

Original Article

Nursing Students Knowledge Level on Organ-Tissue Donation and Transplantation and Factors Affecting their Knowledge Level

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Abstract

Aim: Organ and tissue failure happens when organs or tissues lose their ability to function, whether temporarily or permanently. When medical treatments are not enough, organ and tissue donation and transplantation offer a solution by replacing the damaged organ with a healthy one. Research indicates that increasing awareness of organ and tissue transplantation among nursing students and integrating these subjects into their education can lead to higher donation rates.

Materials and Methods: This study employed a descriptive, cross-sectional design to evaluate the knowledge levels of nursing students regarding organ and tissue donation and transplantation, as well as the factors influencing this knowledge. A total of 232 nursing students were selected using G Power 3.1.5, and they participated by completing a demographic form along with the Organ-Tissue Donation and Transplantation Information Scale. Data analysis was conducted using SPSS 20.0.

Results: Of the participants, 183 were female, 40 were vocational high school graduates, and 149 were enrolled in the Nursing Turkish department, with 80 in their first year. Only 21 students had received prior training on organ-tissue donation. The average knowledge score was 12.29. Students in the Nursing Turkish department ($\bar{x}=12.79$) had higher knowledge levels than those in the English department ($\bar{x}=11.41$) ($p<0.05$). Students planning to donate organs ($\bar{x}=12.77$) scored higher than those who did not plan to donate ($\bar{x}=11.36$) ($p<0.05$). Additionally, those who had received prior training ($\bar{x}=13.95$) had higher knowledge scores than those without training ($\bar{x}=12.13$) ($p<0.05$).

Conclusion: The language barrier and cultural variances can impact knowledge levels. Therefore, delivering educational content in multiple languages can effectively overcome such barriers. Higher pre-training levels correspond with increased knowledge among nursing students considering organ and tissue donation, indicating heightened interest in the subject and a more vigorous pursuit of information.

Keywords: knowledge, nursing students, organ donation, transplantation

Introduction

Organ failure is a condition characterized by the temporary or permanent inability of tissues and organs to perform their functions due to any reason. In case of insufficiency,

organ transplantation is needed as the last option in cases where the organ cannot perform its functions despite medical treatment (Tsubaki et al., 2023; Qian et al., 2022). The main purpose of organ

transplantation; to increase the quality of life of the individual and prolong the life span by performing the functions of the functional organ (Nasir and Padela, 2023; Tekin and Abdullayev, 2023).

The number of patients on waiting lists for organ transplantation is increasing worldwide, further increasing the need for organ and tissue donation (World Health Organization [WHO], 2023; Ibrahim and Callaghan, 2023; Link et al., 2021). According to the data of the Global Observatory on Donation and Transplantation, it is stated that more than 150,000 solid organ transplants are performed worldwide every year, but this rate meets 10% of the global need (World Health Organization [WHO], 2024). The number of patients who underwent organ transplantation in Türkiye in 2024 (excluding bone marrow transplantation) was reported as 5902, of which 1267 were performed from cadavers and 2883 were performed as live transplants (ORGANKDS, 2024).

One of the main reasons why the desired level of organ transplantation cannot be reached in the world and in our country is the lack of organ donors required for transplantation (Jones, Smith, and Brown., 2018). In order for an individual to be a donor, he must allow his tissues and organs to be used in the treatment of other patients after the end of his life with his own free will in his own health and document this process (Allahverdi, Allahverdi and Akkus, 2020). Many factors are influential in organ donation, such as education, socioeconomic level, cultural and religious beliefs, changes in bodily integrity, and lack of knowledge about the process (Díaz-Cobacho et al., 2022; Scales and Bentley, 2020).

Healthcare professionals have important responsibilities in changing the beliefs of the society about organ donation and in providing training to the society about organ donation (Akbuga and Surme, 2022). It is predicted that the knowledge and awareness levels of nursing students, who will be a part of health services in the future, will also be reflected in the general organ donation attitude of the society (Bas et al., 2023; Ríos et al., 2020).

The level of knowledge and attitudes of nurses on this issue are among the main factors affecting donation rates in terms of providing accurate information to patients and their families (Allahverdi, Allahverdi and Akkus, 2020; López-Sanjuán et al., 2021). Therefore, it is very important to include trainings on organ and tissue donation in nursing education and to raise awareness of students on this issue.

Studies conducted in recent years show that the level of knowledge of healthcare professionals and nursing students about organ donation is insufficient and that education programs play an important role in eliminating the deficiencies in this field (Gursoy and Vatansever, 2022; Jones, Smith, and Brown., 2018). In addition, it has been stated that factors such as students' demographics, religious beliefs, and personal experiences may also affect their attitudes towards organ donation (Kolagari et al., 2022). The literature review determined that there were few studies on the level of knowledge of student nurses in organ and tissue donation and the factors affecting the level of knowledge.

In this study, which is carried out based on this reason, answers to the following questions are sought;

- What is the level of knowledge of student nurses about organ-tissue donation and transplantation?
- What are the factors affecting the level of knowledge of student nurses about organ-tissue donation and transplantation?

Material-Method: This study was carried out using descriptive and cross-sectional research method. In the data collection and publication process of the study, STROBE (Statement-Checklist of items that should be included in reports of cross-sectional studies) recommended by the literature was used for descriptive studies.

Population and Sample of the Study: The population of the study was determined as all nursing students (N=795) studying in the Department of Nursing (Turkish and English) at a private university. In the sample calculation of the study, 0.25 effect size, 0.05 error level, 95% confidence interval and 95%

power of the measurement were taken as basis for analysis of variance in repeated measurements. The sample size of the study was calculated as 255 using G power 3.1.5 software program. The criteria for inclusion in the study were: a) knowing Turkish, b) volunteering to participate in the study, and the exclusion criteria were determined as filling out the data form incompletely. The study ended with 232 students who met the inclusion criteria.

Data Collection Tools: The data of the study were collected by online questionnaire (Google forms) method using the student introduction form created by the researchers and the Organ-Tissue Donation and Transplantation Information Scale.

Student Introduction Form: It has been prepared by the researchers in line with the relevant literature in order to collect data on the age, gender, high school they graduated from, grade level, the language of the department they studied, the presence of an organ transplant individual in the family or friend circle, the status of organ donation, the status of considering organ donation in the future, and the status of receiving training on organ donation and transplantation before (Tekin and Abdullayev, 2023).

Organ-Tissue Donation and Transplantation Information Scale: The reality and reliability of the scale, which consists of a total of 17 items, in Turkey was made by Emirali et al., (2017). The right answer receives one point for questions 1, 3, 4, 5, 7, 11, 12, 14, and 16, while all other options receive zero points. While answering a question correctly, you receive one point; while answering a question incorrectly, you don't receive any points. The sum of the points for each question determines the scale's overall score. A higher score on the scale denotes a greater understanding of organ donation and transplantation, with 0 being the lowest and 17 being the most. It is assumed that as the score obtained from the scale increases, the level of knowledge increases. In the validity and reliability study of the scale, Cronbach's α value was 0.88. In this study, Cronbach's α value was calculated as 0.641. Accordingly, the answers given to the scale questions are reliable, in other words, they show that the items have the internal

consistency required to collect and obtain a score.

Data Analysis: Statistical Package for the Social Sciences (SPSS) 20.0 package program was used in data analysis. Descriptive statistics (mean, median, standard deviation, minimum and maximum) of the scale results were calculated. Multivariate linear regression analysis was performed to evaluate the effect of demographic characteristics of the participants on scale scores. The suitability of the model was evaluated by ANOVA test, Durbin-Watson autocorrelation test and Koenker constant variance test. The significance of the model was tested with the F test and the corrected R^2 value was reported. VIF values were calculated to examine the problem of multiple connections between independent variables. Hypothesis tests were performed for the variables that were found to be significant, and the differences between the groups were compared with the Mann-Whitney U test. $p < 0.05$ was considered statistically significant.

Ethical Considerations: Ethics committee permission for the study (Date: 31.10.2023, No: 237) was obtained from the Halic University Non-Interventional Clinical Research Ethics Committee and permission to use the scale by e-mail from the developer of the scale used in the research. Before the application of the research forms, the purpose of the study was explained in detail to the participants. Emphasizing that participation in the study was voluntary, informed consent was obtained from the participants. In the whole process of the research, the ethical principles in the Declaration of Helsinki were followed.

Results

It was determined that 78.9% of the students participating in the study were female and the mean age was 20.96 ± 1.926 . It was determined that 64.2% of the students graduated from Anatolian high school, 34.5% of them were educated in the first grade, and 64.2% of them received their nursing education in Turkish. It was determined that 6.9% of the students were individuals in their family or friends who had organ-tissue transplantation, 2.2% had previously donated

organ-tissue, 66.4% were considering donating organ-tissue in the future, and 9.1% had received training on organ-tissue donation and transplantation before (Table 1). It was determined that the students who were previously trained in organ and tissue transplantation mostly received training in the

surgical diseases nursing course (n:21) (Figure 1). It was determined that the students who said "yes" to the question of the presence of an individual with organ-tissue transplantation in your family or friend circle mostly answered "distant relative" (n: 16) (Figure 2).

Table 1. Identifying characteristics of students (n=232)

		n	%
Gender	Male	49	21.1
	Female	183	78.9
Graduated High School	Anatolian High School	149	64.2
	Straight High School	24	10.3
	Science High School	19	8.2
	Vocational High School	40	17.2
Class	1	80	34.5
	2	75	32.3
	3	57	24.6
	4	20	8.6
Chapter Read	Nursing(Turkish)	149	64.2
	Nursing(English)	83	35.8
Is there an individual in your family or friend circle who has had an organ-tissue transplant?	No	216	93.1
	Yes	16	6.9
Have you donated organs?	No	227	97.8
	Yes	5	2.2
Do you plan to donate organs and tissues in the future?	No	78	33.6
	Yes	154	66.4
Have you received training on organ-tissue donation and transplantation before?	No	211	90.9
	Yes	21	9.1

	Mean	Standard Deviation
Age	20.96	±1.926



Figure 1. Responses to where students are studying

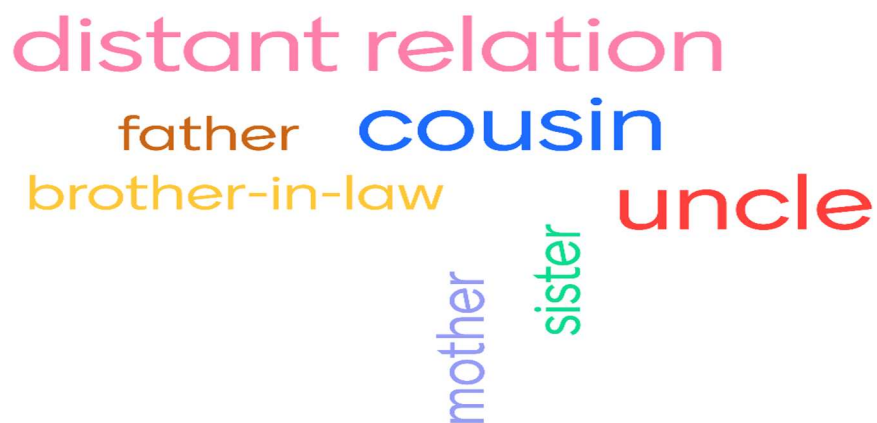


Figure 2. The answers of the students who said "yes" to the question of the presence of an individual with organ-tissue transplantation in your family or friend circle

Multivariate linear regression model was applied to test the linear effect of descriptive features on students scale scores. The variable of the section read was found to be statistically significant ($B=-.978$, $p<0.05$). The total score of the students whose medium of instruction was English was found to be 0.98 points lower than those who were in Turkish. It was determined that those who planned to donate organs in the future had a scale score of 1.30 points higher than those who did not ($B=1.297$, $p<0.05$). It was

determined that the level of knowledge of those who received training on organ-tissue donation and transplantation in the past was 1.56 points higher than those who did not ($B=1.575$, $p<0.05$). There was no statistically significant difference between variables such as age, graduated high school, grade level, presence of an organ transplant individual in your family or friend circle, whether or not they donated organs, and organ-tissue donation variables ($p>0.05$) (Table 2).

Table 2. Statistics of Multivariate Linear Regression Model Variables (n=232)

Model	Non-Standardized Coefficients		t	p	Linearity Statistics	
	B	Std. Error			Tolerans	VIF
Constant	14.715	2.411	6.104	<.001*		
Age	-0.095	0.126	-0.751	0.453	0.627	1.596
Graduated High School	0.069	0.182	0.379	0.705	0.813	1.229
Class	-0.107	0.253	-0.422	0.674	0.621	1.609
Chapter Read	-0.978	0.426	-2.294	.023*	0.885	1.130
Is there an organ transplant individual in your family or friend circle?	-0.144	0.788	-0.183	0.855	0.928	1.078
Have you been an organ donor?	0.017	1.384	0.012	0.990	0.915	1.093
Do you plan to donate organs and tissues in the future?	1.297	0.415	3.126	0.002*	0.961	1.040
Have you received training on organ-tissue donation and transplantation before?	1.575	0.690	2.283	0.023*	0.943	1.060

*Significant p-value of 0.05

Since the data of the study did not provide a normal distribution assumption, the total scores of each variable were compared separately with non-parametric Mann-Whitney U tests (Table 3). According to Table 3, the knowledge level of the students whose medium of instruction was Turkish ($\bar{x}=12.79$) was found to be higher than that of those who received education in English ($\bar{x}=11.41$) ($U=4624.0$, $p<0.05$). It was determined that

the knowledge level of the students who planned to donate organs in the future ($\bar{x}=12.77$) was higher than those who did not think ($\bar{x}=11.36$) ($U=4668.0$, $p<0.05$). It was found that the level of knowledge of those who received training on organ-tissue donation and transplantation in the past ($\bar{x}=13.95$) was higher than those who did not receive ($\bar{x}=12.13$) ($U=4668.0$, $p<0.05$).

Table 3. Hypothesis Tests of Significant Variables in Multivariate Linear Regression Model

		Total Scale Score				Mann-Whitney U Testi	
		N	Mean	SS	Mean	U	p
Language of Instruction	Nursing (Turkish)	149	12.79	2.611	13.00	4624.0	0.001*
	Nursing (English)	83	11.41	3.572	12.00		
Do you plan to donate organs and tissues in the future?	No	78	11.36	3.622	12.00	4668.0	0.005*
	Yes	154	12.77	2.612	13.00		
Have you received training on organ-tissue donation and transplantation before?	No	211	12.13	3.119	13.00	1336.0	0.002*
	Yes	21	13.95	1.564	14.00		

*Significant p-value of 0.05

Discussion

In our study, it was determined that the level of knowledge of nursing students about organ and tissue donation was above the medium level. In the study conducted by Karacan et al., it was determined that the knowledge levels of nursing students were above the medium level, and in other studies in the literature, it was found to be at a medium level (Karacan et al., 2024; Majeed, Hassan, & Mousa, 2024; Tekin and Abdullayev, 2023). It was determined that the level of knowledge of the students who received nursing education in Turkish language about organ-tissue transplantation was higher than those who received education in English. This finding reveals the effect of education in the mother tongue on knowledge acquisition processes. It is similar to previous research on the impact of language on learning processes (Abd-Alrazaq et al., 2023; Antón-Solanas et al., 2021). In this context, it is suggested that education in the mother tongue facilitates a deeper understanding of conceptual information, provides higher levels of knowledge about organ donation, and therefore should be taken into account in the

design of health education programs, taking into account the impact of the language of instruction on learning outcomes (Martínez-Alarcón et al., 2022).

In our study, it was determined that the majority of the participants stated that they were considering organ and tissue donation in the future. This rate is consistent with the results obtained in studies on organ donation in Turkey and shows that the intention to donate organs among young individuals follows a positive course (Sarı, Adıguzel and Demirbag, 2023; Tekin and Abdullayev, 2023). The fact that the level of knowledge of students who intend to donate organs in the future is significantly higher than those who do not think about it indicates a strong relationship between the level of knowledge and the intention to donate. In the literature, it is stated that positive attitudes towards organ donation increase in parallel with the increase in knowledge (Akbulut et al., 2022; Bas-Sarmiento et al., 2023). This finding reveals that trainings, campaigns, symposiums and conferences aimed at raising awareness about organ donation can positively affect the organ donation process.

It was determined that the knowledge levels of the students who received training on organ and tissue donation and transplantation in the past were significantly higher than those who did not receive this training. This result shows that education plays a critical role in increasing awareness and knowledge about organ donation. In the study conducted by Chen et al., it was emphasized that the education given on organ donation and transplantation positively affects the knowledge and attitudes of individuals (Chen et al., 2024). In this context, it is foreseen that expanding the scope of education programs and including subject-oriented courses in the nursing education curriculum will be an important strategy in reaching more students and increasing social awareness about organ donation by providing students with the opportunity to lead on this issue and raise awareness in the society.

However, the fact that only 2.2% of the participants have donated organs and tissues in the past reveals that there are deficiencies in the transformation of consciousness into behavior (Alaniz et al., 2023). In parallel with these findings, it is emphasized in the literature that the actual donation rates are low due to reasons such as individuals' lack of knowledge about organ donation, the complexity of donation processes, and cultural factors (Majeed, Hassan ve Mousa, 2024; Martínez-Alarcón et al., 2022).

According to the findings of the research, the fact that demographic variables such as gender, type of high school graduated and grade level do not have a significant effect on the level of knowledge about organ donation reveals that education is more decisive than demographic characteristics in the acquisition of this knowledge. Similarly, it is emphasized in the literature that knowledge and awareness about organ and tissue donation are directly related to education rather than demographic factors (Bas-Sarmiento et al., 2023; Singh et al., 2023).

Strengths and Limitations: The strengths of the research are that it comprehensively evaluates the level of knowledge of nursing students on both organ and tissue donation and transplantation, the research includes a

large group of participants, and examines the effect of demographic variables on the level of knowledge, revealing the effect of factors such as education level, language differences and personal attitudes towards organ donation on knowledge.

The limitations of the study are that it was limited to nursing students at a particular university, which limited the generalizability of the findings to all nursing students. In addition, the fact that a large proportion of the participants were trained in the Turkish nursing program leads to the fact that the findings about the language barrier do not provide a complete representation for students studying in other languages. The evaluation of the knowledge levels of the participants based only on their own statements brought about a lack of an objective evaluation in the measurement of the level of knowledge. The adoption of a cross-sectional research design has been insufficient to show the changes in the level of knowledge about organ and tissue donation over time. Therefore, it is recommended to prefer longitudinal designs with larger and more diverse samples in future research.

Conclusions and Recommendations: As a result, it has been determined that the level of knowledge of nursing students who study nursing in the national official language, receive training on organ and tissue donation and consider organ-tissue donation is higher. Based on this reason, it is predicted that the language barrier and cultural differences affect the level of knowledge, so the presentation of educational content in more than one language may be effective in overcoming the language barrier. The higher level of knowledge of the students who have received previous training on organ-tissue donation shows that education plays an important role in increasing the level of awareness and knowledge on this issue. In addition, the higher level of knowledge of nursing students who are considering organ-tissue donation proves that these students are more intense in their search for information due to their interest in the subject. In this context, it is an undeniable fact that the importance and necessity of adding compulsory or elective courses on organ-

tissue donation and transplantation process to the nursing education curriculum, and organizing seminars, symposiums, workshops and awareness-raising campaigns.

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