INSTRUCTIONAL DESIGN AND ASSESSMENT

Emphasizing Bloom's Affective Domain to Reduce Pharmacy Students' Stigmatizing Attitudes

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Objective. To create a learning environment using Bloom's affective domain as a framework that would reduce third-year pharmacy students' stigmatizing attitudes toward patients with mental illness.
Design. Prior to the start of the module, students were asked to complete the 27-question Attribution Questionnaire Short Form (AQ-27). The teaching approach and in-class activities were designed to allow students' to experience the major categories within Bloom's affective domain. The module used patient cases, interactive-learning activities, and reflective discussions to augment pharmacological and therapeutic knowledge with a humanistic understanding of mental illness. Students were asked to retake the AQ-27 after completing the module.
Assessment. Paired responses on the AQ-27 were reported for 74 of 104 students, which represents a response rate of 71.2%. Students' scores changed significantly on nine of the 27 questions. Students' attitudes pre- to post-module revealed a significant increase in the help construct, while there was a significant decrease in the dangerousness and fear constructs.
Conclusion. Designing and implementing a course along the continuum of Bloom's affective domain resulted in appropriate changes in students' attitudes toward patients with mental illness.
Keywords: affective domain, stigma, psychiatry, mental illness, reflective discussion

INTRODUCTION

Health care providers' stigmatizing attitudes toward patients can create an insurmountable barrier to effective patient interactions, if not completely detach the patient's beliefs, motivations, and feelings from the provision of care.[1,2] Patients with a psychiatric or substance use disorders, for example, may cause health care providers to feel uncomfortable, which, in turn, can lead them to endorse negative stereotypes, desire greater social distance, and espouse negative attitudes.[3-5] The pharmacy literature has documented this occurrence, reporting that pharmacy students and pharmacists hold suboptimal attitudes regarding working with these patients, possess stereotypical beliefs, and feel less confident providing them with medication counseling.[2,6,7] Therefore, it is imperative for pharmacy schools to address these attitudinal components of learning, in addition to developing knowledge and technical skills, in order to challenge and shape students' attitudes.

Bloom's taxonomy, a widely accepted categorization of knowledge, skills, and attitudes, offers guidance in addressing attitudes and values. The taxonomy describes learning in three domains: cognitive, psychomotor, and affective. According to this taxonomy, the cognitive domain relates to mental skills, the psychomotor domain to physical skills, and the affective domain to feelings and emotions.[8] The affective domain, though not a typical focus in scientific fields, is of extreme importance for pharmacy students because it deals with how individuals manage the emotional context of situations involving people. Karthwhol and colleagues described the characteristics within this domain as listening to and respecting others (receiving phenomena), being open to revising judgments and accepting of ideas that may be inconsistent with original values (internalizing values), and having sensitivity toward individual and cultural differences (valuing).[9] A major aspect of the affective domain involves the process of self-reflection as a means to resolve dissonance or conflicts regarding feelings toward a specific topic or

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individual.[8] If not reflected upon and shared in discussion, one's beliefs can solidify, manifesting as ingrained behaviors.

Health professions programs, including medicine,[10] nursing,[11] physician assistant,[12] and pharmacy,[13] recognize the importance of fostering interpersonal and humanistic qualities in their students so they can engage and empower patients in their own care. Pharmacy educational organizations support the development of characteristics classified in the affective domain.[13,14] The Center for the Advancement of Pharmacy Education (CAPE) calls for "inclusion of an affective domain that would address personal and professional skills, attitudes and attributes required for the delivery of patient-centered care."[13] Student characteristics developed in the CAPE educational subdomains of patient-centered care, patient advocacy, cultural sensitivity, communication, and professionalism represent this domain.[13] The Accreditation Council for Pharmacy Education (ACPE) also emphasizes the social and behavioral aspects of pharmacy practice, recommending the inclusion of professionalism and cultural awareness in curricula.[14] Together, these guidelines illustrate the importance of developing students' capabilities to provide comprehensive care that is rich in content and compassion. This is especially critical given the prevalence of mental health conditions as pharmacists are on the front lines of health care with significant accessibility to and frequent interactions with such patients. Key to the pharmacist-patient interaction is the provision of empathetic patient-centered care.

Educational interventions focused on reducing stigmatizing attitudes in medical,[15,16] nursing,[15] and physician assistant[17] programs demonstrated that students gained a greater understanding of the negative effects of their bias, had a reduction in their stigmatizing attitudes, and showed an increase in willingness to work with patients with mental illness following the intervention. Pharmacy education ranging from brief workshops[2,6] to elective courses[18,19] have also reported a reduction in pharmacy students' stigmatizing views and social distance toward individuals with these conditions. However, missing from the pharmacy literature is the description of an interactive classroom environment where students are continuously engaged in and challenged by peer-to-peer discussions in order to confront and develop their existing knowledge and beliefs regarding mental illness. Additionally, absent from the pharmacy literature are studies explicitly demonstrating how to incorporate Bloom's affective domain into course design. The authors hypothesized that creating a learning environment using Bloom's affective domain as a framework would reduce third-year pharmacy students' stigmatizing attitudes toward mental illness.

DESIGN

Prior to the start of the psychopharmacotherapeutic module, third-year pharmacy students were asked to complete the 27-question Attribution Questionnaire Short Form (AQ-27). The AQ-27 is a validated scale used to evaluate health care students' attitudes toward individuals with mental illness.[20] The AQ-27 starts with a brief patient vignette followed by 27 questions that assess nine stereotype constructs. The vignette begins by describing a representative case patient, eg, "Harry is a 30 year-old single man with schizoaffective disorder. Sometimes he hears voices, experiences periods of mania as well as depression, and gets upset. He lives alone in an apartment and works as a clerk at a large law firm. He had been hospitalized six times because of his illness." The AQ-27 is divided into nine constructs (blame, anger, pity, help, dangerousness, fear, avoidance, segregation, and coercion) with each construct containing three questions. Responses are rated on a nine-point Likert scale ranging from one (not at all) to nine (very much). Scores for each of the nine constructs are computed by summing responses to the three questions comprising that construct. Each construct has a maximum score of 27. Higher scores represent greater endorsement of that corresponding attitude. For example, a higher score on the statement "I think it would be best for Harry's community if he were put away in a psychiatric hospital," would indicate that a student was in stronger agreement with it. The AQ-27 is published on MedEdPORTAL[21] and has demonstrated good test-retest reliability.[20,22]

The psychopharmacotherapeutic module was created for third-year pharmacy students enrolled in the Pharmacotherapeutics course at Campbell University College of Pharmacy & Health Sciences (CPHS). There were 104 students enrolled in this course in the 2016 academic year. The module consisted of six class sessions held consecutively over a two-week period during the spring semester. Each session covered a different disorder and included substance use disorders, schizophrenia, bipolar disorder, anxiety spectrum disorders (including generalized anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder), insomnia, and major depressive disorder. One study author organized the module and facilitated five of the six class sessions, while another led one class session.

The module was created to be team-based and used mainly patient cases for in-class work and discussion. The instructors used the entire class time to engage students in a variety of active-learning exercises, and facilitated the

students' discussion rather than delivering a lecture. The duration of class sessions ranged from two to three hours. During class, students were randomly divided into four large groups (approximately 25 students per group), then further divided into smaller subgroups of no greater than seven. Students were asked to stay within their group and subgroup throughout the entire module. Classroom exercises were divided up among the four larger groups, but students were asked to work on this material within their smaller groups. A number of different active-learning strategies were selected at the instructors' discretion and included muddiest point clarification, simultaneous reporting, case-based learning, think-pair share, and Socratic questioning.

Students were asked to participate in reflective discussions during the classroom exercises in order to augment students' pharmacological and therapeutic knowledge with a humanistic understanding of mental illness and addiction. Prompts for reflective discussion focused on addressing stigmatizing attitudes, developing empathy, and improving interpersonal communication. Prompts were embedded within a slide set or asked by the instructor during class. The following are two examples of prompts used in the schizophrenia class session: (1) Reflect on someone you know or a patient you have worked with who was diagnosed with schizophrenia. Did that person act in a way that surprised you? How did you respond to that person? How did others? (2) Reflect on a patient diagnosed with schizophrenia and experiencing an extrapyramidal side effect like parkinsonian side effect. How much do you think it would impact their activities of daily living? How do you think it would change that patient's willingness to trust a health care provider or to continue taking an antipsychotic medication?

One hundred percent of class time was spent with students interacting in small or large group discussion. Approximately 75% of class time was dedicated to pharmacology and pharmacotherapeutic discussions, while 25% was spent on reflective discussion. The teaching approach and in-class activities were designed to allow students' to experience major categories within Bloom's affective domain.

Students were asked to take the AQ-27 prior to and following completion of the module. Students received an email with a link to both the pre- and post-module surveys. The pre-module survey was opened one-month prior to the start of the course module and closed immediately prior to the first class session of the module. Students completed the post-module survey immediately following the last class of this module. The students' participation in both surveys was voluntary.

The primary outcome of the study was comparison of students' scores on the AQ-27 pre- and post-module. Only the scores of students with paired data, ie, those who completed both the pre- and post-module survey, were included in the final data analysis.

The Duke Office of Clinical Research (DOCR) managed all survey data using REDCap (Vanderbilt University, Nashville, TN), a secure, web-based application for building and managing online surveys and databases.[23] The DOCR served as an "honest broker" for this project to protect and maintain the integrity of collected data. Statistical support was provided by the Duke Department of Biostatistics and Bioinformatics. The Duke Investigational Review Board (IRB) approved the project as exempted educational research and an extension was granted by Campbell University IRB. The project was funded by an internal research grant through Campbell University College of Pharmacy & Health Sciences.

Continuous variables were summarized using means and standard deviations, while categorical variables were presented using counts and percentages. Changes in the individual and grouped AQ-27 scores from pre-module to post-module were assessed using a paired t test across all students' data. Change was defined as post-module score minus pre-module score for all comparisons. Results are displayed as the mean$\pm$SD change with 95% confidence intervals for the mean change. A $p<.05$ was considered statistically significant and SAS, version 9.4, was used for all analyses. The data analysis was generated using SAS/STAT software, version 9.3, for Windows (SAS Institute Inc., Cary, NC).

EVALUATION AND ASSESSMENT

Paired responses were reported for 74 out of 104 students, which represents a response rate of 71.2%. The results (change between pre- and post-module responses) for each question on the AQ-27 are presented in Table 1. Responses to the three questions that make up the avoidance construct were reverse scored as instructed by the AQ-27 assessment guide.[21] Question-by-question exploration revealed students' scores on nine of the 27 questions changed significantly following module completion. Scores on the six questions pertaining to the constructs of dangerousness (AQ2, AQ13, and AQ18) and fear (AQ3, AQ19, and AQ24) decreased significantly on the post-module survey. Scores on two of the three questions (AQ20, and AQ21, but not AQ8) pertaining to help increased significantly on the post-module survey. Lastly, there was a significant decrease in scores on question AQ11 from the blame construct following module completion.

Changes for each of the nine constructs are listed in Table 2. Examination of change in students' attitudes pre- to post-module revealed a significant increase in the help

Table 1. Changes in Pharmacy Students' Scores Pre- to Post-module on Individual Questions on the AQ-27[a] (n=74)

Question	Pre-module Scores Mean (SD)	Post-module Scores Mean (SD)	Change[b] Mean (SD)	*p* value
1. I would feel aggravated by Harry.	3.3(1.7)	3.0(1.5)	-0.3(1.7)	.14
2. I would feel unsafe around Harry.	4.6(1.8)	3.8(1.5)	-0.8(1.5)	<.01
3. Harry would terrify me.	3.6(1.7)	3.1(1.6)	-0.6(1.9)	.009
4. How angry would you feel at Harry?	2.4(1.4)	2.2(1.4)	-0.2(1.4)	.23
5. If I were in charge of Harry's treatment, I would require him to take his medication.	7.2(1.6)	7.0(1.7)	-0.2(2.0)	.40
6. I think Harry poses a risk to his neighbors unless he is hospitalized.	3.6(1.3)	3.3(1.4)	-0.3(1.6)	.14
7. If I were an employer, I would interview Harry for a job.	5.3(1.8)	5.3(1.6)	-0.1(1.8)	.77
8. I would be willing to talk to Harry about his problems.	7.0(1.7)	7.3(1.4)	0.2(1.5)	.18
9. I would feel pity for Harry.	6.2(1.7)	6.2(1.9)	-0.1(1.7)	.79
10. I would think that it was Harry's own fault that he is in the present condition.	1.6(1.2)	1.8(1.2)	0.2(1.6)	.33
11. How controllable, do you think, is the cause of Harry's present condition?	4.2(2.0)	3.6(2.1)	-0.6(2.7)	.049
12. How irritated would you feel by Harry?	3.5(1.8)	3.3(1.7)	-0.2(1.8)	.30
13. How dangerous would you feel Harry is?	4.5(1.5)	3.6(1.7)	-0.8(1.6)	<.01
14. How much do you agree that Harry should be forced into treatment with his doctor even if he does not want to?	4.9(1.8)	5.3(1.8)	0.3(1.8)	.15
15. I think it would be best for Harry's community if he were put away in a psychiatric hospital.	3.3(1.5)	3.3(1.5)	-0.03(1.6)	.86
16. I would share a carpool with Harry every day.	4.1(1.8)	4.4(1.9)	0.3(1.8)	.14
17. How much do you think an asylum, where Harry can be kept away from his neighbors, is the best place for him?	3.1(1.6)	2.9(1.6)	-0.2(1.7)	.43
18. I would feel threatened by Harry.	4.0(1.7)	3.3(1.5)	-0.8(1.7)	<.01
19. How scared of Harry would you feel?	4.2(1.7)	3.3(1.7)	-0.9(1.7)	<.01
20. How likely is it that you would help Harry?	6.8(1.6)	7.3(1.3)	0.5(1.6)	.007
21. How certain would you feel that you would help Harry?	6.4(1.6)	7.0(1.6)	0.6(1.9)	.005
22. How much sympathy would you feel for Harry?	7.1(1.4)	7.0(1.6)	-0.2(1.5)	.36
23. How responsible, do you think, is Harry for his present condition?	2.8(1.9)	2.8(1.9)	-0.1(1.7)	.66
24. How frightened of Harry would you feel?	4.4(1.7)	3.6(1.9)	-0.8(1.7)	<.01
25. If I were in charge of Harry's treatment, I would force him to live in a group home.	3.4(1.5)	3.4(1.9)	0.01(1.6)	.96
26. If I were a landlord, I probably would rent an apartment to Harry.	5.7(1.7)	5.5(1.9)	-0.3(1.7)	.16
27. How much concern would you feel for Harry?	7.1(1.4)	7.2(1.4)	0.2(1.5)	.38

Abbreviations: [a]AQ-27 = Attribution Questionnaire Short Form
[b]Change = post-module minus pre-module

construct, while there was a significant decrease in the dangerousness and fear constructs.

DISCUSSION

When an instructor designs a course, the most critical elements are determining what topics to teach, how best to deliver content, and how to assess learning outcomes. In this process, there is usually a deliberate focus on giving students new knowledge and skills, or building upon their existing understanding and competency level; the cognitive and psychomotor domains of learning. However, in any profession with a human element, how one treats and works with others is of utmost importance.

Designing classroom exercises in accordance with Bloom's affective domain allowed students to share their perspectives and challenged their own viewpoints and

Table 2. Changes in Pharmacy Students' Scores Pre- to Post-module on the Nine Constructs of the AQ-27[a] (n=74)

Construct (Question[a] Numbers)	Pre-module scores Mean (SD)	Post-module scores Mean (SD)	Change[b] Mean (SD)	*P* value
Blame (AQ10+AQ11+AQ23)	8.7(3.8)	8.1(4.0)	-0.5(3.8)	.2
Anger (AQ1+AQ4+AQ12)	9.2(4.3)	8.5(3.9)	-0.7(3.8)	.10
Pity (AQ9+AQ22+AQ27)	20.4(3.6)	20.3(4.0)	0.1(3.8)	.90
Help (AQ8+AQ20+AQ21)	20.2(4.2)	21.6(3.8)	1.4(4.1)	.004
Dangerousness (AQ2+AQ13+AQ18)	13.1(4.4)	10.7(4.2)	-2.4(3.5)	<.01
Fear (AQ3+AQ19+AQ24)	12.2(4.6)	9.9(4.7)	-2.3(4.5)	<.01
Avoidance (AQ7+AQ16+AQ26)	11.8(4.0)	11.8(4.5)	0.03(3.4)	.10
Segregation (AQ6+AQ15+AQ17)	10.0(3.5)	9.5(3.7)	-0.5(3.6)	.30
Coercion (AQ5+AQ14+AQ25)	15.5(3.2)	15.6(4.2)	0.1(3.7)	.80

Abbreviations: [a]AQ-27 = Attribution Questionnaire Short Form
[b]Change = post-module minus pre-module

those of their classmates, which in turn, generated greater compassion and empathy toward patients with mental illness. Through the teaching approach and in-class activities implemented in this module, students were presented with numerous opportunities to experience all five categories within Bloom's affective domain including receiving phenomena, responding to phenomena, valuing, organizing, and internalizing values.[9] Following module completion, students had significant changes in three of the constructs assessed in the AQ-27: help, fear, and dangerousness. Exploration of these three constructs revealed that after completing the module, students were more likely to help the case patient and less afraid of the patient or felt the patient was less dangerous. A significant reduction in students' scores (pre- to post-module) were also seen on question AQ-11 (How controllable is the cause of the patient's present condition?), which presumes they would be more likely to view the case patient's condition as a biological disorder. As for the six other constructs assessed, students' scores decreased for each of the constructs of blame, anger, and segregation, increased for the coercion construct, and did not change for the constructs of pity and avoidance.

Health sciences education studies that use the AQ-27 similarly reported mixed findings with respect to changes in scores on each of the constructs.[24-26] Nguyen and colleagues used six items from the AQ-27 in their study evaluating the impact of direct and indirect contact on pharmacy students' mental health stigma.[7] The authors reported a significant change from pre- to post-assessment on two questions from the dangerousness ("I feel threatened" and "I feel unsafe") and three questions from the fear construct ("terrify me," "I am frightened," and "I am scared"). Perhaps the incorporation of direct patient contact or patient testimonials into the course would produce a greater change in students' attitudes on these constructs. Future research should investigate ways to enhance course design in order to address students' attitudinal change on all nine constructs.

This study adds to the growing body of pharmacy literature that examines ways to reduce pharmacy students' stigmatizing attitudes and social distance toward patients with mental illness.[2,6,7,18,19,27] However, these studies describe brief interventions or elective courses and use a variety of teaching techniques (lecture, active learning) and tools (video, patient testimonials, interviews). Strengths of this study include a large sample size, implementation within a required therapeutics course, discussion of psychiatric and substance use disorders, reliance on Bloom's affective domain as a framework for the module design, and the use of class time solely for peer-to-peer discussions through team-based learning. The incorporation of reflective discussion within therapeutic discussions concerning treatment of psychiatric and substance use disorders is a novel approach used in this study.

Incorporating reflective discussions into a course may be one way to help students develop skills related to Bloom's affective domain. Although use of reflective activities is described in the pharmacy literature,[28-32] there are no studies examining the use of these activities in the context of psychiatric and substance use disorders. The process of reflection helps learners connect personal experiences with those of others and permits the integration of new knowledge into existing understanding. Studies in the health professions literature reported that use of reflection was valuable in building self-awareness, developing professional attitudes, and building critical-thinking skills and cultural competence.[28,31,33,34] Incorporating reflective discussion created an opportunity whereby learners shared ideas and encountered others' viewpoints. Frequently these exchanges provided the learner with opportunities for further reflection and refinement of their original perspectives.[35,36] Differing from other interventions described in the literature, this

module used prompts to encourage reflective discussions among students in real time rather than requiring students to use other methods of reflection such as journaling, blogs, video recordings, or diaries.[28]

Limitations of this study include that it was conducted at a single site and for students in a single class year. There was no control group. Students' answers on the AQ-27 following module completion could have been influenced by their familiarity with the questions, having already completed it once (pre-module). Attitude change was measured only immediately following course completion without reexamining retention of change at various time points. A significant minority, approximately 29% of students, enrolled in this course did not complete the pre- and post-course surveys and therefore their scores were not included in our analyses. Lastly, students self-reported their attitudes using an assessment tool; however, the changes in their responses may not translate into positive behavioral change during patient interactions.

SUMMARY

The importance of graduating students who have the appropriate personal and professional attitudes is highlighted in pharmacy educational standards. The interactive classroom environment implemented in this module allowed students numerous opportunities to experience all five categories within Bloom's affective domain, share their perspectives and challenge their own viewpoints and those of their classmates, which in turn, reduced their stigmatizing attitudes toward individuals with mental illness.

REFERENCES

1. Crapanzano K, Vath RJ, Fisher D. Reducing stigma towards substance users through an educational intervention: harder than it looks. *Acad Psychiatry.* 2014;38(4):420-425.
2. Volmer D, Mäesalu M, Bell JS. Pharmacy students' attitudes toward and professional interactions with people with mental disorders. *Int J Soc Psychiatry.* 2008;54(5):402-413.
3. Mittal D, Corrigan P, Sherman MD, et al. Healthcare providers' attitudes toward persons with schizophrenia. *Psychiatry Rehabil J.* 2014;37(4):297-303.
4. Happell B, Gough Nee Hayman-White K. Undergraduate nursing students' attitudes towards mental health nursing: determining the influencing factors. *Contemp Nurs.* 2007;25(1-2):72-81.
5. Rao H, Mahadevappa H, Pillay P, Sessay M, Abraham A, Luty J. A study of stigmatized attitudes towards people with mental health problems among health professionals. *J Psychiatry Ment Health Nurs.* 2009;16(3):279-284.
6. Bamgbade BA, Ford KH, Barner JC. Impact of a mental illness stigma awareness intervention on pharmacy student attitudes and knowledge. *Am J Pharm Educ.* 2016;80(5):Article 80.
7. Nguyen E, Chen T, O'Reilly C. Evaluating the impact of direct and indirect contact on the mental health stigma of pharmacy students. *Soc Psychiatry Psychiatr Epidemiol.* 2012;47(7):1087-1098.
8. Bloom BS, Engelhart MD, Furst EJ, Hill WH, Krathwohl DR. *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain.* New York, NY: David McKay Co. Inc.;1956.
9. Krathwohl DR, Bloom BS, Masia BB. *Taxonomy of Educational Objectives: The Classification of Educational Goals: Handbook II Affective Domain.* New York, NY: David McKay Co. Inc.; 1973.
10. Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Acad Med.* 2013;88(8):1088-1094.
11. American Association of Colleges of Nursing. Competencies and curricular expectations for clinical nurse leader education and practice. http://www.aacn.nche.edu/cnl/CNL-Competencies-October-2013.pdf. 2013. Accessed November 10, 2016.
12. American Academy of Physician Assistants. Competencies for the physician assistant profession (originally adopted 2005; revised 2012). https://www.nccpa.net/Uploads/docs/PACompetencies.pdf. Updated 2012. Accessed November 10, 2016.
13. Medina MS, Plaza CM, Stowe CD, et al. Center for the Advancement of Pharmacy Education 2013 educational outcomes. *Am J Pharm Educ.* 2013;77(8):Article 162.
14. Accreditation Council for Pharmacy Education. Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. Standards 2016. https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf. Accessed April 1, 2016.
15. Iheanacho T, Marienfeld C, Stefanovics E, Rosenheck RA. Attitudes toward mental illness and changes associated with a brief educational intervention for medical and nursing students in Nigeria. *Acad Psychiatry.* 2014;38(3):320-324.
16. Aggarwal AK, Thompson M, Falik R, Shaw A, O'Sullivan P, Lowenstein DH. Mental illness among us: a new curriculum to reduce mental illness stigma among medical students. *Acad Psychiatry.* 2013;37:385-391.
17. Ali N, Waters V, Erdman K. A qualitative analysis of physician assistant students' mental health bias and stigma constructs before and after a psychiatry rotation. *JAAPA.* 2015;28(10):1.
18. Gable KN, Muhlstadt KL, Celio MA. Mental health elective to improve pharmacy students' perspectives on mental illness. *Am J Pharm Educ.* 2011;75(2):Article 34.
19. Dipaula B, Qian J, Mehdizadegan N, Simoni-Wastila L. An elective psychiatric course to reduce pharmacy students' social distance toward people with severe mental illness. *Am J Pharm Educ.* 2011;75(4):Article 72.
20. Corrigan P, Markowitz FE, Watson A, Rowan D, Kubiak MA. An attribution model of public discrimination towards persons with mental illness. *J Health Soc Behav.* 2003;44(2):162-179.
21. Fridberg D, Ahmed A. Critical synthesis package: attribution questionnaire-short form (AQ-27). *MedEdPORTAL Publications.* 2013;9:9532.
22. Brown SA. Factors and measurement of mental illness stigma: a psychometric examination of the Attribution Questionnaire. *Psychiatr Rehabil J.* 2008;32(2):89-94.
23. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research Electronic Data Capture (REDCap): a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2):377-381.
24. Corrigan PW, Watson AC, Warpinski AC, Gracia G. Implications of educating the public on mental illness, violence, and stigma. *Psychiatr Serv.* 2004;55(5):577-580.

25. Law GU, Rostill-Brookes H, Goodman D. Public stigma in health and non-healthcare students: attributions, emotions and willingness to help with adolescent self-harm. *Int J Nurs Stud*. 2009;46(1):107-118.

26. Blair Irvine A, Billow MB, Eberhage MG, Seely JR, McMahon E, Bourgeois M. Mental illness training for licensed staff in long-term care. *Issues Ment Health Nurs*. 2012;33(3):181-194.

27. Bell JS, Johns R, Chen TF. Pharmacy students' and graduates' attitudes towards people with schizophrenia and severe depression. *Am J Pharm Educ.* 2006;70(4):Article 77.

28. Tsingos C, Bosnic-Anticevich S, Smith L. Reflective practice and its implications for pharmacy education. *Am J Pharm Educ*. 2014;78(1):Article 18.

29. Tsingos C, Bosnic-Anticevich S, Lonie JM, Smith L. A model for assessing reflective practices in pharmacy education. *Am J Pharm Educ.* 2015;79(8):Article 124.

30. Van Winkle LJ, Cornell S, Fjortoft N, et al. Critical thinking and reflection exercises in a biochemistry course to improve prospective health professions students' attitudes toward physician-pharmacist collaboration. *Am J Pharm Educ.* 2013;77(8):Article 169.

31. Castleberry AN, Payakachat N, Ashby S, et al. Qualitative analysis of written reflections during a teaching certificate program. *Am J Pharm Educ*. 2016;80(1):Article 10.

32. Tsingos C, Bosnic-Anticevich S, Schneider CR, Smith L. The effect of reflective activities on reflective thinking ability in an undergraduate pharmacy curriculum. *Am J Pharm Educ*. 2016;80(4): Article 65.

33. Ballon B, Skinner W. Attitude is a little thing that makes a big difference: reflection techniques for addiction psychiatry training. *Acad Psychiatry.* 2008;32(3):218-224.

34. Haack S. Engaging pharmacy students with diverse patient populations to improve cultural competence. *Am J Pharm Educ.* 2008;72(5):Article 124.

35. Gould B. Role of reflective group discussions in the development of nursing skills. *Mental Health Practice.* 2011;14(8):32-33.

36. Yacoubian HA, BouJaoude S. The effect of reflective discussions following inquiry-based laboratory activities on students' views of nature of science. *J Res Sci Teach*. 2010;47(10):1229-1252.