

# Auditory Hallucination Simulations in The Medical School Curriculum: The Impact of Distressing Voice Simulations on The Empathy of Medical Students



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## Introduction

- Auditory hallucinations (AH) occur in 64-80% of hallucinations and are among the most distressing symptoms in schizophrenia spectrum disorders.
  - AH create communication and treatment challenges for both patients and healthcare providers.
  - Healthcare professionals often feel uncertain in interacting with individuals experiencing AH due to limited education and training.
- Auditory hallucination simulations (AHSs) have emerged as a promising tool for enhancing healthcare professionals' empathy and understanding towards individuals with mental illness experiencing AH.
  - Prior studies of AHSs in nursing education shows an increase in both knowledge and empathy toward individuals with mental illness.
- Research on AHS effects in medical students is limited.
  - Previous studies have suggested that AHs experiences have lead to increase in empathy for individuals with mental illness experiencing AH.
- This study aims to better gauge the implications of AHS on the knowledge, attitude, and empathy of medical students participating in a psychiatric didactic during 3rd year clerkships.
- Our study holds significant promise for improving mental health outcomes of individuals experiencing AH by providing future physicians the educational tools to help them understand the lived experiences of their patients experiencing AH and increase empathy towards individuals experiencing mental illness.

## Methods

- The study took place a simulated home care environment within the Lloyd Jacobs Interprofessional Immersive Simulation Center at the University of Toledo College of Medicine and Life Sciences in Toledo, OH.
- Inclusion criteria included current third year medical students (22 - 43 years old) who were rotating through their psychiatry clerkship.
- A pre-simulation survey with Likert Scale Ratings was administered before the AHs and an identical post-simulation survey was administered after, along with a simulation debriefing opportunity with the clerkship director.
  - Pre and Post Quantitative Surveys with Likert Scale
    - Ratings (1-5; Strongly Disagree to Strongly Agree) based on beliefs, attitudes, and empathy towards people experiencing auditory hallucinations (refer to Table 1).
    - A higher rating was associated with a higher score of empathy.
    - Surveys were administered by simulation center staff and responses were turned into investigators without identifying information to preserve anonymity of participants.
  - AHS Simulation
    - Students worked in pairs, rotating through five task-based workstations while experiencing escalating auditory hallucinations through headphones.
    - Tasks included communication, critical thinking, and memory challenges (e.g., mixing baby formula, playing a board game, analyzing a news clip).
    - Debriefing session followed post-survey.
  - A student in block 1 was rotating through Psychiatry as their first clinical rotation, while a student in block 10 had completed 9 other clinical rotations before rotating in Psychiatry. Higher blocks meant more previous patient exposure than students in earlier blocks.

## Results and Figures

### Pre and Post Stimulation Quantitative Survey Questions

Table 1.

Pre and Post Simulation Quantitative Survey Questions	
I.	I believe that a person experiencing hallucinations could have difficulties performing activities of daily living.
II.	I believe that a person experiencing hallucinations could have difficulty communicating.
III.	I believe that a person experiencing hallucinations could have difficulty regulating mood.
IV.	I believe that a person experiencing hallucinations could have difficulties performing tasks that require spatial processing skills
V.	I believe that a person experiencing hallucinations could have difficulties performing tasks that require concentration
VI.	I believe that a person experiencing hallucinations could have difficulties performing tasks that require memory.
VII.	I believe that a person experiencing hallucinations could have difficulties performing tasks that require critical thinking skills.
VIII.	I have compassion (concern for and desire to alleviate the suffering of others) towards people who experience hallucinations.
IX.	I have empathy (the ability to identify and understand another person's feelings and perspective) towards people who experience hallucinations.
X.	I believe that having empathy towards people who experience hallucinations improves my ability to care for patients.
XI.	Experiencing simulated hallucinations will improve my empathy towards my patients.

### Demographics

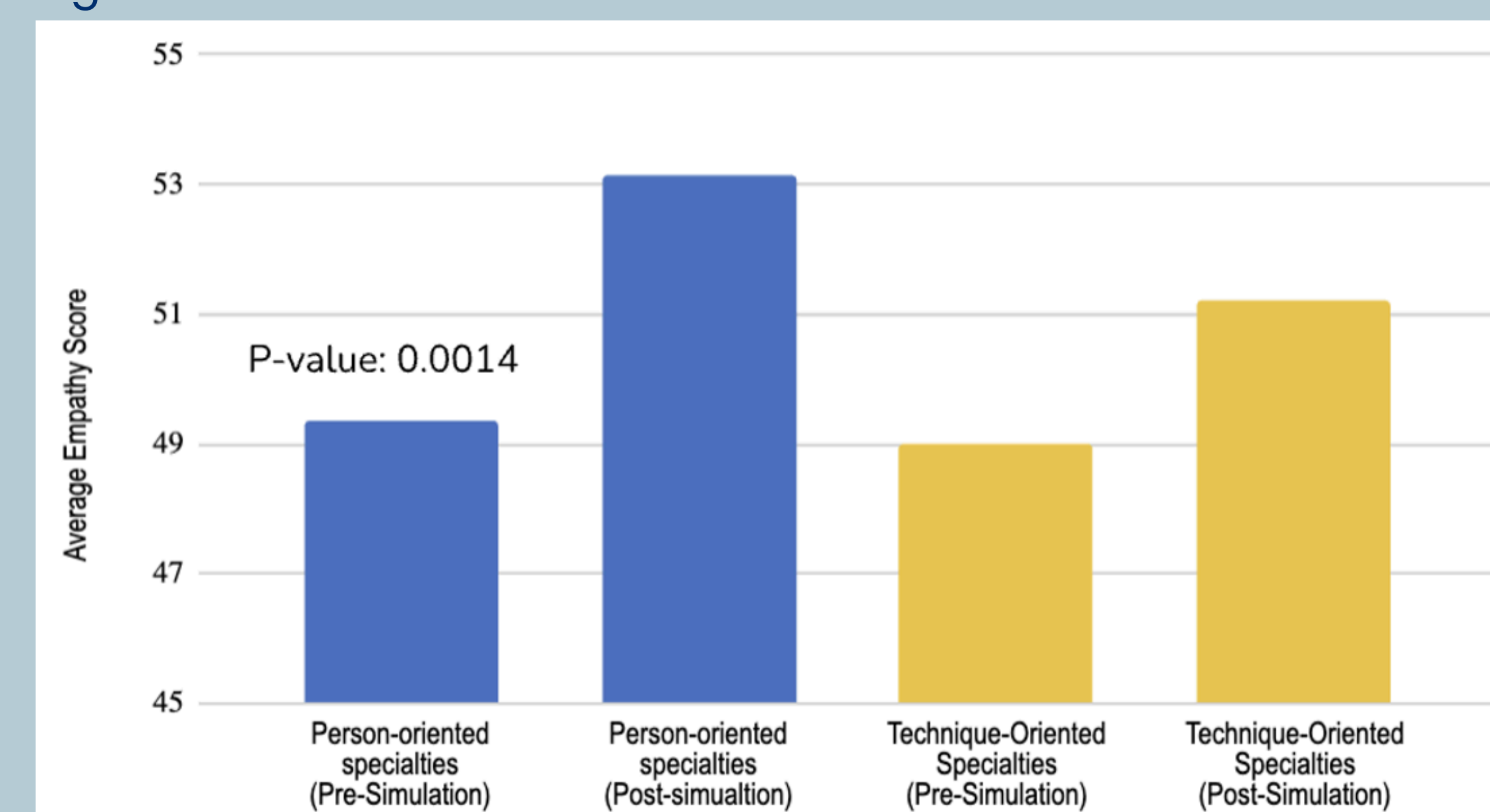
Table 2.

Race		
White	94	61.0%
Black/African American	6	3.9%
Asian	48	31.2%
Not reported	6	3.9%
<b>Total</b>	<b>154</b>	<b>100%</b>
Sex		
Male	82	53.2%
Female	71	46.1%
Not reported	1	0.6%
<b>Total</b>	<b>154</b>	<b>100%</b>
Age		
22-24	52	33.8%
25-27	78	50.6%
28-30	18	11.7%
31+	5	3.2%
Not reported	1	0.6%
<b>Total</b>	<b>154</b>	<b>100%</b>

**Table 1 & Table 2:** The table on the left shows questions 1 - 11 provided on the pre and post-simulation survey that were completed with a Likert Scale (1 - Strongly Disagree; 5 - Strongly agree). The table on the right shows the demographics of the study including race, sex, and age.

### Average Empathy Scores Pre and Post-Simulation

Figure 1.



**Figure 1:** This figure illustrates pre- and post-simulation empathy scores for students in person- vs. technique-oriented specialties. An independent two-sample t-test revealed a significant increase in empathy for person-oriented specialties, while no significant change was observed in technique-oriented specialties.

### Empathy Scores by Gender

Table 3.

Group Comparison	Pre vs Post Empathy Scores of Females and Males Combined		Pre vs Post Empathy Scores for Females Only		Pre vs Post Empathy Scores for Males Only		Pre Simulation Only Scores Comparing Females vs Males		Post Simulation Only Scores Comparing Females vs Males	
	P-value from T-Test	Average empathy scores for each comparison group	P-value from T-Test	Average empathy scores for each comparison group	P-value from T-Test	Average empathy scores for each comparison group	P-value from T-Test	Average empathy scores for each comparison group	P-value from T-Test	Average empathy scores for each comparison group
Pre vs Post	* < .0001	49.0	* 0.0009	50.3	* 0.0128	52.1	.3100	50.4	.3469	52.1

**Table 3:** This table presents p-values from an independent two-sample t-test comparing pre- and post-simulation empathy scores. Significant results are marked with an asterisk. Both males and females showed a statistically significant increase in empathy post-simulation. No significant differences were found between genders before or after the simulation.

## Conclusions

- This study supports the use of experiential learning, specifically auditory hallucination simulations (AHS), to enhance awareness and empathy in medical students. The findings show a significant increase in empathy scores post-simulation.
- Integrating AHS into medical school curriculum may help students better understand their patients' experiences, fostering a more empathetic approach to care. Ultimately, this could improve patient outcomes for individuals with mental illness.

## References

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