ORIGINAL RESEARCH

Improving attitudes toward poverty and attitudes toward interprofessional collaboration through online interprofessional synchronous poverty simulation: A mixed methods comparison study

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ABSTRACT

Introduction: Interprofessional poverty simulations can improve attitudes toward poverty and attitudes toward interprofessional collaboration. This study evaluated an immersive synchronous online poverty simulation.

Methods: A mixed-method study was conducted to compare the outcomes of onsite and online interprofessional poverty simulations. The simulations were carried out at a private university in the US 6 times onsite between 2017 and 2019, and 4 times online between 2020 and 2021. The quantitative portion utilized two pre- and post-test questionnaires: the Attitudes Toward Poverty Short Form and the University of West England Interprofessional Questionnaire, which evaluate attitudes towards poverty and interprofessional collaboration respectively. Additionally, qualitative interviews of selected students were conducted 2-4 weeks after the simulations. Quantitative data were analyzed using paired *t*-tests for individual results, and independent samples *t*-tests to compare onsite with online pre-post changes. Qualitative data were evaluated using thematic analysis by faculty members from three disciplines.

Results: The research indicates that both online and onsite poverty simulations can improve student attitudes toward both poverty and interprofessional collaboration. Results for 196 online participants were compared to 325 onsite participants. Both online and onsite groups showed significant improvements in attitudes toward poverty and interprofessional collaboration ($p < .05$). The quantitative effect size was smaller for online than onsite, but the difference was less in 2021, the second year of the online simulation, likely due to improved implementation techniques. The qualitative data suggested a less intense emotional response for online participants compared to onsite. Overall results suggest that there is a learning curve in offering an effective online poverty simulation, but that online poverty simulations do significantly influence attitudes toward poverty and interprofessional collaboration.

Recommendation: In the article, lessons learned are shared. Online simulations can effectively change attitudes toward poverty, and allow many students to participate who otherwise might not be able to, but the magnitude of the impact for our population was not as great online as onsite. It is recommended that schools of nursing and faculty of other healthcare professions consider the pros and cons of incorporating interprofessional poverty simulations in their curricula.

Key Words: Poverty simulation, Online, Simulation, Higher education, Attitudes toward poverty, Interprofessional collaboration, Mixed methods

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1. INTRODUCTION

Poverty is a powerful social determinant of health (SDOH), and it is vital that nurses do not stigmatize those living with poverty. Interprofessional practice is key to effective healthcare; interprofessional education (IPE) includes students learning from about and with each other. It is recommended that nursing education incorporate both SDOH and IPE.[1–3] Since 2017, an interprofessional poverty simulation has been held annually on the campus of a mid-sized US university. The goals of the simulation are to improve attitudes toward poverty and toward interprofessional collaboration in addressing the challenges associated with poverty. During the COVID-19 pandemic, the delivery method shifted to online. Quantitative pre-post questionnaires and qualitative interviews from four online simulations were compared to six previous onsite simulations.

1.1 Literature review

Experiential learning is "the process whereby knowledge is created through the transformation of experience".[4] Jarvis[5] describes the process of transformational experiential learning as occurring through the interaction of thought, action, and emotion. Experiential learning through simulation engages participants through emotion, thought/reflection, and action. Online simulation has shown benefits in reinforcing course concepts and meeting the objectives of the simulation[6, 7] Critical factors for the success of online simulation include realism, pre-work, and debriefing.[8, 9] Roleplay is one of the most effective ways to increase realism because it allows participants to insert themselves into the simulation.[10]

Interprofessional simulations in healthcare have demonstrated improved attitudes toward interprofessional collaboration, improved knowledge about other healthcare disciplines, enhanced collaboration, and improved communication between disciplines.[11, 12] Poverty simulations have demonstrated improved participant attitudes toward poverty in many fields, including pharmacy, nursing, social work, physical therapy, criminal justice, and education.[13–17] The asynchronous online poverty simulation SPENT has demonstrated improved attitudes toward poverty,[18–21] but no reports have been located that also evaluated SPENT as an interprofessional activity. In a pooled analysis of poverty simulations, Taylor[22] found that participants reported increased self-efficacy and intentions related to interprofessional collaboration pre- to post-simulation. However, the author did not indicate whether the simulations analyzed were onsite, online, synchronous, asynchronous, or a combination of modalities. No research was located that evaluated an online synchronous immersive interprofessional poverty simulation.

1.2 Research objectives

1) How effective is online simulation compared to onsite simulation in changing attitudes toward poverty?
2) How effective is online simulation compared to onsite simulation in changing attitudes toward interprofessionalism?
3) How do participants perceive the online experience of the poverty simulation?
4) How can the online simulation be modified to enhance effectiveness?

2. METHODS

2.1 Design

Mixed methods: pre-post-test surveys and post-intervention qualitative interviews.

2.2 Setting, population, sampling, recruitment and ethics

Inclusion criteria for the study were: university student simulation participants who were willing to and consented to participate. Exclusion criteria were non-participants in the simulation, non-university students, and those who did not consent to participate.

A convenience sample of participants was recruited from a moderate sized private Christian U.S. university. All students in the university were invited to participate in the simulation through announcements and emails. However, specific programs, including Nursing, Social Work (SW), pre-service Education, and undergraduate Ministry, required students to participate in the simulation as part of their coursework. Simulation participants were not required to participate in the study. Links to the instruments were emailed to participants prior to the simulation and given by QR code after the simulation. Consent information was provided upon clicking the link, and electronic consent required to proceed to the surveys. This resulted in a participation rate of 96% for onsite and 87% for online, as detailed in the results section. Participants with significant changes in pre-post test scores were contacted to request an interview. Separate consent to participate in interviews was obtained. Participation in the research was voluntary and not shared with program faculty. The University Institutional Review Board approved the study as exempt.

2.3 Intervention and procedures

The Cost of Poverty Experience (COPE) is a simulation that assigns participants a role within a family living in poverty.[23] Throughout the simulation, families face various challenges as they attempt to complete weekly tasks.

They must utilize resources that mimic real-world agencies to cope with these challenges. Children must attend school, while younger children must be taken to daycare. Parents must attend work or school, pay bills, and keep appointments. As the simulation progresses, healthcare needs arise, behavioral problems occur, families lose their homes, and parents may even go to jail.

From 2017-2019, the COPE simulation was offered in-person on the residential campus. Information on the pre-brief, simulation, small group debrief, and large group debrief are available in previous articles.[24,25] In 2020, the interprofessional planning committee adapted the simulation to a synchronous online format. The committee worked to preserve the integrity of the experience in an online format. The revised simulation was delivered in Zoom™. The committee combined several in-simulation resources to simplify the process and reduce the number of breakout rooms needed. An online spreadsheet permitted financial transactions. Resource volunteers were able to add and subtract money from family budgets; participants had view-only access to their budget. The facilitator and technical support managed the simulation on campus, but most volunteers and all students participated from their dorm rooms or other locations. Training materials were provided for volunteer resources and debriefers prior to the event, and pre-briefing materials were provided to participants several weeks before the event.

On the night of the event, study participants who had not previously done so had the opportunity to complete the two pre-test surveys, the facilitator introduced the simulation, provided instructions on accessing family homes and resources, and introduced each resource. Participants navigated to resource rooms to complete weekly tasks. On "weekends", each family had a breakout room within the Zoom session to meet and discuss their plans for the week. Families received random positive and negative events (equivalent to the fate cards in the onsite version) during the "weekends". After the simulation, volunteer debriefers met with participants for small group discussions to reflect on poverty, the role of their profession in working with families in poverty, and how their professions can collaborate to support families in poverty (see Appendix 1). Each debriefing group included students from two to four professions. After the small group debriefing, the facilitator leading a final large group debriefing focused on poverty-related learning. After the large group debriefing, participants were provided with a QR code to allow those who chose to, to complete the post-test surveys. Course faculty were provided with a suggested post-simulation reflection assignment.

After the event, pre-and post-test results were examined, and students with the most significant changes on the pre-post surveys, stratified by major, were emailed to ask them to participate in qualitative interviews. The interviews occurred approximately 3 weeks after the simulation, to allow time for students to participate in post-simulation reflection assignments and class discussions, and for those in clinical rotations to have an opportunity to apply the learning in their clinical settings.

2.4 Measurement

Two instruments were administered before and after the simulation and debriefings: the Attitudes Toward Poverty Short Form (ATPSF) and the University of West England Interprofessional Questionnaire (IPQ). Both the ATPSF and IPQ are standardized measures with high validity and reliability. Details of the scale development and validation have been previously reported.[26,27] The ATPSF consists of 21 questions using a 5-point scale from strongly agree to strongly disagree. It has three domains: personal deficiency, stigma, and structural perspective. High scores indicate a belief that structural determinants, underlying economic or political structures, are the primary cause of poverty. Low scores indicate a belief that poverty has an individualistic cause.[26] The IPQ consists of 36 questions on a likert-type scale with four subscales: Communication and Teamwork, Interprofessional Learning, Interprofessional Interaction, and Interprofessional Relationships. A lower score on the instrument reflects a more positive attitude towards interprofessional communication, learning, interactions, and relationships.[27]

The interview guide for the qualitative interviews was developed by the interprofessional planning committee, and is available upon request. All interviews were conducted by the Primary Investigator.

2.5 Data analysis plan

Quantitative data analysis for both the in-person and online simulations was conducted using SPSS version 24 for Windows (IBM). Adherence to statistical assumptions was validated by testing for independence, normal distribution, and homogeneity of variance. Cronbach's alpha was run for quantitative measurements. Cronbach's alpha for the poverty scale ranged from .661 to .878. Cronbach's alpha for the interprofessional scale ranged from .766 to .821. Descriptive statistics for the demographic variables were conducted. Pre-to post-test differences for each year were analyzed with paired t-tests. The researchers then compared the onsite results with the online results utilizing independent samples t-tests. Linear regression models examined differences between demographic groups. The significance level for all analyses was set at 0.05.

Thematic analysis was used to evaluate qualitative data. One faculty member from nursing, ministry, and social work participated in the analysis. After reading the transcripts for meaning, each researcher assigned unique codes to significant statements, clustered them by common meanings, and then combined codes into themes. Each faculty coded the interviews independently and identified differences between onsite and online participants. They then met to integrate their analyses. Similarities and differences were examined and clarified. The Principal Investigator summarized the findings, and the group reviewed the summary, clarified, made changes, and worked until consensus was achieved, following the general principles outlined by Yin.[28]

3. RESULTS

As shown in Table 1, a higher percentage of simulation participants completed questionnaires for the onsite than the online simulations. However, due to the introduction of electronic surveys in 2019, fewer invalid surveys resulted from missing data. Therefore, the percentage of all simulation participants included in the final analysis was similar between onsite and online.

Table 1. Participation and Questionnaire Completion Rates Onsite and Online

	Onsite	Online
Participants	2017-102 2018-164 2019-211 Total-477	2020-114 2021-193 Total-307
Questionnaires returned: Research Participation Rate	101+147+211= 459/477=96%	105+163= 268/307=87%
Matched pre-post test rate	420/477=88%	90+106= 196/307=64%
Completed matched surveys (complete case analysis)	325/477=68%	196/307=64%

Pre-test scores for onsite and online were compared to test whether the COVID-19 pandemic and associated social strictures affected attitudes toward poverty and interprofessional collaboration (see Table 3). There were minimal differences on the poverty scale; the baseline interprofessional scale (IPQ) result was slightly worse online.

3.1 Research question 1: How effective is an online simulation in changing attitudes toward poverty compared to onsite simulations?

Positive value indicates improvement in attitude from pre- to post-intervention.

Table 4 shows that paired sample *t*-tests for both onsite and online participants demonstrated significant improvement in attitudes toward poverty ($p < .000$); however, the effect size was smaller for online than for onsite (.25 vs .53).

Table 2. Participant demographics

	Onsite = 325		Online = 196	
	N	**%**	**N**	**%**
Gender				
Male	32	10	31	16
Female	293	90	165	84
Ethnicity				
White	284	87	168	86
Black	6	2	9	5
Asian	12	4	7	4
Hispanic	8	3	11	6
Other	15	5	1	1
Academic rank				
Freshman	47	15	14	7
Sophomore	86	27	48	24
Junior	50	15	20	10
Senior	104	32	93	47
Graduate	38	12	12	6
Major				
SW	76	23	25	13
Nursing	81	25	91	46
OT/PT	35	11	7	4
Education	59	18	31	16
Ministry	18	6	18	9
Other*	56	17	25	13

*Other majors included community development, pre-art therapy, undeclared, criminal justice, business, psychology, English, biology, communications, intercultural studies, computer science, exercise science, graphic design, chemistry, humanities, and recreation administration.

Table 3. Mean pre-test scores (poverty: higher score is more positive; IPQ: lower score is more positive)

	Onsite Mean/SD	Online Mean/SD
Mean/SD poverty scale totals	80.52/9.07	79.91/9.82
Mean IPQ totals	82.5/11.99	85.72/9.72

Table 5 shows an independent samples t-test comparison between onsite and online.

3.2 Research question 2: How effective is an online simulation in changing attitudes toward interprofessionalism compared to onsite simulations?

Table 6 shows that both onsite and online participants demonstrated significant improvements pre- to post-intervention in attitudes toward interprofessional attitudes ($p < .000$ for onsite, $p < .014$ for online), but the effect size was smaller for online than for onsite (.48 vs .18).

Table 7 demonstrates that there was a significant difference in interprofessional attitudes favoring onsite.

Table 4. Paired Samples t-Test results for Poverty Scale

Pairs	Mean difference	SD	95% CI		*t*	df	*p*-value	*Cohen's D*
			lower	upper				
Pooled onsite	3.80	7.21	3.02	4.59	9.51	324	.000*	.53
Pooled online	2.05	8.11	.91	3.19	3.54	195	.000	.25

*$p \leq .05$

Table 5. Independent samples *t*-test comparing pre-post-test differences between onsite and online for poverty scale

	Mean difference in scores	Mean difference pre- to post-test differences onsite vs. online	*p*	Cohen's D for onsite to online differences
Poverty questionnaire	Onsite 3.80 Online 2.05	1.75	.011*	.23 (small)

*$p \leq .05$; Higher score=more positive attitudes toward persons living with poverty.

Table 6. Paired Samples t-test for IPQ onsite and online (lower score reflects more positive attitude)

Pairs	Mean difference	SD	CI		*t*	df	*p*	Cohen's D
			lower	upper				
onsite post-pre	-4.59	9.67	-6.09	-3.09	-6.04	161	.000*	.48
Online post-pre	-1.65	9.34	-2.96	-.34	-2.48	195	.014*	.18

Table 7. Independent samples *t*-test for IPQ comparing pre-post-test differences between onsite and online

	Mean difference in scores pre-post	Difference in onsite and online means	*p*	Cohen's D for onsite to online differences
IPQ	Onsite-4.59 Online-1.65	-2.94	.004*	.31

*$p \leq .05$

3.2.1 *Subscale analyses*

The poverty scale subscales of stigma and structural perspective improved significantly ($p < .05$) for both onsite and online. Neither onsite nor online participants showed a significant improvement in the personal deficiency domain. In 2020, participants actually showed a more negative attitude post-intervention in this domain, but not in 2021.

The IPQ Subscales of teamwork and communication, interprofessional interactions, and interprofessional relationships showed significant improvement for both onsite and online; interprofessional learning was non-significant for both. There was a significant difference (x = 1.72; SD = .43; $p < .001$; Cohen's D .43) favoring onsite in the magnitude of improvement for interprofessional interaction.

3.2.2 *Demographic Associations*

Linear regression models were fitted with demographic variables as predictors for both full scales; subscales were not modeled. For the poverty scale, demographic variables were not significant for onsite or online participants. For the IPQ, in the onsite simulation, demographic variables overall accounted for 2.2% of the variance, with Major being the primary influence. Demographics had no significant impact on pre-post changes for the online model.

3.3 Research question 3: How do participants perceive the online experience of the poverty simulation?

The most common differences noted by researchers in their analysis are described in Table 8.

3.3.1 *Emotional response to simulation*

Researchers noted similar emotions discussed by both online and onsite interviewees, but the online emotions were slightly less varied and not as intense. Intensity of emotion is easy to recognize but difficult to quantify. To illustrate the difference in intensity, the most intense stress-related quote for each group identified by researchers were:

Onsite: There were times during the simulation I felt like a deer in the headlights. I remember a couple times I was standing there in the middle of it all, saying "I don't know what to do. I don't know how to solve this. I don't know what to do next." And so I would just stand there, and suddenly the week would end, and I feel like, "Okay. We've got to do something next week." Sophomore Social Work Major, 2018
Online: Emotionally, for me, it was very stressful and for multiple different reasons. One being that I only had three people in my family, and one of them couldn't navigate anywhere so he left before the second week. The other girl was

driving while she was trying to [participate in the simulation]. She also left within the second or third week, so it ended up just being me trying to do everything for the family. And so, I mean, that's kind of stressful. But when we wrote our reflection paper on it, it made me realize that people [sometimes] aren't reliable, and when you're poor, you need to count on people.. Sophomore Social Work major, 2021

Table 8. Interview participant characteristics

	Onsite (N = 15)	Online (N = 11)
Major		
Education	3	1
Social Work	4	3
Nursing	3	3
Ministry	2	2
Pre-Art Therapy	1	0
Occupational Therapy	2	0
Exercise science	0	1
Criminal justice	0	1
Academic Rank		
Sophomore	4	4
Junior	1	3
Senior	8	3
Graduate Degree	2	1
Role in the Simulation		
Child	4	3
Adult without Children	2	6
Parent	4	2
Elder Adult	2	0
Resource/Debriefer	1	0

While the online student was clearly frustrated, she did not use highly emotionally charged words to describe her stress. Her frustration was with the other students in her group disengaging rather than the stress caused by the simulation. However, the quote also illustrates that this particular student could generalize the experience to poverty, producing experiential learning for this student.

3.3.2 *Fewer shared experiences*

In a previous qualitative analysis of onsite participants, observing and sharing the experiences of others amplified the experience.[24] By contrast, online participants described few shared experiences. They did not typically observe others being disrespected or having bad things happen to them. Online resources were in breakout rooms; occasionally, a participant observed interactions between the resource volunteer and other participants. One participant commented "I remember seeing two people talking to an official, and the one was pleading with them for a better option, and she just wasn't getting it". (Senior Ministry major, 2020). In the onsite simulations, these events were observable regularly because everyone was in a large room together. Both online and onsite students commented on the impact of hearing families in their debriefing describe things that happened to them.

3.3.3 *Environmental differences*

For this theme, observations from volunteers who participated in both onsite and online simulations are included in addition to student interview data. Volunteers noted that onsite, participants feed off other's energy, and there is a sense of adventure, which is missing in the online simulation. By week 4 of the onsite simulations, many participants are literally running from one resource station to another, trying to complete their tasks. Online, volunteers reported seeing adults, children, and pets walk across the room and sometimes interact with participants during the simulation, distracting both the participants involved and their "family members" or others in the debriefing group. In participant interviews, a number of online participants described challenges with engagement.

I do think [being online] made it a lot harder to engage in the simulation because you are not having that interaction face to face, and the distractions that were available around me made it harder to stay engaged. Sophomore Social Work major, 2020

It's a little bit less personal because while you're able to quickly see [resources and family members], it's also easier to quickly click away and go do something else and not talk to family members. Junior Exercise Science Major, 2021

3.3.4 *Engagement/embodied presence*

Not being present physically had more of an impact on learning and emotions for some students than others. Online student comments varied, but overall, they reflected a lower engagement level.

I think there's a lack of the "in the moment"; feeling you are actually present in the situation. Even though I did feel a little tense during the simulation, I was not physically standing in that setting. Senior Ministry major, 2020

3.3.5 *Comparison of onsite and online participant themes*

The discussion above centered on differences between onsite and online participant experiences identified by researchers. In this section, we review major participant themes identified in a previous analysis of onsite interviews[24] and compare them to the themes identified in online interviews.

1) Increased empathy toward those in poverty.

Increased empathy was identified by 15/15 onsite participants vs. 7/11 online participants. Among onsite participants, three sub-themes were identified in developing empathy: imagin-

ing how others may feel, relating one's own story to those of persons in poverty, and seeing one's vulnerability. Online students discussed imagining how those in poverty may feel but tended to do this in the debriefing and follow-up assignments. Personal vulnerability was articulated only once by an online student, who brought up the role of debt in deepening poverty; having student loan debt himself, he felt vulnerable.

Both groups expressed new understandings about poverty. In the online interviews, themes included, in order of frequency: time pressure, competing priorities, knowledge of resources, disrespect by resources, unexpected events, role of mental health/substance abuse disorders, present-focused time orientation, role of legal issues, isolation, transportation issues, difficulty of staying positive, impact on children, language barriers, and limitations. In the onsite interviews, new understandings included time pressure, competing priorities, knowledge of resources, the multifaceted nature of poverty, the effect on values and choices, staying in bad situations, transportation, housing issues, age-related impacts, and present-focused time orientation. Selected quotes from online participants are given below.

I feel like there was a lot of focus on just living and surviving. No long-term plans, no long-term goals. It was just, I need to get through the day, I need to get through the week. Junior Criminal Justice major, 2020

I thought the part of the simulation that was really helpful was to understand the everyday setbacks that people in poverty face. We lost our house [in the simulation] because we couldn't pay rent. That was eye-opening with the experiences that people face... I was able to empathize more, having felt just a tiny bit of what it might be like to be in poverty. Senior Ministry major, 2020

It really showed me the perseverance that someone has to have if they are in poverty. They go through a lot more than some people realize, and they're not in poverty because of anything that they can control... You can't just say to someone in poverty, get a job, or go find a higher paying job, 'cause it's not always something that's feasible for them. There's a lot more to it than that. Junior Exercise Science major, 2021

Poverty is something that there is a lot of discrimination about; there's microaggressions that you may not realize that you are portraying. We're aware of those things when it comes to race or ethnicity or gender or things like that. But when it comes to poverty...it opened my eyes. Doctoral nursing student, 2021

2) Application of learning to practice

Online and onsite participants often identified similar lessons about applying poverty content to their future professional practice. Both groups talked about increasing empathy, being more understanding, and giving grace. Other points discussed included knowing the resources and the importance of resources being respectful, flexible, and accessible. A difference was that themes about resources were explored more frequently and in greater depth among the onsite participants than among the online participants. The following are samples of online student quotes about applications to practice in their field:

A patient may be not taking their medication, not being compliant. [I should be] asking them the why: What's in your life that's causing you not to be able to take your medication? Is it just because you don't want to, 'cause that's where our mind goes; at least, that's where my mind goes. "It's just too much work. You don't want to do it." But maybe it is a financial issue and that's why they're not doing it. Understanding to ask those type of questions is the first step. And then pairing them with resources that I know, that maybe they don't know, or they don't have. I'd like to be more tolerant—more understanding. I think I will be after this with my patients, with my students. Doctoral Nursing student, 2021

One thing I noticed is, going through poverty, you definitely need a support system around you. Not just to help out financially, but you need people to be there for you... The church is definitely a large part of helping out monetarily, where we can see what needs they have that we can meet. But also helping them to find a community where they know that they're loved and can find comfort in God. Senior Ministry major, 2021

As an educator, it had me thinking, "How best can I be available to my students in more than just a teacher-student role"? My main reason for being a teacher is so I can build a community among my students. When they are no longer in my classroom, and they are in other people's class, they can say, "Okay, in Miss A's class we learned how to do this". They can incorporate that in everything that they do. Sophomore Education major, 2020

Since I understand what they're going through, I'll be more capable and emotionally there to help them with the resources that they need because I know it's a difficult process. Sophomore Social Work major, 2021

3) Application of Interprofessional learning to practice

Learning the roles of the different disciplines, communication, and the effectiveness of the IP team were themes present for onsite and online participants. Sample quotes are presented below.

Online: It helped me see how, in the nursing profession, we can advocate for people in several different ways. Part of that is using those of other professions to get the best care possible for our patients... We are not just trying to get them

physically better and then just kick them out the door; we want to make sure that they have mental health resources and assess their emotional well-being and how they're doing spiritually; assess the whole person and all the different aspects that go into their health. Knowing that there are other professionals we can collaborate with, like dietary and social work, even outside the hospital with other rehab facilities, like psychologists and social workers. Senior Nursing Major, 2020

Online: [The simulation helped me see that] as a teacher, I can help out with education, with academics; the social worker can help with outside resources, and then the guidance counselor can help with her mental state, keeping her happy.... You have more of a team; you have groups of people who are able to help you out in your own school building. Sophomore Education student, 2020

Onsite: Working with nursing majors and other majors made me realize that other people (besides social workers) are still needed to help those in poverty. Social Work major, 2017

Onsite: The discussion after the experience was helpful for seeing how different professions would address different aspects of a client's life or experience. Hearing what other peoples' roles were was interesting because I was so focused on my own role. Occupational Therapy Doctoral student, 2017

In comparing online and onsite reflections on the professional application of learning about poverty and interprofessional collaboration, the qualitative data does not suggest that the online experience was inferior to the onsite experience in applying the interprofessional learning to practice.

4. Discussion

4.1 Research questions

4.1.1 *Attitudes toward poverty*

Both onsite and online participants demonstrated significant improvement in attitudes toward poverty ($p < .000$), but with a significant difference favoring onsite ($p < .011$; small effect size .23). Both onsite and online subscale scores showed improvement for stigma and structural perspective but not for personal deficiency, which is similar to what other researchers have found e.g., Merlin-Knoblich et al.,[29] for onsite simulations.

4.1.2 *Attitudes toward interprofessional collaboration*

Both onsite and online participants demonstrated a significant improvement in attitudes toward interprofessional attitudes ($p < .000$; $p < .014$) but with a significant difference favoring onsite ($p < .004$; small effect size .31). However, in 2020 there was no significant difference, whereas in 2021 there was a significant improvement. It is likely that refinements in the online debriefing contributed to the improvement from 2020 to 2021. Subscale 3 (interprofessional interactions) also was significantly different between onsite and online, favoring onsite. Interactions with peers from other disciplines in the online environment may be less impactful than onsite.

While pre-test attitudes toward poverty between pre-pandemic and pandemic years were not different, there was a slight worsening in baseline scores on the IPQ between 2020 and 2021. It is easy to imagine that 18 months of social distancing and masking in their classes could make students less enthusiastic about interprofessional relationships.

4.1.3 *Participant experience*

In Jarvis'[5] learning theory, emotion interacting with action is crucial to personal transformation. Our quantitative results showed smaller effect sizes for online participants. In the qualitative data, the emotional response of the online participants was judged as less intense than that of onsite participants, and there were fewer opportunities to observe the negative experiences of others in the online environment, reducing the chances of vicarious emotional engagement. In the debriefing groups, participants had opportunities to discuss their experiences with each other, but a Zoom discussion may lack the emotional impact of an in-person conversation. If online participants had less range and intensity of emotion than onsite participants, this might explain the quantitative findings of a smaller effect size. However, interviewee discussions about application of the learning to professional practice, arguably the purpose of the experience, were not different between groups. It is possible that online participants with less emotional engagement during the simulation enhanced their learning through later reflection and action, particularly those engaged in regular clinical or field experiences following the simulation. If emotion is critical to long-term change in attitudes and behaviors, as Jarvis theorizes, does the emotion have to occur at the time of the simulation?

Qualitative results specific to interprofessional learning did not yield differences that were obvious to the researchers, despite smaller effect sizes in the quantitative results. This may be because the interprofessional learning was less emotionally driven than the poverty-related learning. In addition, our previous research found that onsite student learning about interprofessional collaboration occurred in the small group debrief, class discussions or reflection assignments, and clinical experiences.[25] Since the IPQ was administered immediately following the large group debrief, the quantitative results did not reflect the full scope of interprofessional transformation, whereas the interviews did.

4.2 Changes made to online simulation based on lessons learned from year 1

In 2020, the online quantitative differences in attitudes toward poverty were less robust than in 2021, and for interprofessional attitudes, the 2020 differences were non-significant, whereas the 2021 results were significant. Our planning team implemented a number of changes between 2020 and 2021 based on observation and feedback. How were the 2020 and 2021 simulations and debriefings different, and which differences most likely accounted for improved outcomes in 2021?

In 2020, in an attempt to simplify the online simulation, some elements that make the simulation challenging were left out, such as requiring payment for transportation between the resources. Only a few families received fate cards (unexpected, primarily adverse, events). No participants were arrested or taken to jail. Errors due to unfamiliarity also contributed. Some resource volunteers failed to put minus signs in front of expenses, so families were paid, rather than charged for, goods and services they obtained. Four families received paychecks weekly when they should have been paid monthly. Some errors were corrected between the first and second 2020 simulations; the remainder were corrected in 2021. In 2021, we restored family fate cards, and added a police officer to arrest and send participants to jail. However, we did not develop a way to charge for transportation.

Specific technical issues reported in 2020 included difficulty moving about the simulation, difficulty accessing the family budget, being dropped from resource rooms, being permitted by volunteers to stay in resource rooms into the weekend, some resource volunteers being locked out of Zoom for some length of time during the simulation, and difficulty getting questions answered. Other reported issues included a required Alcoholics Anonymous meeting that did not occur, resource rooms where no one was there, and no facilitator in a debriefing room. Resources were in separate Zoom sessions in 2020 but in breakout rooms within the same Zoom session in 2021, which greatly decreased technical issues (this was possible due to technical improvements in Zoom).

Leading a small debriefing group online is a slightly different skill set than leading one in person. In 2020, many of our volunteers had not led synchronous online discussions before. In interviews, some 2020 participants reported that their debriefer volunteers did not ask the interprofessional questions. By 2021, not only were most volunteers more familiar with leading online discussions, but we also provided tips for effectively leading discussions in Zoom for the facilitators.

4.3 Suggestions for improvement/lessons learned in implementing online simulation

4.3.1 *Technical issues*

While some of the frustration expressed by online participants was technology-related, the qualitative data suggests that frustration with technology enhanced the emotional impact of the simulation. In reality, those in poverty increasingly must interact with technology, and experience more technical issues than those with more expensive, sophisticated, and up-to-date technology and IT support.[20] Technical difficulties can be framed as a part of the poverty experience. We added this framing to the pre-brief in 2021, and participants interviewed reflected this perspective when discussing technical issues with the simulation.

We emailed written instructions and a video demonstrating navigation through the simulation beforehand; course faculty emphasized watching the videos before the simulation. Many technical issues were solved by emphasizing that mobile devices cannot be used for participation.

4.3.2 *Lack of engagement/dropping out*

The problem of participants leaving the simulation before it was finished was significantly mitigated in 2021 by making it clear in multiple ways to participants that they needed to be present, use a computer and not a phone, stay to the end, and complete the final survey to receive credit for attending.

4.3.3 *Families*

Some participants in 2020 said there was not enough family time on the "weekend". Families sometimes had less than 5 minutes in their family breakout rooms. In 2021, weekends were 10 minutes or more. No participants complained about inadequate family time at 10 minutes. Several participants suggested encouraging participants to exchange phone numbers with other family members to allow communication when not in the family breakout room.

4.3.4 *Child characters*

While children walk to school in the simulation, the parent is supposed to take babies and preschoolers to daycare and pay their fees. Online, parents could not "take" a child to daycare. We eliminated the pre-school aged child characters and daycare from the online simulation in 2021.

A common complaint among those online who played children was that they had nothing to do, and sat in the family breakout room alone and bored after school. School-aged children attend school, but school is only about half of the week. Onsite children had after-school opportunities to observe others and to get into mischief; online children stared at an empty Zoom breakout room waiting for the weekend. We recommend developing a way to simulate after-school

activities online for school-aged children.

4.3.5 *Debriefing*

We recommend requiring all participants to turn on their cameras. During the simulation, we had everyone change their name on their Zoom image to their character name. During the first half of the small group debrief, participants continued to keep their character names as they talked about their experiences during the simulation. Then, when the interprofessional questions began, the facilitator asked participants to change their Zoom name to their real name and major, introduce themselves by major and where they live, and describe their professional and personal experiences with poverty. The personal context helped leverage the geographic, age, and experience diversity of online participants, enriching the discussions. We allowed more time for the small group debriefing online.

4.3.6 *Miscellaneous suggestions*

Initially we failed to have a timer or announcement when only a few minutes were left in a week. Adding a countdown timer to the Zoom for each week was an easy technical fix. In the large group debrief, the leader asks questions such as, "How many of you were homeless at some point during the simulation?" With over 60 participants, no one could see everyone who raised their hands because participant images covered multiple screens. Use of the polling feature or other technical fix would increase the impact of these questions.

We set up a text group for resource volunteers for questions and communication. However, in 2020, a volunteer responded to the initial text group, but we learned later that he never manned the resource due to technical issues. An unmanned resource is self-evident onsite but is not as obvious online. In 2021, a coordinator visited each resource room to make sure every volunteer was present and understood what they needed to do. The coordinator revisited each resource on weekends to see if there were questions or concerns. We recommend having at least one or two "excess" volunteers who can step in at the last minute if a resource experiences technical issues.

In the simulation, certain characters are arrested for various crimes and taken to jail. In 2020, we omitted this. In 2021, we included a police officer could arrest participants and had online permissions move them to the jail for the designated timeframe. Facilitators found that in the small group debriefings, having a family member arrested was often mentioned as emotionally impactful. In 2021, we also had someone who went to the family breakout rooms during "weekends" to distribute "fate card" information to the family and deduct money or add it as required by the fate card.

4.4 Advantages and challenges of the online poverty simulation

The most important advantage of the online simulation is allowing students from disciplines whose programs are entirely or primarily online to participate. The online option also facilitates inter-university joint simulations.

Our online simulation was just as labor-intensive as the onsite simulation. However, recruiting people to play the needed roles was easier because online faculty and their family members and friends could serve as resources and debriefers. The online simulation also does not require a physical space or room setup, which simplifies the simulation.

The lesser emotional engagement, the inability of participants to witness the distress of other families, and distractions in the environment were the most significant challenges recognized by organizers. The two most common disadvantages given by participants were other participants who were playing their family members leaving the simulation part-way through, and challenges with staying engaged personally.

4.5 Future research

Does stronger emotion promote more profound changes in attitudes, insights, and behaviors? Are the behaviors longer lasting if the emotion is stronger? How long does the effect of a poverty simulation last, both in attitudes toward poverty and interprofessional collaboration, and more importantly, in actions in the professional setting? Are "boosters" needed? How often and when? These are important questions for both online and onsite poverty simulations.

4.6 Strengths

The necessary switch during COVID-19 from an onsite to an online modality for poverty simulations essentially constituted a natural experiment in determining the effectiveness of an online experience to deliver experiential learning, which theory suggests depends upon emotional engagement to produce transformation. The simulations took place at the same university across five years, using the same immersive, synchronous poverty simulation other than the delivery modality (onsite vs. online), providing a similar comparison condition. The same quantitative measures were used pre-post for both conditions. Post-simulation interview data for selected students from both conditions allowed for a closer look at potential reasons for the quantitative findings.

4.7 Limitations

Generalizability is limited because the simulation was held at one institution, and the participants had minimal ethnic, religious, and gender diversity. Another threat to generalizability is that the technical aspects of the online simulation

require good internet and the use of a computer, as well as soft skills in utilizing technology. The online simulation would be more easily navigable for those who were younger, more educated, and where English was their first language, which may limit who can benefit from an online simulation. Societal differences pre-pandemic and during the pandemic constitute a potential threat to external validity; however, there were only minor differences in pre-test scores between pre-pandemic and mid-pandemic samples.

A final limitation is that the post-test was collected immediately following the large group debriefing. This data did not capture additional learning that may have occurred or been reinforced by post-experience reflection assignments or class discussions. The post-test also does not capture whether students applied the learning from the simulation in their clinical/practicum experiences. The qualitative data was collected 2-3 weeks after the intervention and helped to fill in those gaps.

5. Conclusion

The online simulation allowed the inclusion of additional majors who had not previously been able to participate because their programs were entirely online. It also facilitates joint simulations with other institutions. There were significant improvements in attitudes toward poverty and interprofessional collaboration both onsite and online. Still, the effect size was smaller for the online simulations than the onsite simulations. Qualitative data suggests that lesser emotional engagement with the simulation contributed to this difference. However, reflection and application to practice in the weeks following the simulation may have ameliorated this effect. Suggestions are provided for enhancing the online experience for programs wishing to implement a similar simulation. This research provides insights that may assist institutions in deciding whether to expand synchronous immersive poverty simulation experiences to online students.

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Authors contributions

Drs. Wise, Eby and Sneed were responsible for concept and design, Drs. Wise, Sneed, Eby and Gilreath were responsible for data collected, Drs. Wise, Sneed and Farmer were involved in data analysis and interpretation, Drs. Wise, Gilreath, Sneed and Eby were responsible for writing and editing. All authors read and approved the final manuscript.

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References

[1] American Association of Colleges of Nursing. The essentials: Core competencies for nursing education [Internet]. 2021 [cited 2023 Dec 3]. Available from: https://www.aacnnursing.org/Portals/0/PDFs/Publications/Essentials-2021.pdf

[2] Education Collaborative I. IPEC Core Competencies for Interprofessional Collaborative Practice: Version 3. 2023; Available from: https://www.ipecollaborative.org/2021-2023-core-competencies-revision

[3] National Academies of Sciences Engineering and Medicine. A

Framework for Educating Health Professionals to Address the Social Determinants of Health. 2016 Mar 7; Available from: https://nap.nationalacademies.org/read/21923/chapter/1

[4] Kolb DA. Experiential learning: Experience as the source of learning and development, David A. Kolb, Prentice-Hall International, Hemel Hempstead, Herts., 1984. No. of pages: xiii + 256. J Organ Behav [Internet]. 1984 [cited 2023 Dec 3]; 8(4): 359–60. https://doi.org/10.1002/job.4030080408

[5] Jarvis P. Towards a comprehensive theory of human learning: lifelong learning and the learning society. New York; 2006. 218 p. Available from: https://www.routledge.com/Towards-a-Comprehensive-Theory-of-Human-Learning/Jarvis/p/book/9780415355414

[6] New K, Edwards C, Norris H. Meeting our students' educational needs during a global pandemic: Creating online clinical learning experiences. Teaching and Learning in Nursing. 2022 Jan 1; 17(1): 126–9. PMid:35035317 https://doi.org/10.1016/j.teln.2021.07.006

[7] Hassler LJ, Moscarella D, Easley L, et al. Flipped Clinical Teaching: Battling COVID-19 with Creative and Active Pedagogy. Journal of Nursing Education. 2021 Sep 1; 60(9): 534–7. PMid:34467817 https://doi.org/10.3928/01484834-20210719-03

[8] Hampe H. Online Simulation of a Root Cause Analysis for Graduate Health Administration Students. Clin Simul Nurs. 2017 Aug 1; 13(8): 398–404. https://doi.org/10.1016/j.ecns.2017.04.001

[9] Kim J, Park JH, Shin S. Effectiveness of simulation-based nursing education depending on fidelity: A meta-analysis. BMC Med Educ. 2016; 16(1). PMid:27215280 https://doi.org/10.1186/s12909-016-0672-7

[10] Van Wyk R, Labuschagne MJ, Joubert G. Simulation as an educational strategy to deliver interprofessional education. Afr J Health Prof Educ. 2020; 12(2). https://doi.org/10.7196/AJHPE.2020.v12i2.1213

[11] Morrell BLM, Nichols AM, Voll CA, et al. Care across campus: Athletic training, nursing, and occupational therapy student experiences in an interprofessional simulation. Athletic Training Education Journal. 2018. Available from: https://meridian.allenpress.com/atej/article-abstract/13/4/332/9173 https://doi.org/10.4085/1304332

[12] Smith BS, Anderson K. Attitudes Toward Interprofessional Education: Comparing Physical Therapist and Other Health Care Professions' Students. Journal of Physical Therapy Education [Internet]. 2018; 32(2). Available from: https://journals.lww.com/jopte/fulltext/2018/06000/attitudes_toward_interprofessional_education_.14.aspx https://doi.org/10.1097/JTE.0000000000000039

[13] Phillips KE, Roberto A, Salmon S, et al. Nursing Student Interprofessional Simulation Increases Empathy and Improves Attitudes on Poverty. J Community Health Nurs. 2020 Jan 2 [cited 2023 Dec 3]; 37(1): 19–25. PMid:31905301 https://doi.org/10.1080/07370016.2020.1693095

[14] Clarke C, Sedlacek RK, Watson SB. Impact of a simulation exercise on pharmacy student attitude toward poverty. Am J Pharm Educ. 2016; 80(2). PMid:27073274 https://doi.org/10.5688/ajpe80221

[15] Hitchcock LI, Peterson DT, Debiasi L, et al. Learning About Poverty Through Simulation: A Pilot Evaluation. J Soc Work Educ. 2018 Jul 3; 54(3): 517–31. https://doi.org/10.1080/10437797.2018.1434427

[16] Noone J, Sideras S, Gubrud-Howe P, et al. Influence of a poverty simulation on nursing student attitudes toward poverty. Journal of Nursing Education. 2012; 51(11): 617–22. PMid:22978272 https://doi.org/10.3928/01484834-20120914-01

[17] Miller J, Vick C. An Examination of the Community Action Poverty Simulation in Rural Education. Alabama Journal of Educational Leadership. 2022 Sep; 9: 133–41.

[18] Hernández-Ramos P, Bachen CM, Raphael C, et al. Experiencing poverty in an online simulation: Effects on players' beliefs, attitudes and behaviors about poverty. Cyberpsychology. 2019; 13(3). https://doi.org/10.5817/CP2019-3-1

[19] Layth HA. Playing Spent!: FGWC Experiences of Poverty Simulation Games. 2023 May 26; 51(3): 245–52. https://doi.org/10.1177/0092055X231172598

[20] Parks JM. "It's not always poor decisions": Shifts in business student's attitudes toward poverty after completing Spent. Journal on Empowering Teaching Excellence. 2023 Apr 18; 7(1): 7.

[21] Parks JM, Worthy S. Using Spent's Online Poverty Simulation to Teach Family and Consumer Sciences College Students About Poverty. J Fam Consum Sci. 2023 Jun 15; 115(2): 35–8. https://doi.org/10.14307/JFCS115.2.35

[22] Taylor J. Using Poverty Simulations to Drive Student to Address Social Impediments in Health Care. J Poverty. 2023 Feb 6; Available from: https://www.tandfonline.com/doi/abs/10.1080/10875549.2023.2173704

[23] Think Tank. The Cost of Poverty Experience. 2011. Available from: https://thinktank-inc.org/cope

[24] Wise BL, Sneed KJ, Farmer SF, et al. Student Learning about Poverty and Interprofessional Practice from an Interprofessional Poverty Simulation: A Qualitative Analysis. J Poverty. 2023; Available from: https://www.tandfonline.com/doi/abs/10.1080/10875549.2023.2173706

[25] Wise BL, Sneed KJ, Eby RA, et al. Interprofessional poverty simulation affects student attitudes toward poverty and interprofessional relationships. Internet Journal of Allied Health Sciences and Practice. 2023; 21(1). Available from: https://nsuworks.nova.edu/ijahsp/vol21/iss1/8/

[26] Pollard KC, Miers ME, Gilchrist M. Collaborative learning for collaborative working? Initial findings from a longitudinal study of health and social care students. Health Soc Care Community. 2004 Jul; 12(4): 346–58. PMid:15272890 https://doi.org/10.1111/j.1365-2524.2004.00504.x

[27] Yun SH, Weaver RD. Development and Validation of a Short Form of the Attitude Toward Poverty Scale. Adv Soc Work [Internet]. 2010 Oct 18; 11(2): 174–87. https://doi.org/10.18060/437

[28] Yin, Robert K. Qualitative Research from Start to Finish. 2011, Guilford Press.

[29] Merlin-Knoblich C, Summers LTM, Abrams L. The Immediate and Extended Impacts of Poverty Simulations on Multicultural Attitudes and Attitudes Towards Poverty. J Poverty. 2023; 27(3): 235–51. https://doi.org/10.1080/10875549.2021.2023723

[30] Pew Charitable Trust. America's digital divide [Internet]. 2019 [cited 2023 Dec 3]. Available from: https://www.pewtrusts.org/en/trust/archive/summer-2019/americas-digital-divide