Impact of Structured Training Program about Cadaver Organ Donation and Transplantation on Knowledge and Perception of Nursing Students at Public and Private Nursing Teaching Institute of Northern India - An Interventional Study

Sukhbir Singh, Kiran Kaur¹, Ravinder S. Saini², Sunita Singh¹, H. K. Aggarwal³, Hem Chandra⁴

Research Scholar, H. N. Bahuguna Uttarakhand Medical Education University, Dehradun and Sr. Professor, Department of Hospital Administration, Pandit Bhagwat Dayal Sharma, Post Graduate Institute of Medical Sciences, Rohtak, Haryana, ¹College of Nursing, Pandit Bhagwat Dayal Sharma, University of Health Sciences, Rohtak, Haryana, ²Department of Hospital Administration, Himalyan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun, Uttarakhand, ³Department of General Medicine, Pandit Bhagwat Dayal Sharma, Post Graduate Institute of Medical Sciences, Rohtak, Haryana, ⁴Vice-Chancellor, H. N. Bahuguna Uttarakhand Medical Education University, Administrative Block, Govt. Doon Medical College Campus, Dehradun, Uttarakhand, India

Abstract

Background: "Donation gap" refers to the shortage of organ donors worldwide. The medical/nursing students and various healthcare workers have poor awareness and attitude toward organ donation. **Objective:** We conducted this study to assess the current level of knowledge and perception regarding cadaver organ donation and transplantation among nursing students and to evaluate the impact of structured training interventions on their baseline knowledge and perception level. **Methods:** It was a single-group pre-post interventional study done by nursing students of one government and one private nursing college.A pre-tested questionnaire was used as a study tool. **Statistical Analysis:** Various statistical tests like one-way repeated measure ANOVA, Mauchly's test of sphericity, and Greenhouse–Geisser correction were used. Pairwise comparisons used Bonferroni corrections. **Results:** The pre-test group had the lowest mean knowledge (50.2346, SD = 15.35188), and immediately after training group had the highest (57.3900, SD = 14.34626). After one month, knowledge decreased but was still higher than pretraining (mean = 52.3607, SD = 13.28141). **Conclusions:** The positive attitude of nursing students may augment cadaver organ donation and transplantation in the future. The study has also highlighted the further training needs of the participants.

Keywords: Cadaver organ donation, healthcare workers (HCWs), knowledge, nurse, organ transplantation, perception, structured training program, World Health Organization (WHO)

INTRODUCTION

"Donation gap" refers to the shortage of organ donors worldwide.[1] According to WHO,[2,3] developed countries have an organ donation rate of 20–30 per million (i.e. 70%–80%) compared to 0.26 per million in India.[4] People's misconceptions about cadaveric organ donation also contribute to low organ donation in our country. Lack of legal and procedural knowledge also causes poor organ donation.[5-7] As the first contact with the donor family, HCWs can persuade them to donate. Living organ donations are the main source, but trade has continued despite national and international laws.[8-10] Donating cadaveric body organs is the only way to increase organ donations. Few studies[11,12] reported that people have poor organ donation knowledge and attitudes. Similarly, medical/nursing students and various healthcare workers have poor awareness and attitude toward organ donation, and physicians' positive attitude may inspire the public and can improve donor rates.[13-15]

Address for correspondence: Dr. Sukhbir Singh, Department of Hospital Administration, Pt. B. D. Sharma Postgraduate Institute of Medical Sciences, Rohtak - 124 001, Haryana, India. E-mail: drbrar1980@gmail.com

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This study assessed nursing students' knowledge and perception of cadaver organ donation and transplantation in a government and private institution. It evaluated the impact of structured training interventions on their baseline knowledge and perception. This study received Institute Ethics Committee approval.

MATERIALS AND METHODS

Study design

It was a pre-post single-group intervention study. This study was approved from Institute Ethics Committee vide No. BREC/21/021, dated 16.04.2021.

Participants and sample size

This study was conducted in the year 2021 among the nursing students of one government nursing college and one private nursing college in Haryana state. All nursing students in the study institutions (n = 481) were recruited [Table 1]. Non-attending and non-consenting participants were excluded from the study.

Study tool

After a thorough literature review, a structured questionnaire was created to assess cadaver organ donation and transplantation knowledge and perception. The survey had three parts. The first part included the participant's sociodemographic details like age, gender, education level, residence, etc., The second part tested cadaver organ donation and transplantation knowledge. The third part used a five-point Likert scale to measure respondents' perceptions of the study topic. Ten experts pilot-tested the questionnaire's content, applicability, comprehension, etc., Twenty knowledge- and fifteen perception-based questions covered different aspects of cadaver organ donation and transplantation, including the associated legal and ethical issues.

Tool administration

Before the training session, the study tool was administered digitally to evaluate nursing students' baseline knowledge and perceptions of the study topic. The training program included IEC material and audio-visual classroom lectures. The researcher and other faculty trained participants used the Zoom platform. The same study tool was digitally administered immediately and one month after training to evaluate its impact. Before each study, participants gave digital informed consent.

Statistical analysis

All knowledge-assessment questions were scored. Correct answers were worth five points. Incorrect answers were not penalized. The Likert scale for assessing participants' perceptions scored 05 to 01 for a strongly agree to disagree response. There were three groups based on three different periods, i.e. pre-training, immediately after training, and post-one month after training. Three-time periods' knowledge and perception scores were calculated. Overall mean and question-by-question pre-test, post-test, and one month after

Table 1: Distribution of participants as per their sociodemographic profile

Parameter	Count
Institution	
Govt. College of Nursing	275 (81%)
Pvt. College of Nursing	66 (19%)
Age	
<=20	145 (43%)
21-25	165 (48%)
26-30	26 (8%)
31-35	4 (1%)
>35	1 (0.30%)
Gender	
Female	335 (98%)
Male	6 (2%)
Place of Residence	
Rural	176 (52%)
Urban	165 (48%)
Type of Family	
Joint	86 (25%)
Nuclear	255 (75%)
Educational Qualification	
BSc 1st	87 (26%)
BSc 2nd	79 (23%)
BSc 3rd	23 (7%)
BSc 4th	61 (18%)
MSc 1st	35 (10%)
MSc 2nd	14 (4%)
Post Basic 1st	30 (9%)
Post Basic 2nd	12 (4%)
Educational Status of Father	
<10th	15 (4%)
10th	92 (27%)
12th	93 (27%)
Graduate	92 (27%)
Postgraduate	19 (6%)
Diploma/others	30 (9%)
Educational Status of Mother	
<10th	47 (14%)
10th	110 (32%)
12th	74 (22%)
Graduate	44 (13%)
Postgraduate	15 (4%)
Diploma/others	51 (15%)

post-test differences were calculated. We used one-way repeated measure ANOVA to compare knowledge and perception scores across periods. To use one-way repeated measure ANOVA, we checked its assumption as sphericity or equality of variance between each pair of three time periods. Mauchly's test of sphericity tests sphericity formally. Mauchly's W = 0.999 and *P* = 0.854 for knowledge and W = 0.974009 and *P* = 0.011519 for perception. Mauchly's sphericity test showed that data related to perception assessment had violated sphericity (*P* < 0.05). The data related to mean knowledge score had not violated the sphericity; hence, one-way repeated

measure ANOVA was used in mean knowledge scoring. However, the data related to mean perception score violated sphericity; hence, one-way repeated measure ANOVA with Greenhouse–Geisser correction was used in mean perception scoring. Pairwise comparisons used Bonferroni corrections.

RESULTS

There were a total of 341 participants in the study. Table 1 shows the respondents' age, sex, education, residence, institution, and family type, and 48% of participants were 21–30 years old, 98% were females, 74% were pursuing BSc, 81% were from government institutions, 52% were from rural areas, and 75% were from nuclear families.

In most questions, the correct percentage increases immediately after training and decreases after one month of training. Pre-training, immediately after, and post-one-month training groups were created. All three time periods had knowledge and perception scores. The pre-test group had the lowest mean knowledge (50.2346, SD = 15.35188), and the immediately after training group had the highest (57.3900, SD = 14.34626). Perception decreased after one month but was higher than the pre-training level (mean = 52.3607, SD = 13.28141). Mean knowledge scores differed significantly (f = 32.891, *P* = 0.0003).

Similarly, the mean perception score was lowest in the pre-test group (mean = 52.1701, SD = 4.17204), and immediately after training group had the highest mean perception (54.8211, SD = 7.14103). Perception decreased after one month but was higher than the pre-training level (mean = 53.0968, SD = 6.85132). The mean perception score differed significantly (f = 17.134812, *P* = 0.00002) [Table 2].

The pairwise comparison of mean knowledge was made using Bonferroni corrections. There was a significant difference in mean knowledge score when the pre-test group was compared with the immediate after training (mean difference = -7.1554, SE = 0.91416, *P* = .00001), post-one-month training group (mean difference = -2.1261, SE = 0.91177, *P* = .06088). The immediate after the training group was compared with the pre-test (mean difference = 7.1554, SE = .91416, *P* = .00001) and post-one month after the training group (mean difference = 5.0293, SE = .89224, *P* = .00002). The post-one month after the training group was compared with the pre-test (mean difference = 2.1261, SE = .91177, *P* = .06088) and immediately after the training group (mean difference = -5.0293, SE = .89224, *P* = .00002) [Table 3].

Similarly, on pairwise comparison using Bonferroni corrections, a significant difference in mean perception score was observed

Table 2: Mean knowledge and perception score in different time groups

Descriptive Statistics				
Parameter	Mean	Std. Deviation	*n*	*F, P*
Mean Knowledge (Pre-training)	50.2346	15.35188	341	32.891,
Mean Knowledge (Immediately after Training)	57.3900	14.34626	341	0.0003
Mean Knowledge (One-month post-Training)	52.3607	13.28141	341	
Mean Perception (Pre-training)	52.1701	7.33728	341	17.134812,
Mean Perception (Immediately after Training)	54.8211	7.14103	341	0.00002
Mean Perception (One-month post-Training)	53.0968	6.85132	341	

Table 3: Pairwise comparison of mean difference in knowledge and perception score

Pairwise Comparisons				
Measure: Knowledge				
(I) Time	(J) Time	Mean difference (I-J)	Std. error	*P*
Pre-training	Immediate after training	-7.1554	0.91416	0.00001
	One-month post-Training	-2.1261	0.91177	0.06088
Immediate after Training	Pre-training	7.1554	0.91416	0.00001
	One-month post-Training	5.0293	0.89224	0.00002
One-month post-Training	Pre-training	2.1261	0.91177	0.06088
	Immediate after training	-5.0293	0.89224	0.00002
Measure: Perception				
Pre-training	Immediate after training	-2.6510	0.46859	0.00002
	One-month post-Training	-0.9267	0.48551	0.17143
Immediate after training	Pre-training	2.6510	0.46859	0.00002
	One-month post-Training	1.7243	0.42250	0.00017
One-month post-Training	Pre-training	0.9267	0.48551	0.17143
	Immediate after training	-1.7243	0.42250	0.00017

Adjustment for multiple comparisons: Bonferroni

when the pre-test group was compared with the immediate after training (mean difference = -2.6510, SE = 0.46859, P = .00002) and post-one-month training group (mean difference = -0.9267, SE = 0.48551, P = .17143), and the immediate after the training group was compared with pre-test (mean difference = 2.6510, SE =.46859, P = .00002), post-one month after training group (mean difference = 1.7243, SE =.42250, P = .00017), and post-one month after training group was compared with the pre-test (mean difference = 0.9267, SE =.48551, P = .17143), immediately after training group (mean difference = -1.7243, SE =.42250, P = .00017) [Table 3].

DISCUSSION

All nursing professionals must have adequate knowledge about cadaver organ donation and transplantation, including the associated legal and ethical issues. However, not many studies related to nursing students are available on this subject in the indexed literature. Therefore, this study was conducted among nursing students in one government and one private nursing college in Haryana to map their knowledge and perceptions about cadaver organ donation and transplantation and to see the impact of the structured training program on it.

We discovered that 91% of respondents were aware of organ donation from deceased individuals. This finding is comparable to the Goa study,[16] in which 91.5% of participants reported familiarity with cadaver organ donation, but slightly lower than those of the Delhi[17] and Bangalore[18] studies (96% and 99%, respectively). In the present study, 26% of participants indicated that television was the most common source of information about organ donation from deceased donors, followed by scientific journals (24%), newspapers (16%), radio (1%), and other sources (36%). This finding is supported by a cross-sectional study[19] of medical students in which television was reported as the most common source of information about the study topic. However, these findings differ from those of the Goa study,[16] where newspapers (44.8%), followed by television (40.5%), were reported as the most common source of information about cadaveric organ donation. In the current study, only nursing students were included, whereas consultants, resident doctors, and nurses were included in the Goa study.

Consequently, the difference in findings can be attributed to the difference in samples. In the current study, 41% of respondents stated that cadaver organ donation is unpopular due to religious reasons, followed by socio-cultural factors (31%), expensive treatment (10%), inadequate hospital infrastructure (7%), and legal issues (5%). The conclusion is supported by a study conducted in Turkey,[20] which found a statistically significant correlation between religious attitude and the sub-dimension of apprehension of medical neglect on the Organ Donation Attitude Scale. In contrast, 3.6% of participants in the Goa study[16] cited their "religious beliefs" as their unwillingness to donate. Differences in the results may be attributable to differences in sample size and regional variation, and 82% of

respondents knew that cadaver liver, kidney, pancreas, heart, lung, and intestines can be donated.

In comparison, 57% knew that cadaver cornea, bone, skin, heart valve, blood vessels, nerves, and tendons could also be donated. In contrast, participants in the Goa study[16] revealed that the cornea was the most frequently donated organ (89.3%), followed by the kidney (80%), heart (68.3%), and lungs (25.3%). In another study[7] conducted in South India, kidney donation awareness was found to be the highest (94%), followed by heart (82%), liver (78%), cornea (59%), and lungs (55%) donation awareness. The Goa study and the South India study did not assess the awareness of cadaveric tissue donation. We found that the structured training program positively impacts participants' knowledge and perception of participants. The overall score was highest after training, followed by one month after training, and was lowest before training. This finding conforms with the results of a few other studies,[21,22] wherein the researchers reported the positive impact of the training program on the study topic. Although our study has shown an overall improvement in the knowledge and perception score among the participants due to training intervention, it has also thrown light on the domains where the participants performed well and areas where their performance was moderate. The improvement after training was moderate on the topics like the category of patients fit for cadaver organ donation, coordination of deceased organ donation activities in hospitals, the organization responsible for promoting cadaver organ donation in the state, legislation covering the cadaver organ donation and transplantation, clinical findings for declaring a patient as brain stem dead, and correct organ and tissue donation form for pledging the organ as per Act. Goa's study[16] reported that 94% of the participants knew that brain-dead people could donate organs. This finding is higher than our study (52%).

Similarly, in our study, it was reported that 62% of participants were not aware of the legislation covering cadaver organ donation and transplantation. However, the knowledge of this aspect among our study participants was better than the finding of another study,[23] where it was reported that 94% of the participants were unaware of the organ donation law. Hence, the current study has also revealed the future training needs of the participants.

CONCLUSIONS

This study has shown the positive impact of relevant training on the knowledge and perception of nursing students about cadaver organ donation and transplantation. The positive attitude of nursing students may augment cadaver organ donation and transplantation in the future. The study has also highlighted the further training needs of the participants. The importance of frequent training is also concluded in the study.

Strength of the study
The study was multicentered, involving both government and private nursing institutions. The impact of training intervention

was followed over a period of time. However, in the related studies available in indexed literature, only the immediate effect of training was assessed among the participants. This study is also novel for the Haryana state as no such study from this area is available in the indexed literature.

Limitation of the study

The study was conducted only among nursing students. No other category of HCW was enrolled in the study. Hence, the results of the study cannot be interpolated on other healthcare workers.

Recommendations

1. Regular training of nursing students on cadaver organ donation and transplantation, focusing on areas of moderate performance.
2. Plan more multicenter studies with nursing institutions.
3. Other categories of HCWs must be trained.
4. Further research may determine if classroom training increases cadaver organ donation.

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Conflicts of interest

There are no conflicts of interest.

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