Original Article

The effect of a COMSKIL-based education program on nursing students' communication skills during the COVID-19 pandemic: A quasi-experimental study

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Abstract

Background & Objective: Therapeutic communication with patients is one of the most critical competencies for nursing students in clinical settings. In this study, we investigated the impact of an online education program based on the COMSKIL model on the communication skills of undergraduate nursing students.

Material & Methods: This quasi-experimental study involved presenting a specific education program based on the COMSKIL model to a group of undergraduate nursing students in the 4th to 8th academic semesters. The program was delivered through the online platform of the university during the COVID-19 pandemic. The data were collected at three time points: baseline (T1), immediately after education (T2), and two months after education (T3). Two instruments were used to collect data: a sociodemographic information questionnaire and a Persian version of the Quindam Communication Skills Questionnaire. The data were analyzed using independent t tests, one-way Analysis of Variance (ANOVA), and repeated measures analysis of variance.

Results: The study's hypothesis was accepted, showing that the education program had a positive impact on the communication skills of the students over time. The total mean score of students' communication skills significantly improved ($p < 0.0001$) from T1 (107.91 ± 7.53) to T3 (121.76 ± 4.91) two months after the education program. The effect size indicated that this increase was moderate.

Conclusion: The findings of this study have practical implications for nursing students in real-world patient care scenarios in clinical settings. The innovative and evidence-based educational model used in this study can replace outdated methods of instruction. Given that effective communication between nurses and patients is vital for providing high-quality patient care in a supportive environment, we recommend integrating this person-centered program into the curriculum planning of undergraduate nursing students.

Keywords: education, communication, nursing student, COMSKIL, communication skills

Introduction

Interpersonal communication involves the exchange of ideas, information, and feelings through verbal and nonverbal messages. Good communication skills are a basic characteristic of effective communication (1) and are essential for all healthcare providers during patient care (2). Effective communication is the foundation of care and is considered an important prerequisite for successful care in all healthcare systems. Communication is also a key component in producing positive outcomes for patients and caregivers (3).

Previous studies have shown that effective communication can reduce blood pressure, pain, stress, anxiety, and uncertainty in patients while also increasing the rate of patient recovery and patients' ability to comply with treatments and psychosocial adjustment (4-6). Despite the importance of communication skills in providing care to patients, healthcare providers receive

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little training in this area during their education at the university. Sometimes they receive this training later through in-service programs just because of job requirements. Therefore, proper training in this area is crucial (7).

In clinical practice, communication is an effective way for healthcare students to improve their performance in clinical settings (8). However, previous studies have shown that healthcare students' communication skills are often moderate or even poor (9, 10). As nursing students can directly impact the care of patients and their families through therapeutic communication, high-quality communication between patients and nursing students can produce significant outcomes for patients, such as enhanced acceptance of the disease, more accurate symptom disclosure, better adherence to treatments, decreased anxiety and psychological distress, reduced feelings of loneliness, and improved satisfaction with care (11).

Communication skills are divided into four dimensions: intrapersonal skills, interpersonal skills, coping skills, and judgment skills. Empathetic communication, which is both a personality trait and a communication skill, plays a crucial role in interpersonal relationships (13) and is at the core of interpersonal skills (12). Effective communication skills are essential during patient care to accomplish various tasks, such as clarifying simple explanations about the disease, obtaining patients' approval for different procedures and tests, helping patients manage their condition, discussing disease prognosis, communicating with patients and their families, responding to patients' emotions such as frustration and anger, communicating with patients through interpreters, sharing clinical decision making, explaining their participation in clinical trials, dealing with their feelings such as defensiveness and avoidance, communicating with long-term survivors, handling disease recurrence, and managing end-of-life care, death, and dying issues (14).

The conceptual framework of this study is based on the COMSKIL model, which was introduced as a communication skill training model in medical education at Memorial Sloan-Kettering Cancer Center between 2005 and 2008. The model can be used by physicians and other healthcare disciplines (15) and provides a basis for curricula in which the education and assessment of specific skills are aligned. The COMSKIL model is based on Goals, Plans, and Action (GPA) theory, sociolinguistic theory, and the common-sense model of illness, which explain the ways in which individuals formulate their communications in this model (16). The COMSKIL model focuses on a person-centered approach, and earlier studies with this model have shown satisfactory results abroad (15, 16). Furthermore, the model introduces flexible strategies and skills that healthcare providers can use in different challenging situations (15). The 26 communication skills are classified into six levels: Establishing consultation framework skills (EST), Checking skills (CH), Questioning skills (QU), Empathic communication skills (EMP), Information organization skills (INF), and Shared Decision-Making skills (SDM) (17).

A review of the literature shows that there are a number of intervention studies in the field of communication skills for healthcare students (18, 19), but only a limited number of them have used educational models (16). To our knowledge, no one has used the COMSKIL model for nursing students in our society. Our empirical evidence shows that although there is the concept of communication in the curriculum planning of undergraduate nursing students and that they become familiar with it in specific workshops and courses, such as individual and social psychology, patient education processes, and health status assessment, they need more specific information and skills with different cases in various clinical situations. Therefore, this study aimed to explore the effectiveness of an online education program based on the COMSKIL model on the communication skills of undergraduate nursing students. The hypothesis of the study was that the online COMSKIL model-based education program has an effect on the level of communication skills of undergraduate nursing students.

Material & Methods

Design and setting(s)

This quasi-experimental study involved a single group of undergraduate nursing students. The study was conducted before and after an educational intervention.

Participants and sampling

This study was conducted among nursing students from a single university in northern Iran across three academic semesters (the 4th, 6th, and 8th). The students were invited to participate through the university website and were selected because they were enrolled at the university during the time of the research. The university rules allowed students to be recruited only once a year.

An invitation letter was published on the university website a month before the study began, which provided a summary of the study, its objectives, and a guide for

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participation (including students' rights, potential risks, and benefits of participation). Interested students who voluntarily chose to participate opened the link to the informed consent form, filled it out, and sent it to the first author via the university website.

Out of the total of 106 undergraduate nursing students in the 4th, 6th, and 8th academic semesters, 96 participated at baseline and responded to the pretest of the study. However, only 71 students remained for the rest of the study and responded to the posttests. The remaining 25 students were excluded from the study because they could not participate in any of the sessions for various reasons, such as internet problems (n = 20), sick leave (n = 2), or the interference of educational programs (n = 3). A modified CONSORT flow diagram with a single arm (20) was used to show the selection process for nursing students, which is presented in Figure 1.

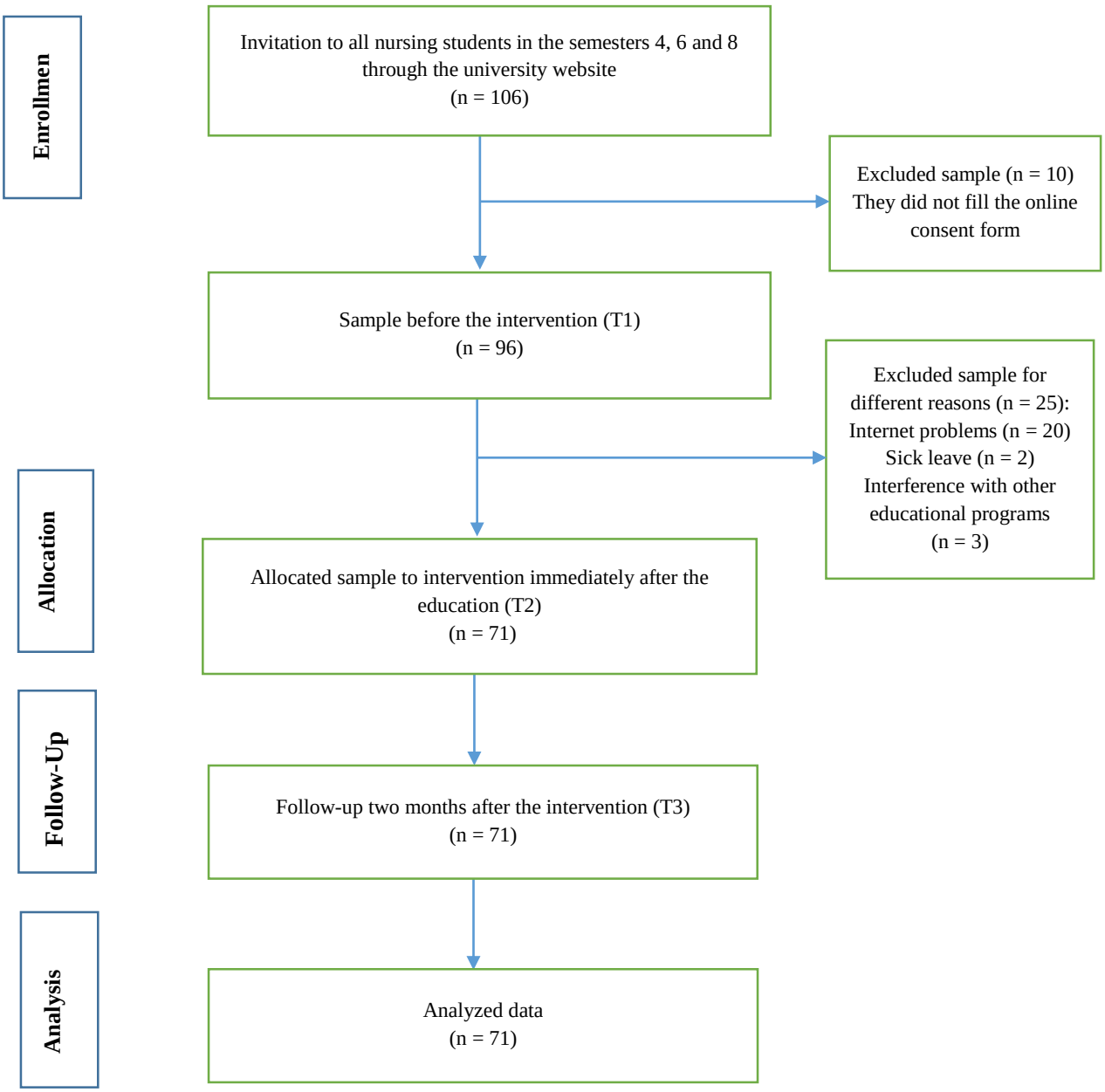


Figure 1. Modified CONSORT flow diagram with a single arm for selection of nursing students

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A power analysis was conducted using G* Power 3 version 3.1.5.1, which estimated an effect size of 0.19. The results indicated that the number of students for which changes were detected by a power of 80% at the 0.05 significance level was sufficient.

For inclusion in the study, undergraduate nursing students were invited to participate if they were in their fourth semester or beyond, had started their clinical training courses, or had experience communicating with patients in clinical settings. Additionally, the students could not have a history of mental health problems or treatments. The history of mental health problems was assessed through a self-reported question on the university website, which was sent along with the consent form link.

Incomplete responses to the questionnaires (more than 10%) and absences from one of the six educational sessions (checked through the system at the beginning of each session) were considered exclusion criteria for the study.

Tools/Instruments

Data were collected in this study using two questionnaires: a sociodemographic information questionnaire, which included age, sex, academic semester, and year of education, and a Persian version of the Quindam Communication Skills Questionnaire (21). The Quindam Communication Skills Questionnaire comprises 34 items with a Likert scale ranging from 1 to 5 (rarely, sometimes, often, most often, always). It has five subscales, including listening (7 items), ability to receive and send messages (9 items), understanding and insight into the communication process (5 items), emotion control (8 items), and decisiveness in communication (5 items). The total score of the questionnaire ranges between 34 and 170, with scores of 34–68 indicating poor communication skills, scores of 68–102 indicating moderate communication skills, and scores above 102 indicating high communication skills. The Persian version of the questionnaire has been confirmed to be valid and reliable in Iranian society (22). The internal consistency reliability of the questionnaire (total items) was 0.82 according to the Cronbach's alpha coefficient at T1. A Cronbach's alpha coefficient of 0.70 or greater is considered satisfactory for the reliability of a questionnaire (23).

Data collection methods

This study provided a communication skills education program for undergraduate nursing students based on the COMSKIL model. The program was conducted over six sessions, with each session lasting two hours. The students participated in one session per week for six consecutive weeks, for a total of 12 hours. The program was delivered through the online platform of the university to ensure consistency and provide students with enough time to gain experience in the real clinical world.

The education program focused on six levels of communication skills, including EST, CH, QU, EMP, INF, and SDM, which were classified through feedback lectures and discussions on clinical case studies with the help of media (a series of PowerPoint slides and videos) (Table 1). The students were divided into groups, and the clinical case studies were discussed in groups of 7-8 people. In total, five clinical case studies were delivered to the groups during the six sessions.

Each session included approximately 15-20 PowerPoint slides presented concurrently with the feedback lecture. Four 15-minute videos were displayed in sessions two to five. At the end of each session, the students were divided into virtual groups (beginning in the second session) and presented with similar scenarios about therapeutic communication with the patient, focusing on communication skills in different hospital settings. Each group was asked to discuss the scenarios for 30 minutes and then present their reflections in the online session.

The data were collected at three time points: baseline before education (T1), immediately after education (T2), and two months after the educational intervention (T3). Pretests were performed in the first session before starting the education program (T1). Posttests were taken immediately after six sessions of the education program (T2) and then two months later (T3). The two-month interval was considered the minimum interval to evaluate participants' awareness after the education intervention, based on the role of lifetime memory and the value of lifelong learning, as described in the literature (24).

Data analysis

In our study, we used SPSS statistical software version 20 (IBM Corporation, Armonk, NY, USA) for data analysis. We used both descriptive and inferential statistics. The descriptive statistics included frequency, percentage, range of score changes, mean, and Standard Deviation (SD). The inferential statistics included independent t tests, one-way analysis of variance (ANOVA), and repeated-measures ANOVA. To ensure the normality of the distribution of the main variables of the study, we evaluated them using the Shapiro-Wilk test

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at the beginning of the analyses. The results showed that they were normally distributed, allowing us to use parametric statistical tests in our study. We also checked the homogeneity of the variance-covariance matrix using Machelli's test. When evaluating an intervention, participants are usually compared at multiple time points, or when participants are exposed to more than one condition, they are compared through repeated-measures ANOVA to estimate the changes in the outcome variables (25). We used Cohen's thresholds for interpreting the effect size, where none was 0 - 0.20, small was 0.20 - 0.49, moderate was 0.50 - 0.79, and large was ≥ 0.80 (4). We considered the data to be significant at $p < 0.05$.

Table 1. Communication skills education program inspired by the COMSKIL model

Session	Objective	Summary of education and activities
First	Presenting an introduction and program schedule Introducing the COMSKIL model and components Establishing the consultation framework skills (EST): -Declare agenda items. -Invite patient agenda items. -Negotiate agenda.	✓ Overview of the program schedule and learning objectives ✓ Introduction to the COMSKIL model with a person-centered approach ✓ Core communication components ✓ Role of the nurse and patient in the communication behavior, setting, and time of the communication ✓ Communication barriers ✓ Communication strategies, skills, and process tasks ✓ Therapeutic communication in nursing theories ✓ Establishing therapeutic communication with the patient and creating an agenda
Second	Checking skills (CH): -Check patient understanding. -Check patient medical knowledge. -Check patient preference for information.	✓ Continuing therapeutic communication with the patient ✓ Evaluating the patient's understanding, medical knowledge, and preference for information ✓ Cognitive appraisal of the patient ✓ Biased perceptions and evaluation errors ✓ Discussion on a case study in the groups (7-8 students) ✓ Presentation of the groups ✓ Giving feedback to the groups
Third	Questioning skills (QU): -Invite patient questions. -Ask open questions. -Endorse question asking. -Clarify. -Restate. -Make a "take stock" statement.	✓ Questioning techniques ✓ Paying attention to verbal and nonverbal communications ✓ Discussion on a case study in the groups (7-8 students) ✓ Presentation of the groups ✓ Giving feedback to the groups
Fourth	Empathic communication skills (EMP): -Acknowledge. -Normalize. -Validate. -Encourage expression of feelings. -Praise patient efforts.	✓ Empathic communication with the patient ✓ Active listening ✓ Perceptions, emotions and cognitions ✓ Interaction of emotion, and cognition ✓ Emotion cues ✓ Biased perceptions and evaluation errors ✓ Discussion on a case study in the groups (7-8 students) ✓ Presentation of the groups ✓ Giving feedback to the groups
Fifth	Information organization skill (INF): -Preview information. -Summarize. -Review next steps.	✓ Organizing information ✓ Information cues ✓ Discussion on a case study in the groups (7-8 students) ✓ Presentation of the groups ✓ Giving feedback to the groups
Sixth	Shared decision-making skills (SDM): -Introduce shared decision-making. -Check patient preference for decision making. -Reinforce shared decision-making. -Make partnership statements. -Express a willingness to help. -Offer decision delay.	✓ Shared decision making ✓ Challenges of decision making and errors ✓ Discussion on a case study in the groups (7-8 students) ✓ Presentation of the groups ✓ Giving feedback to the groups

Results

The descriptive results of our study showed that the undergraduate nursing students were in the age range of 19–27 years, with a mean and SD of 22.2 ± 1.4 years. The majority of the students were female (69%) and single (97.2%). We examined the relationships between the demographic variables of the nursing students and their mean total scores for communication skills, as shown in Table 2.

At T1, the highest mean levels of communication skills were reported by the female students, married students, and students in the age group younger than 22 years; however, the t test results were not significant ($p > 0.05$).

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Nevertheless, the results of a one-way ANOVA showed that the mean level of communication skills was significantly different among the students in various semesters at T1 (p = 0.026). Specifically, students in the 4th and 8th semesters showed greater mean levels of communication skills than did the students in the 6th semester at T1. However, this difference was not significant among the students in various semesters at T2 (p = 0.063) or T3 (p = 0.061).

Table 2. The mean level of students' communication skills based on demographic variables at three time points from T1 to T3 (n = 71)

Demographic variables	Number N (%)	Before intervention (T1) M (SD)	Immediately after intervention (T2) M (SD)	Two-month after intervention (T3) M (SD)
Age				
< 22	41 (57.7)	107.21 (8.13)	114.73 (3.42)	116.50 (3.18)
> 22	30 (42.3)	105.05 (9.04)	114.47 (4.16)	116.12 (3.74)
P-value*	-	0.526	0.222	0.660
Sex				
Female	49 (69.0)	108.79 (7.16)	119.16 (5.09)	121.20 (5.05)
Male	22 (31.0)	105.95 (8.13)	120.00 (3.11)	123.00 (4.44)
P-value*	-	0.143	0.479	0.156
Marital status				
Single	69 (97.2)	106.13 (8.52)	114.62 (3.78)	116.49 (3.46)
Married	2 (2.8)	112.54 (10.61)	112.54 (2.16)	113.57 (0.73)
P-value*	-	0.886	0.350	0.124
Academic semester				
4th	24 (33.8)	109.75 (7.50)	120.50 (4.61)	122.83 (3.95)
6th	23 (32.4)	104.47 (6.20)	117.60 (4.19)	119.78 (5.29)
8th	24 (33.8)	109.37 (7.89)	120.08 (4.51)	122.58 (5.02)
P-value**	-	0.026	0.063	0.061

Notes: * P-values derived from independent t-tests comparing means between groups at each time point. ** P-values derived from one-way ANOVA tests comparing means between academic semesters at each time point.
Abbreviations: N, number of participants; SD, standard deviation; M, mean

The results of the repeated-measures ANOVA confirmed our hypothesis (Table 3), indicating that the COMSKIL model-based education program had a positive effect on the communication skills of undergraduate nursing students. The mean total communication skills score of the students significantly increased from T1 (107.91 ± 7.53) to T2 (119.42 ± 4.57) and T3 (121.76 ± 4.91). Moreover, the mean scores of all subscales of communication skills, including listening skills, ability to receive and send messages, understanding and insight into the communication process, and emotional control and assertiveness in communication, significantly increased from T1 to T3 after the education program (p < 0.0001). The results of Cohen's thresholds for interpretation of the effect size showed that our education program had a moderately positive effect on increasing the total score of the communication skills subscale and the subscale score of the "ability to receive and send message." Although changes in the rest of the subscale scores of the communication skills subscale were small from T1 to T3, changes in the scores of the "emotional control" and "assertiveness in communication" subscales were very close to the moderate bound (Table 3).

Table 3. The results of the repeated-measures ANOVA for the CS and CS subscales in undergraduate nursing students at three time points from T1 to T3

Variables	Scale Range	Before intervention (T1) M (SD)	Immediately after intervention (T2) M (SD)	Two-month after intervention(T3) M (SD)	F	p	Effect size	Power
Total communication skills	34-170	107.91 (7.53)	119.42 (4.57)	121.76 (4.91)	18.05	< 0.0001	0.72	1
Ability to receive and sending message	9-45	29.52 (2.85)	32.29 (2.75)	34.07 (3.02)	148.12	< 0.0001	0.67	1
Listening skill	6-30	19.87 (2.42)	21.35 (1.35)	21.23 (1.27)	19.04	< 0.0001	0.21	1
Emotional control	9-45	28.54 (3.38)	32.53 (1.45)	32.47 (1.58)	64.20	< 0.0001	0.47	1
Understanding and insight into the communication	5-25	15.45 (1.71)	16.73 (1.06)	16.64 (1.16)	21.13	< 0.0001	0.23	1

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Assertiveness in communication	5-25	14.52 (2.34)	16.50 (2.07)	17.32 (2.27)	68.93	< 0.0001	0.49	1

Notes: Effect size: none: 0-0.20; small: 0.20-0.49; moderate: 0.50-0.79; and large: ≥ 0.
Abbreviations: M, mean; SD, standard deviation; F, F-statistic from the repeated-measures ANOVA; P, p-value associated with the F-statistic.

Discussion

In this quasi-experimental study, we aimed to explore the effectiveness of an online education training program inspired by the COMSKIL model on the communication skills of undergraduate nursing students through the university website. Our results indicated that the hypothesis of the study was accepted, and the mean score of total communication skills and its subscales significantly improved in our nursing students two months after the education program. Although the baseline total communication skills scores were not low, they moderately improved in our sample after the education training program.

A literature review revealed the importance of communication skills in the management of healthcare conditions by healthcare students, especially nursing students who are expected to manage the healthcare needs of their patients (11). Therefore, it is necessary to improve the level of communication skills of nursing students when confronting different patients in various situations in clinical settings.

Our study's findings are consistent with previous research conducted on different target groups. For instance, a study involving emergency medical residents revealed that implementing a three-hour communication skills training program resulted in a significant improvement in residents' communication skills scores, leading to increased patient satisfaction (27). Another study conducted on nurses showed that an education program led to high scores on subscales of communication skills such as informative communication, empathy, and respect (28).

At the University of Leipzig, a new curriculum was developed based on the COMSKIL model program for teaching doctor-patient communication skills to 312 medical students. The course aimed to equip students with the basic communication techniques required to manage various communication scenarios they may encounter in their future work as care providers. The curriculum was evaluated using questionnaires designed to address its theoretical and practical content, with satisfactory findings indicating its suitability for use in medical universities (16).

An online communication skills training program for nursing students at a South Korean university resulted in significantly increased levels of empathy, communication skills, and self-efficacy among students in the intervention group compared to those in the control group (29). Similarly, an Iranian study on the effect of a role-playing nurse-patient communication program on nursing students' caring behaviors showed that the experimental group's mean score of communication skills significantly improved compared to that of the control group (30). Finally, a clinical trial involving 60 Iranian pediatric nurses at the hospital showed that following an education intervention, the verbal and nonverbal communication skills scores of the intervention group were significantly greater than those of the control group. The Cambridge Calgary scale was used to assess nurses' communication skills with children during six-hour workshops held in one day (31).

In our study, we observed that the nursing students' mean total communication skills score did not significantly change with age, sex, or marital status over time. However, we found that students in the 4th and 8th semesters had a significantly greater mean score for total communication skills than did the students in the 6th semester at baseline. Our findings align with previous studies on age (32, 33), sex (33, 34), and marital status (34). However, in contrast, a study found a significant positive relationship between the mean scores of students' communication skills and their marital status (35). Furthermore, our results regarding the academic semester of students differ from earlier studies that found that healthcare students' communication skills scores decreased with increasing years of education (33, 36). These differences might be explained by the use of various questionnaires, education intervention programs, and sample sizes across different healthcare settings.

To summarize, our education program had a moderately positive effect on the total communication skills level of undergraduate nursing students over time. This finding highlights the importance of focusing on the level of communication skills of nursing students with their patients and their families in clinical settings and during the planning of the nursing education curriculum. Furthermore, we recommend repeating similar research with a control group to further validate our findings and provide more robust evidence for the effectiveness of communication skills training programs in nursing education.

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One of the strengths of our study is the application of the COMSKIL model, which has a person-centered approach and includes 26 communication skills. However, the findings of our study are based on pretest and posttest analyses of data from a single group of nursing students, which limits the generalizability of our results. A major limitation of our study is the lack of a control group, which can influence the results. Although we acknowledge this limitation, it was not possible to select a control group due to the low number of nursing students at the selected university and the challenges of comparing nursing students at different universities with different educational infrastructures. Furthermore, our sample may not be representative of undergraduate nursing students, as they were selected from only one university. Another limitation of our study is the implementation of the program online, which may have resulted in a sense of isolation and required self-discipline from the students. These limitations should be taken into consideration when interpreting the findings of our study.

Conclusion

Our study revealed that the implementation of an education training program based on the COMSKIL model resulted in a moderate improvement in the total communication skills of undergraduate nursing students. Skillful communication is a crucial competency in the field of nursing and plays a vital role in providing high-quality patient care in a supportive environment.

Based on our results, we suggest integrating this model-based education program with a person-centered approach into the curriculum planning of undergraduate nursing students. In addition, we recommend replacing old, outdated education methods with this new evidence-based education approach in nursing schools to ensure that students receive the most effective communication skills training possible. By doing so, we can help prepare nursing students to become competent healthcare professionals who can communicate effectively with patients and their families, ultimately improving patient outcomes and satisfaction.

Ethical considerations

We would like to emphasize that this study was conducted with the utmost respect for ethical guidelines and was approved by the research ethics committee of Tonekabon University, with the ethical code of IR.IAU.TON.REC>1399.056. Informed consent was obtained from all participants, and their confidentiality and rights were respected throughout the study. We believe that adherence to ethical guidelines is crucial when conducting research, and we take pride in having followed these guidelines throughout the study.

Artificial intelligence utilization for article writing

We want to make it clear that artificial intelligence was not used to write the article.

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Conflict of interest statement

We declare that there are no conflicts of interest related to this paper.

Author contributions

The training program was developed by Maryam Sedaghati Kesbakhi, Camelia Rohani, and Simin Arab. The data were collected and computerized by Maryam Sedaghati Kesbakhi. Leila Hosseini Tabaghdehi analyzed the data, while Maryam Sedaghati Kesbakhi and Camelia Rohani performed the data treatment and interpretation. Maryam Sedaghati Kesbakhi drafted the manuscript, while Camelia Rohani supervised and critically revised the article and contributed significant text. Camelia Rohani also performed language revisions on the article. All authors have read and approved the final manuscript of the article.

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Data availability statement

We would like to inform readers that the data collected for this study will be available upon request.

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