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A Qualitative Analysis of Student Pharmacists' Response after an Auditory Hallucination Simulation

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ABSTRACT

Objectives: The goal of this research was to evaluate pharmacy students' experiences and reactions when exposed to an auditory hallucination simulator.

Methods: A convenient sample of 16 pharmacy students enrolled in the Advanced Psychiatry Elective at a private, faith-based university in the southeastern United States was selected. Students participated in an activity in which they listened to an auditory hallucination simulator from their personal laptop computers and completed a variety of tasks. Following the conclusion of the simulator, students composed a reflection guided by a five-question prompt. Qualitative analysis of the reflections was then completed to identify and categorize overarching themes.

Results: The overarching themes identified included: 1) students mentioned strategies they used to overcome the distraction; 2) students discussed how the voices affected their ability to complete the activities; 3) students discussed the mental/physical toll they experienced; 4) students identified methods to assist patients with schizophrenia; 5) students mentioned an increase in their empathy for patients; 6) students reported their reactions to the voices; 7) students recognized how schizophrenia could affect the lives of these patients; and 8) students expressed how their initial expectations and reactions to the voices changed throughout the course of the simulation. Overall, the use of this simulator as a teaching aid was well received by students.

Summary: In conclusion, pharmacy students were impacted by the hallucination simulator and expressed an increased awareness of the challenges faced by these patients on a daily basis.

Keywords: Pharmacy student; Auditory hallucination; Models, educational; Empathy; Patient simulation

BACKGROUND

Pharmacists are one of the most accessible healthcare professionals and are consistently rated among the most trusted professionals.¹ As such, empathy and understanding towards the symptoms and challenges faced by patients is an important aspect of pharmacy student education.² Patients with mental illness may experience hallucinations as a common symptom.³ Specifically, auditory hallucinations may be experienced by individuals with schizophrenia, bipolar disorder, depression and other mental illnesses.⁴ Pharmacists are likely to encounter patients who are experiencing hallucinations, as well as other psychotic symptoms, in the community and hospital setting. This could be due to the fact that some of the most commonly prescribed medications in the United States include atypical antipsychotics.⁵ As a result, it is important for pharmacists to understand and assess symptoms their patients experience, including psychiatric symptoms.

Simulation-based education in pharmacy curricula has been commonly utilized in recent years.⁶ It is hypothesized that simulation-based education enhances student's knowledge,

confidence, clinical performance, critical thinking, and decreases medication errors.⁷ While it is impossible to mimic all of the symptoms of mental illnesses, auditory hallucination simulators provide the experience of hearing voices.⁸ The Hearing Distressing Voices[®] toolkit includes a 45 minute experience in which the participant listens to "hallucinations" while participating in a variety of activities.⁸

Current literature regarding the use of auditory hallucination simulators in academic settings has focused largely on the assessment of student empathy. Skoy and colleagues published an article reporting increased empathy in student pharmacists after exposure to the Hearing Distressing Voices[®] toolkit.⁹ During their study, 81 student pharmacists completed the auditory hallucination simulator and the Kiersma-Chen Empathy Scale (KCES) was utilized to measure the students' empathy changes. The assessment consists of 15 questions based on a 7-point Likert scale with scores that range from 15 to 105.¹⁰ After utilizing the simulator, the students total KCES scores increased from 83.7 to 87.6 ($p < 0.01$), meaning student empathy increased and would be considered educationally significant based on the nature of the scale.⁹ Themes were also identified from required reflections written by students. Significant findings of the study revealed that the majority of students (83%) reported increased empathy. Additionally, the most common theme identified among students was distracted/difficulty concentrating (64%). Skoy and colleagues suggested that exposure to such simulations may enhance

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communication between pharmacy students and those with mental illnesses.

The use of this toolkit in the education of other medical professionals has also been described in the literature. Studies assessing the use of auditory hallucination simulators in nursing and medical students found the experience enabled the students to better understand the challenges faced by patients having auditory hallucinations.¹¹⁻¹³ Empathy was still discussed as a common theme within the other medical professions using the simulation. Bunn and colleagues found a statistically significant increase in medical student empathy after participating in the simulation and no significant change in the comparison group.¹⁴ In contrast, Sideras et al. found there was a lack of increase in empathy in nursing students participating in the simulation versus students that did not, according to the Jefferson Scale of Empathy.¹⁵ However, negative attitudes toward patients with schizophrenia was significantly reduced in the treatment group. Dearing and Steadman assessed nursing student empathy quantitatively and qualitatively. The investigators found that students in the experimental group had significant changes in their Medical Condition Regard Scales scores after the simulation compared to the control group in regards to the statements "There is little I can do to help patients like this" and "Treatment for these patients is a waste of money."¹⁶

Additional studies assessing the use of a hallucination simulator found an increase in stigma or social distance. Brown and colleagues compared the effect of the Hearing Distressing Voices[®] toolkit with a film segment titled *Living with Schizophrenia* on mental illness stigma as measured by the Social Distance Scale and Affect Scale.¹⁷ Scores decreased for the film indicating a decrease in stigma whereas scores increased for the simulation indicating an increase in stigma.¹⁷ Brown and colleagues also compared the Hearing Distressing Voices[®] toolkit in undergraduate students who were listening to the hallucinations in the lab with those who were performing activities on campus on the Attribution Questionnaire-27.¹⁸ The authors found no difference in overall mental illness stigma and, specifically, less willingness to help/interact and increased attitudes toward forced treatment.¹⁸ Lastly, Ando and colleagues conducted a systematic review of the effect of hallucination simulators on stigma of schizophrenia.¹⁹ The authors reviewed 10 studies, including some of the articles discussed above and concluded that hallucination simulators increased empathy, but also increased the desire for distance from individuals who experience auditory hallucinations.¹⁹

We discuss the utilization and student response to the Hearing Distressing Voices[®] toolkit during an Advanced Psychiatry Elective at a private, faith-based university in the southeastern United States. As a result of the previous literature focusing largely on empathy associated with these simulators, the goal

of this research was to evaluate overall pharmacy students' experiences and reactions using qualitative analysis methods.

METHODS

The Hearing Distressing Voices[®] toolkit⁸ was utilized during an Advanced Psychiatry elective course, which was offered to third-year pharmacy students during the spring semester. This course occurred after neuropsychiatric disorders were covered in the core curriculum course, during the fall semester of the third year (based on a 4 year curriculum). The elective course covered an assortment of psychiatric disease states and incorporated a variety of teaching methods, which included traditional lecture, media, contact-based education (i.e., a patient or family member sharing their experience with the psychiatric condition being taught) and the hallucination simulator. The auditory hallucination exercise was conducted in the course classroom during the 4th week of class following the viewing of a film about a patient with schizophrenia. During the exercise, students were instructed to listen to the auditory hallucination simulator from their personal laptop computers using in-ear headphones with adjustments made to the volume for comfort. The exercise lasted approximately 45 minutes and required students to engage in a variety of activities. The activities included a fictional job application for the student to complete listing their name, address, education, work experience, etc. The students also attempted a word find puzzle with 32 hidden words, as well as a number find puzzle with 33 hidden seven-digit codes. The next activity was an origami exercise where the students attempted to follow instructions that showed them how to fold a piece of paper to form a boat or a frog. The last activity was a modified mental status examination that course instructors conducted on the student while the student was listening to the hallucinations. The course instructors asked students questions, such as the day/date, current president/vice-president, recall of a series of numbers, and serial 7's. The intent of conducting the mental status exam, as well as the paper activities, was to have the student experience what it may be like for a patient who is actively hallucinating to perform a variety of tasks that require mental concentration. At the conclusion of the class period (1 hour and 40 minutes), students were instructed to complete a written guided reflection by responding to each of the following questions:

1. What was your initial reaction to the voices? What emotions did the voices make you feel?
2. What strategies did you use to complete the activity while hearing the voices? What was the most difficult activity to complete during the simulation and why?
3. How would you cope with hearing the voices while interacting with other individuals?
4. What effects would you think these hallucinations would have over an extended period of time?

5. How will this activity impact your perception and interaction with individuals with mental illness?

Qualitative analysis of activity reflections was completed using the MAXQDA 10 software (VERBI Software; Berlin, Germany) to identify and categorize themes. The analysis process began with the three researchers independently reading reflections and creating draft codes.²⁰ Two researchers addressed the discrepancies among the coding and developed the final code book, which included both conceptual codes and subcodes. Each researcher independently coded reflections using the final code book. Lastly, one researcher reviewed the combined coding for discrepancies and deleted duplicate coding. Since 3 researchers completed the coding, a “majority rules” approach was used to resolve discrepancies.

The university Institutional Review Board approved the conduct of the parent study.²¹ This study utilized an empathy rating scale to quantitatively evaluate the impact of traditional lecture versus simulation teaching techniques in the same cohort of pharmacy students. The overall empathy study results and demographic information have been published separately.²¹

RESULTS

Third year pharmacy students (n=16) were enrolled in the Advanced Psychiatry elective course. Students viewed the film *A Beautiful Mind*, which portrays a patient experiencing visual hallucinations and delusions. Two weeks later, all students participated in the auditory hallucination simulator exercise and completed the guided reflection assignment. The overarching themes identified in the reflections are listed in Table 1. Traditionally, when conducting qualitative research, the frequencies of students responding are not included in the results; however, due to the small sample size these numbers have been included for transparency.

1. Strategies used to cope with the voices and complete the activities

Students identified strategies that would assist in completing the activities and managing the voices e.g. how they ignored the vocals during the simulation (n=13) or how they would use extreme concentration to complete the tasks (n=6). It is important to note that the approaches discussed by the students would not necessarily be effective for a patient with schizophrenia. For example, due to the consistency of the voices experienced by a patient with schizophrenia, simply ignoring the voices would not be effective. When analyzing the reflections, the students seemed to understand that these strategies would not be effective long term.

Specifically students discussed the strategies they used to complete the communication exercises (n=7). Some students mentioned they tried to respond to questions quickly and use

facial cues. Others stated that reading lips was used to be able to identify what the requestor was asking.

“I would have to stare at their lips to help me process what they are saying, and just try to block out the voices registering in my cognition. I would also just have to take my time, because it is impossible to think clearly and quickly while hearing instructions in your head. Repetition of communication with other individuals would be an important aspect of interaction to be sure I not only have time to process, but also to assure that I was understanding them correctly since I would be constantly distracted.”

Students also discussed the strategies they used to complete the number exercises (n=4). They expressed that focusing on one or two numbers at a time was one method of completing this task. One student explained:

“In order to complete my task, I had to make a mark next to the sequence I was working on so I wouldn’t forget, and then I would have to search each row number by number for the first three numbers of the sequence and then look back at the mark I made to see if it was the one I was looking for or not.”

Additional strategies students used included recognizing that the voices were not real (n=5) and that the activity would eventually end (n=2). Also, some students stated that they would work on the activities when there was a break in the voices (n=2):

“I tried to work through the puzzles faster when the voices stopped, but I was just thinking, ‘how much longer until they’re back?’”

2. Effects of the voices on students’ ability to complete the activities

Many students mentioned specifically that certain activities were more challenging than others (n=15). Overall students felt that the modified mental status exam and the number search were the most challenging activities. Two different students expressed their challenges:

“I was having an impossible time trying to find the number sequences, while at the same time the voices were telling me how stupid I was, as if they knew I was doing that exact puzzle and not getting it.”

“The [mental status exam] was by far the hardest activity because I had someone trying to communicate directly with me. I could not just read the assignment. I had to try and hear her voice over the voices in my headphones.”

A small number of students stated that they simply skipped some of the challenging activities or they did not finish them within the allotted time (n=3).

3. *Mental/physical toll the voices would have on students*

The majority of students identified how the voices affected them mentally and physically. Many of these students expressed feeling uneasy, uncomfortable, anxious or irritable in response to the voices (n=13). One student stated:

“Near the end when he started to say, ‘you should eat this mess,’ I was more uncomfortable.”

Additionally, several students mentioned how the voices distracted them from completing the activities (n=9):

“I kept zoning out of the puzzle and into what the voices were saying. I would eventually lose focus and have to start over again.”

Frustration or annoyance was also mentioned as an emotion experienced by many of the students (n=8). Students explained that after a period of time hearing the voices they would start to believe what was being said (n=5). One student explained:

“My confidence would also take a hit with the hallucinations over time because one of the voices just kept talking about how much of a mess I was and that I couldn’t fix it. Eventually, I would probably start to believe it.”

Similarly, some students explained that it became difficult to determine which voices were real and which were hallucinations (n=4). A few students also expressed paranoia (n=5), disturbance (n=5), and embarrassment (n=3) in response to the voices. Some students mentioned that when the voices stopped they would anticipate them returning and become anxious (n=6). One student stated:

“One thing I experienced that I did not consider was anxiety during the absence of the voices. It seemed this happened to a few of my classmates as well. I adjusted to having the voices around and I was able to go out my business and do my work, then suddenly it stopped. I was then left with my own thoughts. Instead of being relieved that it was gone, I felt even more anxiety about their absence. I knew that it would be coming back at some point so I was on edge waiting for them to return. I worried about it being a new voice, a new phrase, a song, or being louder.”

Lastly, a small amount of students specifically mentioned experiencing a headache as a result of the activity (n=3).

4. *Identified methods to assist patients with schizophrenia*

Some students explained how this activity helped them identify ways they would assist patients with schizophrenia. Students expressed how they would be understanding and comforting (n=7) while remaining calm and patient (n=7). One student explained:

“I will do my best to allow them to work through what I am saying and what they are hearing. I think patience is probably key to working with the mentally ill. I can also relate better to what kind of feelings they may be experiencing, as a result of their voices, and help them find a way to handle their emotions and develop outlets to redirect their thoughts. I think it will also be easier to help identify what is real and what is not.”

5. *Expressed empathy and understanding of what schizophrenic patients experience*

Students explained how this activity increased their empathy and understanding of patients with schizophrenia. Specifically, some students explained how they understood how listening to these voices would influence a patient’s self-esteem (n=9). One student bluntly stated:

“Personally, I think my self-esteem would have cracked very early on and I would have killed myself.”

A small number of students also mentioned how they had a deeper respect for these patients and what they experience on a daily basis (n=2). For example:

“As I said before, it has definitely opened my eyes to the condition and the struggle these patients face on a daily basis. I have incredible respect for these patients and how strong they must be to withstand the battle for their mind.”

A few students stated that they understood the suicidal tendencies of patients with schizophrenia and their need for medications (n=3).

6. *Reactions to the Voices*

Students expressed their reactions to the voices in the activity. Some students expressed that they were not bothered by the voices (n=10) while others had negative reactions (n=9). Two students stated:

“The voices didn’t bother me whatsoever, and if anything, they might have helped me concentrate on the tasks more so than no noise.”

“Effectively, the voices made me feel worthless. The voices made me feel unworthy of living,”

One student expressed a positive reaction to the voices. These comments were mainly in reference to the soothing voices that were heard on the recording.

7. Recognized effects on the life of a patient with schizophrenia

Many students expressed how schizophrenia would affect a patient's life. Specifically, they mentioned how their condition could cause these patients to become isolated (n=6):

"I would definitely limit the time spent around others, in particular having to interact intimately. I don't think I would mind crowds too much as you can sort of blend in and not have to talk to anyone, however I would not welcome conversations with others. I'd probably keep headphones on while in public to keep others away. I would avoid eye contact so no one would attempt to engage. If I had to speak with others I would keep it very brief, and it would be known I was trying to get out."

Some students also expressed how schizophrenia could affect a patient's ability to complete tasks (n=4). Two students particularly mentioned how they understood patients turning to substance abuse to find relief from the voices. One student stated:

"I think this would begin to eat at you over time and likely reflect in your interactions with others. This may cause you to have violent outbursts directed at yourself or others. I can definitely understand why schizophrenia is associated with so many other psychiatric and medical disorders. I think it would be very stressful to cope with, which may lead to substance abuse (cigarettes, EtOH, cocaine), isolating oneself, which can lead to depression, and can be accompanied by many negative symptoms that make it harder for you to want to take care of yourself (obesity, HTN, hyperlipidemia, etc.)."

8. Initial expectations and reactions to the voices changed as the activity progressed

Some of the students expressed how their initial reaction to the simulation changed. Specifically, students mentioned how they thought the simulation was going to be more difficult than it actually was (n=7). One student explained:

"Before the simulator started I thought I was going to have a hard time concentrating on the tasks but once it started I was really surprised to see that I could ignore the commands but was still listening to everything they said."

Other students explained how at first they thought they could handle the voices, however, after a while it became increasingly unmanageable (n=7).

"At first I was able to brush it off and ignore it, but once I was about 30 minutes in I started to become agitated. It was much more repetitive than I expected."

DISCUSSION

The hallucination simulator provided students in the Advanced Psychiatry course a snapshot of hallucinations a patient with schizophrenia deals with on a daily basis. Most students found that even with the use of coping strategies it was difficult to complete the required tasks during the simulation. In addition, students felt an array of emotions, such as uneasiness, irritability, and anxiety with many ultimately reporting increased empathy and understanding for those with mental illnesses. Students became aware of the implications auditory hallucinations would have on a patient's life and identified isolation, depression, substance abuse, and an overall reduced quality of life as consequences resulting from ongoing hallucinations. As a result of the simulator, the pharmacy students in this report were able to develop plans they would implement in clinical practice when dealing with hallucinating patients. These findings affirm the effectiveness of using simulators of mental illness in pharmacy curriculums.

The findings in this report closely resemble those found in the study conducted by Skoy et al., which evaluated the use of the Hearing Distressing Voices[®] toolkit and its effect on pharmacy student empathy, however there are a few notable differences.⁹ As stated previously, the qualitative analysis of this study did not focus heavily on empathy, but overall student experience. In our report, we identified eight overarching themes (Table 1) that represented student perceptions throughout the activity. All of the students in our study identified strategies used to cope with the voices to complete activities. Most of these students simply ignored the voices, but others stated that they tried to focus on the activity with extreme concentration or used communication strategies, such as reading lips or facial expressions. The students in the Stoy et al. study did not report techniques they used to cope with the voices and most of the student responses were in reference to increased empathy towards patients with schizophrenia, which was the objective of the study.⁹ Most of the students in our study discussed how the voices would negatively affect their mental, emotional and/or physical stability as time progressed. Of these students, most felt uneasy, uncomfortable, anxious or irritable. In contrast, most of the students in the Skoy et al study reported feeling distracted or having difficulty concentrating.⁹ Feeling distracted was the third most reported emotion in our study.

The current report has a few limitations. Only students who were enrolled in the Advanced Psychiatry elective participated in the auditory hallucination simulation resulting in a small sample size of 16 pharmacy students. As stated in the course objectives, upon completion of the course, students would be able to display increased empathy and compassion towards patients with mental illnesses. Therefore, the pharmacy students may have felt obligated to report an increase in understanding and empathy in order to receive a decent grade in the course. Additionally, students who chose to enroll in this elective course may have had greater interest or understanding for patients suffering from mental illnesses at baseline, which could have impacted the results. The institution at which this study was conducted is a faith based establishment. It is unknown whether the results of our study could be replicated at a non-faith based institution. This could be considered an area for future research. Demographic information, such as whether students had been exposed to patients with schizophrenia prior to the simulation, was not collected.

Our study found that exposing pharmacy students to challenges encountered by patients with auditory hallucinations through a simulator had an impact on their understanding. The use of simulators in pharmacy education is not a novel concept and the benefit of simulators has been recognized by the Accreditation Council on Pharmacy Education (ACPE). In 2010, ACPE approved utilization of simulations for up to 20% of the hours required in the introductory pharmacy practice experiences (IPPEs).⁷ Within our pharmacy curriculum, simulations have been used for counseling encounters and to assess patient vital signs, pulmonary abnormalities, and to administer injectable medications. Incorporating simulators that bring a better understanding of patients with mental illnesses into the pharmacy curriculum could be beneficial to future practitioners in decreasing stigma and increasing empathy.

SUMMARY

In conclusion, pharmacy students were impacted by the hallucination simulator and expressed an increased awareness of the challenges faced by these patients on a daily basis.

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Table 1: Overarching Themes Identified From Reflections

Theme	Number of Students Discussing this Theme	Number of Coded Segments
1. Strategies used to cope with the voices and complete the activities	16	53
2. Effects of the voices on students' ability to complete the activities	16	34
3. Mental/physical toll the voices would have on students	15	69
4. Identified methods to assist patients with schizophrenia	15	20
5. Expressed empathy and understanding of what schizophrenic patients experience	14	33
6. Reactions to the voices	14	23
7. Recognized effects on the life of a patient with schizophrenia	13	25
8. Initial expectations and reactions to the voices changed as the activity progressed	12	16