Feasibility of a Cinematic-Virtual Reality Program Educating Health Professional Students about the Complexity of Geriatric Care: A Pilot Study

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Table of Contents

Original Manuscript **5**
Supplementary Files **27**
TOC/Feature image for homepages **28**
TOC/Feature image for homepage 0 ..... **29**

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Abstract

Background: The United States population is aging. With this demographic shift, more older adults will be living with chronic conditions and geriatric syndromes. To prepare the next generation of health care professionals for this aging population, we need to provide training that captures the complexity of geriatric care.

Objective: The aim of this pilot study was to assess the feasibility of the cinematic virtual reality (cine-VR) training in the complexity of geriatric care. We measured changes in attitudes to disability, self-efficacy to identify and manage elder abuse and neglect, and empathy before and after participating in the training program.

Methods: We conducted a single arm, pre-test and post-test pilot study to assess the feasibility of a cine-VR training and measure changes in attitudes to disability, self-efficacy to identify and manage elder abuse and neglect, and empathy. Health professional students from a large university in the Midwest were invited to participate in one of four cine-VR trainings. Participants completed three surveys before and after the cine-VR training. We performed paired t-tests to examine changes in these constructs before and after the training.

Results: A total of 65 health professional students participated in and completed the full cine-VR training for 100% retention. Participants did not report any technological difficulties or adverse effects from wearing the head-mounted displays or viewing the 360-degree video. Of the 65 participants, 48 completed the pre- and post-assessments. We observed an increase in awareness of discrimination towards people with disability (t.05,47= -3.967, P<.001). Additionally, we observed significant improvements in self-efficacy to identify and manage elder abuse and neglect (t.05,47= -3.364, P=.002). Lastly, we observed an increase in participants' empathy (t.05,47= -2.329, P=.024).

Conclusions: We demonstrated that our cine-VR training program was feasible and acceptable to health professional students at our Midwestern university. Findings suggest that the cine-VR training increased awareness of discrimination towards people with disabilities, improved self-efficacy to identify and manage elder abuse and neglect, and increased empathy. Future research utilizing a randomized control trial design with a larger, more diverse sample and a proper control condition is needed to confirm the effectiveness of our cine-VR training. Clinical Trial: Not applicable

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Original Manuscript

Feasibility of a Cinematic-Virtual Reality Program Educating Health Professional Students about the Complexity of Geriatric Care: A Pilot Study

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Competing interests: None reported.
Ethical approval: The study was approved by the Ohio University Office of Research Compliance (Institutional Review Board #22-X-153).
Informed consent: All participants provided electronic informed consent. Informed consent was completed prior to participation in the study.

Abstract

Background: The United States population is aging. With this demographic shift, more older adults will be living with chronic conditions and geriatric syndromes. To prepare the next generation of

health care professionals for this aging population, we need to provide training that captures the complexity of geriatric care.

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Conclusions: We demonstrated that our cine-VR training program was feasible and acceptable to health professional students at our Midwestern university. Findings suggest that the cine-VR training increased awareness of discrimination towards people with disabilities, improved self-efficacy to identify and manage elder abuse and neglect, and increased empathy. Future research utilizing a randomized control trial design with a larger, more diverse sample and a proper control condition is needed to confirm the effectiveness of our cine-VR training.

The United States (US) population is aging. Over the next three decades, the number of Americans aged 65 and older is projected to increase from 58 million in 2022 to 82 million in 2050, representing a 47% increase.[1] With this demographic shift, more older adults will be living with chronic conditions. According to the National Council on Aging, 94.9% of adults aged 60 and older have at least one chronic condition and 78.7% have two or more.[2] Moreover, 42% of adults aged 60 and older have obesity, which increases the risk for cardiovascular disease, type 2 diabetes, and certain cancers.[3] This translates to older Americans requiring more health care and access to health care professionals. Thus, training the next generation of health care professionals in the complexity of care for older adults is an urgent need.

Despite this need, the education system lacks adequate training in geriatric care.[4] Health professional training should address age-related physiological, physical, cognitive, and psychosocial changes that may negatively impact quality of life, disability, morbidity, and mortality.[5, 6] Further, this training should emphasize early detection of and treatment for geriatric syndromes (e.g., polypharmacy, falls, frailty, incontinence) given their high prevalence and frequent under-recognition in older adults.[7] Finally, health professional training should draw attention to implicit and explicit biases in aging as well as ethical issues related to elder abuse and neglect and end-of-life care.[8]

Clinical simulation may be an innovative approach to teaching health professional students about the complexity of care in older adults. Prior research demonstrates that clinical simulation is an effective methodology for health professional students.[9] The value of clinical simulation is it replaces or enhances real experiences with guided experiences that replicate the real world in a fully interactive manner.[10] Moreover, clinical simulation is repeatable, which allows for repetition of acquired skills with appropriate feedback.[11] Clinical simulation can be delivered in different modalities, including role play, standardized patients, computer screen-based simulation, and electronic patients.[11] Electronic patients are most commonly mannequin-based or replicas of

clinical sites; however, new advancements in technology have led to more sophisticated and realistic virtual reality (VR) based simulations.[12]

Cinematic-VR (cine-VR) is one type of VR-based simulation. Specifically, cine-VR leverages 360-degree video and spatialized audio through film. It differs from traditional VR, which uses computer-generated characters and worlds. In cine-VR, filmmakers apply the techniques of cinema (i.e., narrative storytelling, script writing, actors, lighting, post-production) to create an immersive, visually compelling environment.[13, 14] We created a cine-VR training program to depict the complexity of geriatric care. Our clinical simulation depicted an older adult with multimorbidity, disability, and several geriatric syndromes. In addition, we wove in themes of intersectionality with regards to agism, ableism, and racism. We conducted a pilot study to assess the feasibility and acceptability of the cine-VR training program with health professional students. We also measured changes in health professional students' attitudes toward disability, self-efficacy to identify and manage elder abuse and neglect, and empathy.

METHODS

Research Design

We conducted a single arm, pre-test post-test study to assess changes in attitudes to disability, self-efficacy to identify and manage elder abuse and neglect, and empathy. The pilot study was designed to assess the feasibility of our data collection methods, willingness of participants to complete the cine-VR training program, sample size estimation, and refinement of measurements. We will utilize the findings to inform the development of a future randomized controlled trial to compare the cine-VR training program to traditional instruction.

Ethics Approval

We obtained ethics approval from the Ohio University Office of Research Compliance Institutional Review Board (approval number: #22-X-153). We ensured our pilot study met the

requirements set forth in the regulations on public welfare in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) by complying with federal, state, and local laws and regulations for human subjects; the principles set forth in "The Belmont Report," and the Helsinki Declaration of 1975. All participants provided informed consent to participate in the study.

Cinematic-Virtual Reality (Cine-VR) Episodes

The cine-VR episodes were designed to educate health professional students about complex health conditions, social drivers of health, and implicit bias. We conveyed these objectives through our case, John Chen, an 80-year-old Chinese American man with a 14-year history of type 2 diabetes and comorbid hypertension. Mr. Chen is a person who is hard-of-hearing with a mobility disability. His most recent Hemoglobin A1c level was 9.7%. His medications include metformin and glyburide for his diabetes and lisinopril for his blood pressure. He also has osteoarthritis, decreased renal function (eGFR=58 mL/minute/1.73 m^2), elevated triglycerides due to his glucose levels (299 mg/dL), and a body mass index of 23.1 kg/m^2. He has not received diabetes self-management education and support, despite being enrolled in both Medicare and Medicaid. Recently, Mr. Chen moved in with his son's family, but he is having a difficult time adjusting to his new home. Although he is able to move around on his own, his ambulation is unsteady, and he falls often. He also experiences frequent urinary incontinence, which frustrates his son and daughter-in-law because they have to clean him. Moreover, Mr. Chen does not drive, shop, cook, or bathe on his own. Therefore, he is reliant on his family to meet most of his daily needs. This leaves Mr. Chen feeling isolated, dependent, and ashamed of his physical limitations.

In the cine-VR training program, participants watched 6 episodes, ranging in length from two minutes to five minutes. The episodes captured three separate patient-provider interactions, including visits with a primary care physician, an urgent care physician, and an emergency department physician. Participants were encouraged to identify issues with his medical care as well as concerns about the caregiving he received at home. Specifically, participants were challenged to figure out

why Mr. Chen was experiencing so many falls, injuries, and health emergencies.

The fifth and sixth episodes of the cine-VR training program were “guided simulations,” or pre-recorded cine-VR face-to-face conversations with the emergency department physician and Mr. Chen. The guided simulations were designed to simulate a high stakes conversation, to give participants an opportunity to practice difficult conversations without the pressure of causing harm. Participants were instructed to speak pre-determined dialogue that appeared at the bottom of the 360-degree video visible within the headset. The first “guided simulation” was a conversation between the participant and the emergency department physician. The participant assumed the role of a clinical colleague and encouraged the physician to inquire further about the bruises observed on John’s body, and to call social work for suspicion of elder abuse and neglect. The second “guided simulation” was a conversation between the emergency department physician, Mr. Chen, and a social worker. In this “guided simulation,” the participant took on the role of the emergency department physician and asked Mr. Chen difficult questions about his injuries, his family, and life at home.

Cine-VR Training Curricular Content

We developed curricular content to be taught in tandem with the cine-VR episodes. The curriculum included 6 debriefs or reflections that reinforced key takeaways from each cine-VR episode. The key takeaways from each episode focused on the following content: 1) Diabetes, Disability, and the Aging Population, 2) Bias towards Disability, 3) Association between Disability and Elder Abuse and Neglect, 4) Recognizing Elder Abuse and Neglect, 5) Identifying Risk Factors for Elder Abuse and Neglect, 6) Reporting Elder Abuse and Neglect. An experienced behavioral diabetes researcher (EAB) delivered both trainings. Integrity of the curricular content was ensured via written materials, a peer-review process of all materials, delivery by one trained behavioral diabetes expert, and team member observation of cine-VR training.

Cine-VR Technology

Participants viewed the cine-VR episodes with Pico G2 4K head-mounted displays. These

head-mounted displays allowed participants to move their head and body in any direction to choose what aspects they paid attention to during each cine-VR episode. We also synchronized all cine-VR episodes from a central computer using VR Sync software (Utrecht, Netherlands) so all participants viewed the same content in the head-mounted display at the same time.

Power Analysis

This was a pilot study so we did not conduct an a priori power analysis. Using the guidance of Lancaster et al.,[15] we recruited a minimum sample size of 30 participants.

Recruitment

Health professional students were recruited from a large university in the Midwest. Eligibility criteria for participating in the pilot study included English speaking and reading adults aged 18 years and older who were enrolled during the 2022-2023 academic year and majoring in one of the following programs: pre-medicine program, speech-language pathology, audiology, nutrition/dietetics, physical therapy, nursing (any level), social work (any level), athletic training, exercise physiology, pre-physician assistant program, psychology, public health administration, or public health. There were no other exclusion criteria.

Measures

To assess the feasibility of the cine-VR training program, we measured recruitment, retention, length of time required to recruit, rate of completion of the cine-VR training, and feasibility of the data collection measures. Additionally, participants provided demographic factors (age, gender, race, ethnicity, year in program, program) and completed the following measures:

Attitudes to Disability Scale: is a 16-item scale that assesses attitudes toward disability and attitudes toward people with a disability. The 16 items were answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale included four domains or subscales with good internal consistency: Inclusion (Cronbach's $\alpha = 0.76$), Discrimination (Cronbach's $\alpha = 0.74$), Gains (Cronbach's $\alpha = 0.75$), and Prospects (Cronbach's $\alpha = 0.72$).

Responding to Elder Abuse in GERiAtric Care – Provider Questionnaire: is a 25-item scale that assesses healthcare provider preparedness to identify and manage elder abuse and neglect. For the purposes of this study, we utilized eight of the 25 items. The items we used addressed self-efficacy to identify and manage elder abuse and neglect on a 0 to 10 scale. The 17 excluded items were written for practicing healthcare professionals. In our sample, the eight self-efficacy questions demonstrated excellent internal consistency for identifying and managing elder abuse and neglect (Cronbach's $\alpha = 0.95$).

Jefferson Scale of Empathy Health Care Provider Students Version: is a 20-item scale that assesses empathy among health professional students. The 20 items were answered on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Scores are summed for a composite score, ranging from 20 to 140. The scale demonstrated good internal consistency (Cronbach's $\alpha=0.85$).

Data Collection

Participants completed the assessments online via Qualtrics, an electronic questionnaire service (Provo, UT: Qualtrics). To access the pre-assessment, participants scanned a QR code from a PowerPoint slide that directed them to the Qualtrics website. The website included a brief description of the study, the online informed consent form, demographic questions, and the three measures. All participants provided online informed consent prior to completing the measures. After the cine-VR training, participants scanned a different QR code that directed them to the post-assessment measures.

We collected data anonymously. To link participants' pre- and post-assessment responses, we included three questions at the beginning of the pre- and post-assessments, which served as a unique identifier (i.e. model of first car, high school mascot, the number day of the month they were born). Total time to complete the pre- and post-measures took approximately 15-20 minutes. Participants received a $25.00 gift card for human subject compensation. To maintain anonymity, participants

clicked on a new Qualtrics link that was not connected to their pre- or post-measures to receive a gift card; it was possible that participants received compensation without completing all pre- and post-measures.

Statistical Analysis

First, we assessed participants' demographic factors using descriptive statistics and presented them as means and standard deviations or sample size and percentages. Next, we examined the distribution of the data to ensure they met statistical test assumptions. To assess changes pre- and post-cine-VR training, we conducted paired t-tests; all test statistics are presented with α values and degrees of freedom. We also calculated effect sizes using Cohen's d, with a small effect=0.2, medium effect=0.5, and a large effect=0.8. We defined statistical significance as a p-value less than .05 and conducted analyses in SPSS statistical software version 29.0 (Chicago, IL: SPSS Inc.).

RESULTS

Feasibility

A total of 65 health professional students participated in and completed the full cine-VR training for 100% retention. Participants did not report any technological difficulties or adverse effects from wearing the head-mounted displays or viewing the 360-degree video. We scheduled four cine-VR trainings in a six-month period to recruit the 65 participants, and all four trainings lasted approximately 60 minutes. For data collection, 65 participants completed the pre-assessment measures; however, only 48 completed the post-assessment measures for a 74% completion rate of measures. The 74% rate of completion suggests that we may want to consider adaptations or refinements to our selected measures. Overall, the ease of recruitment, length of time required to recruit, retention in the cine-VR trainings, and feasibility of data collection methods suggest that the cine-VR training was feasible.

Demographics

A total of 48 health professional students consented to participate in the pilot study and completed all pre- and post-assessments. The mean age of participants was 22.5±3.0 (see Table 1). Forty-one participants (82.6%) self-identified as women, six (17.4%) self-identified as men, and one (2.1%) self-identified as non-binary. The participants self-identified their race as follows: 6.3% (n=3) Asian or Pacific Islander, 18.8% (n=9) Black or African American, 4.2% (n=2) Mixed Race, and 70.8% (n=34) White. For ethnicity, two participants (4.2%) self-identified as Hispanic/Latino/Spanish origin and two (4.2%) self-identified as Mexican/Mexican American/Chicano. The majority of participants were in the final year of their program (56.3%, n=18), with pre-medicine as the most reported major (42.6%, n=20).

Attitudes toward Disability Findings

Pre- and post-domain scores for the Attitudes to Disability Scale can be found in Table 2. Post-cine-VR training, we observed significant changes in one of the four Attitudes to Disability Subscales: Discrimination Domain ($t_{.05,47}$= -3.967, P<.001). This change had a Cohen's d of .55, indicating a medium effect. This finding suggests that the cine-VR training may have increased participants' awareness of discrimination towards people with a disability. In the Discrimination Domain, three of the four items showed a significant change with more participants 'agreeing' and 'strongly agreeing' with the following statements post-training: "People often make fun of disabilities" ($t_{.05,47}$= -3.923, P<.001); "People tend to become impatient with those with a disability" ($t_{.05,47}$= -3.186, P=.003); and "People tend to treat those with a disability as if they have no feelings" ($t_{.05,47}$= -2.687, P=.010). Post-cine-VR training, we did not observe significant changes in the Inclusion Domain ($t_{.05,47}$= -.156, P=.877), Gains Domain ($t_{.05,47}$= -1.764, p=.084), or Prospects Domain ($t_{.05,47}$= -.300, P=.765).

Self-Efficacy to Identify and Manage Elder Abuse and Neglect Findings

Post-cine-VR training, we observed significant changes in participants' self-efficacy to identify and manage elder abuse and neglect ($t_{.05,47}$= -3.364, P=.002, Table 3). This change had a

Cohen's d of .49, approaching a medium effect.

Six of the eight items demonstrated significant improvements in perceived self-efficacy. Specifically, participants reported increases in their self-efficacy to ask questions about abuse to an older individual who has clear indications of being abused ($t_{.05,47}$= = -3.354, P=.002, Cohen's d=.48) and to ensure that they ask questions about abuse in private ($t_{.05,47}$= = -2.911, P=.005, Cohen's d=.42). We also observed increases in self-efficacy for providing support to an older individual who discloses abuse ($t_{.05,47}$= = -2.438, P=.019, Cohen's d=.35) and directing an older adult experiencing abuse to the right support person or service ($t_{.05,47}$= = -3.174, P=.003, Cohen's d=.46). Lastly, participants showed improvements in their self-efficacy for helping older adults experiencing abuse who do not want to change their situation ($t_{.05,47}$= = -2.433, P=.019, Cohen's d=.35) and handling an older person who says no to questions about abuse despite strong suspicions of abuse ($t_{.05,47}$= = -2.601, P=.012, Cohen's d=.38).

One item showed a trend in improving self-efficacy to help an older adult make a report to the police or social services ($t_{.05,47}$= = -1.984, P=.053, Cohen's d=.29). Participants did not show an improvement in their self-efficacy to ask questions about abuse to an older adult who has no clear indications of presently or previously experiencing abuse ($t_{.05,47}$= = -.585, P=.561, Cohen's d=.08). This finding highlights an area to be addressed in future research.

Empathy Findings

Pre-cine-VR training empathy scores ranged from 47.0 to 128.0, with a mean and standard deviation of 105.7±16.6. Post-cine-VR training empathy scores ranged from 80.0 to 131.0, with a mean and standard deviation of 110.4±12.1. We observed a significant increase in participants' empathy scores post-cine-VR training (mean change= 4.8, $t_{.05,47}$= -2.329, P=.024), with a Cohen's *d* of .34 indicating a small effect. This finding indicates a noticeable difference in empathy before and after participating in the cine-VR training. While the effect size is small, an increase in empathy may have practical significance in training health professional students about the complexity of diabetes

management. More research is needed to confirm this finding.

DISCUSSION

Principal Results

In this pilot study, we assessed the feasibility of implementing a cine-VR training program with health professional students. Our findings showed that we were able to recruit, implement, and retain participants for the full cine-VR training. Moreover, participants reported no adverse effects or issues with the cine-VR technology. Three-quarters of the participants completed the pre- and post-measures for the pilot study. Overall, we observed significant improvements in participants' awareness of discrimination toward people with disability, self-efficacy to identify and manage elder abuse and neglect, and empathy. These improvements suggest that the cine-VR training program may be an effective teaching modality to educate health professional students about the complexity of care in older adults. More research is needed with a larger, more diverse sample and a proper control condition to confirm its effectiveness.

Comparison with Prior Work

Prior research in geriatric clinical simulation has documented improvements in knowledge, [16] clinical judgment,[17] and interprofessional collaboration.[18] These simulations utilized a variety of modalities, including role-playing, online cases, standardized patients, and role-modeling videos.[16-18] Our cine-VR training program combined similar approaches with our case, Mr. John Chen, serving as our standardized patient throughout all six episodes. We also integrated role-playing through our "guided simulations" and depicted role models through each clinical encounter. Further, our cine-VR training replicated clinical environments as well as interactions among interprofessional teams. The integration of multiple modalities increased the fidelity of our clinical simulation. Higher fidelity simulations have been shown to improve clinical skills, communication, clinical decision-making, and critical thinking.[19] Additional research with our cine-VR training

program should explore these domains.

Our cine-VR training program has several advantages compared to other simulation approaches. First, our cine-VR was standardized, safe, and reusable. If needed, participants could repeat the training as often as desired to learn or reinforce knowledge and clinical skills. Also, participants could practice difficult, high stakes conversations through our "guided simulations," without any risk or harm to the patient, Mr. Chen. Next, the multisensory experience of cine-VR engages emotional learning. Research on emotional learning shows that it increases long-term memory as well as increased acquisition of skills.[20-22] Finally, cine-VR training offers participants a glimpse into the lives of their patients, thereby increasing their awareness of another person's feelings and experiences. This form of perspective-taking increases empathy similar to the findings in our pilot study.[23-25] Thus, cine-VR has the potential to increase empathy in health professional students; more research is needed to assess empathy and other prosocial behaviors (i.e., helping, sharing, comforting) in future research.

Limitations

Limitations of this study included the small sample, data collected from one site, selection bias, subject bias, and lack of a control group. We recruited a sample of 65 participants for the training, and of those, 48 completed the pre- and post-assessment. While the sample of 48 participants was small, it was sufficient to pilot the measures for our pilot study. Next, we collected data from one university in the Midwest, which limits the generalizability of our findings to all health professional students. In addition, students who volunteered to participate may have been more willing or motivated to participate in this cine-VR training on care for older adults. Thus, the findings may be susceptible to subject bias and/or social desirability bias. Finally, we did not include a control condition as a comparison group. Future research must include a control condition to determine the effectiveness of the cine-VR training.

Conclusions

We demonstrated that our cine-VR training program was feasible and acceptable to health professional students are our university in the Midwestern US. Our findings suggest that the training increased awareness of discrimination towards people with disability, improved self-efficacy to identify and manage elder abuse and neglect, and increased empathy. More research is needed to confirm the effectiveness of this cine-VR training program on the complexity of care for older adults. Future research should employ a randomized controlled trial to compare the cine-VR to an attention control condition. If confirmed, the cine-VR training program may be a new, effective approach to learning about multimorbidity, geriatric syndromes, and biases related to aging.

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Table 1. Participant Demographic Characteristics in Cinematic-Virtual Reality (Cine-VR) Study (n=48)

Variable	n (%)
Age (years)	22.5±3.0
Gender	
Woman	41 (82.6)
Man	6 (17.4)
Non-binary	0 (0)
Transgender	0 (0)
Genderqueer	0 (0)
An identify not listed	0 (0)
Ethnicity	
Hispanic/Latino/Spanish origin	2 (4.2)
Mexican/Mexican American/Chicano	2 (4.2)
Race	
American Indian/Pacific Islander	0 (0)
Asian/Pacific Islander	3 (6.3)
Black/African American	9 (18.8)
Middle Eastern	0 (0)
Mixed Race	2 (4.2)
White	34 (70.8)
Program*	
Child Life Specialist	18 (38.3)
Exercise Physiology	1 (2.1)
Nutrition	4 (8.5)
Pre-Medicine	20 (42.6)
Pre-Physician Assistant	2 (4.3)
Psychology	2 (4.3)
Year in Program*	
Year 1	6 (12.5)
Year 2	4 (8.3)
Year 3	9 (18.8)
Year 4	18 (56.3)

Note. Missing values ‘Program’ (n=1); ‘Year in Program’ (n=2)

Table 2. Participants’ Attitudes to Disability Scale Mean Scores Before and After the Cinematic-Virtual Reality (VR) Training Program (n=48)

Questions	**Pre-VR** Mean ± SD	**Post-VR** Mean ± SD	t-value	P

Inclusion Domain				
People with a disability find it harder than others to make new friends.	3.9±0.6	3.8±0.8	.948	.348
People with a disability have problems getting involved in society.	3.5±1.2	3.8±0.8	-2.047	.046
People with a disability are a burden on society.	1.2±0.4	1.3±0.6	-1.000	.322
People with a disability are a burden on their family.	1.9±0.9	1.7±1.0	1.944	.058
Total	2.6±0.6	2.6±0.5	-.156	.877
Discrimination Domain				
People often make fun of disabilities.	3.9±0.6	4.2±0.6	-3.923	<.001
People tend to become impatient with those with a disability.	3.9±0.8	4.3±0.7	-3.186	.003
People tend to treat those with a disability as if they have no feelings.	3.5±1.1	3.9±0.8	-2.687	.010
People with a disability are easier to take advantage of (exploit or treat badly) compared with other people.	3.7±0.9	3.9±1.0	-1.095	.279
Total	3.8±0.6	4.1±0.6	-3.967	<.001
Gains Domain				
Having a disability can make someone a stronger person.	3.8±0.7	3.9±0.8	-1.219	.229
Having a disability can make someone a wiser person.	3.7±0.8	3.7±0.8	.227	.821
Some people achieve more because of their disability (e.g., they are more successful).	3.0±0.8	3.2±0.8	-1.741	.088
People with a disability are more determined than others to reach their goals.	3.0±0.7	3.1±0.6	-1.401	.168
Total	3.3±0.5	3.5±0.6	-1.764	.084
Prospects Domain				
Sex should not be discussed with people with disabilities.	1.6±0.9	1.4±0.7	1.752	.086
People should not expect too much from those with a disability.	1.5±0.5	1.6±0.8	-1.182	.243
People with a disability should not be optimistic (hopeful) about their future	1.3±0.7	1.5±0.9	-1.543	.130
People with a disability have less to look forward to than others.	1.6±0.7	1.6±0.7	.423	.674
Total	1.5±0.5	1.5±0.6	-.300	.765

SD=standard deviation

Table 3. Participants' Perceived Self-Efficacy to Identifying and Managing Elder Abuse and Neglect Before and After the Cinematic-Virtual Reality (VR) Training Program (n=48)

Questions	**Pre-VR mean±SD**	**Post-VR mean±SD**	**t-value**	**P**	**Cohen's d**
1. Asking questions about abuse to an older patient who has clear indications of now being, or having previously been, subjected to abuse.	6.2±2.4	7.2±2.4	-3.354	.002	.48
2. Asking questions about abuse to an	5.7±2.6	5.9±2.4	-.585	.561	.08

older patient who has no clear indications of now being or having previously been, subjected to abuse.					
3. Ensuring you are able to ask questions about abuse in private to an older patient who has a relative who insists on being present during all contact.	6.1±2.7	7.0±2.4	-2.911	.005	.42
4. In conversation, providing support to an older patient who tells about abuse.	7.4±2.6	8.0±2.1	-2.438	.019	.35
5. Helping an older patient subjected to abuse on to the right body in healthcare, or to the right support function in society.	6.6±2.9	7.7±2.1	-3.174	.003	.46
6. Helping an older patient subjected to abuse to make a report to the police or social services.	6.9±2.8	7.6±2.2	-1.984	.053	.29
7. Helping and supporting an older patient subjected to abuse, who does not currently want to change his or her situation.	5.5±2.9	6.3±2.6	-2.433	.019	.35
8. Handling the meeting with an older patient who says no to questions about abuse, but where you still have strong suspicions that the patient is subjected to abuse.	5.7±2.8	6.6±2.2	-2.601	.012	.38
Total	6.3±2.4	7.0±1.8	-3.364	.002	.49

SD=Standard deviation

Supplementary Files

TOC/Feature image for homepages

This is a photograph of the main character, John Chen, from the virtual reality series designed to educate healthcare professionals and trainees on the complexity of geriatric care.