ORIGINAL RESEARCH

Impact of a poverty simulation program on the unconscious biases – A multi-site study

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ABSTRACT

Background and objective: University-based, pre-licensure programs can expose healthcare students to the realities of poverty and its relationship to healthcare using an interprofessional Poverty Simulation. The aim of the study was to evaluate the effectiveness of a Poverty Simulation on the unconscious bias among health professions students.
Methods: A pre-test/post-test online survey design was implemented (N = 181) at two institutions. Paired-sample *t*-tests compared pre-and post-simulation scores for the Poverty Attributions Survey (PAS) and Interprofessional Attitudes (IPAS) subscales.
Results: Significant differences were found for the PAS subscales assessing Individual (pre-simulation M = 4.09, SD = 1.15; post-simulation M = 4.71, SD = 1.13) and Cultural attributions of poverty (pre-simulation M = 3.74, SD = 1.16; post-simulation M = 4.20, SD = 1.25); $t(168) = -7.814$, $p < .001$ and $t(175) = -5.242$, $p < .001$, respectively. A significant difference between pre- (M = 1.83, SD = .57) and post-simulation scores (M = 1.68, SD = .69) for the IPAS Teamwork, Roles, and Responsibility subscale was found, $t(170) = 2.511$, $p = .013$, Cohen's d = 0.23.
Conclusions: Results support engaging healthcare students in the realities of poverty to positively influence understanding and empathy, reducing unconscious bias.

Key Words: Poverty, Unconscious bias, Simulation, Interprofessional education

1. INTRODUCTION

University-based pre-licensure simulations can expose students in health professions to the realities of poverty. Poverty simulation may ultimately influence students' perceptions of poverty and have the potential to reveal unconscious bias. The Oxford Dictionary defines "unconscious bias" as an unfair belief about a group of people that a person is of, and that affects behaviors and decision-making (n.d.). To address perceptions of poverty, the Missouri Association for Community Action developed the Community Action Poverty Simulation (CAPS). This simulation learning experience introduces the social determinants of health and healthcare inequities in a simulated, interactive community setting using various family settings. Health profession students will eventually become practicing professionals who must help identify barriers to health and healthcare in communities. Providing a poverty simulation to learners is aimed at improving overall understanding of poverty and how it impacts individuals, families, and communities. This program plays an essential role in their training and education using an interprofessional framework. The simulation exercise is reported to facilitate "students doing things and thinking about what they are doing".[1]

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2. BACKGROUND

Poverty rates in the United States are influenced by numerous factors, including local and national economic conditions, employment rates, and social policies. Poverty became an urgent concern during the COVID-19 pandemic when resources and work opportunities were limited, and individuals found that their economic situation had deteriorated significantly.[2] Poverty is a barrier that keeps families from meeting their basic needs and is a direct cause of health inequities.[3] Poverty results in limited access to the essentials others take for granted, including clean water, fresh vegetables, and affordable, safe housing.[4] The percentage of Americans living below the poverty line increased between 2019 and 2020 because many low-wage workers experienced the worst of these economic changes.[2] Despite the resolution of the COVID-19 pandemic, many families continue to struggle with inflation, specifically, the high prices of gasoline, groceries, and other consumer costs that increased by 8.7% from 2021 to 2022 (Isidore et al., 2022).[5] Many students may have experienced privileged living experiences prior to college and may not be aware of poverty or what it would feel like to make choices between buying groceries or paying rent for a family despite the economic changes occurring in the world around them.

When addressing poverty in Texas and Louisiana, demographic diversity must be considered, including the significant influx of immigrants, as well as the existing minority populations and recent refugees currently living in the Houston (Texas) area. Moreover, in the proximity to the Gulf of Mexico, residents are vulnerable to hurricanes, flooding, and other natural disasters that exacerbate poverty. The 2022 poverty rates in Texas and Louisiana were higher than the national average, at 14.9% and 18.6%, respectively.[6] Supplemental Security Income benefits have been adjusted only once since 1972, when a $2,000 asset limit for single individuals and $3,000 for couples was instituted. No adjustments had been made to help recipients keep up with inflation.[7] Without exposure to a poverty simulation, many students in these regions may not be aware of groups of people living below the poverty level.

To better prepare students to enter healthcare settings, we need to understand their perceptions about poverty, which may predict how they will practice once they are professionals.[4] Individual biases are typically rooted in social and cultural conditioning and can affect numerous aspects of one's life, including interactions with others, hiring decisions, and professional judgments.[4] Unconscious bias is deeply rooted in society. Individuals may not even be aware that they have biases or that they influence their behavior.[8] Unconscious biases often stem from societal stereotypes and cultural norms that exist in regions of the country. These biases can be based on race, gender, age, ethnicity, religion, and sexual orientation, among other individual characteristics. Bias can discernibly impact decision-making and affect how one perceives and evaluates others. Unconscious bias can lead to unfair or discriminatory outcomes, even when individuals believe their decisions are fair and objective. Unconscious bias can profoundly impact employment, healthcare, law enforcement, and interpersonal relationships. Many individuals give more weight to information that confirms their preexisting beliefs or stereotypes, including perceptions of certain groups based on skin color or ethnicity.[9] Efforts to introduce college students to unconscious bias typically include raising awareness of the problem, providing education and training, and implementing policies and practices that promote fairness and equality. Overall, these efforts may contribute to creating more inclusive environments and reduce the impact of bias on decision-making processes.[8,9]

Many pre-licensure healthcare students have not experienced poverty firsthand and may have had little to no direct interaction with individuals living under these conditions. Educators can provide students with opportunities to gain a better understanding of poverty. Several studies revealed that measuring attributions for poverty is highly linked with an individual's perception of this condition.[9,10] Poverty simulations have been employed as learning tools for several health science student groups at various educational levels.[11,12] While poverty may be a problem for some students and their families, unless a health professional has had direct, personal experience, he or she may find it challenging to understand.

2.1 Procedure

The CAPS program allows students to bridge the knowledge gap and better understand poverty. It is a long-standing program in college settings. A CAPS is an interactive immersion experience involving three hours of a family simulation based on a rapid day-in-the-life experience with other students.[13] Some of the first research studies using CAPS intervention for poverty awareness and evidence to support its success began in 2014 when the CAPS program effectively reduced Attitudes Toward Poverty (ATP) scores.[14] Turk and Colbert[15] also evaluated perceptions of poverty among undergraduate nurses using CAPS and reported significant improvements in students' empathy and attitudes towards poverty, including recognizing structural and societal barriers. Likewise, Iheduru-Anderson, & Foley,[16] presented qualitative results suggesting that simulation generated feelings of empathy and compassion toward individuals living in poverty. CAPS exposes student participants to the realities of a "day in the life of someone living in poverty" based on real-life experiences.

Interestingly, Sanko et al.[17] used the UPPTS to evaluate the impact of a simulation program on a group of undergraduate nursing, graduate nursing, and physical therapy students (n = 118). Although they reported no change in attitude overall, statistically significant improvement was observed on the subscales focused on empathy and willingness to help those living in poverty. The CAPS program is designed to increase one's understanding of the nature of poverty through simulated life experiences of a family who is getting through a day without adequate resources. This simulation experience can inspire change and provide future healthcare professionals with a more empathetic perspective.

2.2 Theoretical framework

The theoretical framework of Kolb's Experiential Learning Theory posits that simulation (i.e., hands-on learning) is more likely to influence learning than didactic methods. This theory has been used to develop educational programs in psychology, medicine, and nursing.[18] This theory explains that "learning" is knowledge created by transforming and grasping an experience based on a four-stage learning cycle involving 1) Concrete experiences, 2) Reflective observation, 3) abstract conception, and 4) active experimentation. This theory assimilates learners through abstract experiences and converges by helping them to learn through active experimentation. The learners use problem-solving skills to address practical concerns and use active and concrete experiences to learn via hands-on activities.[18]

This study aimed to evaluate the impact of participation in a poverty simulation on pre-licensure healthcare and health-related program students. Of note, programs focused on attributions for poverty and attitudes toward unconscious bias that explore these competencies have become required components of pre-licensure education at accredited healthcare programs.[19,20]

3. METHOD

The study was based on a quasi-experimental design using pre- and post-surveys. All student participants were asked to complete an anonymous electronic survey, which began with a item requesting their consent to participate.

3.1 Ethical considerations

The study was reviewed by The Sam Houston State University IRB (protocol #2020-32) and approved on February 2, 2020. Louisiana Tech University #HUC 22-039 was approved on December 9, 2021.

3.2 Sample and Setting

A convenience sample included students from the following disciplines: Nursing, Nutrition Science and Dietetics, Athletic Training, Population Health, Human Development, and Family Sciences programs from Sam Houston State University, The Woodlands, Texas, and Louisiana Tech University, Ruston, Louisiana. Students participated in three-hour simulations that included pre- and post-briefing sessions. The pre-licensure healthcare students included in this analysis were part of the convenience sample from the two universities who had no previous exposure to poverty simulation programs.

Interprofessional Professional Education (IPE) working groups from two separate universities collaborated to introduce CAPS Poverty Simulation provided by the East Texas Human Needs Network (ETHNN) at two locations (The Woodlands, Texas, and Ruston, Louisiana) in the fall of 2021 and spring 2022. The facilitator and program delivery at each location was the same to reduce research bias. During the poverty simulation, students were asked to play the role of a specific individual in a family, for example, a single mother with multiple children, a homeless person, a senior adult living alone, a family member with some in the household who was ill, or a member of a family with a non-working adult who had recently lost a job. The students participated as members of the simulated family group for four weeks, with each week represented by a 15-minute increment, and experienced changes in life circumstances that occurred during this period. The simulated "community" or town was created in a large room. It included a hospital, a school, a bank, a grocery store, social security office, and a utility office, among other simulated community businesses and agencies. Students and their neighbors were arranged in groups that included the number of chairs required for each family structure as predetermined by the CAPS, similar to what one might expect in a home in this community. The agencies and businesses lined the periphery of the room. These simulated community entities were facilitated by faculty and staff volunteers who were provided a complete set of instructions on how to run the entity they were assigned. Students were given family packets with assigned tasks that needed completion within specific fifteen minute intervals.

3.3 Instruments

The Poverty Attributions Survey (PAS) was used, specifically the Individual, Cultural, and Structural Attributions of Poverty subscales, which were also used as a proxy for unconscious bias.[21] Each scale item is rated by the respondent for their level of agreement on a 6-point Likert-type scale (1 = strongly agree to 6 = strongly disagree). A participant's degree of agreement with each poverty attribution is based on his or her mean score on each attribution scale. The Cronbach's alpha was 0.93, suggesting good internal consistency.

Additionally, the subscales measuring Individual, Cultural, and Structural Attributions of Poverty were reliable, with Cronbach's alphas of 0.98, 0.90, and 0.95, respectively.

The Interprofessional Attitudes Scale (IPAS) assesses attitudes that focus on the Core Competencies for Interprofessional Collaborative Practice using five sub-scales: (1) Teamwork, Roles, and Responsibilities; (2) Patient-Centeredness; (3) Interprofessional Biases; (4) Diversity and Ethics; and (5) Community-Centeredness. Each item was scored on a 5-point agreement scale ranging from strongly disagree to strongly agree.[22] The Cronbach's alpha was found to be 0.92, suggesting good internal consistency; the subscales reliability were (1) Teamwork, Roles, and Responsibilities (α = 0.83); (2) Patient-Centeredness (α = 0.95); (3) Interprofessional Biases (α = 0.60); (4) Diversity and Ethics (α = 0.96); and (5) Community-Centeredness (α = 0.94).

3.4 Data collection

Inclusion criteria were as follows: enrolled students from the College of Health Science (COHS) students at SHSU or College of Applied and Natural Sciences students at Louisiana Tech University who attended school either full- or part-time; 2) 18 years of age or older; and 3) able to participate in the three-hour poverty simulation exercise administered by the ETHNN. Individuals were excluded from the survey research study if they were 1) under 18 years of age and 2) non-English speaking. All participants in the poverty simulation were asked if they consented to the survey research portion, which included completing a pre-and post-simulation 15-minute questionnaire. Participation was voluntary, and students could withdraw from the study at any time. Written consent was documented in Qualtrics before having access to the questionnaires. Students who signed up to participate in the simulation were sent an e-mail inviting them to participate in the pre-survey prior to the simulation. Students were assigned a unique code for matching the pre- and post-simulation. During the simulation, researchers sent a second e-mail to participants with a link to the post-event survey to be completed.

Sociodemographic data were collected including age, gender, race, marital status, degree program, degree sought (e.g., a bachelor's or a second/advanced degree), employment status, hours worked per week, first-generation college student status. Measures of central tendency and frequencies were used to describe questionnaire items. Paired sample t-tests compared pre- and post-simulation attitudes and attributes of poverty scores, including subscales.

To avoid participant confusion, one tool was reverse-coded so that the levels of agreement matched. Analysis was performed using SPSS version 29.[23] Data validation was performed to identify missing values and duplications. Before data analyses, data were also examined for normality and transformed if they were not normally distributed. All *p*-values were calculated from two-tailed tests and considered significant when less than .05.

4. Results

The pre-licensure students (n = 181) who participated in the study were primarily female (77.9%), White (60.8%), and of junior/senior status (58%) with a mean age of 23.66 (SD = 4.72) years. As shown in Table 1, the student participants were enrolled in nursing (43.6%), dietetics (33.1%), medicine (18.8%), speech pathology (3.3%), and athletic training programs (1.1%), which are disciplines that generally lead to employment in patient-care settings. This participant sample (n = 181) for this analysis was a subset of a larger dataset (N = 262) and included pre-licensure healthcare students only. We evaluated pre- and post-ratings of attitudes toward interprofessional work for the participants as a group, within individual disciplines, and between disciplines. Financial aid was defined as receiving money for education through scholarships or government programs rather than parental support; we report that 72.9% of students received financial aid. Paired-sample *t*-tests compared the pre- and post-simulation scores for each student on each of the Interprofessional Professional Attitudes Scale (IPAS) subscales (see Table 2). The IPAS assessed five sub-scales: (1) Teamwork, Roles, and Responsibilities; (2) Patient-Centeredness; (3) Interprofessional Biases; (4) Diversity and Ethics; and (5) Community-Centeredness related to interprofessional practice.[22] A significant difference (albeit only a small effect [Cohen's d = 0.23]) was observed between pre- (M = 1.83, SD = .57) and post-simulation subscale scores (M = 1.68, SD = .69) for the IPAS Teamwork, Roles, and Responsibility subscale, with $t(170) = 2.511$, $p = .013$. This finding suggests that the simulation experience improved the participants' recognition of the benefits of teamwork when engaged in healthcare delivery, enhanced their understanding of their roles, and highlighted the need for communication between team members. No statistically significant differences were found for the Patient-Centeredness, Interprofessional Biases, Diversity and Ethics, or Community-Centeredness subscales. No significant differences were observed when comparing the pre- and post-simulation interprofessional bias scores. However, as noted in Table 3, a trend toward statistical significance was observed in response to the question, "I have prejudices or make assumptions about health professionals/students from other disciplines" ($t(172) = 1.79$, $p = .8$). Likewise, a significant difference was observed in the partic-

ipants' pre- and post-simulation Diversity and Ethics scores in response to the question, "I understand what it takes to effectively communicate across cultures", $t(175) = -2.20$, $p = .03$ (see Table 4).

Pre- and post-simulation responses to the PAS subscales were evaluated using paired-sample *t*-tests (see Table 3). Our results revealed significant differences between pre- (M = 1.83, SD = .57) and post-simulation scores (M = 1.68, SD = .69) for the PAS subscales documenting Individual (pre-simulation M=4.09, SD=1.15; post-simulation M = 4.71, SD = 1.13) and Cultural attribution (pre-simulation M = 3.74, SD = 1.16; post-simulation M = 4.20, SD = 1.25); $t(168) = -7.814$, $p < .001$ and $t(175) = -5.242$, $p < .001$, respectively. A medium effect was calculated for the Individual subscale change (Cohen's d = 0.54) and a small-to-medium effect for the cultural subscale (Cohen's d = 0.38). The results of our analysis revealed that, upon completing the simulation, the participants were less likely to attribute poverty to individual control and cultural circumstances. No significant differences were determined when we compared responses to the structural attribution subscale; this implies that the participants did not significantly change their perspective on the influence of external processes impacting poverty. We also performed paired samples *t*-tests to determine whether participating in the poverty simulation resulted in significant changes in any of the nine items included in the structural attribution subscale. While we identified no significant differences following the simulation, we did observe decreased post-simulation sample means for eight of these nine items. This result implies that there was generally more agreement regarding the impact of structural institutions and processes on those living in poverty (see Table 4).

Table 1. Demographic characteristics of participants at baseline (N = 181)

	Frequency	Percent
	n	**%**
Gender		
Males	39	21.5
Females	141	77.9
Other	1	0.6
Race		
White, non-Hispanic	110	60.8
White, Hispanic	23	12.7
African American	18	9.9
Asian	20	11.0
Middle Eastern	2	1.1
Mixed Race	5	2.8
Other	3	1.7
Student Class		
Freshman	9	5.0
Sophomore	13	7.2
Junior	26	14.4
Senior	79	43.6
Graduate (Master's)	21	11.6
Graduate (Doctoral)	33	18.2
Study Area		
Nutrition	60	33.1
Athletic Training	2	1.1
Nursing	79	43.6
Medicine	34	18.8
Speech Pathology	8	3.3
Financial Aid		
Yes	132	72.9
No	49	27.1

Table 2. Pre-post simulation comparison of interprofessional attitude scale subscales

Subscale	Pre IPAS†			Post IPAS†			*t*	df	*p*	Cohen d
	n	M	SD	n	M	SD				
Teamwork, Roles, Responsibilities	171	1.83	0.57	171	1.68	0.69	2.51*	170	.01	0.23
Patient Centeredness	172	1.22	0.60	172	1.30	0.61	-1.31	171	.19	0.13
Interprofessional Biases	171	2.63	0.85	172	2.50	0.88	1.53	171	.13	0.14
Diversity and Ethics	174	1.23	0.57	174	1.31	0.66	-1.76	173	.08	0.13
Community Centeredness	166	1.32	0.57	166	1.35	0.65	-0.49	165	.62	0.04

*$p < .05$; †Interprofessional Attitude Scale

Table 3. Pre-post simulation comparison of poverty attribution scale subscales

Pairs	Pre PAS†			Post PAS†			*t*	*df*	*p*	Cohen *d*
	n	*M*	*SD*	*n*	*M*	*SD*				
Individual	169	4.09	1.15	169	4.70	1.13	-7.81**	168	< .001	0.54
Cultural	176	3.74	1.16	176	4.20	1.25	-5.24**	175	< .001	0.38
Structural	166	3.13	1.28	166	3.05	1.38	0.86	165	.39	0.06

**$p < .001$; †Poverty Attribution Scale

Table 4. Pre-post simulation comparison of structural attributions toward poverty

Poverty is a result of…..	Pre-Simulation			Post-Simulation			*t*	df	*p*	Cohen d
	M	n	SD	M	n	SD				
	2.92	178	1.49	2.92	178	1.66	0.00	177	1.00	0
	3.33	177	1.54	3.19	177	1.61	1.23	176	.22	0.09
	3.15	179	1.51	3.04	179	1.66	0.94	178	.35	0.08
	3.25	178	1.43	3.15	178	1.62	0.93	177	.35	0.07
9 items	3.34	179	1.62	3.15	179	1.59	1.61	178	.11	0.12
	3.27	177	1.55	3.09	177	1.59	1.39	176	.17	0.11
	3.26	176	1.39	3.15	176	1.52	0.97	175	.33	0.08
	2.99	178	1.46	2.98	178	1.50	0.15	177	.89	0.01
	3.13	173	1.52	3.01	173	1.54	0.94	172	.35	0.08

5. Discussion

In this study, we evaluated the impact of the simulation program on unconscious bias among students in preprofessional health care programs. Unconscious bias has been evaluated in only a few such simulation studies.[11, 17, 24] across various disciplines. In this study, the PAS tool was used as a proxy to explore bias toward persons living in poverty. Our findings revealed significant differences in the pre-and post-simulation responses to the PAS subscales focused on the Individual and Cultural attributions. The responses indicated improved perspectives related to people living in poverty, which can influence the delivery of health care to this population. However, the simulation did not find a statistically significant change in the subscale measuring structural attributions toward poverty. The interprofessional finding of this study included an improvement in the IPAS Teamwork, Roles, and Responsibility subscale. Because the simulation required participants to assume roles and work as a family team to accomplish tasks, they became more sensitive to the value of teamwork. Cultural fluency highlighted students' awareness of important cultural attributes in the simulation.

Implications

In this study, an interdisciplinary team hosted a simulation event that increased students' awareness of how individuals living in poverty interacted with community resources and how they made decisions with limited resources. The impact of poverty simulations on students was evaluated. The findings support the effectiveness of poverty simulations as experiential learning for pre-licensure undergraduate students soon to enter the workforce to better understand the issues for individuals living in poverty. Although the students may not have had a direct experience with poverty, the simulation helped them to develop empathy by better understanding the lives of those living in poverty. Future healthcare providers with exposure to those who experience poverty on a daily basis need to have an understanding of the impact of their underlying biases on how they will care for this population. As they enter the workforce, this understanding of poverty with its inherent limitations of resources can result in barriers to obtaining medication, treatment, and transportation. The CAPS and similar programs can amplify students' knowledge and understanding of the challenges faced by those living in poverty.

6. Conclusion

While the relationship between poverty and unconscious bias remains complex, unconscious bias clearly contributes to the perpetuation and exacerbation of the problems faced by those living in poverty.[3] Poverty and unconscious bias are interconnected; biases contribute to the perpetuation of systemic inequalities that disproportionately affect the poor and other marginalized groups.[4] The cycle of poverty profoundly impacts various aspects of life, including education, employment, and access to opportunities.[25] Individuals who are subjected to biased judgments face even more significant barriers, including those that contribute to a cycle of poverty, limit access to resources, and prevent social mobility. Unconscious bias can influence hiring selections and workplace practices that include discriminatory practices, thereby limiting the economic opportunities available to individuals from impoverished and marginalized groups.[8] Thus, if left unchecked, unconscious bias can lead to lower income levels and increased vulnerability to poverty. Similarly, biases in financial aid decisions can access to loans, credit, and other financial services.[26] Individuals facing bias may encounter challenges in building wealth and breaking free from the cycle of poverty.[26] Unconscious bias in healthcare settings can lead to disparities in the quality of care received by members of different demographic groups.[3] Poor health outcomes can further exacerbate economic challenges for individuals and communities living in poverty. Unconscious bias can in-

fluence the development and implementation of policies and may thus perpetuate ongoing systemic inequalities. As a first step, it will be most important to determine ways to foster empathy and promote advocacy for policies and initiatives designed to reduce poverty.[9] Awareness of these biases will ultimately lead to more inclusive and equitable solutions. If we are to break the cycle of poverty, we need to address these problems at individual, institutional, and systemic levels to create environments that reduce the impact of poverty on individuals and their communities.

6.1 Recommendations

A poverty simulation can be a powerful and immersive teaching tool that can help individuals gain a deeper understanding of the challenges faced by people living in poverty. The success of these simulation programs relies on having a clear outline of the goals and objectives one hopes to achieve at relatively little cost to a department. Educators might also select simulations (e.g., tabletop exercises or online programs) that align with their learning objectives to allow students to work through problems with limited resources. Simulation experiences go beyond reading a textbook or listening to a lecture and bring in real-life issues, barriers, and the factors contributing to poverty. The facilitators and educators then encourage the participants to explore the broader implications and consider potential solutions that enable them to translate their newfound understanding into action. In addition to simulation, students might participate in clinical activities, be encouraged to volunteer, serve in advocacy positions, and support organizations working to understand poverty. Poverty is a real problem, and simulation fosters empathy, uncovers potential bias, and may lead to a commitment to address poverty in students' future careers.[25]

6.2 Limitations of the study

The participants were from a convenience sample. Student responses were obtained one moment in time rather than longitudinally. Students' personal exposure to poverty before the simulation was not assessed. The universities have a high proportion of first-generation college students requiring financial aid and are situated in a rural environment. We did not evaluate the effectiveness of CAPS compared to other simulation programs.

7. Conclusion

CAPS programs delivered as an interprofessional education event can influence many of the biased attitudes held by pre-licensure students toward people living in poverty.[13] This event enables students to appreciate a "day in the life" experienced by those in poverty and to become aware of their unconscious biases. The program aims to positively impact health equity, influence bias, and increase students' understanding of health determinants that affect impoverished persons. In Meidert et al.,[8] the prevalence of unconscious bias among currently licensed professionals (e.g., physicians, nurses, and educators), notably stereotyping and prejudice toward those living in poverty, were summarized. These biases may profoundly impact and increase systemic inequalities if those providing services do not recognize the cost and transportation needed to acquire specific healthcare resources.[7] Exposure to poverty through simulation may lead to an improved understanding and acknowledgment of one's own unconscious bias and can enhance one's empathy and knowledge of the barriers to healthy living faced by many members of our community. Future research should include more rigorous studies involving randomized sampling methods and other interventions in undergraduate college programs to expose students to the results of poverty and social determinants of health, barriers to care, bias, and career opportunities in community health.

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Authors contributions

MC - research design, research proposal, recruitment, writing manuscript.
SPC - research design, data collection, recruitment, statistical analysis, writing manuscript.
MW - research design, data collection, recruitment, writing manuscript.

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Informed consent

Obtained.

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the Committee on Publication Ethics (COPE).

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

DATA SHARING STATEMENT

No additional data are available.

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