

INSTRUCTIONAL DESIGN AND ASSESSMENT

Use of an Auditory Hallucination Simulation to Increase Student Pharmacist Empathy for Patients with Mental Illness

Elizabeth T. Skoy, PharmD,^a Heidi N. Eukel, PharmD,^a Jeanne E. Frenzel, PharmD,^a
Amy Werremeyer, PharmD,^a Becky McDaniel, MSN, RN-BC^b

^a North Dakota State University School of Pharmacy, Fargo, North Dakota

^b North Dakota State University School of Nursing, Fargo, North Dakota

Submitted July 7, 2015; accepted November 4, 2015; published October 25, 2016.

Objective. To increase student pharmacist empathy through the use of an auditory hallucination simulation.

Design. Third-year professional pharmacy students independently completed seven stations requiring skills such as communication, following directions, reading comprehension, and cognition while listening to an audio recording simulating what one experiencing auditory hallucinations may hear. Following the simulation, students participated in a faculty-led debriefing and completed a written reflection.

Assessment. The Kiersma-Chen Empathy Scale was completed by each student before and after the simulation to measure changes in empathy. The written reflections were read and qualitatively analyzed. Empathy scores increased significantly after the simulation. Qualitative analysis showed students most frequently reported feeling distracted and frustrated. All student participants recommended the simulation be offered to other student pharmacists, and 99% felt the simulation would impact their future careers.

Conclusions. With approximately 10 million adult Americans suffering from serious mental illness, it is important for pharmacy educators to prepare students to provide adequate patient care to this population. This auditory hallucination simulation increased student pharmacist empathy for patients with mental illness.

Keywords: simulation, mental illness, empathy, pharmaceutical care laboratory

INTRODUCTION

Auditory hallucinations, defined as sensory perceptions of sound that have no basis in external stimulation, are noted throughout the human lifespan.¹ Auditory hallucinations can occur in nonclinical (otherwise healthy) individuals as well as in several clinical conditions including, but not limited to: schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder, epilepsy, substance abuse, dementia and delirium. However, the most common setting in which auditory hallucinations occur is in the context of a mental illness.²

Serious mental illness is prevalent in the United States, effecting approximately 10 million adults.³ Serious mental illnesses in which patients may experience auditory hallucinations are also prevalent. One in every 100 Americans (1.1%) is diagnosed with schizophrenia, and 6.9% of Americans live with major depressive disorder.^{4,5} Prevalence rates of other mental illnesses associated with auditory hallucinations fall within this range.

Medications used to treat mental illnesses associated with auditory hallucinations made up approximately 10% of the top 200 medications by volume in the United States in 2012.⁶ Based on these statistics, it is likely that practicing pharmacists will be involved in the care of patients with these mental illnesses and patients who experience auditory hallucinations.

Previous research indicated pharmacists and pharmacy students may not be well-prepared to optimally care for patients with mental illness.^{7,8} Health care providers with high levels of empathy may be less judgmental or stigmatizing toward people with mental illness and, therefore, may deliver better care.^{8,9} Empathy and the ability to match another's emotional and mental state are critical for the success of daily interactions, teamwork, and cultural transmission.¹⁰

Empathy, if thought of as a skill, is a communication process that develops over time as people mature.¹¹ Appendix A of the Guidance for the Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy ("Standards 2016") recommends that all graduates be skilled in professional communication including the ability to demonstrate patient compassion and empathy.¹² The American

Corresponding Author: Elizabeth Skoy, North Dakota State University, School of Pharmacy, 1401 Albrecht Blvd., Fargo, ND 58102. Tel: 701-231-5669. Fax: 701-231-7606. E-mail: Elizabeth.Skoy@ndsu.edu

Association of Colleges of Pharmacy (ACCP) Center for the Advancement of Pharmaceutical Education (CAPE) Advisory Panel on Educational Outcomes 2013, outlines a similar expectation stating graduates should demonstrate empathy when interacting with others.¹³

Educators use games and simulations to increase student empathy.¹⁴⁻²⁰ Activities typically focus on the elderly, diabetes mellitus, or an underserved population.¹⁶⁻¹⁹ Little is published about ways to modify the degree of empathy that pharmacists or pharmacy students have when interacting with patients with mental illness. This study focuses on the development of empathy when interacting with patients who experience auditory hallucinations.

A simulated auditory hallucination recording titled Hearing Distressing Voices was created by Patricia Deegan, PhD, who is a diagnosed schizophrenic. Based on her personal experiences with auditory hallucinations, she created the simulation to help “mental health professionals understand the challenges that face people with psychiatric disabilities.”²¹ Use of the Hearing Distressing Voices simulation is reported in the nursing education literature, but has never been reported in pharmacy education.²²⁻²⁴

DESIGN

The primary objective of the simulation was to increase student pharmacists’ empathy for patients who experience auditory hallucinations. The College of Health Professions purchased the Hearing Distressing Voices toolkit through university development foundation grant funding.

The Hearing Distressing Voices simulation took place during a required pharmaceutical care laboratory course. Eighty-one third-year professional pharmacy students participated in the simulation and research study. In the week prior to the simulation, students attended a 3-hour lecture focused on characteristics and treatment of psychosis and schizophrenia, including discussion about auditory hallucinations. Students independently completed the simulation in groups of 12 or 14; however, the toolkit provided enough resources to include up to 20 participants simultaneously.

Prior to the simulation, faculty members led a 10-minute introduction and provided each student with a compact disc player with the simulation disc, nonnoise canceling headphones, and an informed consent document. During the introduction, students were told they would complete a series of seven stations while listening to a recording of simulated auditory hallucinations. Students were also reminded it was to be an individual, not a shared, experience, so they were instructed not to interact with others unless required to do so at a station. As a precautionary measure, if they previously experienced auditory hallucinations or if the

simulation caused severe distress, students were asked to silence the recording and continue to complete the stations.

Faculty members briefly described the stations and explained they could be completed in any order. Additionally, a written description of the corresponding activity was provided at each station. To accommodate each student, there was a duplicate of each station, so two students could be participating at the same station simultaneously. Each student was given a checklist with station numbers so they could keep track of which stations they had completed.

Students were then asked to start the recording and adjust the volume to a comfortable level, but not adjust the volume thereafter even if the recording became extremely quiet or loud. This was a reminder to the students that those who experience auditory hallucinations cannot adjust the volume at which they hear them. The seven stations took students approximately 45 minutes to complete. If a student was waiting for a station to become available, they were told to wait patiently just as someone would sit while waiting to see a medical provider or to have their prescription filled.

The simulation toolkit supplied resources and station suggestions related to activities of daily living such as: reading comprehension, following directions, communicating with others, and cognitive functions. Faculty members used some of these, and supplemental stations were also created to expose the students to activities related to pharmacy practice such as following a prescription consultation (Figure 1).

Following the simulation, students participated in a faculty-led group debriefing that took approximately 20 minutes. During the debriefing, students discussed challenges with the stations and shared their overall thoughts of the experience.

Following the debriefing, students were assigned a written reflective composition with three guided questions: how they felt during the “Hearing Distressing Voices” simulation; whether they thought the exercise would influence their future practice as a pharmacist; and whether they would recommend the experience to other pharmacy students. The North Dakota State University Institutional Review Board approved this research.

EVALUATION AND ASSESSMENT

Immediately before and after the simulation, students were provided the Kiersma-Chen Empathy Scale (KCES) to measure empathy. The KCES is a valid and reliable tool that includes 15 items to assess empathy of health care professions students. The KCES was chosen over other available tools as it was developed directly for health care professions students and was available without a fee.²⁵

Students responded to each item on the KCES using a 7-point Likert scale (1=strongly disagree, 7=strongly agree). Faculty members then calculated a composite score using the KCES scoring instrument. Overall, a high

composite score means a high level of empathy. A matched sample analysis was used to compare pre/post KCES individual questions and composite scores. Differences were evaluated with Wilcoxon signed rank test. A pair-wise *t* test was also used and showed similar results. Due to normality, the Wilcoxon signed rank test was used to determine significant changes in empathy from the simulation.

The reflective compositions were qualitatively analyzed by two of the authors following methodology outlined by Miles et al.²⁶ All reflective essays were read independently and repetition of key words and responses were identified, which lead to primary code identification. These codes were then discussed and verified and were deemed to reflect the key themes of the reflective responses. Reflections were then jointly reread, and identified codes were assigned to each response if applicable. The frequency of codes were then counted to identify the most frequently reoccurring themes.

The results of the pre/post KCES are reported in Table 1. Of the 15 items reported in the KCES, students

showed a gain in empathy for all questions. A significant gain in empathy was seen in 13 of these items ($p < 0.05$). In addition, students' overall empathy significantly increased from a mean composite score of 83.7 to 87.6 ($p < 0.01$).

All identified themes from the written reflections and the frequency of most common themes are reported in Table 2. After counting the frequency of codes, it was found that 64% of students reported they felt distracted or had difficulty concentrating during the simulation. In addition, 83% reported a gain in empathy or understanding for patients who experience auditory hallucinations. Twenty-two percent addressed the impact auditory hallucinations have on everyday tasks for patients. As explained by one student "From a future pharmacist perspective, I would say that this activity opened my eyes for how frustrating this disease can be, and how simple everyday tasks can be hard and stressful, especially when trying to convey what one is experiencing to another individual who has not had to experience it first-hand."

Table 1. Comparison of Results for the Pre/Post Kiersma-Chen Empathy Scale (KCES) Scores

| KCES Question | Pre Mean ^a | Post Mean ^a | Mean Change | <i>p</i> Value |
|--|-----------------------|------------------------|-------------------|----------------|
| 1. It is necessary for a health care practitioner to be able to comprehend someone else's experiences. | 6.3 | 6.5 | 0.2 | <0.01 |
| 2. I am able to express my understanding of someone's feelings. | 5.5 | 5.8 | 0.3 | <0.01 |
| 3. I am able to comprehend someone else's experiences. | 5.4 | 5.7 | 0.3 | <0.01 |
| 4. I will not allow myself to be influenced by someone's feelings when determining the best treatment. | 4.3 | 3.9 | -.04 ^b | <0.01 |
| 5. It is necessary for a health care practitioner to be able to express an understanding of someone's feelings. | 6.3 | 6.4 | 0.1 | 0.06 |
| 6. It is necessary for a health care practitioner to be able to value someone else's point of view. | 6.3 | 6.4 | 0.1 | 0.02 |
| 7. I believe that caring is essential to building a strong relationship with patients. | 6.5 | 6.6 | 0.1 | <0.01 |
| 8. I am able to view the world from another person's perspective. | 5.3 | 5.5 | 0.02 | 0.85 |
| 9. Considering someone's feelings is not necessary to provide patient-centered care. | 1.99 | 2.0 | -.02 ^b | 0.02 |
| 10. I am able to value someone else's point of view. | 5.7 | 5.8 | 0.1 | <0.01 |
| 11. I have difficulty identifying with some else's feelings. | 3.1 | 2.7 | -0.4 ^b | 0.01 |
| 12. To build a strong relationship with patients, it is essential for a health care practitioner to be caring. | 6.2 | 6.4 | 0.2 | <0.01 |
| 13. It is necessary for a health care practitioner to identify with someone else's feelings. | 5.9 | 6.2 | 0.3 | <0.01 |
| 14. It is necessary for a health care practitioner to be able to view the world from another person's perspective. | 5.7 | 6.1 | 0.4 | <0.01 |
| 15. A health care practitioner should not be influenced by someone's feelings when determining the best treatment. | 4.0 | 3.2 | -0.8 ^b | <0.01 |
| Total Score | 83.7 | 87.6 | 4.7 | <0.01 |

^aScale: 1-7 (1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=neutral, 5=somewhat agree, 6=agree, 7=strongly agree)

^bQuestion is inversely scored so the negative value reflects a positive change in empathy

Table 2. Identified Themes and Frequency from Written Reflection (n=81)

| How did you feel during the simulation? | Frequency % |
|---|--------------------|
| Distracted/difficulty concentrating | 64 |
| Frustrated | 44 |
| Difficulty communicating | 31 |
| Anxious | 22 |
| Uncomfortable | 20 |
| Embarrassed/ashamed | 14 |
| Enlightened/eye-opening | 14 |
| Scared | 11 |
| Responding to voices | 10 |
| Incompetent | 9 |
| Difficulty remembering | 9 |
| Confused | 6 |
| Distressed | 5 |
| Isolated | 5 |
| Do you think this exercise will influence your future practice as a pharmacist? | |
| Yes | 99 |
| Reported an increase in empathy/understanding for the patient population | 83 |
| Reported the activity will improve how they communicate with the patient population | 40 |
| Addressed the impact auditory hallucinations have on everyday tasks | 22 |
| Will be prepared to look for signs of auditory hallucinations | 11 |
| Will have more patience with the patient population | 6 |
| Reported the activity helped diminish stereotypes | 5 |
| Would you recommend this experience to other pharmacy students? | |
| Yes | 100 |
| Spontaneously recommended for other health care professionals | 20 |

All but one student reported the simulation would impact their future pharmacy careers. One predominant theme that emerged from the written reflections was an increased ability to communicate with patients and recognize patients who are experiencing auditory hallucinations. Although it was not an objective of the simulation, 40% of students stated the simulation altered the way they will communicate health care information to patients potentially affected by auditory hallucinations. Notably, 100% of students believed this activity should be provided to future pharmacy students, and 20% independently suggested that it be offered to all health care professionals, showing that students found value in the experience. One student addressed this in the reflection with the following statement: “Experiencing hallucinations oneself aids in developing empathy more than studying the disease process ever could. I would recommend this simulation activity to pharmacy students, nursing students, medical students - anyone with a future in healthcare [as] it is universally applicable in my eyes.”

DISCUSSION

The objective of this activity was to increase students’ empathy for individuals experiencing auditory

hallucinations by immersing them in the Hearing Distressing Voices simulation. The KCES indicated that a gain in empathy was achieved in all 15 questions items; however, the gains were not significant with questions 5 and 9. These questions had a high baseline empathy score before participating in the simulation, which could explain the lack of significant increase. The three biggest growth areas in empathy were reflected in questions 4, 14, and 15 of the KCES. These questions addressed the need for taking another’s thoughts and feelings into account when deciding treatment and the need for understanding the world from another’s perspective. Based on KCES results and almost all students reporting this would influence their future practice, the authors concluded that the primary objective was achieved. To the best of faculty knowledge through observing the simulation and reading reflections, no students needed to silence the simulation.

Furthermore, students participating in the simulation reported feeling distressed, anxious, uncomfortable, and/or embarrassed during the simulation. These affective reactions are similar to those reported by individuals experiencing auditory hallucinations in both clinical and nonclinical contexts.²⁷ Students also reported that they were distracted, had difficulty concentrating, and at times responded aloud to

the voices they heard. These descriptions are also similar to symptoms observed in patients experiencing auditory hallucinations in clinical settings. These findings likely indicate that the simulation was effective in placing the students in a mindset similar to that of an individual experiencing auditory hallucinations and may be part of the reason for the marked increase in empathy toward it. However, one limitation of this study was to determine if the simulation would have a marked long-term effect on students' empathy scores. Empathy can deteriorate over time, and this study did not determine the longevity of the changes in empathy.²⁸ To determine the true impact of the study, one would need to follow students longitudinally and evaluate them in a patient care scenario involving an individual experiencing auditory hallucinations. This could be an area of future research.

It is important for health care providers to understand patients' perspectives and continually increase their ability to relate to all patients. This simulation only applied to increasing empathy for patients who experience auditory hallucinations. It is unknown if empathy was also increased for patients with other major disease states such as diabetes mellitus, terminal cancers, chronic pain, or other psychiatric diagnoses.

Use of the Hearing Distressing Voices simulation is reported in the nursing education literature. Sideras et al found the simulation did not significantly increase nursing students' empathy, but it did decrease the negative attitude associated with those with mental illness.²² Similarly, two other studies utilizing the simulation in nursing students determined the simulation decreased stigma and discrimination against those with mental illness.^{23,24} The impact of the simulation on stigma or discrimination toward those suffering with mental illnesses could be further studied in student pharmacists. Areas of related research include comparing changes in empathy from the simulation among various health professions students.

Obstacles one may encounter when implementing this activity include monetary costs and faculty time. The Hearing Distressing Voices Toolkit can be purchased for \$350, and because of copyright of the simulation, portable compact disc players must be purchased for each participant.²¹ To execute the simulation, we employed one faculty facilitator, two advanced pharmacy practice experience students to play the role of the pharmacist at the consultation station, and two nursing faculty members to facilitate the emergency room admission station. Stations could be reformulated to match the resources available to each institution.

SUMMARY

Implementation of the Hearing Distressing Voices auditory simulation taught students what experiencing auditory hallucinations may feel like and how it affects patients' daily

tasks. The simulation also increased student empathy for patients who experience auditory hallucinations. Use of the simulation may increase the efficacy of communication between pharmacy students and patients who experience auditory hallucinations.

REFERENCES

1. The Free Dictionary by Farlex. Auditory hallucination. <http://medical-dictionary.thefreedictionary.com/auditory+hallucination>. Accessed August 6, 2015.
2. de Leede-Smith S, Barkus E. A comprehensive review of auditory verbal hallucinations: lifetime prevalence, correlates and mechanisms in healthy and clinical individuals. *Front Hum Neurosci*. 2013;7:Article 367, 1-25.
3. National Institute of Mental Health. Serious mental illness among US adults. <http://www.nimh.nih.gov/health/statistics/prevalence/serious-mental-illness-smi-among-us-adults.shtml>. Accessed October 27, 2015.
4. National Institute of Mental Health. Schizophrenia. <http://www.nimh.nih.gov/health/statistics/prevalence/schizophrenia.shtml>. Accessed August 6, 2015.
5. National Institute of Mental Health. Major depression among adults. <http://www.nimh.nih.gov/health/statistics/prevalence/major-depression-among-adults.shtml>. Accessed August 6, 2015.
6. Top 200 Drugs. Drug facts. <http://genius.com/Drug-facts-top-200-drugs-annotated>. Accessed August 6, 2015.
7. Phokeo V, Sproule B, Ratman-Wilms L. Community pharmacists attitudes towards and professional interactions with users of psychiatric medications. *Psychiatr Serv*. 2004;55(12):1434-1436.
8. Overton SL, Medina SL. The stigma of mental illness. *J Couns Dev*. 2008;86(2):143-151.
9. Corrigan PW, Penn DL. Lessons from social psychology and discrediting psychiatric stigma. *Am Psychol*. 1999;54(9):765-776.
10. Goldstein TR, Winner E. Enhancing empathy and theory of mind. *J Cog Develop*. 2012;13(1):19-37.
11. Davis CM. What is empathy and can empathy be taught? *Phys Ther*. 1990;70(11):701-711.
12. Accreditation Council for Pharmacy Education. Guidance for the accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. Guidance for Standards 2016. <https://www.acpe-accredit.org/pdf/GuidanceforStandards2016FINAL.pdf>.
13. American Association of Colleges of Pharmacy. CAPE Educational Outcomes 2013. <http://www.aacp.org/resources/education/cape/Pages/default.aspx>.
14. Chen JT, LaLopa J, Dang DK. Impact of patient empathy modeling on pharmacy students caring for underserved. *Am J Pharm Educ*. 2008;72(2):Article 40.
15. Manolakis ML, Olin JL, Thornton PL, Dolder CR, Hanrahan C. A module on death and dying to develop empathy in student pharmacists. *Am J Pharm Educ*. 2010;75(4):Article 71.
16. Whitley HP. Active-learning diabetes simulation in an advanced pharmacy practice experience to develop patient empathy. *Am J Pharm Educ*. 2012;76(10):Article 203.
17. Van Winkle LJ, Fjortoft N, Hojat M. Impact of a workshop about aging on the empathy scores of pharmacy and medical students. *Am J Pharm Educ*. 2012;76(1):Article 9.
18. Chen A, Kiersma M, Yehle K, Plake K. Impact of an aging simulation game on pharmacy students' empathy for older adults. *Am J Pharm Educ*. 2015;79(5):Article 65.

19. Kerr J, Stahnke A, Behnen E. Assessing empathy and self-efficacy levels of pharmacy students in an elective diabetes management course. *Am J Pharm Educ.* 2015;79(3):Article 42.
20. Lor KB, Truong JT, Ip EJ, Barnett MJ. A randomized prospective study on outcomes of an empathy intervention among second-year student pharmacists. *Am J Pharm Educ.* 2015;79(2):Article 18.
21. Deegan P. The Hearing Distressing Voices Toolkit. <https://www.patdeegan.com/pat-deegan/training/hearing-voices-training>. Accessed July 15, 2015.
22. Sideras S, McKenzie G, Noone J, Dieckmann N, Allen TL. Impact of a simulation on nursing students' attitudes toward schizophrenia. *Clinical Simulation in Nursing.* 2015;11(2):134-141.
23. Wilson SE, Prescott J, Becket G. Empathy levels in first- and third-year students in health and non-health disciplines. *Am J Pharm Educ.* 2012;76(2):Article 24.
24. Dearing KS, Steadman S. Challenging stereotyping and bias: a voice simulation study. *J Nurs Educ.* 2008;47(2):59-65.
25. Kiersma ME, Chen AMH, Yehle KS, Plake KS. Validation of an empathy scale in pharmacy and nursing students. *Am J Pharm Educ.* 2013;77(5):Article 94.
26. Miles MB, Huberman M, Saldana J. *Qualitative Data Analysis: A Methods Sourcebook.* 3rd Ed. Thousand Oaks, CA: SAGE Publications; 2013.
27. Johns LC, Hemsley D, Kuipers E. A comparison of auditory hallucinations in a psychiatric and non-psychiatric group. *Brit J Clin Psychol.* 2002;41(1):81-86.
28. Neumann M, Edelhauser F, Tauschel D, et al. Empathy decline and its reasons: a systematic review of studies with medical students and residents. *Acad Med.* 2011;86(8):996-1009.

Appendix 1. Simulation Station Descriptions and Activities

Station 1: Listen to and understand a consultation for a new medication

An advanced pharmacy practice experience (APPE) student counseled the participating students on an antipsychotic medication. The APPE student used the open-ended questioning model of consultation.

Station 2: Follow medication directions

Fill a weekly medication organizer correctly medications based on the information on labeled prescription vials.

Station 3: Complete a cognitive test

Perform a number find

Station 4: Follow written instructions

Create an origami boat by following written instructions.

Station 5: Comprehend written information

Read three brief articles on novel drug information and take a reading comprehension quiz by answering three corresponding questions

Station 6: Communicate with a health care provider

Participating student is being admitted to an emergency room for chest pain. A nurse collects subjective information from the student.

Station 7: Follow directions

Walk to an assigned room within the building and communicate with an assigned individual. Ask for phonebook, transcribe three pizza delivery phone numbers and return to the facilitating faculty member.