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Research Article

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Effectiveness of a Poverty Simulation in Second Life[®]: Changing Nursing Student Attitudes toward Poor People

Abstract: Social justice is a fundamental value of the nursing profession, challenging educators to instill this professional value when caring for the poor. This randomized controlled trial examined whether an interactive virtual poverty simulation created in Second Life[®] would improve nursing students' empathy with and attributions for people living in poverty, compared to a self-study module. We created a multi-user virtual environment populated with families and individual avatars that represented the demographics contributing to poverty and vulnerability. Participants ($N = 51$ baccalaureate nursing students) were randomly assigned to either Intervention or Control groups and completed the modified Attitudes toward Poverty Scale pre- and post-intervention. The 2.5-hour simulation was delivered three times over a 1-year period to students in successive community health nursing classes. The investigators conducted post-simulation debriefings following a script. While participants in the virtual poverty simulation developed significantly more favorable attitudes on five questions than the Control group, the total scores did not differ significantly. Whereas students readily learned how to navigate inside Second Life[®], faculty facilitators required periodic coaching and guidance to be competent. While poverty simulations, whether virtual or face-to-face, have some ability to transform nursing student attitudes, faculty must incorporate social justice concepts throughout the curriculum to produce lasting change.

Keywords: Second Life[®], virtual simulation, poverty, on-line teaching, social justice, nursing students

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Social justice is a fundamental value of the nursing profession (American Association of Colleges of Nursing, 2008, p. 4). To ensure the poor are cared for fairly, it is the responsibility of nurse educators to instill this value in students. One approach to deepen student empathy is to immerse students in an experiential learning modality about poverty and poor people.

Background

Besides lack of education on the multiple causes of poverty and limited experience of being poor (Vandsburger, Duncan-Daston, Akerson, & Dillon, 2010), college and nursing students may have unrealistic expectations for those living in poverty. They may blame behavioral factors (e.g. laziness) rather than structural factors (e.g. lack of transportation), which can interfere with the quality of their care and civic engagement after graduation (Cozzarelli, Wilkinson, & Tagler, 2001; Reutter, Sword, Meagher-Stewart, & Rideout, 2004; Vandsburger et al., 2010). One way to address this knowledge, experience, and belief gap is through experiential poverty simulations, which have shown promise in changing nursing students' attitudes about people living in poverty (Menzel, Clark, & Darby-Carlberg, 2010; Noone, Sideras, Gubrud-Howe, Voss, & Mathews, 2012; Patterson & Hulton, 2012).

Poverty simulations reported in the literature have used copyrighted kits for face-to-face sessions from the Missouri Association for Community Action (MACA, n.d.), which require extensive financial, human, and space resources. Fewer resources are needed to conduct a virtual poverty simulation.

Theoretical/conceptual basis

Active cooperative learning is a "method to teach the critical thinking skills necessary" for nursing students to

apply classroom knowledge to the care of “patients, families and communities in a manner that promotes positive health outcomes” (Hoke & Robbins, 2005, p. 348). A hallmark of this educational strategy is student interactions in small groups (Glendon & Ulrich, 1992; Ulrich & Glendon, 1999). This interaction can increase learning in simulations (Jeffries, 2005).

Multi-user virtual environments promote active learning by allowing simultaneous participants to interact with digital objects and each other in the form of “avatars” (fictionalized computer representations of persons) and experience real world problems (Dieterle & Clarke, 2009; Sewell & Thede, 2013). Second Life® is a program used increasingly in virtual reality simulations in nursing education (Aebersold, Tschannen, Stephens, Anderson, & Lei, 2012; Ahern & Wink, 2010; Evans & Curtis, 2011; Farra, Miller, Timm, & Schafer, 2013; Honey, Connor, Veltman, Bodily, & Diener, 2012; Tiffany & Hogle, 2013; Wood & McPhee, 2011). It supports interaction by allowing communication (verbal or text) among avatars and provides an internal currency (L\$) for participants to make purchases or be paid.

A literature review identified the benefits of virtual worlds to create immersive environments in nursing education but found a knowledge gap in the best way to use them (Green, Wyllie, & Jackson, 2013). Graduate nursing students in one study found Second Life® an effective teaching/learning strategy to help them apply concepts when working with marginalized populations (Tiffany & Hogle, 2013).

Unlike most of the Second Life® simulations used in nursing education, the virtual poverty simulation was not designed to teach a new skill. Rather, it was designed to set in motion transformational learning by changing a student’s perspective through participation in a “disorienting dilemma” (Vandsburger et al., 2010, p. 304). In this case, the dilemma was stepping into the shoes of a poor person and attempting to meet life’s demands with inadequate resources and multiple obstacles.

The purpose of this study was to develop a poverty simulation for nursing students through a multi-user virtual environment and to evaluate the pedagogical effectiveness of this virtual active learning experience compared to a passive learning approach, also delivered on-line. The study was designed to answer the following research questions:

1. Does an active learning experience produce more positive changes in attitudes about poverty and poor people than a passive learning approach?
2. Does a virtual simulation increase student recognition of the association between poverty and health compared to a passive learning approach?

Methods

Because nursing education research often lacks rigorous design (Broome, Ironside, & McNelis, 2012; Yucha, Schneider, Smyer, Kowalski, & Stowers, 2011), this study was a randomized controlled trial, with participants assigned to either the Intervention or Control group. Based on a small to moderate effect size of 0.40 (derived from data from a pilot study in the fall of 2008), the study required 100 subjects in each group to have adequate power to detect a difference between the two groups (Beckstead, n.d.).

The sampling frame was baccalaureate students in community health nursing courses over three semesters at a state-funded university. The principal investigator had to eliminate from participation a second baccalaureate school after its computers could not run Second Life®. The university’s institutional review board approved the study. Because the principal investigator was in a position of authority over community health students, another investigator explained the study, obtained informed consent, and randomized students.

Intervention

The principal investigator, a graduate nursing student, and an educational consultant familiar with Second Life® created the simulation on paper, then transferred it onto Wald Island (named for Lillian Wald, a public health nursing pioneer) in Second Life®. See Figure 1. We blocked outsiders from access to the password-protected virtual community.

The design team created two generic families that varied with factors correlated with poverty and that students often encountered in their community clinical experiences. One model was a matriarchal homeless family that had experienced job losses and subsequent eviction, as well as loss of health insurance. They had a variety of poor health conditions, did not have education beyond high school (if that), and the children faced challenges in school. The immigrant family faced language, legal documentation, educational, and cultural barriers. The children faced school difficulties due to language and behavioral problems. They could find work as day laborers or temporaries. The team created avatars corresponding to each character in each family.

The intended outcomes of the simulation were consistent with meeting at least one of the objectives of the community health course and to match students’ level of

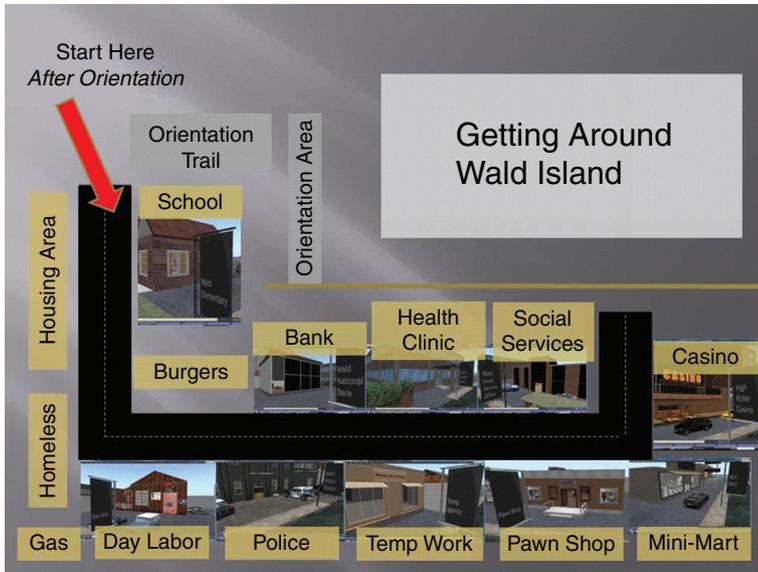


Figure 1 Overview of Wald Island in Second Life®

Table 1 Simulation timetable

Time	Activity
8:30–9:30	Orientation
9:30–9:45	Break
9:45–10:00	First “week” of simulated “month”
10:00–10:05	Student planning for next “week”
10:05–10:20	Second “week”
10:20–10:25	Student planning for next “week”
10:25–10:40	Third “week”
10:40–10:45	Student planning for next “week”
10:45–11:00	Fourth “week”
11:00–11:15	Break
11:15–12:30	Debrief

knowledge. It included four 15-minute “weeks” to equate to the experience of living a month in poverty. Family groups (consisting of two to five avatars) were given a

5-minute break between each “week” to plan for the following week. See Table 1 for the timetable. The goals of each week varied by family but generally included looking for work or working; seeking social services; keeping medical appointments; ensuring children attended school; attending school, if the avatar was assigned a child role; paying for rent, utilities, transportation, and food; and receiving payment from employment or from sale of possessions. (See Figure 2 for sample family.)

Faculty members were assigned pre-defined roles as well: social worker, nurse practitioner, teacher, day labor and temp office managers, banker, pawn shop and convenience store proprietors, and police officer. The virtual walls of the buildings contained informational signs about poverty to give the students something to read while they waited in long lines for services.

Demographics: This immigrant family consists of four people: father Cable Cortez (50 years old), mother Clara Cortez (33), children Cora Cortez (12), and Cade Cortez (11). Neither Cable nor Clara has immigration papers or speaks English. Cable is unable to work as a mason due to accident that crushed his right arm. Receives a monthly disability payment from the union. Clara is working as a house cleaner through Day Labor. Cora and Cade, born in this country, are in school. They rent a one bedroom apartment. They would like to rent a larger one.

Assets: Have 8 Travel Passes, a box of valuables worth L200, and L100 in cash when simulation starts. Valuables are stored in apartment in the Housing Area.

Income: Cable receives his monthly L300 disability payment at the end of the first week. If Clara is able to work as a Day Laborer, she will earn L250 a week (L8 an hour × 40 hours less taxes).

Expenses: L150 each week for Food for One Week. Rent of L400 is due the first week, but they must pay it no later than the end of second week or face eviction in the third week. In addition, must pay utility bills of L150 at the end of second week to avoid disconnection in the third.

Figure 2 Sample family

Procedures

Faculty members were oriented to their roles and to Second Life® in two sessions; one was on-line as a group, followed by one-on-one sessions with each faculty member. The investigators oriented three consecutive trimesters of community health students to Second Life® in a 1.5-hour practice session, then randomized them at a later date by use of a table of random numbers.

Whereas all students were required to complete their assignment depending on randomized group (participation in the simulation or completion of the on-line self-study and quiz), only those students who agreed to participate in the study completed the pre- and post-intervention questionnaire. The questionnaire was delivered through SurveyMonkey®. The pre- and post-questionnaires were available for 1 week prior to or after the simulation.

On the day of the intervention, students were randomly assigned to avatars and families based on where they were seated in the computer lab on the day of the simulation. At the conclusion of the simulation, the investigators divided the participants into three groups (keeping family members together) for debriefing following a script.

Instrument

We used the Attitude toward Poverty Scale (Atherton & Gemmel, 1993), which has been used before with nursing students (Reutter et al., 2004). The Attitude toward Poverty instrument (37 question version) has a Cronbach's alpha of 0.93 and a split-half (odd versus even) reliability of 0.87, both acceptable. Its validity was established via the known groups' method (Atherton & Gemmel, 1993). Nine questions are reverse coded so that higher scores indicate a belief that structural determinants cause poverty, while lower scores favor an individual behavioral explanation. We added eight questions about the relationship between poverty and health that were used in a previous study in nursing students (Reutter et al., 2004). Five of those questions were reverse coded to allow a higher score to reflect a more favorable attitude. In addition, we collected limited demographic data. Students created a unique identifier to enable matching of pre- and post-questionnaires.

Subsequent to this study, Yun and Weaver (2010) developed and validated a short form of the Attitude toward Poverty Scale (ATP Short Form) and established three factors: Personal Deficiency – seven items, Stigma –

eight items, and Structural Perspective – six items. To allow comparison of this study's findings to a study using the Short Form, the data were analyzed again using these 21 questions only.

We used PASW Statistics 18.0 (SPSS) for all data analyses. Statistical tests included frequencies, chi-square, and two sample *t*-tests of differences in means, unpaired and paired samples. Significance was set at $p \leq 0.05$. Cronbach's α (internal reliability) was calculated.

Results

A total of 98 senior students over three semesters completed either the simulation or the self-study module; 51 students completed both questionnaires for a participation rate of 53%. The majority (77%) was in the age group 20–29 years, with 16.9% aged 30–39 years, 4.8% 40–49 years of age, and one response missing. There were no significant differences in age between the Intervention ($n = 33$) and Control ($n = 18$) groups, nor did they differ significantly on the pre-questionnaire on any item except for one, with the Control group disagreeing more with the question “Any person can get ahead in this country,” indicating they had a more favorable attitude toward poor persons.

Using the *t*-test for independent samples to assess the difference pre- and post- intervention on the total score on the Attitude toward Poverty questionnaire between the Intervention and Control groups, the difference was not significant, either for the 37 question original instrument or the 45 question modification. However, there were significant differences on individual questions (Table 2).

Using a paired samples *t*-test, there was no significant change in the total score pre- and post-intervention within the Intervention group. However, there were significant changes in individual questions (Table 3).

Using a paired samples *t*-test, there was no significant change in the total score pre- and post-intervention within the Control group. However, there were significant changes on individual questions (Table 4).

Using the ATP Short Form to analyze the data, the Intervention group showed a significant change (improvement) compared to the Control group on one question on the Personal Deficiency factor and on no questions on the Stigma and Structural Perspective factors. Comparing the Intervention group's pre- and post-scores, there was a significant change (more unfavorable attitude) on one question on the Personal Deficiency

Table 2 Individual question differences between Intervention and Control groups ($p \leq 0.05$)

Question	Direction of change ^a	
	Intervention	Control
Any person can get ahead in this country.	+	-
If poor people worked harder, they could escape poverty.	+	No change
Unemployed people could find jobs if they tried harder.	+	-
Most poor people are satisfied with their standard of living.	+	-
Poor people generally have lower intelligence than non-poor people.	+	-

Note: ^a+, More favorable attitude toward poverty and poor people; -, more unfavorable attitude.

Table 3 Within Intervention group change, pre- and post-intervention ($p \leq 0.05$)

Question	Direction of change ^a
Welfare makes people lazy.	+
People in welfare should be made to work for their benefits.	+
Some “poor” people live better than I do, considering all their benefits.	+
There is a lot of fraud among welfare recipients.	+
Poor people are dishonest.	-
Society has a responsibility to help poor people (reverse coded; agreement scored higher).	-
Poor people are discriminated against (reverse coded; agreement scored higher).	-
I believe I could trust a poor person in my employ (reverse coded; agreement scored higher).	-

Note: ^a+, more favorable attitude toward poverty and poor people; -, more unfavorable attitude.

factor, a significant change (more favorable attitude) on three questions on the Stigma factor, and a significant change (more favorable attitude) on three questions on the Structural Perspective factor.

Discussion

There were significant differences between groups in five individual questions, with the Intervention group disagreeing more with behavioral causes of poverty, leading to a qualified yes in answering Research Question #1. All

Table 4 Within Control group change, pre- and post-intervention ($p \leq 0.05$)

Question	Direction of change ^a
If poor people worked harder, they could escape poverty.	+
People in welfare should be made to work for their benefits.	+
Poor people act differently.	+
There is a lot of fraud among welfare recipients.	+
Poor people will remain poor regardless what’s done for them.	-
Society has a responsibility to help poor people (reverse coded; agreement scored higher).	-
Poor people are discriminated against (reverse coded; agreement scored higher)	-
I believe I could trust a poor person in my employ (reverse coded; agreement scored higher).	-

Note: ^a+, more favorable attitude toward poverty and poor people; -, more unfavorable attitude.

of the questions showing a favorable change were related to individual behaviors as a cause of poverty.

None of the questions with a significant difference related to the connection between poverty and health, leading to a qualified no in answering Research Question #2. This may be due to an inadequate sample size, ineffective emphasis in the simulation on the connection between poverty and health, lack of standardization in the post-simulation debriefing, experience brevity, or a combination of these factors.

These results are consistent with the findings (using the ATP Short Form) that a face-to-face simulation for baccalaureate nursing students produced no significant change in the Personal Deficiency factor but significant improvements on two questions on the Stigma factor and a significant decline on one question on the Structural Perspective factor (Patterson & Hulton, 2012). However, another study found that a face-to-face simulation produced a significant increase in scores on the ATP Short Form compared to the Control group (Noone et al., 2012).

The sample size was inadequate to detect a difference in total score between groups. It would have increased the sampling frame had the second school planned for inclusion been able to participate. Although educational research is strengthened by involving multiple institutions (Yucha et al., 2011), unforeseen problems when including other schools can create implementation challenges. As a result, generalizability of this study is a limitation.

While most nursing students were between 20 and 29 years of age, the faculty members were older. This age divide may account for the noticeable difference between the Second Life® training needs of faculty members and students. While students were able to become proficient in Second Life® within an hour, faculty members required considerably more time and individual tutoring, up to 4 hours initially.

Although faculty members had adequate time to practice navigating the avatars in Second Life®, moving the avatar with the keyboard during the actual simulation proved to be a challenge even though they were sincerely committed to participation. As an example, the avatar can go backward and forward as well as up in the air (jumping or flying). In addition, the avatars must move around in simulated buildings (going to bank, clinic, work, or school). Some faculty moved the avatars jerkily, while the students moved the avatars smoothly in the direction they needed to go without any difficulty at all. At the same time a participant is navigating the avatar in the virtual environment, the avatars must communicate by text with each other, which posed multitasking challenges to faculty but not students.

Faculty members who had participated in both the previous face-to-face simulations (using the Missouri Association for Community Action kit) and the virtual simulations expressed a decided preference for the former, which they found less stressful and more satisfying for interactions with students. The lack of sound capability for the virtual simulation required faculty and students to communicate by text (where it is difficult to convey emotion), whereas in the face-to-face simulation, both could talk freely. However, students in the Intervention Group did comment that they found Second Life® “fun” and “cool.” As a result, some students in the Control group, who completed the self-study module, expressed envy, which may explain why Control group study participation was so low.

While a virtual simulation does not require the extent of the physical resources associated with a kit, it does

require graphics-capable computers and Second Life® fees (“island” purchase and annual renewal), which can be costly. With many nursing schools moving programs on-line, future studies should evaluate the effectiveness of less costly ways to produce transformation learning for nursing student to promote competency for working with those living in poverty, such as playspent.org. It is also possible that a virtual simulation could be created on a free platform, such as Reaction Grid (<http://reactiongrid.com/>).

The interactive nature of a virtual poverty simulation poses challenges for use as an asynchronous application. However, it is possible to develop avatars that are scripted to interact with students around certain parameters, but programming costs are steep.

Conclusions

The virtual simulation required somewhat more faculty time than the face-to-face simulation due to the need for application training and re-training before each simulation. In the face-to-face simulation, faculty members or community volunteers required only brief training, an advantage.

Although poverty simulations, whether physical or virtual, have some power to transform nursing students in the cognitive and affective domains, it is unrealistic to expect a 2.5-hour simulation (face-to-face or virtual) to change radically student attitudes toward poor people. However, such experiences combined with faculty members threading social justice throughout all courses can reinforce learning to produce graduates better able to meet the needs of the sizeable proportion of the population who live below the poverty level.

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