participants were split between second year (n= 45; 48%) and third year (n= 49; 52%). Their ages ranged from 19 to 24 (*M*= 21.07; *SD*= 0.11). Responses were mixed about which specialty in medicine interested students the most (Figure 2). In the "Other" category, participants each indicated interest in cardiology, neurosurgery, and public health. Qualitative results were analyzed from a subset of six students who participated in in-depth interviews. The qualitative sample included two women and four men in their third year of medical school. Participants were randomized into one the three conditions: the control (n= 31, 33%), the didactic video group (n= 31, 33%), and the service user video group (n= 32; 34%).

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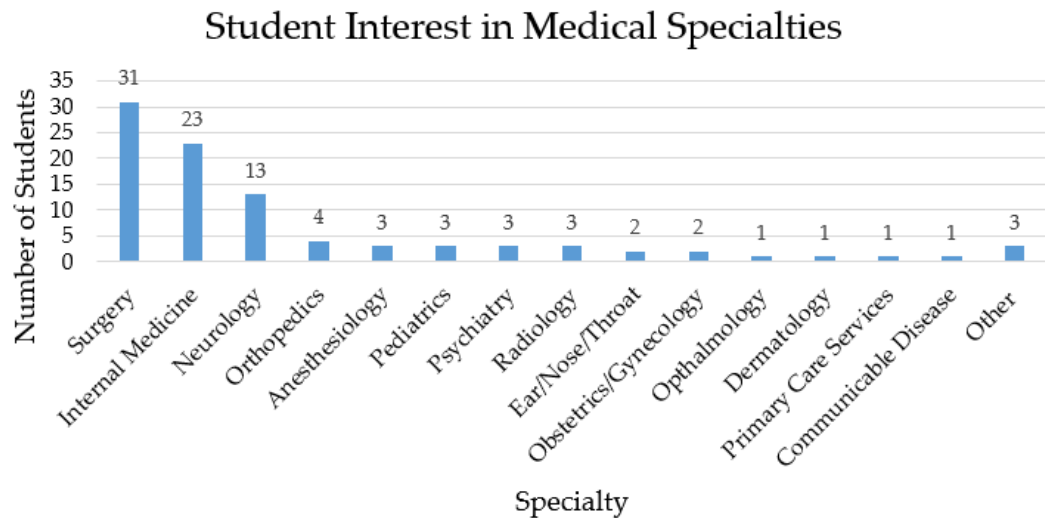
Figure 2: Second and third year medical students' preferred specialties (n= 94).

Experience with mental illness was assessed in a variety of ways. Some students had personal experience with a mental illness or knew a friend or relative who had a mental illness (n= 44; 47%) while others did not (n=39; 41%) or were unsure (n=11; 12%). Even though students followed the same curriculum, some students thought they had been taught about mental health in their classes (n= 26; 28%) and others did not recall being taught (n= 64; 68%). Grade level did not show a significant relationship that could have accounted for this finding (X^2(1)= 51, p= 0.47). The majority of participants stated that they had learned about mental health outside of their curriculum (n= 61; 65%). Some examples provided by students of outside learning were optional campus events, seminars, trainings, and awareness events. The most notable event was the World

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Health Day 2017 showcase of depression on campus (World Health Organization, 2017c).

Computer literacy was evaluated because the IATs are response-latency sensitive measures on the laptop, so they are potentially subject to computer-use bias. Students who used the computer at least a few times a week were categorized as frequent computer users (n= 87, 93%). Only these participants were included in analysis using IAT data. The number and percentage of students allocated to the different conditions by various factors in the table below (Table 1).

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Table 1. Demographic factors for each study condition.

Variables	Control (*n*= 31)	Didactic Video (*n*= 31)	Service User (*n*= 33)
Age			
M(*SD*)	21.03(*1.14*)	21.19(*1.11*)	21.00(*1.08*)
Gender			
Male	23 (24%)	25 (27%)	23 (24%)
Female	8 (8%)	6 (6%)	9 (10%)
Class Level			
Second Year	14 (15%)	15 (16%)	16 (17%)
Third Year	17 (18%)	16 (17%)	16 (17%)
Personal experience or has family member/friend with mental illness			
Yes	18 (19%)	13 (14%)	13 (14%)
No	9 (10%)	14 (15%)	16 (17%)
Don't Know	4 (4%)	4 (4%)	3 (3%)
Previous knowledge about mental illness from schooling			
Yes	10 (11%)	10 (11%)	6 (6%)
No	21 (22%)	21 (22%)	26 (28%)
Previous knowledge about mental illness outside of schooling			
Yes	18 (19%)	21 (22%)	22 (23%)
No	13 (14%)	10 (11%)	10 (11%)
Computer use frequency			
Yes	29 (33%)	28 (32%)	30 (34%)
No	2 (2%)	3 (3%)	2 (2%)

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3.2 Intervention effects

3.2.1 Explicit attitudes towards mental illness

A linear regression ($F_{2,91}$= 6.37, p= 0.003, R^2= 0.12) found that participants in both intervention groups, didactic lecture (M= 33.32; SD= 9.57) and service user testimonial (M= 30.13; SD= 9.16), had significantly lower SDS scores compared to the control group (M= 39.10; SD= 11.14) (Table 2). Although, the difference between the two video groups was not statistically significant ($F_{1,61}$= 1.55, p= 0.23, R^2= 0.02).

3.2.2 Implicit attitudes for harmfulness and burdensomeness

3.2.2.1 Harmfulness attribute

For the harmfulness attribute on the IAT, a linear regression ($F_{2,84}$= 1.19, p= 0.31, R^2= 0.03) showed that the didactic lecture (M= 0.07; SD= 0.33) and the service user testimony (M= 0.04; SD= 0.36) compared to the control condition (M= 0.15; SD= 0.32) did not significantly differ regarding implicit attitudes that people with mental illness were more harmful than people who have physical illness (Table 2). The difference between the intervention conditions was also not statistically significant ($F_{1,56}$= 0.88, p= 0.35, R^2= 0.02).

3.2.2.2 Burdensomeness attribute

A linear regression for the burdensomeness IAT ($F_{1,84}$= 0.88, p= 0.50, R^2= 0.02) found that the didactic lecture (M= 0.10; SD= 0.34) and the service user testimony (M=

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0.17; $SD= 0.29$) did not significantly differ regarding implicit associations that people with mental illness were more burdensome than people with physical illness compared to the control group ($M= 0.20$; $SD= 0.31$) (Table 2). The intervention conditions were not statistically different from each other ($F_{1,56}= 0.62$, $p= 0.43$, $R^2= 0.01$).

3.2.3 Diagnostic accuracy

A logistic regression ($X^2(2)= 2.10$, $p= 0.35$) indicated that intervention groups combined, didactic ($M= 84\%$; $SD=37\%$) and service user ($M= 91\%$; $SD= 30\%$), did not have significantly higher accuracy at diagnosis depression from the patient vignette compared to the control ($M= 77\%$; $SD=43\%$) (Table 2). The service user and didactic groups were not statistically different ($X^2(1)= 0.65$, $p= 0.43$).

3.2.4 Treatment accuracy

Two linear regressions measured treatment accuracy for all therapies and just medications. The didactic ($M= 2.81$; $SD=0.91$) and service user ($M= 2.50$; $SD= 1.19$) conditions compared to the control ($M= 2.65$; $SD=1.14$) did not did not significantly differ with regard to treatment accuracy for all therapies ($F_{2, 91}= 0.62$, $p= 0.54$, $R^2= 0.01$) (Table 2). Additionally, neither of these conditions, didactic ($M= 1.55$; $SD= 1.26$) and service user ($M= 1.47$; $SD= 1.63$), compared to the control ($M= 1.10$; $SD= 1.76$) were significantly different for medication accuracy ($F_{1,91}= 0.79$, $p= 0.46$, $R^2= 0.02$) (Table 2). The comparisons between the intervention conditions for all therapies and just medications were not significantly different ($F_{1, 61}= 1.31$, $p= 0.26$, $R^2= 0.02$; $F_{1, 61}= 0.15$, $p= 0.70$, $R^2< 0.01$).

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Scores for treatment accuracy for all therapies ranged from -1 to +4, and scores for treatment accuracy for medicines ranged from -2 to +7.

3.2.5 Depression symptom knowledge

A linear regression ($F_{1, 75}$= 0.58, p= 0.56, R^2= 0.02) showed that there was no statistical difference in depression symptom knowledge in the control condition (M= 8.80; SD= 1.26) versus the didactic lecture (M= 8.90; SD= 1.01) and the service user testimony (M= 8.53; SD= 1.24) (Table 2). The number of symptoms correctly identified and rejected in each intervention condition did not statistically differ ($F_{1, 61}$= 1.15, p= 0.29, R^2= 0.02). Scores were clustered near the top of the range between 5 and 10.

Table 2: Univariate analyses of the effects of didactic and service user video interventions versus no video on attitudes and depression knowledge.

Total Sample (N=94)	M(*SD*)	β coef.	95% CI	*P*-value
Explicit Attitude (SDS)				
Control	39.10(11.14)	--	--	--
Didactic	33.32(9.57)	-5.90	-10.95 - (-0.86)	0.02*
Service User	30.13(9.16)	-8.85	-13.85 - (-3.84)	0.001*
Implicit Attitude (IAT) [†]				
Harmfulness Attribute				
Control	0.15(0.32)	--	--	--
Didactic	0.07(0.33)	-0.02	-0.11 - 0.06	0.59
Service User	0.04(0.36)	-0.13	-0.30 - 0.04	0.13
Burdensomeness Attribute				
Control	0.20(0.31)	--	--	--
Didactic	0.10(0.34)	-0.05	-0.13 - 0.03	0.25
Service User	0.17(0.29)	-0.03	-0.19 - 0.13	0.70
Diagnosis Accuracy				
Control	0.77(0.43)	--	--	--
Didactic	0.84(0.37)	0.21	-0.43 - 0.85	0.52
Service User	0.91(0.30)	1.04	-0.42 - 2.49	0.16
Treatment Accuracy				
All Therapies				
Control	2.65(1.14)	--	--	--
Didactic	2.81(0.91)	0.08	-0.19 - 0.36	0.56
Service User	2.50(1.19)	-0.15	-0.69 - 0.40	0.60
Medications				
Control	1.10(1.76)	--	--	--
Didactic	1.55(1.26)	0.24	-0.15 - 0.64	0.23
Service User	1.47(1.63)	0.34	-0.44 - 1.12	0.39
Symptom Accuracy [△]				
Control	8.80(1.26)	--	--	--
Didactic	8.90(1.01)	0.04	-0.33 - 0.40	0.85
Service User	8.53(1.24)	-0.24	-0.96 - 0.49	0.52

Notes. Abbreviations: M, mean; SD, standard deviation; CI, confidence interval; SDS, Social Distance Scale; IAT, Implicit Association Test

†Sample n=87 after excluding infrequent computer users

△Sample n=78 after adapting questionnaire

* Statistically significant at $p < 0.05$

3.3 Associations between explicit and implicit attitudes

Pearson correlations were conducted to assess the relationship between explicit and implicit attitudes within-subjects. First, the relationship between both IATs were assessed. There was no correlation between the IAT for harmfulness (M= 0.08; SD= 0.33) and the IAT for burdensomeness (M= 0.15; SD= 0.31) (r= -0.06, n= 87, p= 0.59) (Table 3). When comparing explicit and implicit attitudes, neither the harmfulness IAT (r= 0.11, n= 87, p= 0.33) nor the burdensomeness IAT (r= 0.03, n= 87, p= 0.81) had a significant relationship with explicit attitudes on social distance (M= 34.61; SD= 10.64) (Table 3).

Table 3: Associations between explicit and implicit attitudes towards mental illness within medical students.

Variables	1	2	3
1. Explicit Attitude (SDS)	--		
2. Implicit Attitude (IAT) *Harmfulness Attribute*	0.11	--	
3. Implicit Attitude (IAT) *Burdensomeness Attribute*	0.03	-0.06	--

Notes. Abbreviations: SDS, Social Distance Scale; IAT, Implicit Association Test
n=87 after excluding infrequent computer users for all correlations
* Statistically significant at $p < 0.05$

3.4 *Attitude and demographic predictors*

There was no evidence that diagnostic accuracy, treatment accuracy for all therapies and just medicines, and symptom knowledge were predicted by explicit or implicit attitudes. In logistic regressions, depression diagnostic accuracy was not predicted by either social distance ($X^2(1)= 0.03$, $p= 0.85$), harmfulness implicit attitude ($X^2(1)= 2.80$, $p= 0.09$), or burdensomeness implicit attitude ($X^2(1)= 0.28$, $p= 0.60$). Linear regressions showed that treatment accuracy for all types of therapies was also not predicted by social distance ($F_{1, 62}= 0.62$, $p= 0.43$, $R^2= 0.01$), harmfulness implicit attitude ($F_{1, 85}= 0.15$, $p= 2.16$, $R^2= 0.01$), or burdensomeness implicit attitude ($F_{1, 85}= 0.71$, $p= 0.40$, $R^2= 0.01$). Medicine accuracy for depression was not predicted by social distance ($F_{1, 92}= 0.00$, $p= 0.97$, $R^2< 0.01$), harmfulness implicit attitude ($F_{1, 85}= 0.00$, $p= 1.00$, $R^2< 0.01$), or burdensomeness implicit attitude ($F_{1, 85}= 0.91$, $p= 0.34$, $R^2= 0.01$). Lastly, depression symptom knowledge was not predicted by social distance ($F_{1, 76}= 0.00$, $p= 0.98$, $R^2< 0.01$), harmfulness implicit attitude ($F_{1, 69}= 0.70$, $p= 0.41$, $R^2= 0.01$), or burdensomeness implicit attitude ($F_{1, 69}= 0.32$, $p= 0.57$, $R^2< 0.01$).

The effects of gender, class in medical school, personal experience with mental illness, and outside learning experience about mental health were examined in multiple regressions. Seven models were run to determine if any of these demographics were predictors for the following outcomes: SDS, IAT for harmfulness, IAT for burdensomeness, diagnostic accuracy, treatment accuracy for all therapies, treatment

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accuracy for medications, and symptom accuracy. None of these factors were found to be predictors in any of the models for SDS ($F_{4, 78}$= 1.07, p= 0.38, R^2= 0.05), IAT for harmfulness ($F_{4, 71}$= 0.16, p= 0.96, R^2= 0.001), IAT for burdensomeness ($F_{4, 71}$= 0.37, p= 0.83, R^2= 0.02), diagnostic accuracy (X^2(4)= 8.07, p= 0.09), treatment accuracy for all therapies ($F_{4, 78}$= 0.58, p= 0.68, R^2= 0.03), treatment accuracy for medications ($F_{4, 78}$= 0.58, p= 1.13, R^2= 0.05), and symptom knowledge ($F_{4, 64}$= 0.36, p= 0.84, R^2= 02).

3.5 Qualitative findings

Four primary topics were explored in the qualitative interviews: how to best teach students about mental health, what the prevailing attitudes towards mental health are, why students do not specialize in psychiatry, and what are student evaluations of the videos.

3.5.1 Mental health education

Because none of the students had formal psychiatry education yet, they were asked to speculate about what they thought were the most important concepts to learn regarding mental health. Most of the students reported that they were primarily interested in skills like prescribing medication, learning about prognosis, recognizing symptoms, and identifying the etiology. Only a couple of students identified counseling as an important skill to learn. One of these students believed that *"mental health is directly related to physical problems, […] so all people who are sick and ill should receive some counseling*

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about mental health." Half of the participants recommended that patients with mental health disorders should be referred to the psychiatrist or the asylum for treatment.

When asked about the best method to teach students about mental illness, most students recommended that they gain hands-on experience outside of the classroom. Half of the students were eager to interact with service users outside of the classroom to acquire this type of experience. One student explained that meeting patients in-person can bring about change within students to reduce treatment bias against mental health patients. The student recommended that the exposure should take place in the first year of school just after enrollment because it will leave a lasting impression on students for the rest of their careers.

3.5.2 Attitudes towards mental illness

All of the participants acknowledged that they had observed some level of stigma towards mental illness. They universally agreed that stigma within the community existed, and people who have mental health problems were ostracized. *"Madness"* (Nepali: *paagal* or *baulaahaa*) was a common term used by half of the participants to describe someone who has mental illness in society. One student described madness as an extreme situation where *"you're not caring for yourself, and you harm other people. [It's] when you are completely useless to society and evil towards human beings. It is harmful to humanity."*

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Participants had mixed opinions about whether their peers and faculty held negative views of mental health patients. Even though half of the participants stated that they did not believe doctors treated mental health patients differently than patients seeking care for their physical health, they still described examples of providers, or even themselves, stigmatizing individuals with mental health disorders. In one instance, a student said that it was not appropriate to marry someone with psychosis because that person is unpredictable and dangerous. Another student recommended that dangerous, mad people be sent to the asylum. A third student proceeded to describe mental health patients as dangerous, *"I would like to work alongside [someone with depression], but I have a fifty percent chance that he might attack me. Or if he is depressed, he might not feel good, and he might do something to me."* One student strongly believed that his peers and faculty held biases against people living with mental health problems. When someone is feeling sad or down, the participant said fellow students react, *"You are being psyho or you are being mad. […] Even if you have cancer, people take it normally, but if you have a mental health problem, people take it seriously."*

3.5.3 Psychiatry specialization barriers

When students were asked why psychiatry was not a popular medical specialty among their peers, a couple of participants listed stigma as the primary force deterring students away from the field. One student said the main reason for a lack of interest is because there is a viewpoint in society that psychiatrists are not considered to be real

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doctors, and therefore, the family would not allow them to become psychiatrists. Another student described how students can become confused during their psychiatry rotation because their desire to help mental health patients conflicts with information from teachers, seniors, and the community that it is unimportant. Two participants reported that teaching faculty in the medical school promulgate negative views among the students; each separately described instances when they heard a professor say, *"The difference between a psychiatrist and psychiatric patient is only the coat."* One of the students continued, *"[Faculty] simply ignore mental illness. They simply tell us that it's not such a major illness. We should not focus on it while studying."* One participant stated that low salary was another factor that dissuaded students from specializing in psychiatry.

3.5.4 Video experience

Four students who participated in the qualitative interviews were allocated to one of the two video conditions. Of these students, three viewed the didactic lecture and one viewed the service user testimonial. Those who viewed the didactic lecture all agreed that the video was informative and useful for educational purposes. All three participants recommended that the video should include some type of illustration, picture, or story to increase viewer engagement. One student wanted the didactic video to include a recovery story of a patient that portrayed counseling. He believed that recovery stories could change perceptions and reduce stigma about mental illness. After the video, this same student described his reaction:

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I have started learning. I have started watching some videos, and I have started reading some books from which I can learn. […] I actually want to know more about it, so I can tell who is depressed and who has bipolar disorder. So when I come across such people, I can really know what's going on so that I can help.

The participant who watched the service user testimonial evaluated the video based on the storyline of the service user. She reported that her favorite part of the video was when the service user discovered a list of depression symptoms at the health clinic, which empowered her to ask the doctor for more information. After the video, the participant wanted to know more about the service user's family. She also said that the visual aids helped her memorize the medicines because they were embedded into a clinical case.

4. Discussion

Stigma towards mental illness among health care workers, coupled with limited availability of mental health specialists, makes it incredibly challenging to provide quality mental health services in LMICs (Saxena et al., 2007). Despite the urgent need for mental health services in LMICs, there is little evidence for effective interventions to train medical students in these countries (Henderson et al., 2014). This pilot study aimed to evaluate whether didactic lectures or service user testimonials were possible solutions to reduce stigma and increase knowledge about depression among medical students. Our results demonstrated that an exposure to either didactic lectures or service user testimonials was associated with lower explicit stigma compared to students in the control condition who did not view a video. Previous literature found no impact of one-time contact with service users on attitudes towards mental illness (Kassam et al., 2011; Papish et al., 2013), but this study demonstrated that one-time contact was associated with improved explicit attitudes. We did not find a statistical difference between intervention videos, though there is existing evidence that service user contact, in-person or video-based, is more effective than didactic lectures at improving attitudes (Yamaguchi et al., 2013). Together, these findings suggest that both didactic and service user testimonial videos could be used during medical education in LMICs to improve explicit attitudes towards mental illness.

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Student reports during interviews revealed that stigma towards mental illness and psychiatry was prevalent among students, faculty, and community members. While half of the participants denied that stigma towards mental illness interferes with medical treatment, most of them still admitted that they or their peers would prefer to avoid people with mental health problems in non-medical settings. Evidence from studies in South Asian countries suggests that the current medical curriculum in this region is not reliably improving attitudes or increasing interest in psychiatry (Giasuddin et al., 2015; Poreddi et al., 2015; Tharyan et al., 2001). The contradictory findings and inability to influence student interest in psychiatry suggest that other variables pertaining to the curriculum affect student attitudes towards mental health patients and psychiatry. Giasuddin et al. suggests that the quality of the psychiatry curriculum, the location and perspective of the training, and the attitudes of teaching faculty might all increase stigma among students (2015). Incorporating didactic and service user testimonial videos into the medical curriculum is one possible solution to help standardize the variability in quality of the education. The service user testimonial, in particular, provides students in the didactic video condition with the visual stories they wished to see and expands on the existing perspective currently taught in the medical school. Participants at TU-IOM specifically identified the negative attitudes of teaching faculty as a barrier to pursuing psychiatry, so efforts to improve mental health attitudes should focus on faculty as well as students.

Nepali students associated mental illness with dangerousness both quantitatively and qualitatively, so it is likely one of the main reasons why students want to avoid people with mental health problems. The IAT *d* score averages for each condition were all positive values greater than zero, which indicated that participants associated harmfulness and burdensomeness with mental health patients. The findings from the qualitative interviews suggested that stigma, especially regarding harmfulness and mental illness, is present among the participants. The implicit association between harmfulness and mental illness on the IAT was consistent with the explicit fears detailed in the qualitative interview. Half of the interviewed participants described mental health patients as dangerous, so it was expected that the harmfulness IAT could quantify this attitude. These results support findings in existing literature showing that people living with mental illness are often stereotyped as "dangerous" (Jorm, Reavley, & Ross, 2012). In India, Kermode et al. found that 40.0% of the population perceived people with depression as dangerous, whereas 72.1% viewed those suffering from psychosis as dangerous (2009). In both cases, dangerousness was the greatest predictor of social distance. Therefore, eliminating the perception of mental illness as dangerous is critical to improving attitudes. In many studies, formal education for student health professionals did not change perceptions of mental illnesses as dangerous (Ay, Save, & Fidanoglu, 2006; Bell, Johns, & Chen, 2006; Wilkinson, 1982). This likely occurred because most contact was with exceptionally ill patients, which could have reinforced

negative stereotypes (Jorm, Reavley, & Ross, 2012). One participant pointed out in an interview that stories of recovery had the power to change perceptions. To avoid reinforcing stereotypes, mental health training should prioritize the quality of the contact and include a variety of patients at different stages of recovery.

During the study, the researchers encountered Nepali language barriers among students that might also affect their future practice as physicians with non-English speaking populations. Approximately ten participants said that they were unfamiliar with at least one Nepali term related to mental health during data collection. This was an unexpected problem because all of the participants grew up learning Nepali in school. Because students are only taught in English in their medical curriculums, some of them were unfamiliar with common mental health terms in their native Nepali, including depression, counseling, epilepsy, and psychosis. This reflects a broader problem in Nepal where higher level medical education employs English medical terminology, and there is a lack of consistent use of non-stigmatizing and non-jargon terms for mental health problems (Acharya et al., 2017). This language barrier also makes it challenging to conduct research with tools translated in Nepali, particularly IATs because scoring calculates response-latencies.

The accuracy for depression across all conditions (77-91%) was found to be higher than the average accuracy (47%) of general practitioners in an international meta-analysis (Mitchell, Vaze, & Rao, 2009). Diagnostic accuracy might be higher than

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expected because the vignette was one of the last evaluation activities, so students might have been primed to already think about depression during the previous activities. Incorporating more mental illnesses into the intervention videos could reduce a potential priming effect. Additionally, the vignette is only a proxy for a real patient. It provides all of the information necessary to diagnose depression when, in a clinical setting, health providers would be responsible for gleaning that information from patients. Providing this information for the students could have inflated the diagnostic accuracy such that there were no significant differences between conditions.

Selecting depression as the primary illness to study had both benefits and disadvantages. The researchers selected depression because of its burden globally (Ferrari et al., 2013) and regionally in Nepal (Kane et al., 2017). The disadvantage of selecting a common illness is that the participants were already familiar with some features and treatments for depression. Events like the campaign for depression on World Health Day in 2017 likely increased awareness at TU-IOM among participants (World Health Organization, 2017c). Additionally, students had already taken their neuropharmacology course prior to participating in data collection, so some of them were able to list additional pharmacological therapies than those recommended in the videos. Existing knowledge had the most effect on the symptom knowledge questionnaire. Across all three groups, the symptom scores ranged from 8.53 to 8.90 out of a possible ten points, so the data suggest the presence of a ceiling effect. This furthers

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the notion that students likely already possessed foundational knowledge about depression before participating in this study. Therefore, identifying symptoms in a recognition task might not be the most effective method for measuring depression symptom knowledge in this student population. An open-ended recall task or a patient vignette might be better suited because they require a higher level of critical thinking.

Our study contradicts previous research because we did not find that personal experience was a predictor of attitudes. Existing literature suggests that medical students who have personal experience with mental illness report less stigma (Chiles, Stefanovics, & Rosenheck, 2017; Zhu et al., 2017; Korszun et al., 2012; Roth et al., 2000). Additional research is necessary to determine the influence of personal experience on Nepali students. Besides personal experience, there were no attitudinal or demographic predictors for any of the outcomes. It is possible that outside experience was too broad of a category because it did not identify the quality of the outside experience. Future data collection should attempt to qualify the experiences with multiple choice questions based on the range of responses found in the pilot. The failure to find a significant relationship between explicit and implicit stigma supports existing literature (Dabby, Tranulis, & Kirmayer, 2015; Lincoln et al., 2008; Wang et al., 2012), and it may also signify a broader problem of comparing the measurement constructs. The IAT compares mental and physical illnesses, whereas the SDS has no comparison group. The relationship might not exist due to this incongruence.

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This study exposed biases against psychiatry in the medical school, which might explain why there are relatively few psychiatrists in Nepal (Luitel et al., 2015). Students listed psychiatry among the least desirable specialties. During interviews, participants described how stigma affected student interest in treating mental health patients. One student stated that families were even willing to intervene to prevent students from pursing it because psychiatrists were not viewed as real physicians in society. This pressure is also echoed among academic peers and mentors who reinforced that mental health is unimportant compared to physical diseases, and that people who entered psychiatry must have mental health problems like the patients they treat. In light of this stigma, it is unsurprising that more students reported that they would refer patients to be treated elsewhere compared to the number of students who were eager to learn counseling skills. A lower salary was also described as a barrier for students considering psychiatry. In Nepal, it is estimated that less than 1% of the national health budget is spent on mental health (Luitel et al., 2015), so improving salaries would necessitate investment in the mental health system. Similar findings have also identified stigma, lack of prestige, and low pay as barriers discouraging students from becoming psychiatrists (Sartorius et al., 2010). To attract more students to psychiatry, interventions will have to target these attitudinal and structural barriers.

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4.1 Implications for future research

To further evaluate the effects of service user video testimonials on student attitudes, a larger efficacy RCT will be conducted. Given the reported levels of stigma in the education system towards mental illness, there is a need to identify an effective training method to reduce stigma and educate students about mental health. To learn more about mental illness, half of the interviewees endorsed exposure to service users during medical education. This initial interest is a promising sign that students will be receptive to the incorporation of service users in their curriculums for training and stigma reduction purposes. Students who viewed the didactic video unanimously agreed that it served its purpose as an educational tool, but they also wanted to see more patient storytelling. One student was even motivated by the video to study mental health independently, which is an encouraging sign that these videos might increase student interest in psychiatry during early medical training. Expanding the RCT to two medical institutions in Nepal and increasing the sample size for quantitative and qualitative data will allow the researchers to fully address the research question about whether service user testimonials or didactic lectures are associated with more positive attitudes towards mental illness.

Based on the pilot data, didactic and service user videos are associated with less explicit bias of mental illness. Neither of the intervention conditions were associated with increased knowledge about depression. Future research should consider adding a

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fourth study arm that combines didactic lectures and service user testimonials to see if the combination of approaches could reinforce the information learned about depression and also improve student attitudes. Previous research has found the combination of approaches to be an effective intervention among medical students (Fernandez et al., 2016). Service user involvement might be most effective in education settings to complement the existing theoretical lectures.

Future research should also incorporate baseline data to see how the intervention affects individual subjects and to help show changes in attitudes over time. Since the goal of any intervention is to encourage sustained attitude improvement through medical practice, the long-term effects should also be explored with follow-up testing. In a systematic review, there were no studies conducted in low-income countries that evaluated the medium and long-term impacts of social contact interventions (Mehta et al., 2015). Additional research is necessary to find long-term solutions involving service users in LMICs.

4.2 Strengths and limitations

The RCT design of this study was its greatest strength. It was the first RCT evaluating service user testimonials conducted among medical students in a low-income country. Further, rather than using a single approach to measure attitudes, this study used both explicit and implicit measures. Lastly, the qualitative interviews established the need for a stigma reduction intervention during medical education. This mixed

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method approach can be used to develop and implement an effective intervention to reduce stigma associated with mental illness.

Data were only collected once post-intervention, which was a major study design limitation. The researchers were unable to evaluate the effects of the intervention conditions within individuals using baseline data. It was also impossible to determine the long-term effects of the intervention conditions. Subsequent studies should include baseline and follow-up data collection to expand the scope of the analyses. In this pilot study, the researchers did not conduct a power analysis to determine the sample size. The lack of a statistical difference might be due to an underpowered study rather than the efficacy of the service user intervention. In the full RCT, the researchers will properly assess the interventions based off of a sample size calculation and interview a larger subset of participants. Investigators only interviewed six participants in this pilot, which limits the strength of the qualitative findings. With so few participants, it was unlikely that the researchers found the range or depth of themes to fully answer the research questions. The generalizability of the findings arose as another limitation, as data were only gathered at one institution. Even in Nepal, TU-IOM is unique compared to other medical programs because of its selectivity with regards to enrollment. The full RCT will reduce this limitation by expanding data collection to another institution.

5. Conclusion

This pilot intervention aimed to reduce stigma associated with mental illness among medical students. Stigma was identified as a barrier in the Nepali health system preventing people from receiving high quality care (Adhikari, Pradhan, & Sharma, 2008; Kisa et al., 2016; Petersen et al., 2017). The findings from this study established that stigmatizing beliefs are present among students, faculty, and communities. It was also demonstrated that didactic lectures and service user testimonials could both be effective strategies to improve explicit attitudes regarding mental health. Based off of these pilot results, a full intervention will be conducted at two Nepali medical institutions to further explore whether didactic lectures or service user testimonials are more effective at improving attitudes.

In Nepal, where there are too few psychiatrists to meet the needs of people living with mental illness (Luitel et al., 2015), medical specialists from other disciplines should have the knowledge and be open-minded to provide care for people experiencing mental health problems. The full intervention will inform educators and researchers about which strategies are most effective at reducing stigma among non-specialized medical students. Improving provider attitudes during medical school will ultimately lead to better care for people living with mental illness. Intervention videos can be implemented with minimal resources and scaled rapidly in low-income settings.

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Therefore, the videos are potential solutions for reducing stigma beyond Nepali medical schools to other low resource health worker settings.

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