Effectiveness of a Structured Teaching Programme on Knowledge Regarding Organ Donation among Undergraduate Nursing Students: A Quasi-Experimental Study

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Abstract

Background: Organ donation remains one of the most effective means to save the lives of people with end-stage organ failure. However, a lack of information among healthcare professionals and students remains a key barrier to the promotion of organ donation. As future health care workers, nursing students play a significant role in raising awareness and encouraging the public to become organ donors. Hence, educational interventions are crucial to improve their knowledge and readiness.
Objective: To assess the effectiveness of an organised training programme on knowledge related organ donation among undergraduate nursing students.
Methods: A quantitative study was conducted using a quasi-experimental one-group pre-test post-test design on 325 undergraduate nursing students recruited by multistage sampling process from nursing colleges affiliated to Gujarat University, Ahmedabad. Baseline knowledge was measured with a validated structured knowledge questionnaire comprising 30 items. Participants then underwent a comprehensive teaching curriculum on organ donation. The post-test was performed using the same questionnaire two weeks after the intervention. IBM SPSS Statistics version 29.0 was used to analyse data. Descriptive statistics were utilized to summarize participant characteristics and the paired-samples t-test was employed to test the efficiency of the intervention.
Results: Before the intervention, 60.0% of the participants had inadequate knowledge, 26.2% had moderate knowledge and 13.8% had adequate knowledge. Post-intervention, the proportion of participants with adequate knowledge increased to 47.7%, while the proportion with inadequate knowledge decreased to 24.3%. The mean knowledge score improved considerably from 6.42 ± 2.12 in pre-test to 9.84 ± 2.62 in post-test ($t = 18.622$, $df = 324$, $p < 0.001$). It shows the effectiveness of a structured training programme.
Conclusion: A structured education plan has a considerable impact on the knowledge of nursing students regarding organ donation. Implementing educational interventions on organ donation in undergraduate nursing curriculum may enhance future nurses' ability to educate patients, advocate for organ donation, and contribute to improving organ donation practices.
Keywords: Organ donation; Nursing students; structured teaching plan; Knowledge; Educational intervention; Quasi-experimental study

Introduction:

Organ transplantation is an established lifesaving procedure for patients with end-stage organ failure, which has substantially improved survival and quality of life. However, the lack of donor organs is still a huge problem in healthcare worldwide, which results in increased morbidity and mortality of patients waiting for transplantation. Advances in transplantation medicine have improved clinical outcomes, although organ donation rates remain inadequate in many countries, especially in low- and middle-income settings, highlighting the need for effective public education and awareness campaigns [1,2].

Nurses are vital to the organ donation process, educating patients, advising families, finding donors and championing their cause. This is why nursing students ought to have sufficient knowledge about organ donation as part of their undergraduate education in order to be able to support evidence-based practices in their future professional responsibilities. Yet, prior research have shown that nursing students have positive attitude but inadequate information regarding brain death, donor eligibility, transplantation procedures and legal elements of organ donation [1,3].

Educational interventions have been found to be beneficial in enhancing knowledge, attitudes, and readiness towards organ donation among healthcare students. Structured training programmes in nursing school can increase students' competence and confidence in discussing organ donation with patients and families, and hence help boost organ donation advocacy [4,5]. However, there is less evidence from large scale intervention research among under graduate nursing students of Gujarat. Therefore, the present study was undertaken to assess the efficiency of organized training programme on knowledge related organ donation among undergraduate nursing students in colleges affiliated to Gujarat University, Ahmedabad.

Method

A quantitative research approach with a quasi-experimental one-group pre-test – post-test design was used to assess the effectiveness of a structured education programme on knowledge regarding organ donation among undergraduate nursing students. The study was conducted in selected nursing institutes affiliated to Gujarat University, Ahmedabad, Gujarat, India. The sample size was estimated using G*Power software (Version 3.1.9.7) based on the expected medium effect size, statistical power of 80%, and significance level of 5%. Accordingly, 325 undergraduate nursing students were recruited via multistage sampling technique. Multistage sampling technique was used to choose the nursing institutions and after acquiring administrative clearance from the principals of the individual colleges and written informed consent from the participants, eligible students were enrolled.

Baseline knowledge on organ donation was measured using a validated structured knowledge questionnaire created after a comprehensive evaluation of literature and expert consultation. The questionnaire had satisfactory content validity and internal consistency. Based on the pre-test evaluation, the participants were provided with a Structured Teaching Programme (STP) on organ donation which covered concepts and importance of organ donation, types of organ donation, brain death, donor eligibility, legal and ethical aspects, myths and misconceptions, and role of nurses in promoting organ donation. The intervention was conducted through one 60-min educational session using interactive lectures, PowerPoint slides, video aids, and group discussions. Two weeks following the intervention, a post-test was administered using the same questionnaire to determine the program's success.

Data were entered in Microsoft Excel and analyzed using IBM SPSS Statistics version 29.0. Descriptive statistics (frequency, percentage, mean and standard deviation) were used to describe the demographic characteristics and knowledge scores of the participants. To assess the effectiveness of the organized instruction programme, paired-samples t-test was used to compare the pre-test and post-test knowledge scores. The result of $p<0.05$ was judged statistically significant.

The study was approved by the Institutional Ethics Committee before the start of the trial. The principals of the nursing colleges were approached for administrative permission. All subjects gave written informed consent prior to data collection. Participation was voluntary and confidentiality and anonymity of the individuals' information was maintained during the study. Participants were told they could withdraw from the study at any point without any penalties for their scholastic or academic-related pursuits.

Results

Table 1. Distribution of Nursing Students According to Their Selected Demographic Characteristics

n = 325

Variable	Category	Frequency & %
Age (years)	18	70 (21.5)
	19	66 (20.3)
	20	61 (18.8)
	21	59 (18.2)
	22	42 (12.9)
	23	27 (8.3)
Gender	Male	82 (25.2)
	Female	243 (74.8)
Year of Study	First Year	91 (28.0)
	Second Year	68 (20.9)
	Third Year	113 (34.8)
	Fourth Year	53 (16.3)
Religion	Hindu	302 (92.9)
	Christian	17 (5.2)
	Muslim	5 (1.5)
	Sikh	1 (0.3)
	Zoroastrian	0 (0.0)
Heard about Organ Donation	Yes	237 (72.9)
	No	88 (27.1)
Attended Training on Organ Donation	Yes	73 (22.5)
	No	252 (77.5)

The demographic characteristics of the 325 undergraduate nursing students that participated in the study are presented in Table 1. The largest group of participants was 18 years old (21.5%), followed by 19 years (20.3%). The lowest group was composed of students 23 years old (8.3%). The majority of participants were female (74.8%), with males accounting for 25.2% of the total. Regarding the year of study, the majority of participants were third year nursing students (34.8%). First year students (28.0%) were the second highest group, followed by second year (20.9%) and fourth year students (16.3%). The majority of the participants were of Hindu faith (92.9%), while a tiny proportion of the research population belonged to Christian religion (5.2%), Muslim religion (1.5%) and Sikh religion (0.3%). Almost three quarters of the students (72.9%) said they have known of organ donation before. However, only 22.5% of the participants underwent any official training programme linked to organ donation, and 77.5% had not received any training. These data indicate that although knowledge of organ donation was reasonably high among nursing students, engagement in formal educational programmes on organ donation remained low, underlining the need for structured educational interventions within undergraduate nursing education.

Table. 2: Classification of Knowledge Scores Regarding Organ Donation before intervention

n = 325

Knowledge Level	Score Range (30 Items)	Frequency (n)	Percentage (%)
Inadequate Knowledge	<60% (0–17)	195	60.0
Moderate Knowledge	60–79% (18–23)	85	26.2
Adequate Knowledge	≥80% (24–30)	45	13.8
Total		325	100.0

Table 2 shows the classification of nursing students based on pre-intervention awareness of organ donation. Most of the participants (195; 60.0%) had inadequate information about organ donation

before the structured instruction programme. Moderate knowledge was observed in around ¼ of the students (85; 26.2%) and just 45 participants (13.8%) had adequate knowledge. The findings show that the baseline knowledge regarding organ donation among the undergraduate nursing students was not sufficient and necessitates a systematic educational intervention to enhance the knowledge of organ donation and transplantation.

Table. 3 Classification of knowledge scores regarding organ donation after intervention

n = 325

Knowledge Level	Score Range (30 Items)	Frequency (n)	Percentage (%)
Inadequate Knowledge	<60% (0–17)	79	24.3
Moderate Knowledge	60–79% (18–23)	91	28.0
Adequate Knowledge	≥80% (24–30)	155	47.7
Total		325	100.0

Table 3 depicts the classification of nursing students according to their post-intervention knowledge of organ donation. After the structured instruction programme, acceptable knowledge was exhibited by nearly half of the participants (155; 47.7%) and moderate knowledge was exhibited by 91 (28.0%). The percentage of pupils with poor knowledge reduced significantly to 79 (24.3%). Compared with the pre-intervention data, there was a significant rise in the proportion of students with adequate knowledge and a similar decrease in those with inadequate knowledge. The findings show that the organized training plan had been successful in greatly boosting the nursing students' knowledge of organ donation.

Table 4. Comparison of Pre-test and Post-test Knowledge Scores Regarding Organ Donation among Nursing Students (n = 325)

Knowledge Score	Mean ± SD	Median (IQR)	Minimum–Maximum	t-value	df	p-value
Pre-test	6.42 ± 2.12	6.00 (5–8)	1–13	18.622	324	<0.001*
Post-test	9.84 ± 2.62	10.00 (8–12)	3–15			

Paired-samples t-test; $p < 0.05$ was considered statistically significant.

Table 4 presents the pre-test and post-test knowledge scores on organ donation among nursing students. The mean knowledge score before the exam was 6.42 ± 2.12. The median knowledge score was 6.00 (IQR: 5–8), and the range was 1–13. The mean post-test knowledge score after structured instruction programme was 9.84 ± 2.62 with a median of 10.00 (IQR: 8–12) and range of 3–15. The paired samples t-test demonstrated a statistically significant increase in knowledge scores following the intervention ($t = 18.622$, $df = 324$, $p < 0.001$). These results suggest that the organized training approach was helpful in considerably increasing the understanding of nursing students about organ donation.

Association between Post-test Knowledge Scores and Selected Demographic Variables

The relationship between post-test knowledge on organ donation and selected demographic characteristics was examined using Chi-square test. The research revealed that year of study, previous awareness of organ donation and past participation at organ donation training programmes were substantially linked with post-test knowledge scores ($p < 0.05$). Higher levels of knowledge were considerably higher in students in the later years of nursing studies, students who had previously heard about organ donation and students who had taken part in formal training sessions after the structured teaching programme. However, age, gender and religion were not significantly linked with post-test knowledge levels ($p > 0.05$). These findings indicate that the level of previous education exposure and academic advancement may affect the level of knowledge acquisition of organ donation among undergraduate nursing students.

Discussion

The present study revealed that the structured training plan greatly increased the knowledge of nursing students regarding organ donation. Before the intervention, 60.0% of the participants had poor knowledge, but after the intervention, the percentage of students with adequate knowledge increased

to 47.7%. The mean knowledge score also considerably rose from 6.42 ± 2.12 to 9.84 ± 2.62 ($t = 18.622$, $p < .001$). The results show that structured educational interventions are beneficial to improve knowledge of organ donation among undergraduate nursing students.

The demographic characteristics showed that majority of the respondents were female (74.8%), third-year nursing students (34.8%), and had heard about organ donation before (72.9%). However, just 22.5% have undergone official training on organ donation. This shows that although the knowledge is there, structured educational exposure is still inadequate. Similar results were reported by **Bertocchi et al. (2025)**, who found that only 40.4% of nursing students felt well informed on organ donation and brain death, suggesting considerable knowledge gaps but a generally supportive attitude towards organ donation. Authors proposed required instructional activities in undergraduate nursing curriculum to enhance students' preparation [5].

The large increase in knowledge seen in this study is similar to the findings reported by **Hamdan et al. (2026),** who found that an educational intervention significantly improved the knowledge and attitudes of allied health students regarding organ donation compared to their baseline measurements. The outcomes of the study confirm the importance of structured educational programs in raising awareness of organ donation among future healthcare workers [6].

Similarly, **Alwesmi et al. (2023) and Martínez-Alarcón et al. (2022)** found that the baseline knowledge of nursing students was relatively poor with the mean knowledge score of 6.43 out of 15. Higher levels of knowledge were associated with significantly more positive attitudes about organ donation and increased desire to donate their organs, demonstrating that enhancing knowledge is a critical pre-requisite for fostering positive behavioural intentions [7, 10].

In the present study, the significant reduction in inadequate knowledge after the intervention further supports earlier findings that educational programmes are beneficial in correcting misconceptions related to brain death, donor eligibility and transplantation procedures. **Khaleghi et al. (2026)** and **Murakami, M et al. (2025)** reported that both theoretical education and combined theoretical-clinical education considerably enhanced the understanding of nursing students, whereas those with more clinical exposure had greater improvement in the attitude toward organ donation[11,12].

The present findings also imply that education interventions should be implemented into the undergraduate nursing courses. Previous studies have regularly highlighted lack of curricular emphasis on organ donation as a reason for inadequate awareness among healthcare students. Similarly, **Ruta, F et al. (2022)** found that nursing students had higher knowledge than some other types of healthcare students but stressed the need for continual educational reinforcement to increase awareness of organ donation [13].

The results of the present study combined with available evidence suggest that structured training programmes are an effective method to improve understanding about organ donation in nursing students. Increasing the education on organ donation in undergraduate nursing curricula may increase future nurses' confidence in educating patients and families, advocating for organ donation, and improving transplant outcomes.

Conclusion

The present study suggests that the organized training programme was helpful in considerably boosting nursing students' understanding regarding organ donation. The mean knowledge score and percentage of students with acceptable knowledge increased significantly after intervention. The findings underscored the necessity of including structured educational courses on organ donation in the undergraduate nursing curricula to expand knowledge, increase awareness and equip future nurses to be effective advocates of organ donation and transplantation.

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Conflicts of interest: The authors declare no conflict of interest in the reported work.

Ethics approval

Prior to data collection, ethical approval for this study was obtained from the Institutional Ethics Committee. Administrative authorization was sought from the principals of participating colleges of nursing. All subjects provided their written informed permission before the research Enrollment. The participation was optional and the confidentiality and identities of the individuals were protected throughout the research.

Ethical concern: All participants gave written informed consent after the explanation of aims, procedures, advantages and voluntary nature of the study.

Author Contributions (CRediT)

Suhasini Christian: Conceptualization, technique, investigation, data collecting, data curation, formal analysis, writing- original draft preparation.

Dr. Ravindra HN: Conceptualization, methodology, supervision, validation, interpretation of results, writing - review and editing, and administration.

All writers have read and approved the final version of the text and have agreed to be accountable for all parts of the work.

Availability of data and materials

The data that support the findings of this study are accessible from the corresponding author upon reasonable request. The statement should conform to the specific standards of the target journal.

Abbreviations

- STP – Structured Teaching Programme
- SD – Standard Deviation
- SPSS – Statistical Package for the Social Sciences
- IEC – Institutional Ethics Committee
- MCQ – Multiple Choice Questions

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