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Original Article

The Effect of Virtual Empathy Training on Nurses' Empathy and Attitudes Toward Elderly Care

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A B S T R A C T

Introduction: This study evaluated the effect of virtual empathy skills training on nurses' attitudes toward elderly care.

Methods: A quasi-experimental, single-group, pre-test/post-test study was conducted in 2023. Eighty-four nurses from Yazd Shohadaye Kargar Hospital were selected via purposive sampling. Over five weeks, participants received empathy skills training through a virtual group created using dedicated software and an educational brochure. Each week, participants shared their patient care experiences. The researcher facilitated discussions to challenge perspectives, provided summaries, and encouraged feedback. Data were collected via a self-report questionnaire comprising demographic items and the Jefferson Empathy Scale, administered before the intervention, immediately after, and two months post-intervention. Data were analyzed in SPSS using descriptive and inferential statistics.

Results: Post-intervention, the mean empathy score showed a statistically significant increase from the pre-intervention score ($p < 0.001$). This significant improvement in empathy was maintained at the two-month follow-up ($p < 0.001$). The mean attitude score also increased significantly from baseline at both post-intervention assessments ($p < 0.01$).

Conclusion: The training effectively enhanced nurses' empathy and improved their attitudes toward elderly care. Incorporating empathy training into undergraduate nursing education is therefore recommended.

Keywords: Empathy Skills; Attitude; Virtual Education; Aged Care; Nurses

Introduction

The steady increase in global life expectancy has positioned population aging as one of the most prominent demographic phenomena of the modern era (1). This demographic transition necessitates significant adaptation, particularly within healthcare systems (2). Older adults, due to natural physiological changes associated with aging, are more vulnerable to various illnesses and require specific medical attention (3). In Iran, mirroring global trajectories, the expanding elderly population creates an urgent imperative to adapt health systems and social structures to sustain the well-being and quality of life of older adults (4, 5).

The resultant surge in demand for medical services within this demographic underscore the necessity of employing skilled and specialized nurses in geriatric care. Given that nurses constitute the primary interface with patients, their training in establishing therapeutic relationships is paramount (6, 7). Suboptimal care quality among the elderly carries significant risks, including immobility, institutionalization, secondary infections, pressure injuries, dehydration,

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malnutrition, polypharmacy side effects, depression, anxiety, and cognitive decline (2).

Elderly care can be influenced by several factors, including nurses' attitudes towards older adults, which significantly determine the quality of therapeutic interactions and the nurses' willingness to provide care (8, 9). A persistent challenge in the field is the documented existence of negative attitudes toward the elderly among some practicing nurses and nursing students (10-12), with some expressing reluctance to pursue geriatric care as a future career trajectory (13). For instance, a cross-sectional study in Iran reported that 54.3% of participating nurses held negative attitudes toward the elderly (10). Consequently, implementing targeted measures to enhance positive attitudes, especially within health education curricula, is essential for fostering the necessary rapport between healthcare providers and the elderly to achieve established care plan objectives (14)**.** Effective nurse-patient communication, crucial for accurately identifying patient needs and necessary interventions, demands that nurses fully comprehend their patients' feelings, perspectives, and circumstances (15). Empathy is identified as a core underpinning trait that improves these attitudes and strengthens the nurse-patient relationship. Reynolds (16) posits that empathetic engagement allows nurses to better understand patient reactions to health issues and the nature of their personal contexts, requiring both knowledge and skill acquisition in empathy.

Empathy, as a professional competency, involves the cognitive capacity to comprehend the patient's experiences, concerns, and perspectives, coupled with the intentional expression of this understanding to facilitate support (17). This quality plays a crucial role in patient communication, serving as a facilitator for relationship building and an enhancer of care quality, impacting both process and outcome (18). Evidence from Iranian hospitalized elderly patients confirm their expressed need for empathetic understanding (19). Conversely, qualitative research in home care settings has indicated that communication from nursing assistants was predominantly task-oriented, highlighting a deficit in person-centered approaches (20).

Furthermore, a concerning trend reported in the literature is the diminution of empathy among nursing students during their university education (5, 15) While systematic reviews, such as that by Bornero et al., suggest that empathy skills can be fostered through training, with 11 out of 17 studies reporting positive improvements, the continued incidence of empathy decline among health students persists (21)**.**

Nursing inherently relies on nurturing supportive relationships; however, many practitioners struggle to consistently manifest empathy, often overlooking direct and indirect emotional expressions from patients, resulting in missed opportunities for empathetic demonstration (22). While traditional methods such as verbal training, role-playing, and communication workshops have been explored (23), the constraints of modern, fast-paced healthcare environments, which limit staff availability for conventional training, necessitate the exploration of alternative, cost-effective modalities. Virtual education is emerging as a viable alternative to face-to-face instruction, offering benefits such as increased flexibility, reduced logistical burdens, and enhanced learning efficiency (24). Despite this potential, empirical research specifically examining the application and effect of virtual empathy training within the context of geriatric nursing care remains limited. Therefore, this study was designed to determine the effect of virtual empathy training on nurses' attitudes toward caring for the elderly.

Method

Study design

This study used a quasi-experimental, single-group, pretest-posttest design (The limited number of eligible participants made this study a single group, which is one of the limitations of the study).

Participants

The study population comprised all nurses working in the adult wards of Yazd Shohadaye Kargar Hospital, Yazd, Iran. The samples were selected purposively. Based on Gholamzadeh et al., (3) $N = \frac{2(z1-\alpha/2+ Z\ 1-\beta2\ )2}{\Delta2}$, with a standard deviation of 10.7, a test power of 80%, a confidence level of 95%, and a minimum detectable difference of 5 points, the required sample size was calculated to be 73 participants. Considering an anticipated attrition rate of 10%, the final sample size was increased to 84.

Data were collected using a self-report method through a two-part questionnaire, including demographic information and the Jefferson Scale of Physician Empathy–Health Professionals version (JSPE-HP) (25). Data were gathered before the study began, immediately after the intervention, and two months post-intervention by the researcher.

Instrumentation

The demographic questionnaire solicited information such as age, gender, educational background, and history of caring for an elderly family member. The JSPE-HP comprised 20 statements, where respondents rated their level of empathy towards elderly patients based on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total scores could range from 20 to 100, indicating higher levels of empathy with increasing scores "In this study, 'nurses' attitudes toward empathetic care for the elderly' were inferred from the attitudinal and cognitive components embedded within the JSPE-HP given the lack of a specific attitude questionnaire toward the elderly, the attitudinal subscales of the JSPE-HP were used as an indicator for this concept. The content validity of the demographic questionnaire was verified, and the reliability of the JSPE-HP was assessed using Cronbach's alpha, which yielded a coefficient of 0.74. In a 2012 study by Hashemipour assessing the reliability and validity of

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the Persian version of the JSPE-HP among 554 students, a Cronbach's alpha coefficient of 0.83 was reported (26)**.**

Data collection

Following approval from the ethics committee and institutional review board, data collection began. The researcher performed purposive sampling by visiting Shohadaye Kargar Yazd Hospital. After explaining the study objectives and ethical protocols, written informed consent was obtained from the participants, who also provided their mobile phone numbers. A written guarantee was given to ensure the confidentiality of all personal information and group discussions.

A virtual group was established on a specified platform. Over a five-week period, an educational brochure covering various dimensions of empathy skill training was shared with the group (Table1). Each week, the researcher facilitated discussions in which participants shared and reflected on their patient care experiences, encouraging active engagement. Weekly summaries of these discussions were then posted, and participants were invited to provide their feedback.

Statistical analysis

Data were entered into Excel and analyzed using SPSS version 23. Descriptive statistics, including absolute and relative frequencies, means, and standard deviations (mean ± SD), were calculated. Inferential analyses were performed using chi-square tests and repeated-measures analysis of variance (ANOVA), followed by a Bonferroni post hoc test. The significance level for all tests was set at $p < 0.05$.

Ethical considerations

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Approval was obtained from the Ethics Committee of Shahid Sadoughi University of Medical Sciences, Yazd, Iran (ethical code: IR.SSU.REC.1398.217). All participants were informed of the voluntary nature of the study and their right to withdraw at any time. Written informed consent was obtained from each participant, and the confidentiality of all personal information was strictly maintained.

Table1. Key content and operational objectives of empathy training

Module No.	Module Title (Topic)	Key content & operational ggals	Weekly objective/Target
1	The increasing prevalence of elderly populations and geriatric patients in healthcare settings	Analysis of demographic trends (dependency ratio), emphasizing the necessity for a paradigm shift from acute care to chronic disease management, and understanding the burden of comorbidity in the elderly.	Week 1: Establish baseline knowledge Participants will be able to state three major demographic shifts driving the need for geriatrics-focused care.
2	Physiological changes and needs of older adults compared to younger individuals	In-depth examination of sensory decline (vision, hearing), pharmacokinetic implications, and psychological challenges related to loss of autonomy (ADL/IADL). Focus on balancing patient safety and independence	Week 2: Develop an awareness Participants will accurately describe the impact of at least two age-related physiological changes on daily patient interaction and safety protocols.
3	Ageism phenomenon and principles of gerontology	Definition and identification of age biases (including unconscious bias), introduction to “Successful Aging” models, and focusing on a Person-Centered Care approach to uphold dignity.	Week 3: Identify personal and systemic ageism Participants will identify and articulate one personal bias related to aging and apply the core principles of Person-Centered Care to a case study.
4	Ethical principles and effective therapeutic communication skills with the elderly	Review of medical ethics (Autonomy, Beneficence), training in empathy-based communication skills, including implementing the “Three-Second Rule of Silence” after questioning and active listening techniques for emotional validation.	Week 4: Master practical, empathy-based communication techniques Participants will demonstrate proficient use of empathetic listening and validation techniques in role-playing scenarios.
5	Reflective practice and fnal integration	Group debriefing sessions using reflective models (e.g., Gibbs’ Cycle), identifying empathetic successes and their impact on reducing burnout, and analyzing potential effects on quality of care indicators.	Week 5: Synthesize learned skills through critical reflection Participants will complete a reflective log demonstrating integration of learned skills and propose one actionable change to their current practice based on the training.

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Results

The study included 84 eligible nurses. The sample comprised 53.6% women. Analysis of work experience revealed that 53.6% of the participants had fewer than 29 years of experience, while 54.6% had more than 15 years of experience. A full summary of participant demographic characteristics is presented in Table 2.

Post-hoc pairwise comparisons with Bonferroni correction revealed that empathy scores were significantly higher both immediately post training (M = 93.25 ± 6.41) and two months post training (M = 88.95 ± 14.85) compared to pre-training scores (M = 72.75 ± 10.15; $p < 0.001$). However, the difference between the scores at the immediate and two-month post-training time points was not statistically significant.

Similarly, Bonferroni post-hoc tests indicated that attitude scores were significantly higher both immediately post-training (M = 167.3 ± 10.5) and two months post-training (M = 159.8 ± 14.2) compared to pre-training scores (M = 119.2 ± 19.1; $p < 0.01$).

Furthermore, while empathy scores for all groups showed a comparable decline two months post-training relative to the immediate post-training assessment, they remained significantly elevated above pre-training baseline levels. (Table 3)

The relationship between participant gender and empathy scores was also examined. Prior to the training, male nurses had a higher mean empathy score than female nurses. Following the intervention, this pattern reversed, with female nurses demonstrating a higher mean empathy score than male nurses. (Table4)

Analysis of the relationship between age and empathy scores toward the elderly revealed that, at baseline, nurses under 40 years of age had higher mean empathy scores than those aged 40 and above. Following the training, both age groups showed an increase in scores, with a more pronounced improvement observed in the younger cohort. At the two-month follow-up, scores had declined from the immediate post-training levels for both groups, with a more marked decrease noted among nurses under 40. (Table 5)

Table 2. Frequency distribution of participant demographic characteristics

Variable		Percentage	Frequency
Gender	Female	53.6	45
	Male	46.4	39
Service area	Surgical Department	32.1	27
	ICU	17.85	15
	Dialysis	8.33	7
	CCU	11.90	10
	Internal	29.76	25
Having an elderly person at home	Yes	86.9	73
	No	13.1	11
education level	Bachelor	94	79
	Master	6	5
Age	Under 39 years old	53.6	45
	Over 40 years old	46.4	39
Work history	Under 14 years old	46.4	39
	Over 15 years old	53.6	45

Table 3. Mean empathy and attitude scores of nurses toward the elderly before, immediately after, and two months after virtual empathy skills training

Variable	Time Point	Mean ± Standard Deviation (M ± SD)	p-value (Comparison to Pre- training)
Empathy	Pre-training	72.75 ± 10.15	
	Immediately post-training	93.25 ± 6.41	$p < 0.001$
	Two Months post-training	88.95 ± 14.85	$p < 0.001$
Attitude	Pre-training	119.20 ± 19.1	
	Immediately post-training	167.30 ± 10.5	$p < 0.01$
	Two months post-training	159.80 ± 14.2	$p < 0.01$

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Table 4. Mean empathy scores by gender across assessment time points (pre-training, post-training, and two-month post training

Empathy level	Gender	Estimated marginal mean
Before training	Female	73.18
	Male	72.20
Immediately post-training	Female	93.72
	Male	92.87
Two months post-training	Female	89.02
	Male	88.86

Table 5. Mean empathy scores by age group across assessment time points

Time point	Age	Estimated marginal mean
Before training	≤ 39	76.0
	≥ 40	74.0
Immediately post-training	≤ 39	94.5
	≥ 40	92.0
Two months post-training	≤ 39	90.8
	≥ 40	89.5

Discussion

The primary objective of this study was to accurately measure the amount of change in nurses' self-reported empathy scores resulting from a specialized training intervention.

Analysis of the collected baseline data provided a clear demographic profile of the participants. The sample was predominantly female, which is characteristic of the nursing workforce in many settings. The average age of the participating nurses was approximately 38 years old. A significant contextual factor revealed by the data was that the vast majority of the nurses reported having an elderly family member residing within their household or immediate family circle, suggesting a pre-existing level of personal familiarity with the needs of the geriatric population.

The central findings of this study relate to the change in empathy scores following the intervention. Prior to the training, the baseline data indicated that the average empathy score was measurably higher among the male nurses compared to their female counterparts. Crucially, the virtual empathy skill training proved effective across the board, as a statistically significant increase in the average empathy scores was observed in both male and female nurse groups upon the completion of the program. This outcome underscores the potential of virtual training modalities to enhance vital non-technical skills in clinical settings.

The immediate positive effect of the intervention on empathy scores finds substantial support within established literature exploring educational interventions in healthcare empathy and attitudes. Several prominent studies have documented similar positive shifts following targeted training (26-28)**.** Specifically, the observation that initial empathy scores were higher among male participants resonates with Artishedar's study, though that particular study ultimately noted no statistically significant disparity between genders**.**

To rigorously interpret this gender-based baseline discrepancy within the Iranian context, several hypotheses warrant consideration. One possibility is that in the specific cultural-social context of Iranian healthcare institutions, traditional gender roles influence self-reporting, where male respondents may project a professional persona aligning with societal expectations, thus inflating their pre-training scores. Furthermore, the distinction between our sample of practicing nurses and studies utilizing student populations is critical, as established professional hardening developed through career trajectories unique to the local employment structure might differentially affect gender baselines. Finally, the specific measurement tool employed may interact uniquely with gendered self-perception in a non-Western sample, leading to measurement variance. This nuanced analysis of baseline disparities strengthens the study by contextualizing these findings within local cultural and professional realities. Future research should specifically investigate these mediating factors to fully contextualize gender differences in clinical empathy.

However, the observed benefits of this specific training within the Iranian clinical setting present a notable contrast to certain international findings, such as those reported by Lambrinou (29). This divergence is likely rooted in core differences between the studies' scopes. Lambrinou's research focused on German nursing students and their general perception of aging. In contrast, the current study engaged practicing professional nurses who provide routine, direct care to elderly patients—a distinct, high-stakes clinical context. This fundamental difference—measuring empathy in active practitioners versus general attitudes in students—is a key factor in explaining the variation in observed outcomes. Ultimately, this research offers strong, contextualized evidence advocating for the

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adoption of virtual empathy training for actively employed hospital nurses caring for geriatric populations.

Further stratification of the data revealed a correlation between age and baseline empathy. Specifically, nurses under the age of 39 exhibited higher initial empathy scores. This finding presents a point of divergence when compared against several previous studies, including those by Artishedar (28), Söderhamn (30), Hweidi (31), which did not find such a distinct age-based difference. However, this outcome is consistent with the observations reported by Hamedani Zadeh (32), Hosseini Seresht (33), and Lambrinou (29). The contrast with Artishedar's research—where age groups showed parity in scores—might be explained by the differing focus on academic knowledge in older student populations versus clinical experience in practicing nurses.

A cornerstone of the results was the significant, immediate boost in average empathy scores directly following the intervention. More importantly, this positive effect proved durable. Follow-up assessments conducted two months post-intervention indicated that the average empathy score maintained a statistically significant elevation when compared to the initial pre-training baseline. This sustained improvement corroborates findings from studies by Gholamzadeh et al., (3) and Qorbani et al., (34). Conversely, these durable gains contradicted the stability noted in a study by Adib-Hajbaghery et al., (35).

Reviewing the broader educational landscape shows that empathy enhancement is achievable through various methods. For instance, Chen et al., demonstrated positive outcomes when nursing students participated in an elderly adult simulation game (36), and an innovative bonding program involving community engagement also improved attitudes (37). Intriguingly, a separate Iranian program focused on geriatric care failed to yield similar improvements in student attitudes (35).

The highest mean empathy scores across all measured units were recorded immediately following the conclusion of the training course. While a slight, measurable drop was observed at the two-month follow-up compared to this immediate peak, the final average score remained significantly higher than the initial pre-training level, confirming the program's substantial, lasting impact.

A key component of the training involved guided discussions where nurses shared past experiences, reflected on existing attitudes toward older individuals, and collaboratively identified both the strengths and the inherent barriers to developing positive geriatric care perspectives. It is highly probable that the synthesis of the training materials with this open dialogue about real-world experiences drove the positive shift. Alarmingly, the study began by noting that all participating nurses initially reported having a poor general attitude toward older persons—a sentiment echoed in other national research. For example, Nefisah et al., documented unfavorable attitudes among Iranian nursing students toward geriatric cardiac care (38), and Sanagoo et al., found that younger university students displayed the most negative views (39). Furthermore, a domestic study indicated a gradient from negative attitudes in first-year students to a neutral stance in third-year students (33).

It is important to note that not all literature points toward negative baseline attitudes; other research has shown satisfactory levels of acceptance among nurses and students (40, 41). These inconsistencies highlight the crucial role of methodological differences (sample size, population studied) and, most significantly, cultural and social context. Attitudes toward the elderly are not universal. A multi-national comparison involving six countries illustrated these variances (42). In Eastern cultures, where respect for elders is a core value, older adults are often revered as sources of wisdom. Paradoxically, research by Huang suggested that undergraduate students from Western nations sometimes reported more favorable attitudes than their Eastern counterparts (43).

The perspective and feelings held by caregivers are fundamental drivers of educational success, ongoing professional relationships, and ultimately, the quality of care delivered. When professionals harbor negative feelings about providing hands-on care for the elderly, it is unrealistic to expect compassionate, high-caliber service delivery. Lovell linked negative stereotypes to a reduced recruitment rate into geriatric specialties (24). Supporting this, Hamedani Zadeh et al., found nurses held generally neutral attitudes toward physical geriatric care (32), and research in Birjand revealed that over half of the nurses in internal-surgical departments held weak attitudes toward caring for cardiac patients (23). Qorbani et al., further confirmed that negative attitude scores statistically outweighed positive ones, concluding that intervention programs are essential to reshape provider perspectives (34).

A direct contrast emerged from the work of Adib-Hajbaghery et al., at Kashan University of Medical Sciences (35), where an elderly care program failed to yield any significant change in empathy scores.and even showed a slightly adverse effect on attitudes. This underscores the unique findings of the current study. No prior research has investigated the impact of virtual education on nurses' empathy toward the elderly**.** Therefore, these results offer novel evidence demonstrating that targeted training significantly and lastingly improves empathy in practicing nurses.

Conclusion

The findings of this study clearly demonstrate that the designed educational intervention was effective, resulting not only in a statistically significant increase in participants' empathy scores but also in a marked improvement in their professional attitudes toward the elderly population. This significant correlation between empathy and attitude underscores that targeted empathy training transcends the acquisition of a mere skill; it functions as a potent lever for shaping the overall cognitive and affective framework of healthcare professionals.

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Given the robust evidence from this research confirming the efficacy of this intervention, it is strongly recommended that Empathy-Based Training be formally incorporated as a structural and mandatory component within the undergraduate nursing curriculum. This integration should utilize practical teaching methodologies, such as clinical scenarios, simulation-based learning, and perspective-taking workshops, to ensure students simultaneously develop both their cognitive understanding and their emotional responsiveness. Implementing this recommendation will lay the foundation for cultivating a generation of nurses who are not only technically proficient but are also humanistically equipped with the highest levels of compassionate care for vulnerable populations, particularly the elderly, thereby leading to an overall enhancement in care quality and patient satisfaction at the systemic level.

Study limitation

A primary methodological limitation of this study was the utilization of a single-group design, lacking a concurrent control group. This constraint arose from insufficient availability of suitably qualified nursing personnel willing or able to participate in the control arm, thereby potentially impacting the external validity and generalizability of the reported findings. This design weakens the ability to infer causality. For future studies, we strongly recommend using a two-group design (an intervention group and a waiting list control group)**.**

Secondly, due to the single-center recruitment strategy, the generalizability of these findings is inherently limited to nurses possessing comparable demographic and professional characteristics within similar clinical settings. Future research employing multi-center, randomized sampling methodologies is warranted to establish broader external validity.

Conflict of interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Authors' contributions

The idea and design of this study were conceived by Fatemeh Khabazzadeh. The educational materials and booklet were presented by Fatemeh Khabazzadeh and Mehdi Ghafouri, while Mehdi Ghafouri was responsible for data analysis and manuscript writing. Both authors reviewed the final manuscript.

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