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Original Article

The effects of blended learning on nursing students' cultural competence and empathy: a quasi-experimental study

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Abstract

Background & Objective: Along with the recent trend of globalization, nursing students need to have high cultural competence to provide nursing care services to patients with diverse cultural backgrounds. The purposes of this study were to explore the effects of blended learning on nursing students' cultural competence and empathy.

Materials & Methods: In this pretest-post-test quasi-experimental study with control group, 65 senior third-year undergraduate nursing students were selected using whole enumeration sampling. They were divided into two groups: intervention (n = 30) and control (n = 35) non-randomly. Content of the blended learning program was based on the framework of the Campinha-Bacot cultural competence model. The intervention group completed the educational course that had three parts (face-to-face lecture, storytelling, and case-based learning). It was carried out once weekly for three weeks, with each session lasting 2 hours. A two-hour in-person workshop using a lecture method was held according to the approved undergraduate nursing curriculum. The outcomes, including cultural competence and empathy, were measured using the Perng and Watson's (2012) Cultural Capacity Scale and the Jefferson Scale of Empathy Health Profession Students before and two weeks after the intervention. The data were analyzed using descriptive statistics, independent t-test, paired t test and ANCOVA analysis with Stata-17 software.

Results: Most of the participants were single (n = 58, %95), male (n =33, %54) and in the sixth semester of the bachelor of nursing (n = 34, %56). An analysis of covariance (ANCOVA) between the groups showed a statistically significant difference between the changes in the mean scores of all subscales of cultural competence and cultural competence total score ($F = 22.19$, $p < 0.001$, mean difference and standard deviation 14.96 ± 9.31). No significant difference was found for the changes in the mean scores of all subscales and the empathy total score in two groups ($F = 1.19$, $p = 0.31$ mean difference and standard deviation -2.45 ± 14.36).

Conclusion: The findings of this study showed that the blended learning program may be effective in improving cultural competence among nursing students. It is recommended that nursing program managers add multicultural educational programs into curricula they use.

Keywords: blended learning, cultural competence, empathy, nursing students

Introduction

Along with the recent trend of globalization and increasing cultural exchanges among countries, Asian countries are also becoming multicultural [1]. Iran has also historically been a multiethnic, multi-religious, and multilingual society in which people from diverse cultures live together with their distinct sets of values [2].

Nursing students, during their clinical courses, meet different linguistic backgrounds, religious affiliations, ethnic or racial origins, immigrants, migrants, and refugees. So, their proper preparation can ensure the quality of nursing practices in the future and reduce the gaps in healthcare caused by cultural diversity. There is a need for healthcare professionals, including students, to be properly trained to be able to provide culturally competent care [3]. Nursing educators encourage nursing students to take part in extracurricular activities with people from other countries to share cultural experiences, adding this to organized lectures on cultural education [4].

Campinha-Bacote defines cultural competence as a continuous process with five constructs: cultural awareness, cultural knowledge, cultural skill, cultural encounters and cultural desire [5]. These concepts of Campinha-Bacote's model have a symbiotic relationship with each other. Therefore, they must be addressed in every encounter with the client [6]. The nursing literature has shown that the Campinha-Bacote model is the most frequently used and frequently cited framework for research. Also, the Campinha-Bacote model holds more immediate appeal because it helps address cultural competence with respect to healthcare delivery [7]. Finally, several authors have shown that Campinha-Bacote model is suitable as a framework for adding cultural competence into their practice [8,9]. Nursing students from multicultural contexts experience challenges during transcultural nursing care, suggesting a lack of cultural competence [10]. They must be aware of cultural needs, cultural values and cultural differences of their clients to provide culturally appropriate care [11]. It has been shown that neglecting cultural competence in educational approaches, ignoring the significance of culturally congruent care in clinical settings, poor intercultural communication, and not enough skills in cultural humility are the challenges that affect the cultural competence of Iranian nursing students [12].

Empathy was recognized as one of the components of cultural competence of health care professionals. Empathy can make nurses sensitive to patients' values and culture to provide care based on cultural competence [13]. Sohrabi et al. showed that cultural competence training increases learners' empathy in clinical setting [14]. A recent qualitative study carried out on Iranian nurses showed that not enough cultural knowledge could be related to the reduction of their empathy. The nurses who took part in the study preferred to avoid caring for patients with different cultures [15]. Thus, a high level of empathy is essential for the professional development of students in preparation for healthcare professions [16].

It has also been reported that the current cultural education in the nursing curriculum needs certain changes to improve students' cultural competence. As it has been stated in some studies, nursing students are not self-reliant even after completing the training course on providing culturally proper care [4]. Also, findings from a recent study by Nuuyoma et al. suggest that the cultural competence of undergraduate nursing students in low- and middle-income countries needs enrichment [10]. Cultural competence cannot be achieved through traditional classroom sessions, assignments, or activities [17].

A systematic review showed that blended teaching methods with active simulation and case study approaches are necessary to improve students' cultural competence [1]. The results of the evidence-based meta-analysis study by Li et al. showed that blended learning can effectively improve the level of knowledge and satisfaction of nursing students. They stated that there is not enough research on this topic. Therefore, development and combination into study programs must be thought about in a clear educational approach to ensure a purposeful and meaningful learning process [18]. Blended learning, with the advantages of traditional and e-learning, is an effective approach to easy access to educational materials and increasing learning effectiveness. This approach, by providing different methods, increases the attractiveness of education and also pays attention to individual differences. Considering that not all students learn in the same way, using different methods for education seems necessary [19]. Combining technology with learning, which has recently received attention and emphasis from the Ministry of Health's Education Department, makes it easier to achieve educational goals. It supports the development of learners through the use of educational media. Also, training programs based on specific cultural models and blended learning strategies have yet to be carried out in Iran.

The lack of cultural competence training makes it difficult for Iranian nurses to answer to the increasing demands of foreign patients to provide culturally proper nursing care. To address this issue, it is essential to create a policy that helps with proper training in nursing schools. The present study aimed to find out the beneficial effects of the blended learning on the cultural competence and empathy of nursing students.

Materials & Methods

Design and setting(s)

This quasi-experimental study with a pre-test and post-test design and a control group was carried out at the School of Nursing and Midwifery, the Lorestan University of Medical Sciences, Khorramabad, Iran, From January 25, 2023 to July 2, 2023.

Participants and sampling

The study population was made up of all registered third-year undergraduate nursing students (n=70). Sixty-five nursing students were selected through a whole enumeration method based on the study inclusion criteria. Then they were divided into two groups: intervention (n = 30) and control (n = 35) non-randomly. (**Figure.1**).

The inclusion criteria included the willingness to take part in the study and to complete at least three academic semesters of internship in clinical settings.

Exclusion criteria included absence of more than one session, participation in communication skills or promotion of transcultural awareness courses during the intervention and the failure to fill in the questionnaire.

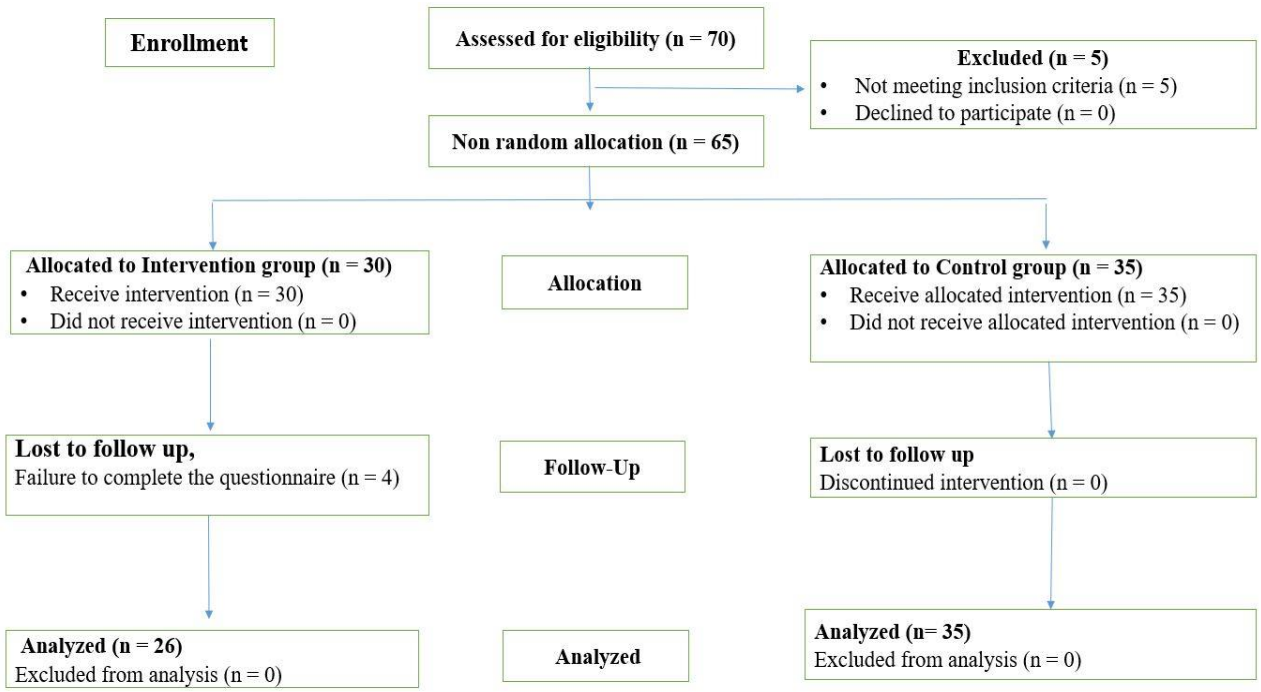

Figure 1. Flowchart of the study

Tools/Instruments

Data collection tools included a student demographic information form, Cultural Capacity Scale (CCS) by Perng and Watson (2012), and Jefferson Scale of Empathy Health Profession Students' version (JSE-HPS).

Demographic information questionnaire: The demographic information questionnaire included the respondents' characteristics such as age, gender, marital status, academic semester, interest in nursing, and cultural background information (previous cultural diversity training, the experience of taking care of patients with diverse cultural backgrounds and the encounter with patients belonging to specific demographic groups during 12 months).

Cultural Capacity Scale (CCS) by Perng and Watson: The scale has 20 items for the purpose of checking cultural competence in nursing students. It covered the domains of cultural sensitivity, cultural knowledge, and cultural skills. Each item was scored on a 5-point Likert scale ranging from 1(strongly disagree) to 5 (strongly agree). Total scores ranged from 20 to 100. A higher score meant higher cultural competence [20]. In Iran, the original version of the tool was translated from English to Persian at the same time by two experienced

translators fluent in English. The scale content validity index was 0.90 and accepted using 5 experts.

Then, by completing the questionnaire by 349 subjects, Cronbach's alpha and test-retest coefficients were gotten at 0.83 and 0.84, respectively [21].

In this study, Cronbach's α of the CCS scale was 0.71.

Jefferson Scale of Empathy Health Profession Students' version (JSE-HPS): This was used for checking empathy of students who are studying medicine and other forms of health care to prepare for working in clinical settings [22].

It was first designed by Jefferson et al. in 1987 with 45 items, and was revised by Hojat et al. who reduced it to 20 items in 1995.

JSPE-HPS contains three dimensions: perspective-taking, compassionate care/emotional engagement and standing in the patient's shoes [23].

This scale is scored on a 7-point Likert scale from 1(strongly disagree) to 7 (strongly agree).

Items 1, 3, 6, 7, 8, 11, 12, 14, 18, and 19 are scored reversely.

Higher scores on the JSE-HPS showed greater student empathy, and scores could range from 20 to 140 [24].

Hashemipour and Karami in Iran translated the original version of the JSPE-HP questionnaire into Persian language by a forward-backward translation method. Reliability was tested on 30 Dental and Medical students. Then validity and internal consistency were tested on 554 students.

Cronbach's alpha coefficient of the JSPE-HP was excellent (0.83).

The coefficient of test re-test reliability was 0.82 [25]. In this study, Cronbach's α of the (JSE-HPS) scale was 0.86.

Intervention design based on the framework of the Campinha-Bacot model

Campinha-Bacot defines cultural competence as a continuous process with five constructs: cultural awareness, cultural knowledge, cultural skill, cultural encounters and cultural desire [5]. The first involves cultural awareness, understanding the influences of their own culture. It helps them avoid biases toward other cultures. The second component is cultural knowledge. Healthcare professionals must combine their knowledge about health-related beliefs, cultural values, incidence and prevalence of diseases, and treatment effectiveness [26]. The third component is cultural skill, defined as the ability to communicate effectively with people from other cultures. The fourth component is cultural encounters, a process that encourages health care providers to directly interact with clients from culturally diverse backgrounds. The last component is cultural desire, an internal request to be culturally competent and shows a genuine desire to be open and flexible towards others, accepting differences and learning from others [27]. The content of the intervention was based on the four concepts of the cultural competency model. Students understood the concepts of cultural competency through case reports and storytelling. They were introduced to the characteristics of culturally competent nurses and their responses to providing culturally appropriate care. The intervention of blended learning program had three parts: face-to-face lecture, sharing personal experiences as part of storytelling, and case-based learning. Each unit was run for two hours over three weeks. The total intervention time was 6 hours. The educational content for the intervention group is shown in **Table 1.**

Table 1. Titles of educational content in the intervention group

Session	Contents	Duration of training (hours)
Session 1: Lecture	- Definitions of concepts of communication skills, unique challenges of students in showing communication skills - Definitions of concepts of cultural competence based on the Campinha Bacot model, cultural diversity, strategies for providing culturally proper care, understanding of the importance of empathy and active listening.	2
Session 2: Storytelling	- An experienced Iranian nurse living in Germany was invited through the Adobe Connect online as a guest. An Iranian nurse living in Iran with the experience of taking care of patients with different ethnicities and religions was also invited. They shared their clinical experiences in caring and empathizing with patients of different races and ethnicities with students through storytelling.	2
Session 3: Case-based learning	- Nursing instructors used several paper-based case learning about cultural diversity in small groups for further practice and providing feedback to the students.	2

Part 1: Introduced information on the definitions of concepts of cultural competence based on the Campinha Bacot model, communication skills, unique challenges of students in showing communication skills, an introduction to the cultural competence of nursing students, cultural diversity issues, strategies and techniques for providing culturally proper care, and an understanding of the importance of empathy and active listening taught through lectures and discussions.

Part 2: The learning content was passed on through sharing personal experiences as part of storytelling. Storytelling is defined as when nursing educators relate their clinical or other experiences to improve student learning.

The literature suggests that storytelling by nursing educators can help students combine what they learn in the classroom with what they learn in clinical settings [28]. In this stage, nursing experts (2 persons) experienced in the interaction and care of foreign immigrant families and different Iranian ethnicities were invited to express about diverse cultural backgrounds and cultural considerations. An experienced Iranian nurse living in Germany was invited through the Adobe Connect online as a guest. An Iranian nurse living in Iran with the experience of taking care of patients with different ethnicities and religions was also invited. They shared their clinical experiences taking care of patients of different races and ethnicities internationally based on the Campinha Bacot model cultural competency concepts with the students.

They were expected to train the participants how to improve their empathy toward new immigrants through storytelling.

The discussion, and questions and answers of the students with the guests of the meeting who were experienced in delivering nursing care services at international and national levels were actively guided by two nursing lecturers.

Part 3: The nursing students were involved in case-based learning. Nursing instructors used several paper-based case studies about cultural diversity for further practice and providing feedback to the participants. The students were divided into three small groups (n = 10). After reviewing the cases for about 30 to 40 minutes, the students' answers and strategies regarding cultural care were evaluated and analyzed at the end of this unit. The cases were real and relevant [29].

The case study is an example of the application of concepts based on the Campinhabacot model that shows all its defining attributes of the concepts and helps to better express the meaning of the model concepts.

The nursing instructors approved the design of the cases and their contents. For the control group, a two-hour in-person workshop using a lecture method was held according to the approved undergraduate nursing curriculum. All courses were taught by the first author and the corresponding author currently working toward a Ph.D. in nursing education and case-based learning who were trained in cultivating multicultural competence.

Data collection methods

After getting the approval of the study from the Ethics Committee of Lorestan University of Medical Sciences, the students who provided written informed consent to take part in this study were selected. Both of the groups completed a pre-test questionnaire to collect baseline data before the intervention.

The intervention group received 6 hours of cultural competence intervention in three consecutive weeks, two hours each week. The post-test questionnaire was completed by both of the groups two weeks after the training. The participants could have been influenced by the researchers' behavior while completing the questionnaire.

Data analysis

The data were analyzed using SPSS software version 17. Descriptive parameters such as mean and standard deviation were used.

Kolmogorov-Smirnov test was used to ensure the normality of data distribution. Independent tests, paired t-tests and the chi-square test were used for intergroup and intragroup comparisons. For the means after the intervention between the study groups, ANCOVA was used by controlling the baseline values (before the intervention). $P<0.05$ was considered statistically significant.

Results

The ages of the participants ranged with the mean age of 22.52 ± 2.32 years. Most of the participants were single (n = 58, %95), male (n =33, %54) and in the sixth semester of the bachelor of nursing (n = 34, %56). program. Seventy-five percent of the participants were interested in nursing. No significant difference was found between the two groups in terms of all demographic characteristics between the two groups ($p > 0.05$, **Table 2**).

Table 2. Sociodemographic characteristics of participants in intervention and control groups

Characteristic	Intervention (n = 26)	Control (n = 35)	Sig.
Gender, n (%)			$X^2 = 2.324$ p = 0.127
Male	17 (65.4)	16 (45.7)	
Female	9 (34.6)	19 (54.3)	
Semester, n (%)			$X^2 = 0.60$ p = 0.437
Fifth	13 (50.0)	14 (40.0)	
Sixth	13 (50.0)	21 (60.0)	
Marital status, n (%)			$X^2 = 0.11$ P = 0.739
Married	1 (3.8)	2 (5.7)	
Unmarried	25 (96.2)	33 (94.3)	
Interest in nursing, n (%)			X2 =0.07 P = 0.150
Yes	22 (84.6)	24 (68.6)	
No	4 (15.4)	11 (31.4)	
Previous cultural training, n (%)			X2 = 29.19 P = 0.001
Yes	16 (61.5)	0 (0.0)	
No	10 (38.5)	35 (100.0)	
Experience caring for foreign patients, n (%)			X2 = 1.64 p = 0.200
Yes	7 (26.9)	15 (42.9)	
No	19 (73.1)	20 (57.1)	
Interaction with specific populations (past 12 months), n (%)			X2 = 1.31 p =0.252
Yes	11 (42.3)	20 (57.1)	
No	15 (57.7)	15 (42.9)	
Age (years) Mean ± SD	22.96 ± 2.70	22.20 ± 1.90	t = -1.26 p = 0.209

Note: Chi-square test (X^2) was used for categorical variables; independent t-test was used for age comparison.
Abbreviations: n, number of participants; SD, standard deviation; X^2, Chi-square test; t, independent t-test; Sig., statistical significance; p, probability value.

A paired t-test was used to check the within-group difference in the cultural competence and empathy and its subscales before and after the intervention. In the intervention group, the results showed that the mean score on the cultural competence scale changed from 71.80 ± 9.34 in pretest to 76.84 ± 9.52 in posttest, which was a significant increase ($p < 0.05$, $t = -2.19$, Mean difference -5.03 ± 2.29). In the control group, the mean score on the cultural competence scale changed from 59.42 ± 15.5 in pretest to 61.88 ± 9.16 in posttest, which was not a significant increase ($p = 0.36$, $t = -0.92$, Mean difference -2.45).

In the intervention group, the results showed that the mean score on the empathy scale changed from 109.38 ± 14.29 in pretest to 113.92 ± 14.26 in posttest ($p = 0.25$, $t = -1.16$, Mean difference -4.53). In the control group, the mean score on the empathy changed from 116.62 ±15.5 in pretest to 116.37 ± 9.16 in posttest.

In two groups, this did not show a statistically significant difference ($p = 0.92$, $t = 0.09$, Mean difference 0.257, **Table 3**).

After adjusting the effect of the baseline competence score, between-group analysis of covariance showed a statistically significant difference between the changes in the mean scores of all subscales and the cultural competence total score of the two groups ($F = 22.19$, $p < 0.001$).

However, between-group analysis of covariance did not show a statistically significant difference between the changes in the mean scores of all subscales and the empathy total score of the two groups ($F = 1.19$, $p = 0.31$, **Table 4**).

Table 3. Within-group comparisons of cultural competence and empathy scores before and after intervention

Variable	Group	Pre-test Mean ± SD	Post-test Mean ± SD	Sig.
Cultural Competence				
Skill	Intervention	44.34 ± 6.10	46.26 ± 6.96	t = -1.13 p = 0.267
	Control	37.28 ± 12.47	38.00 ± 6.47	t = - 0.33 p = 0.738
Knowledge	Intervention	20.92 ± 2.97	23.23 ± 2.65	t = -3.72 p = 0.001
	Control	16.71 ± 4.95	17.82 ± 4.23	t = -1.09 p = 0.282
Sensitivity	Intervention	6.53 ± 1.77	7.34 ± 1.26	t = -2.22 p = 0.035
	Control	5.42 ± 1.66	6.05 ± 1.93	t = -1.66 p = 0.105
Total score	Intervention	71.80 ± 9.34	76.84 ± 9.52	p = 0.25 t = -1.161
	Control	59.42 ± 15.50	61.88 ± 9.16	p = 0.92 t = 0.095
Empathy				
Perspective-taking	Intervention	61.69 ± 11.43	61.23 ± 9.52	t = 0.15 p = 0.876
	Control	66.85 ± 7.95	63.45 ± 8.57	t = 2.30 p =0.027
Compassionate care	Intervention	38.80 ± 5.66	37.38 ± 6.62	t = 0.76 p = 0.454
	Control	41.00 ± 5.40	37.60 ± 8.26	t = 2.30 p = 0.027
Standing in patient's shoes	Intervention	8.88 ± 2.14	9.19 ± 2.19	t = -0.55 p = 0.581
	Control	8.77 ± 2.79	8.80 ± 2.93	t = -0.04 p = 0.961
Total score	Intervention	109.38 ± 14.29	113.92 ± 14.26	t = -1.16 p = 0.256
	Control	116.60 ± 22.14	116.37 ± 2.41	t = 0.09 p = 0.924

Note: Paired t-test was used for within-group comparisons.
Abbreviations: SD, standard deviation; t, paired t-test statistic; Sig., statistical significance; p, probability value.

Table 4. Between-group comparisons of cultural competence and empathy scores at posttest using ANCOVA

Variable	**Intervention Group** Mean ± SD	**Control Group** Mean ± SD	F	p-value
Cultural Competence				
Skill	46.26 ± 6.96	38.00 ± 6.47	12.89	0.001
Knowledge	23.23 ± 2.65	17.82 ± 4.23	17.84	0.001
Sensitivity	7.34 ± 1.26	6.05 ± 1.93	6.47	0.002
Total score	76.84 ± 9.52	61.88 ± 9.16	22.19	0.001
Empathy				
Perspective-taking	61.23 ± 9.52	63.45 ± 8.57	1.61	0.209
Compassionate care	37.38 ± 6.62	37.60 ± 8.26	0.14	0.865
Standing in patient's shoes	9.19 ± 2.19	8.80 ± 2.93	1.93	0.154
Total score	113.92 ± 14.36	116.37 ± 14.30	1.19	0.312

Note: Analysis of covariance (ANCOVA) was used for between-group comparisons, adjusting for baseline scores.
Abbreviations: SD, standard deviation; F, F-statistic from ANCOVA; p, probability value.

Discussion

In the present study, a short-term intervention with three components was carried out. This program increased nursing students' overall cultural competence and its subscales. However, it did not significantly affect their cultural skills or empathy. The study results showed that this program can be effective in improving nursing students' cultural competence. These findings were consistent with the results of a randomized controlled trial carried out by Kula et al. They found that the intervention of cultural awareness effectively strengthened the cognitive aspect of cultural competence, particularly with regard to knowledge and basic understanding [30].

The Campinha-Bacote model is complete enough to guide empirical research and the development of educational interventions. It can make significant contributions to nursing education and practice. Thus, an educational program based on an appropriate model could be useful to improve students' cultural competence and involving them in taking care of patients with different cultures [31]. Shih et al. carried out a transcultural educational program in Taiwan and Australia. Blended learning programs based on cultural competency model for health care professionals and students reduce health inequity and effectively improve the quality of health care services for migrant populations with diverse cultural norms [32].

Also, the results of this study revealed that this program could not increase either the total scores of empathy or the scores of the three related dimensions. The findings of the study by Sohrabi et al. showed that cultural competence training based on the Campinha-Bacote model increases learners' empathy in clinical settings [14]. The results of a literature review of 20 articles showed that teaching empathy, interpersonal communication skills, empathy based on mindfulness, transcultural nursing, and cultural competence had positive relationships with the level of empathy [16]. Hostility towards patients or victim blaming is a negative consequence of not enough cultural knowledge. Understanding people's behavior can be achieved by knowing the historical context, health beliefs, and practices of a specific cultural population [33]. However, theories and empirical research looking at the relationship between cultural competence and empathy are limited.

The present study used a self-report questionnaire to check the participants' empathy, which may have indirectly affected the results by response bias and social desirability bias. Fisher and Katz have described this social desirability bias in self-reported assessments [34]. Also, since a short-term intervention was carried out in the present study, this short duration of time may not have been enough to encourage empathy. In addition, study design (non-random allocation) can also affect the results.

Thus, effective strategies to strengthen empathy among nursing students, as well as measures to prevent its decrease, should be implemented promptly. This issue is critical because interaction with patients is essential to patients' emotional workload and recovery process.

The present study was limited to a nursing school in Western Iran. This study did not use a large sample or long-term follow-up phase. Since people were non-randomly assigned to two groups, the results and statistical inferences should be understood cautiously, and the results cannot be generalized to all nursing students. Studies with a more robust design are recommended. A larger sample size should be used in future studies. More samples from multiple sites and recruitment of nursing student participants from faculties with various backgrounds are needed. The participants of the present study expressed their willingness to take part, and their results may differ from non-volunteers due to selection bias. Therefore, further research is needed to improve our understanding of the causes of decreased empathy among nursing students.

Conclusion

The blended learning program carried out in the present study had a beneficial effect on the cultural competence of nursing students. Even though this program increased nursing students' total cultural competence significantly after the intervention, this study did not prove the effect of the blended learning program on nursing students' empathy. However, it can be a basis for future research in this field. This study has several implications. Patient culture is one of the main foundations of clinical nursing. In order to provide culturally responsive care based on this model, educational administrators should add cultural competence and empathy into the curriculum. Cultural competence and empathy can be developed in nursing students through appropriate educational strategies. Combining various strategies into the teaching-learning process appears to increase students' understanding of patients. These strategies allow for the achievement of higher cultural competence and empathy, which leads to positive outcomes for patients. Finally, this blended learning program played a crucial role in

improving students' cultural competence. Students were exposed to a wide range of cultural perspectives by listening to people's experiences and engaging in case-based learning. Therefore, it is suggested that nursing program managers add multicultural educational programs into curricula they use.

Ethical considerations

This study followed the rules of the World Medical Associations or the Helsinki Declaration. This study was approved by the Ethics Committee of Lorestan University of Medical Sciences (IR.LUMS.REC.1402.011).

The researchers clearly explained the research objectives and process to the participants to ensure that the data would be collected anonymously.

Each participant was given a code to protect their identity. All the information obtained from the questionnaire will be kept safe to be used only for scientific research.

All participants signed written informed consent forms prior to random allocation. The participants could withdraw from the study anytime during the research period without harm.

Artificial intelligence utilization for article writing

No AI tools were used for content generation, data analysis, interpretation, and English language editing.

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Conflict of interest statement

The authors declare that they have no competing interests.

Author contributions

All authors took part in the design and creation of the study. ShB, and MGh. were responsible for study idea or design. ShH. and ShB.

performed the data collection. YM. analyzed and explained the participant's data. ShB, MGh, ShH and YM, were significant contributors to writing the manuscript, manuscript preparation, review, and editing. All authors read and approved the final manuscript.

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Data availability statement

Requests can be made to the corresponding author for the datasets used and analyses.

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