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Evaluating the Impact of an Anti-stigma Intervention on Pharmacy Students' Willingness to Counsel People Living with Mental Illness

Benita A. Bamgbade[1] · Jamie C. Barner[1] · Kentya H. Ford[1]

Abstract Third-year pharmacy students (n = 88) participated in an anti-stigma intervention program consisting of presentations, videos, discussion and active-learning exercises. Willingness to counsel (WTC) people with mental illness (MI) was evaluated using immediate pre and post-tests comparing diabetes, depression and schizophrenia. At pre-test, WTC diabetes was highest (higher = increased WTC) while schizophrenia was the lowest. There were no statistically significant differences between pre/post-test WTC for diabetes and depression, while schizophrenia WTC increased significantly (p < 0.05). At post-test, diabetes WTC was significantly higher than depression and schizophrenia (p < 0.0001). Regression results for WTC depression showed that comfortability and gender were significant (p < 0.05) predictors. Regression results for WTC schizophrenia showed that comfortability was a significant (p < 0.05) predictor. As highly accessible healthcare providers, pharmacists have the potential to positively impact healthcare, but this depends on WTC. Colleges of pharmacy may consider instituting policies that support experiential education involving counseling people living with MI, as this may increase comfortability.

✉ Jamie C. Barner
  jbarner@austin.utexas.edu

  Benita A. Bamgbade
  benitabam@utexas.edu

  Kentya H. Ford
  kentya.ford@austin.utexas.edu

[1] Health Outcomes and Pharmacy Practice Division, The University of Texas at Austin College of Pharmacy, 2409 University Ave., STOP A1930, Austin, TX 78712-1120, USA

Introduction

Approximately 50% of Americans will experience a mental illness in their lifetime (Kessler et al. 2005). Various modalities exist to treat mental illness including psychotherapy and cognitive behavioral therapy (Stern et al. 2008). Although medications have been successful in treating various symptoms associated with mental illness (Stern et al. 2008), many of these medications are associated with side effects, such as weight gain and extrapyramidal symptoms, which may potentially contribute to poor medication adherence. Medication adherence rates among people living with mental illness are suboptimal, ranging from 20 to 70% (Julius et al. 2009; Velligan et al. 2009). Through medication counseling, pharmacists have an opportunity to improve these rates, thereby improving health outcomes (Bell et al. 2005; Finley et al. 2003; Rubio-Valera et al. 2011). Furthermore, as one of the most accessible healthcare professionals, pharmacists can potentially improve health outcomes for many people living with a mental illness.

People living with mental illness have expressed a desire to receive medication counseling from pharmacists. More specifically, people living with mental illness are interested in information related to adverse effects, medication use and drug interactions (Bell et al. 2006c; Black et al. 2009; Hoch et al. 2011; Krueger and Hermansen-Kobulnicky 2010). Furthermore, in one study, study participants receiving psychotropic medications ranked pharmacists as the second most commonly used medication information resource after their psychiatrists

(Black et al. 2009). Additionally, study participants identified the following pharmacy services as important: resolving medication-related problems; addressing questions about psychotropic medications; discussing medication tapering and discontinuation; providing information on medication effectiveness; addressing side effects; and discussing medication response (Black et al. 2009). Pharmacists have also expressed positive attitudes towards providing services (e.g., managing side effects and providing medication advice) to people living with mental illness (Liekens et al. 2012b; Scheerder et al. 2008).

Despite the desire of medication counseling among people with mental illness and pharmacists' positive attitudes toward service provision, the literature suggests that pharmacists infrequently counsel people with mental illnesses (Cannon-Breland et al. 2013; Liekens et al. 2012b; Phokeo et al. 2004; Scheerder et al. 2008). Several factors may impact pharmacy counseling including busyness of the pharmacy, lack of privacy, pharmacists' role beliefs, lack of compensation, staffing and perceived skills (O'Donnell et al. 2005; O'Loughlin et al. 1999; Smith et al. 2004; Svarstad et al. 2003). While these factors may impact counseling related to diseases in general, there may be unique issues that impact counseling for people prescribed psychotropic medications. Regarding mental health counseling, pharmacists have reported lack of: education or training; confidence; medical information about people and their treatment and communication skills (Liekens et al. 2012b; Rickles et al. 2010; Scheerder et al. 2008). Another potential barrier to provision of pharmacy services to those living with mental illness is stigma (Liekens et al. 2012b), which can be defined as "when elements of labeling, stereotyping, separation, status loss, and discrimination co-occur in a power situation…" (Link and Phelan 2001). In this conceptualization of stigma, a person labels an individual with mental illness as different, stereotypes this difference as negative, develops an "us" versus "them" attitude leading to separation, which can result in status loss and discrimination. Research shows that pharmacists' with more negative attitudes towards mental illness are less willing to counsel people who use psychotropic medications (Liekens et al. 2012a; O'Reilly et al. 2013; Rickles et al. 2010).

Although stigma has been shown to negatively impact willingness to counsel (WTC), interventions that target stigmatizing beliefs can positively impact pharmacists' WTC (Liekens et al. 2013). One study showed that when compared to a control group 8 months after training ended, trained pharmacists spent more time with people who were mentally ill, asked more biomedical and psychosocial questions, and provided more information. Additionally, mystery shoppers (trained researchers who posed as someone seeking health care) felt better understood by trained pharmacists and felt pharmacists expressed more open attitudes (Liekens et al. 2014).

Understanding pharmacy students' attitudes towards mental illness counseling is important because they represent the next generation of practicing pharmacists. Early interventions among pharmacy students may positively influence mental illness counseling when they become practicing pharmacists. Because pharmacy students who have pharmacy practice experience typically serve in a supportive (technical) role (Siracuse et al. 2008), it is possible that they may not have the same counseling barriers as pharmacists (e.g., lack of compensation or pharmacist role beliefs). Thus, without the 'backdrop' of these frequently reported barriers, exploring how pharmacy students' attitudes relate to their WTC may provide a clearer understanding of how stigma influences this relationship.

Presently, the literature is limited on pharmacy students' barriers to counseling regarding mental health issues. When compared to pharmacists, pharmacy students have reported more negative attitudes toward schizophrenia (Bell et al. 2006a, 2009; O'Reilly et al. 2011). Similar to the literature for practicing pharmacists, research has shown that pharmacy students generally have neutral to positive attitudes toward providing pharmacy services to people who have mental illness (Bell et al. 2006b; Nguyen et al. 2012; O'Reilly et al. 2010; Volmer et al. 2008). In addition, interventions have been successful in improving pharmacy students' attitudes toward mental illness and attitudes towards providing pharmacy services to people living with mental illness (Bell et al. 2006b; Buhler and Karimi 2008; Nguyen et al. 2012; O'Reilly et al. 2010). The impact of these interventions mirrors the literature on pharmacists in that pharmacy students have positive attitudes toward providing services and that their attitudes are modifiable through intervention. While the successful results of these interventions are promising, these studies do not measure actual WTC but rather attitudes toward counseling people with mental illness [e.g., "I am likely to counsel a patient with depression" (WTC) vs "Pharmacists should be sensitive to patients' desires, needs and capabilities" (attitudes toward counseling)]. Although WTC does not ensure actual counseling will take place, measuring WTC may be a useful way to predict provision of services. The Theory of Planned Behavior literature suggests that behavioral intention (e.g. willingness) and actual behavior are moderately to highly correlated (Ajzen 1985; Albarracin et al. 2001; Bednall et al. 2013; Hagger et al. 2002; Sheppard et al. 1988). Additionally, much of the literature on pharmacy students and mental illness interventions were conducted in other countries, which may have limited generalizability to the US. Furthermore, the intervention studies that have examined pharmacy students' attitudes toward provision of

services to people with mental illness have primarily utilized consumer educators, which may not be feasible when access and resources are limited (Bell et al. 2006b; Buhler and Karimi 2008; O'Reilly et al. 2010; Patten et al. 2012). The present study is designed to investigate if a brief intervention will positively impact pharmacy students' attitudes and intentions to counsel people with mental illness.

The objectives of this study are to determine: (1) if exposure to a brief intervention course impacts pharmacy students' WTC people with mental illness; (2) whether pharmacy students' WTC differs between people with depression, schizophrenia, and diabetes; and (3) whether pharmacy students' mental illness stigma is related to WTC while controlling for confidence, prior exposure to mental illness counseling, personal mental health history, knowledge, future plans, race and gender.

Methods

Sample, Setting and Intervention

The design for the present study is a one group pre-post intervention study. Third-year pharmacy students (N = 120) enrolled in a required Pharmacoeconomics course (Spring 2014) participated in a two and a half hour anti-stigma intervention program that was provided over two class periods. Third-year pharmacy students were selected to participate because they had already completed their mental health pharmacotherapy module.

The intervention included presentations, videos, discussion and active-learning exercises. The presentations focused on mental illness prevalence, signs and symptoms of depression and schizophrenia and study findings from the pharmacy and mental health literature. Both the presentation and intervention have been described elsewhere (Bamgbade et al. 2016). Participants engaged in several active learning exercises that were designed to increase engagement, encourage reflection and provide practical application of the information provided. For example, several short YouTube videos were presented of people living with mental illness and associated stigma, and health care providers discussing stigma and care delivery. After each video, students shared their thoughts and perceptions with a classmate. This was followed by a class discussion led by the primary researcher. Another active learning exercise entitled "Auditory Hallucination", involved students role-playing a counseling encounter between a pharmacist and a person living with schizophrenia. Two additional students simulated 'hallucinating voices' by continuously repeating statements (e.g. "Why are you talking to him?"; "That medicine is poison!") into the person living with schizophrenia's ear while varying the tone and volume of their voices. After this exercise, the person living with schizophrenia and pharmacist role players were asked to discuss their experiences during this exercise.

Study Instrument

Students were asked to complete an anonymous survey immediately before and after the intervention. To maintain anonymity, students created a code based on an algorithm that would facilitate matching their pre and post-test responses. Depression and schizophrenia were targeted as mental health disease states for this study because the majority of the literature focuses on these diseases, thus allowing for comparisons to previous work. Additionally, depression and schizophrenia represent the range of mental illness stigma in society, as the public is more familiar with (less stigmatizing towards) depression and has more stigmatizing views towards people with schizophrenia (Angermeyer and Matschinger 2003; Crisp et al. 2000; Lauber et al. 2004).

The primary dependent variable, WTC, was measured using two items: "I am likely to provide medication counseling to patients with [disease state]." and "I am likely to screen for medication-related problems in patients with [disease state]." WTC was compared across depression, schizophrenia and diabetes in six separate questions. These items were measured on a 5-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). Diabetes was selected as a control and to provide a comparison of counseling people with mental health disease states versus a common non-mental health disease state. Also, all three disease states (i.e., depression, schizophrenia, and diabetes) were previously covered in the students' pharmacotherapy modules.

The primary independent variable was stigma, which was operationalized utilizing Link and Phelan's framework as discussed above (Link and Phelan 2001). Stigma related to depression and schizophrenia were measured separately using the following subdomains: (1) recovery (possibility of recovering from a mental illness and living a fulfilling life-5 items); (2) safety (posing a danger to others-4 items); (3) disclosure (willingness to disclose a personal mental illness-3 items); (4) separation (willingness to interact in social situations with a person living with mental illness-10 items); and (5) comfortability (relating to or feeling comfortable around a person with mental illness-5 items). Separation was measured using an 8-item Social Distance Scale (SDS), which has been shown to be valid and reliable, in addition to two items derived from the literature ("I would try to avoid patients with serious mental illness" and "If a colleague told me he/she had a serious mental illness, I would still want to work with him/her") (Corrigan et al. 2001; Link et al. 1987; Penn et al. 1994). Other stigma

subdomain constructs were developed by the researchers or adapted from previously validated instruments (Bell et al. 2008; Cannon-Breland et al. 2013; Gabbidon et al. 2012; Jorm et al. 1999; Kassam et al. 2012; O'Reilly et al. 2010, 2011). All stigma subdomain items (N=27), were measured using the same 5-point Likert scale as WTC with higher numbers representing more negative (stigmatizing) attitudes.

Covariates in the multivariate model included: confidence, prior exposure to mental illness counseling, personal mental health history, knowledge, future interest in psychiatric rotations, race and gender. Confidence in counseling was measured for all three disease states (depression, schizophrenia, diabetes) on a 5-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5) for the following two items: "I am confident in providing medication counseling to patients with [disease state]" and "I am confident in screening for medication-related problems in patients with [disease state]". Prior exposure to mental illness counseling (six items) measured the frequency with which students witnessed practicing pharmacists engage in mental health counseling activities (e.g., discuss options for managing side effects; assess patient's understanding of why the medication was prescribed) using the following 5-point Likert scale "never (1); sometimes (2); half of the time (3); often (4); and always (5)". Personal mental health history assessed whether the participant or a family member or close friend had been diagnosed with any mental illness (yes/no). Mental health knowledge included content regarding prevalence of mental illness and the symptomology of mental illness and was measured using ten true/false questions developed by the authors based on the intervention components. Future interest in psychiatric rotations measured participants' interest in registering for a fourth-year psychiatric rotation using a 5-point Likert scale anchored by "strongly disagree" (1) to "strongly agree" (5). Lastly, race and gender were included in the model. The survey was pretested prior to the intervention with four health outcomes graduate students and two faculty members. Minimal wording changes were made following pre-testing. This study was approved by The University of Texas at Austin Institutional Review Board. The authors have no conflicts of interest to disclose. All authors assume responsibility for manuscript content.

Data Analysis

Data were analyzed using SAS (Version 9.3). Descriptive statistics were computed for all variables. Paired t tests were used to compare WTC mean pre and post-intervention scores for each disease state (depression, schizophrenia and diabetes). Repeated measures analysis of variance was used to compare WTC post-test scores across disease states

(depression, schizophrenia, and diabetes), change scores (change from pre- to post-intervention) for WTC across disease states (depression, schizophrenia, and diabetes) and post-test confidence scores across disease states (depression, schizophrenia, and diabetes). Lastly, multivariate linear regressions analyses were conducted to determine, after controlling for other variables, whether pharmacy students' mental illness stigma was related to their WTC (depression or schizophrenia). Post-test responses were used for the regression analyses.

Results

A total of 120 participants participated in day 1 of the intervention and completed the pre-test survey. On day 2 of the intervention, a total of 88 students completed both the intervention and post-test survey (73.3% response rate). Participants who did not complete both pre and post-test surveys were excluded. There were no statistical differences between those who were excluded (i.e., completed only the pre-test) and those who were included (i.e., completed the pre and post-tests). Demographic results showed that participants were representative of the College of Pharmacy. On average, participants were 25.2 ± 3.1 years, mostly female (67.1%) and primarily Asian (37.5%) or Caucasian (31.8%). Anxiety was the most frequently self-reported mental illness diagnosis among students (11.5%), followed by depression (9.3%). Although less than 12% of students self-reported having a mental illness, almost one-half (46%) reported having a family member or close friend diagnosed with a mental illness with a plurality reporting depression (37.9%) and anxiety (21.8%) (Note: Some respondents chose more than one mental illness for this question). Tables 1 and 2 detail stigma subdomain scores and descriptive results for study covariates, respectively. Each of the stigma subdomains improved significantly from pre to post-intervention (with a decrease in means from pre to post representing decreased stigma) for both depression and schizophrenia with the exception of disclosure, which remained unchanged. Among the subdomains, the highest post-test means were safety (depression 2.6 ± 0.7, schizophrenia 2.8 ± 0.7) and disclosure (depression 3.3 ± 1.0, schizophrenia 3.4 ± 1.0), while the lowest post-test means were recovery (depression 1.8 ± 0.6, schizophrenia 1.8 ± 0.6). In general, means for schizophrenia tended to be higher than depression means across all subdomains implying that students had higher stigma for schizophrenia than for depression. Among the stigma subdomains, safety had the largest significant change from pre to post-intervention. Reliability for the stigma subdomain scales ranged from 0.6 to 0.9. Additional detail regarding the stigma subdomain results can be found elsewhere (Bamgbade et al. 2016). About

Table 1 Means and Cronbach's alphas of stigma subdomains (n = 88)

Stigma subdomains[a]	Depression				p^b	Schizophrenia				p^b
	Mean (SD)		Cronbach's alpha			Mean (SD)		Cronbach's alpha		
	Pre	Post	Pre	Post		Pre	Post	Pre	Post	
Recovery	2.0 ± 0.6	1.8 ± 0.6	0.6	0.8	<0.01	2.1 ± 0.6	1.8 ± 0.6	0.6	0.7	<0.01
Safety	3.0 ± 0.7	2.6 ± 0.7	0.6	0.7	<0.01	3.4 ± 0.7	2.8 ± 0.7	0.7	0.7	<0.01
Disclosure	3.3 ± 1.0	3.3 ± 1.0	0.8	0.9	0.70	3.3 ± 1.0	3.4 ± 1.0	0.8	0.9	0.34
Separation	2.4 ± 0.8	2.2 ± 0.6	0.9	0.9	<0.01	2.7 ± 0.7	2.4 ± 0.7	0.9	0.9	<0.01
Comfortability	2.3 ± 0.8	2.2 ± 0.7	0.8	0.8	0.01	2.7 ± 0.8	2.5 ± 0.7	0.8	0.8	<0.01

[a]Scale anchors: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. Higher scores = higher stigma

[b]Paired t test using pre-test versus post-tests scores; significance set at $\alpha < 0.05$

Table 2 Means of study model covariates (post-test) (n = 88)

Variable	
	n (%)
Future interest in psychiatric rotation (one item)[a]	45 (51.1)
	Mean (SD)
Confidence in counseling (two items/disease state)[b]	
Depression[c]	3.5 (0.9)
Schizophrenia[d]	3.2 (0.9)
Diabetes[e]	4.2 (0.7)
Prior exposure to RPh counseling (six items)[b]	2.3 (1.1)
Knowledge (ten items)[f]	6.8 (1.5)

[a]Yes/No

[b]1 = never, 2 = sometimes, 3 = half of the time, 4 = often, 5 = always

[c–e]ANOVA results: F = 72.94, df = 2, p = 0.0001; Dunnett's post-hoc comparison: like letters are not significantly different p < 0.05

[f]Correct number of responses out of ten

Table 3 Paired t test of differences in willingness to counsel from pre to post-intervention and analysis of variance of change scores across disease states (n = 88)

Disease state[a]	Pre Mean (SD)	Post Mean (SD)	Change[b] Mean (SD)	t value[c]	p value[c]
Depression	4.0 (0.8)	4.1 (0.8)	0.1 (0.6)	−1.8	0.0747
Schizo-phrenia	3.7 (0.9)	3.9 (0.9)	0.2 (0.7)	−2.63	0.0101
Diabetes	4.4 (0.6)	4.5 (0.5)	0.07 (0.6)	−1.14	0.2592

[a]Scale anchors: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly

[b]ANOVA results: F = 2.69, df = 2, p = 0.0706

[c]Paired t test results

half of respondents expressed an interest in completing a psychiatric rotation in their final year clinical rotations. Additionally, participants reported being significantly more confident in providing counseling for diabetes (4.2 ± 0.7), when compared to depression (3.5 ± 0.9) and schizophrenia (3.2 ± 0.9) (p < 0.0001). On average, participants reported seeing a practicing pharmacist counsel a person living with mental illness only "sometimes" (2.3 ± 1.1). Lastly, out of ten knowledge items, students answered on average 6.8 ± 1.5 questions correctly.

Overall, WTC diabetes had the highest means both pre and post intervention, 4.4 ± 0.6 and 4.5 ± 0.5, followed by depression 4.0 ± 0.8 and 4.1 ± 0.8 and lastly, schizophrenia at 3.7 ± 0.9 and 3.9 ± 0.9. Results from an ANOVA and subsequent Dunnett's test showed that diabetes WTC post-test scores were significantly higher than depression and schizophrenia WTC post-tests scores (p < 0.0001). When comparing pre- and post-test scores, paired t tests revealed

no statistically significant differences in participants' depression or diabetes WTC (Table 3), while schizophrenia WTC increased significantly (p < 0.05). ANOVA results showed that although there were no statistically significant differences among the three WTC change scores (i.e., depression, schizophrenia and diabetes), the change score for schizophrenia was the highest (0.2 ± 0.8), followed by depression (0.1 ± 0.6) and diabetes (0.07 ± 0.6).

Two multivariate linear regression models were run to determine what factors were related to WTC for both depression and schizophrenia. For depression, the model was significant (F = 5.0, df = 12, p < 0.0001) and accounted for 37% of the variance in WTC. Only one stigma subdomain, comfortability, was a significant predictor of depression WTC (p < 0.05) in addition to gender (a covariate) (p < 0.05). Participants who had higher comfort levels and who were female were significantly more willing to counsel people with depression. Regarding schizophrenia, the model was significant (F = 3.86, df = 12, p < 0.001) and accounted for 32% of the variance in WTC. Similar to depression, higher comfortability was significantly and positively related to WTC for schizophrenia (p < 0.05). No

other variables were significant in the models (i.e., recovery, safety, disclosure, separation, confidence, prior exposure to mental illness counseling, personal mental health history, knowledge, future interest in psychiatric rotations, race and gender).

Discussion

This study showed that participants were most willing to counsel people with diabetes, followed by people with depression and lastly people with schizophrenia. These results were expected as WTC is potentially affected by stigma, and studies have demonstrated that mental illnesses are more stigmatized than physical illnesses (Cannon-Breland et al. 2013; Liekens et al. 2012b; Phokeo et al. 2004; Scheerder et al. 2008). Although participants were least willing to counsel people with schizophrenia before the intervention, the anti-stigma intervention was successful in improving pharmacy student's WTC this disease state. These results are promising as schizophrenia is among the most stigmatized mental illnesses (Angermeyer and Matschinger 2003; Crisp et al. 2000; Lauber et al. 2004). Results from this study provide further evidence that pharmacy student interventions can improve attitudes towards providing pharmacy services, as previous studies have shown (Bell et al. 2006b; Buhler and Karimi 2008; Nguyen et al. 2012; O'Reilly et al. 2010). The present study also extends the literature by providing evidence that interventions can also improve WTC. By using an intervention comprised of active learning exercises and videos, this intervention may be an alternative to using consumer educators. Colleges and schools of pharmacy with limited resources may want to utilize technology (e.g. YouTube videos) to help students connect mental illness to actual lived experiences. A study by Nguyen et al. (2012) supports this assertion in findings that showed pre-post intervention changes in stigma were the same for in-person versus filmed consumer educators.

Despite positive improvements in WTC schizophrenia, participants had no significant differences in their WTC depression or diabetes. No change in WTC diabetes was expected as this disease state was used as a control. The lack of change in WTC depression could potentially be explained by society's increased familiarity with depression in general. Over the years, depression diagnoses and anti-depressant use have increased (Hasin et al. 2005; Mojtabai and Olfson 2014; Olfson et al. 2002). Additionally, antidepressant agents are among the most frequently advertised, and although depression is stigmatized, participants' familiarity with the disease (via advertising) may have affected their comfortability and WTC. Therefore, ceiling effect may potentially play a role in unchanged WTC

depression. However, in light of WTC scores for diabetes (pre/post: 4.4/4.5), we believe there is still a potential for meaningful and significant improvements in WTC for both depression (pre/post: 4.0/4.1) and schizophrenia (pre/post: 3.7/3.9).

Although improved, WTC increased by 0.1 points for depression and 0.2 points for schizophrenia. This suggests further opportunity to find ways to improve WTC mental illnesses. About half of participants expressed interest in enrolling in a psychiatric rotation in their fourth year. This finding, in combination with literature reporting pharmacy students' neutral to positive attitude towards providing services (Bell et al. 2006b; Nguyen et al. 2012; O'Reilly et al. 2010; Volmer et al. 2008), suggests that students may be interested in serving people living with mental illnesses. However, participants also reported seeing a practicing pharmacist counsel a person living with mental illness only sometimes. This suggests that despite interest, students may not have had an opportunity to observe counseling among people living with mental illness, which may negatively impact their WTC. Schools and colleges of pharmacy may consider adopting program policies that require students to counsel a minimally specified number of prescriptions relating to mental illness. While our intervention discussed stigma and discrimination towards people living with a mental illness from the perspective of health care providers and included active learning activities (e.g., hallucination exercise), future interventions may want to include more "hands on" experiences such as students participating in mock counseling sessions. Additionally, increasing the amount of time spent discussing methods to interact with people living with mental illness throughout the curriculum, especially experientially, may positively influence WTC.

Regarding covariates in the regression analysis, only gender was a significant predictor of WTC depression, with females more likely to counsel than males. Starting from puberty and in to adulthood, depression has been shown to be more prevalent in women when compared to men (Kessler et al. 1993). Some estimate that in adulthood, depression affects twice as many women as men (Kessler et al. 1993). Additionally, when compared to males, females have reported more familiarity with depression (Connery and Davidson 2006). The relationship between WTC and gender may potentially be explained by this high prevalence and increased familiarity. Among the stigma subdomains, only comfortability was a significant predictor for both depression and schizophrenia. Although unexpected, upon closer examination of scale items, comfortability was the only subdomain with specific items that directly related to counseling (e.g., "I would feel awkward asking a patient why he or she has been prescribed an antipsychotic"). The

safety, disclosure and separation subdomains were more directly related to personal feelings (e.g., "If I were under treatment for a serious mental illness, I would not disclose this to any of my colleagues"), which could have impacted the regression results. Surprisingly, the recovery subdomain was not related to WTC in the multivariate analyses. One could reason that if a health care provider does not believe a person with a mental illness can recover, they may not perceive any value in providing counseling, which could negatively influence WTC. However, this hypothesis was not supported by the study results.

Although the initial multivariate regression analyses showed no multicollinearity among the stigma variables and covariates, the authors conducted post-hoc analyses to further explore comfortability as the only significant stigma subdomain related to WTC. Two post-hoc regressions were run to determine if any of the other stigma constructs (while controlling for the same covariates) could explain the variance in comfortability (dependent variable). Both post-hoc models were significant (depression: $F = 6.18$, $df = 11$, $p < 0.0001$; schizophrenia: $F = 6.08$, $df = 11$, $p < 0.0001$) and each model accounted for over 40% of the variance in comfortability. For the depression regression, the recovery and disclosure stigma subdomains were significant predictors of comfortability in addition to confidence, a covariate included in the model. For the schizophrenia regression, the disclosure stigma subdomain was a significant predictor of comfortability in addition to confidence and gender, which were included as covariates. These findings may explain why comfortability was the only significant stigma domain. Perhaps the other stigma subdomains' effects on WTC occur indirectly and are mediated through comfortability. Disclosure was a significant predictor for both depression and schizophrenia comfortability. To a degree, one's desire to disclose a mental illness depends on their perception of others' stigma toward mental illness. If one believes mental illness is something that should not be discussed, it is possible that one would think that others would not be willing to discuss it, which in this study is represented by comfortability (e.g., "I would feel awkward asking a patient why he or she has been prescribed an antidepressant."). Confidence, a covariate entered into the model, was also significant for both depression and schizophrenia models. The relationship between these variables could be viewed as inherent (i.e., when one is more confident, one is more comfortable). The recovery stigma subdomain was only a significant predictor for the depression comfortability regression. This relationship is unclear and warrants further investigation. Lastly, gender, a covariate, was a significant predictor of schizophrenia comfortability stigma, where females had higher comfortability levels. As mentioned previously, the higher prevalence and familiarity of depression among women may be extended to schizophrenia. More research is needed to fully explore this relationship.

The present study is not without limitations. Study limitations include several suboptimal pre-test stigma scale reliability measurements. However, all post-test scale reliabilities were in the acceptable range (i.e., Cronbach's alpha ≥ 0.7). Also, post-test scales were used in the multivariate analyses. Additionally, since the data collected were self-reported and mental illness is a sensitive topic, participants may have been susceptible to social desirability. The researchers attempted to mitigate this by having participants generate a unique code, which rendered the survey anonymous. Results from this study should not be viewed as long-term effects of a pharmacy student intervention as post-tests were immediately administered after the intervention. Additionally, results from this study were conducted using third year pharmacy students at one college of pharmacy and may lack generalizability to students in earlier or later years and to other colleges and schools of pharmacy. Generalizability may also be limited due to the present study's small sample size (N = 88). However despite a small sample size, the study response rate was high (73.3%). Lastly, the majority of participants in this study self-identified as White or Asian. Among people of Asian descent, attitudes towards mental illness and mental illness treatment have been documented as unique from those of Whites (Abdullah and Brown 2011; Fancher et al. 2014). These differences may further limit the generalizability of these results as the majority of practicing pharmacists in the US are White.

The results from this study emphasize the need for further study into pharmacy students' WTC mental illnesses. Although interventions have been successful in improving attitudes towards counseling and towards mental illness, few have evaluated WTC. Results from this study suggest that while improving attitudes toward mental illness through interventions is possible, improving actual WTC is also possible, which is a unique contribution to the literature. WTC for both depression and schizophrenia was significantly affected by comfortability. Results from this study also suggest that a complex relationship exists between WTC and stigma. In efforts to decrease comfortability stigma among students, schools and colleges of pharmacy may consider instituting policies that specifically require students to observe a pharmacist counseling a person living with a mental illness. Schools and colleges of pharmacy may also consider requiring students to counsel on a minimally specified number of medications related to mental illness to decrease comfortability stigma. More research is needed to explore the potential mediating effect between comfortability stigma and the other stigma subdomains (recovery, safety, separation and disclosure) as they

relate to willingness to counsel. Additionally, future studies should employ comparison groups and explore the medium to long-term effect anti-stigma interventions have on stigma and whether booster training or intervention is needed.

Compliance with Ethical Standards

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of interest The authors have no conflicts of interests to declare.

Human and animal rights This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed consent was obtained from all individual participants included in the study.

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