

## ***The Effect of Education on the Knowledge Level, Awareness and Attitudes of Physiotherapy Students' Towards Organ Donation and Transplantation***

*Fizyoterapi Öğrencilerinin Organ Bağışına ve Nakline Yönelik Bilgi Düzeyi, Farkındalık ve Tutumlarına Eğitimin Etkisi*

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**Abstract:** The current educational curriculum does not provide physiotherapists with adequate knowledge and skills regarding tissue and organ donation and transplantation. This study aims to investigate whether educational interventions on organ donation and transplantation lead to significant changes in physiotherapy students' knowledge, awareness, and attitudes. The study involved 96 students from the Department of Physiotherapy and Rehabilitation at a state university, with a mean age of  $19.61 \pm 1.43$  years. Data were gathered through face-to-face interviews and evaluated using a socio-demographic information form, the Organ-Tissue Donation and Transplantation Knowledge Scale, and the Organ Donation Attitude Scale. After administering a pre-test, a 60-minute educational session was conducted, followed by a post-test. Statistical analysis revealed significant differences in the Organ Donation Knowledge Scale before and after the educational intervention ( $p=0.0001$ ). Significant differences were also observed in the Organ Donation Attitudes Scale, the Humanity and Moral Conviction sub-dimension, the Fears of Medical Neglect sub-dimension, the Fears of Bodily Mutilation sub-dimension, and the Total Negative Attitudes sub-dimension ( $p=0.0001$ ). Healthcare professionals play a critical role in informing and guiding people about organ donation for increasing awareness and encouraging positive attitudes. Therefore, providing comprehensive and effective education on organ donation and transplantation to physiotherapists can significantly enhance their ability to improve public knowledge and attitudes towards organ donation.

**Keywords:** Organ donation, Knowledge level, Attitude, Physiotherapy students, Education.

**Öz:** Fizyoterapistler, mevcut eğitim programları aracılığıyla doku ve organ bağışı ile nakli konusunda yeterli bilgi ve beceri kazanmamaktadır. Bu çalışmada fizyoterapi öğrencilerine organ bağışı ve nakline yönelik verilen eğitim ile öğrencilerin bilgi düzeyi, farkındalık ve tutumlarında anlamlı farklılık oluşup oluşmadığının incelenmesi amaçlanmıştır. Çalışmaya bir devlet üniversitesinin Fizyoterapi ve Rehabilitasyon Bölümü'nde öğrenim gören, yaş ortalaması  $19.61 \pm 1.43$  yıl olan toplam 96 öğrenci katılmıştır. Veriler yüz-yüze görüşme yöntemiyle toplanmış ve sosyo-demografik bilgi formu, Organ Doku Bağışı ve Nakli Bilgi Düzey Ölçeği ve Organ Bağışı Tutum Ölçeği kullanılarak değerlendirilmiştir. Öğrencilere ön test yapıldıktan sonra, 60 dakika süren bir eğitim gerçekleştirilmiş ve ardından son test uygulanmıştır. Organ Bağışı Bilgi Düzeyi Ölçeğinde eğitim öncesi ve sonrası istatistiksel olarak anlamlı fark ( $p=0.0001$ ) bulunmuştur. Organ Bağışı Tutumları Ölçeğinin Yardımseverlik ve Ahlaki Değer alt boyutu, Tıbbi Olarak İhmal Edilme Korkusu alt boyutu, Bedensel Yaralanma Korkusu alt boyutu ve Toplam Negatif Tutumlar alt boyutunda eğitim öncesi ve sonrası istatistiksel olarak anlamlı fark ( $p=0.0001$ ) bulunmuştur. Sağlık çalışanlarının hasta ve yakınlarını organ bağışı konusunda bilgilendirme ve yönlendirme rolleri, organ bağışı ile ilgili farkındalığı arttırmada ve olumlu tutumları teşvik etmede büyük önem taşır. Bu nedenle, fizyoterapistlere organ bağışı ve nakli hakkında kapsamlı ve etkili eğitimler verilmesi, fizyoterapistlerin halkın organ bağışı konusundaki bilgi ve tutumlarını geliştirmelerine önemli katkı sağlayabilir.

**Anahtar Kelimeler:** Organ bağışı, Bilgi düzeyi, Tutum, Fizyoterapi öğrencileri, Eğitim.

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## Introduction

Organ donation and transplantation are considered to be one of the fundamental building blocks of modern health services. These procedures are crucial for treating severe illnesses and enhancing quality of life. Healthcare professionals are key players in the successful implementation of organ donation and transplantation processes, as they are both intermediaries between donors and recipients and professional practitioners (Jawoniyi et al., 2018).

Attitudes towards organ donation and transplantation vary due to religious, cultural, social and societal values. Studies have reported that the primary cause for negative attitudes towards organ donation is incomplete and/or misinformation on the subject. Therefore, it is emphasized that training is needed to increase organ donation (Şantaş & Şantaş, 2018). In particular, the knowledge, attitudes, and awareness of healthcare professionals on this subject are important factors that directly affect the effectiveness of organ donation and transplantation processes.

It has been reported that undergraduate education of students studying in medical and health sciences and related departments is insufficient to change and improve students' attitudes about organ donation and transplantation both in our country and in other countries (Akkas et al., 2018; Kiberd, 1998; Özmen et al., 2008; Sağıroğlu et al., 2015; Sakallı & Sucu Dağ, 2020; Soylar & Ulaş Kadioğlu, 2018). While medical school and health sciences students tend to have more positive attitudes compared to students from other departments, research highlights gaps in their knowledge, conflicting attitudes, and educational needs concerning organ donation and transplantation. These studies suggest that incorporating education on organ donation and transplantation into the curriculum is essential (Fontana et al., 2017; Goz et al., 2006; Kim et al., 2006; Sağıroğlu et al., 2015; Symvoulakis et al., 2014; Yalçın Balçık et al., 2019). However, it has also been reported that the reason why some students are not registered donors

despite their high awareness and positive attitudes regarding organ donation is due to lack of knowledge and education (Kolagari et al. 2022; Sengul & Sahin, 2022).

There are few studies in the current literature assessing the knowledge, attitudes, and beliefs of physiotherapy students regarding organ-tissue donation and transplantation. A study conducted in India evaluated the knowledge, attitudes, and beliefs of physiotherapy students concerning organ donation (Sharma et al., 2018). There are also few studies in our country evaluating the views, knowledge level, and attitudes of Turkish physiotherapy students regarding organ-tissue donation (Güler et al., 2017; Sakallı & Sucu Dağ, 2020; Tuncer & Gurses, 2024). Although these studies highlight the educational needs of physiotherapy students regarding organ donation and transplantation, there is a lack of research evaluating the effectiveness of such educational efforts.

In light of the existing gaps and limitations in the literature, this study aims to assess the attitudes, awareness, and knowledge levels of physiotherapy students regarding organ donation and transplantation, as well as to evaluate the impact of the education provided on these processes.

## Materials and Methods

### Study Design

The study adhered to the principles outlined in the Declaration of Helsinki and received approval from the university's ethics committee (approval number: GO 2023/66). All participants provided written informed consent.

### Participants

The study included 96 physiotherapy students who volunteered to participate in the research and were studying at the faculty of health sciences at a state university in the 2022-2023 academic year. The study was conducted between February 2023 and March 2023 at the Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Burdur Mehmet Akif Ersoy University. The

inclusion criteria were: (i) being an undergraduate student in the department of Physiotherapy and Rehabilitation (ii) age between 18 and 25 years, (iii) agreeing to participate in the study voluntarily. The exclusion criteria was: (i) failing to complete any of the assessments.

### **Procedure**

Data collection tools were self-report scales adapted for Turkish validity and reliability. Data were collected through a face-to-face interview method utilizing a questionnaire. The questionnaire consisted of a total of 81 questions, including 24 questions that questioned the participants' socio-demographic characteristics, medical conditions and various opinions about organ donation, a 17-item "Organ-Tissue Donation and Transplantation Knowledge Scale" that included information about organ donation, and a 40-item "Organ Donation Attitude Scale".

Following the administration of the pre-test, a 60-minute education on "Organ Donation and Transplantation" was given by an expert team consisting of experienced doctors, nurses and physiotherapists.

Content of the educational program were (i) What is Organ Donation? (ii) Importance of Organ Donation, (iii) Status of Organ Donation in Turkey, (iv) Legal and Religious Dimensions of Donation, (v) Organ Donation Process, (vi) Who Can Donate Their Organs?

Questions and feedback from students were received after the education. Following the education, students were given an educational brochure and a post-test was administered 7 days after the education.

### **Data Collection Instrument**

*Sociodemographic Data Form:* Socio-demographic characteristics, medical conditions and various opinions about organ donation were questioned in 24 questions.

*Organ-Tissue Donation and Transplantation Knowledge Scale (ODTKS):* It is a 17- item scale developed by

Emiral et al. (2017) to evaluate individuals' knowledge about organ donation and transplantation. For questions 1, 3, 4, 4, 5, 7, 11, 12, 14, 16, the correct answer is assigned 1 point, while all other answers receive 0 points. For the remaining questions on the scale, a wrong answer is given 1 point, while the other responses receive 0 points. The total score on the scale is calculated by summing the scores from each individual question. The scale ranges from a minimum score of 0 to a maximum score of 17, with higher scores indicating a greater level of knowledge about organ donation and transplantation.

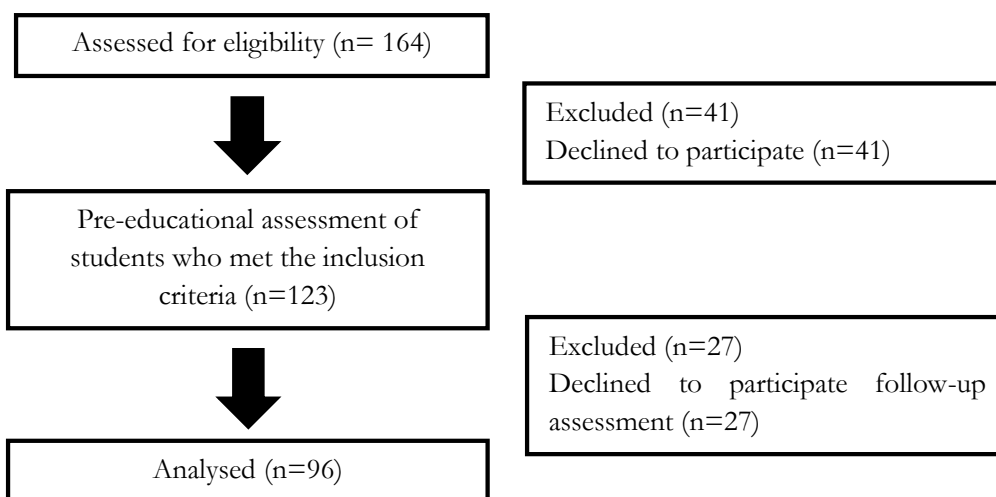
*Organ Donation Attitude Scale (ODAS):* The scale designed to evaluate individuals' attitudes toward organ donation was initially developed by Parisi & Katz in 1986, revised by Kent & Owens in 1995, and later validated for use in Turkey by Yazici Sayin in 2016. The scale comprises of 40 questions in 6-point Likert type and is analysed in 3 dimensions, each of which is evaluated within itself. The first dimension shows "Humanity and Moral Conviction" (HMC) about organ donation and consists of 20 positive statements. The scale ranges from a minimum score of 20 to a maximum score of 120. The second dimension, "Fears of Medical Neglect" (FMN), includes 10 negative statements, with scores ranging from a minimum of 10 to a maximum of 60. The third dimension, "Fears of Bodily Mutilation" (FBM), also comprises 10 negative statements, with the same scoring range. Higher scores in all three dimensions reflect an increased attitude towards each respective dimension (Yazici Sayin, 2016).

### **Statistical Analysis**

The data were analyzed using IBM SPSS software (version 26.0). Descriptive statistics of demographic data and dependent variables were interpreted as frequency, mean $\pm$ standard deviation ( $\bar{x}\pm$ SD), and percentile. Continuous variables were presented as mean $\pm$ standard deviation ( $\bar{x}\pm$ SD), while categorical variables were reported as counts (n) and percentages (%). The Shapiro-Wilk test was performed to assess normality of the data. To analyze differences

between initial and final measurements, the paired t-test was used for parametric data, and the Wilcoxon signed-rank test was applied for non-

parametric data. The significance level was accepted as  $p < 0.05$  for all analyses.



**Figure 1.** Flow diagram of the study.

**Table 1.** Socio-Demographic Characteristics of Students

Variables		x±SD			
Age (years)		19.61±1.43			
Education satisfaction (0-10)		8.73±1.07			
Variables		n	%		
Gender	Male	18	18.8		
	Female	78	81.3		
Organ failure in the relatives	Yes	8	8.3		
	No	88	91.7		
		Pre-Education		Post-Education	
		n	%	n	%
Knowing that there is an “Organ Donor Registration System” in Turkey	Yes	45	46.9	91	94.8
	No	51	53.1	5	5.2
Knowing how the “Organ Donor Registration System” works	Yes	9	9.4	78	81.3
	No	87	90.6	18	18.7
Accepting transplant an organ into your body from an another person	Yes	79	82.3	83	86.5
	No	1	1	0	0
	Perhaps	16	16.7	13	13

## Results

Out of 164 Physical Therapy and Rehabilitation students invited to the study, 123 agreed to

participate, and the initial assessment was conducted. The study concluded with 96 participants completing the follow-up assessment conducted one week later (Fig. 1). Participants reported their satisfaction with the education using a numerical rating scale, with an average score of  $8.73 \pm 1.07$ . The average age of the participants was  $19.61 \pm 1.43$ , and other demographic information is summarized in Table 1.

The pre- and post-education scores of the students on the ODTKS, along with the significance levels of the observed changes, are presented in Table 2. Additionally, Table 3 displays the scores and

significance levels for the students on the ODAS before and after the education. Significant changes were observed in all measurements compared to the pre-education period.

Table 3 summarizes the students' levels of willingness to donate organs and their organ donation status both prior to and following the education. Prior to the education, there were 2 individuals who had donated organs. However, the evaluation conducted one week after the training revealed that 15 individuals had donated organs, representing a 13.5% increase in organ donation rates.

**Table 2.** Differences in the Pre and Post Education Scores on the Knowledge and Attitudes Scales.

Variables	Pre-Education $\bar{x} \pm SD$	Post- Education $\bar{x} \pm SD$	Difference $\bar{x} \pm SD$	p	Effect Size
<b>ODTKS</b>	12.67±1.91	15.03±1.45	2.35±2.05	<b>p&lt;0.001*</b>	<b>1.366</b>
<b>ODTKS-DC</b>	3.23±0.72	3.93±0.73	0.69±0.99	<b>p&lt;0.001*</b>	<b>0.965</b>
<b>ODTKS-LEMP</b>	9.43±1.68	11.09±1.15	1.65±1.64	<b>p&lt;0.001*</b>	<b>1.115</b>
<b>ODAS- HMC</b>	96.94±16.32	105.44±13.29	8.50±11.38	<b>p&lt;0.001*</b>	<b>0.565</b>
<b>ODAS-FMN</b>	20.62±7.67	16.53±5.86	4.09±5.59	<b>p&lt;0.001*</b>	<b>0.588</b>
<b>ODAS-FBM</b>	25.81±10.46	22.27±9.24	3.54±5.32	<b>p&lt;0.001*</b>	<b>0.357</b>
<b>ODAS-TNA</b>	46.43±16.04	38.82±13.31	7.61±8.18	<b>p&lt;0.001*</b>	<b>0.511</b>
<b>WDO</b>	2.87±0.93	3.28±1.05	0.40±0.90	<b>p&lt;0.001*</b>	<b>0.407</b>

ODTKS: Organ-Tissue Donation and Transplantation Knowledge Scale, ODTKS-DC: Donor Characteristics Sub-dimension, ODTKS-LEMP: Legal, Ethics, Medical Process Sub-dimension, ODAS: Organ Donation Attitude Scale, HMC: Humanity and Moral Conviction, FMN: Fears of Medical Neglect, FBM: Fears of Bodily Mutilation, TNA: Total Negative Attitude, WDO: Willingness to Donate Organs.

**Table 3.** Willingness towards organ donation.

Willingness to Donate Organs	Pre- Education		Post- Education	
	n	%	n	%
I don't want to donate any part of my body and I don't want to sign an organ donor card either.	8	8.3	6	6.3
I am undecided about signing an organ donor card; I don't think I want to donate my organs.	22	22.9	10	10.4
I am undecided about signing an organ donor card, but I think I would like to donate my organs.	42	43.8	46	47.9
I want to donate my organs and would like to sign an organ donor card.	22	2.9	19	19.8
I have already signed an organ donor card.	2	2.1	15	15.6

## Discussion

The aim of this study was to evaluate the effects of education given to physiotherapy students regarding organ donation and transplantation on the students' knowledge level, awareness and attitudes. The findings show that receiving education on organ donation increases the knowledge level and positively affects attitudes. In addition, an increase in organ donation rates was observed after the education.

### ***Organ Donor Registration System and its Operation***

In studies conducted on students studying health sciences, the percentage of students who know the functioning of the Organ Donor Registration System in our country is not sufficient. In a study involving 352 nursing students, 30.1% were unaware of the steps to take if they wished to donate organs (Özbek Yazıcı et al., 2015). In a study involving nursing students, 83.7% stated that they did not know the working structure of the organ donation registration system in Turkey (Yazıcı Sayın & Dağcı, 2022).

In a study conducted in a state hospital in our country, it was determined that the rate of healthcare professionals who knew the Organ Donor Registration System was 78.6%, while the rate of those who knew how this system worked was 40.9% (Karataş, 2021). In a study by Türkben Polat et al. (2020) involving nursing students, 68.4% of the students reported that they did not know where to apply to donate organs. In our study, 46.9% (n=45) of physiotherapy students were aware of the "Organ Donor Registration System" in Turkey prior to receiving education, whereas this awareness increased to 94.8% (n=91) following the education. While the percentage of students who knew how the organ donor registration system worked before the education was 9.4% (n=9), this rate became 81.3% (n=78) after the education. The study's findings indicate that awareness of the "Organ Donor Registration System" in Turkey is insufficient, and knowledge about how this system operates is quite low. After the training, the rate of knowing the Organ Donor

Registration System and its operation has increased significantly. To the best of our knowledge, organ donation is not included in the curriculum in physiotherapy departments. For this reason, we think that the number of students who know how the organ donor registration system works before the training is quite low.

### ***Organ-Tissue Donation and Transplantation Knowledge Level***

In the study assessing Turkish physiotherapy students' knowledge and attitudes towards tissue/organ transplantation and donation, the average score for ODTKS-DC was  $3.48 \pm 0.79$ , for ODTKS-LEMP was  $9.56 \pm 2.15$ , and the overall score was  $13.04 \pm 2.51$  (Tuncer & Gurses, 2024). In a study by Tekin and Abdullayev (2023) on nursing students, the mean score for ODTKS was  $12.9 \pm 2.4$ . The mean score for ODTKS-DC was  $3.5 \pm 0.9$ , while the mean score for ODTKS-LEMP was  $9.4 \pm 1.9$ .

In a study conducted with 252 participants at a public hospital in Konya Province, which assessed healthcare professionals' knowledge and attitudes about organ donation, the mean score on the ODTKS-DC subscale was  $3.53 \pm 0.98$ , while the mean score on the ODTKS-LEMP subscale was  $8.42 \pm 3.27$  (Karataş, 2021).

In our study, the mean knowledge level score on the ODTKS before the education was found to be consistent with the findings reported in literature. In our study, the mean score of the knowledge level of ODTKS before the education was found to be  $12.67 \pm 1.91$ , and the mean score after the education was found to be  $15.03 \pm 1.45$ . The mean score for the ODTKS-DC subscale was  $3.23 \pm 0.72$  before the education and  $3.93 \pm 0.73$  after the education. The mean score for the ODTKS-LEMP was  $9.43 \pm 1.68$  before the education and  $11.09 \pm 1.15$  after the education. A statistically significant increase in the knowledge level scores of physiotherapy students regarding Organ-Tissue Donation and Transplantation was observed following the education.

### ***Organ Donation Attitude***

When the mean scores obtained from the ODAS in the study by Güler et al. on nursing students, the mean total score for the ODAS-HMC was  $95.13 \pm 18.81$ . For the ODAS-FMN sub-dimension, the mean score was  $29.30 \pm 10.74$ , while for the ODAS-FBM sub-dimension, it was  $30.00 \pm 10.68$ . The mean total score for the sub-dimension of overall negative attitude was  $59.31 \pm 19.44$  (Güler et al., 2020).

In another study conducted on nursing students, the mean score of ODAS-HMC, which is a positive attitude indicator of the ODAS, was  $104.00 \pm 15.05$ . The mean score of the ODAS-FMN, which are indicators of negative attitudes, was determined to be  $45.88 \pm 11.64$  and the mean score of the ODAS-FBM was determined to be  $42.74 \pm 12.65$ , and the total scale score was determined to be  $192.63 \pm 29.63$  (Sarı et al., 2023). In a study involving healthcare professionals at a state hospital, it was determined that they received  $96.8 \pm 22.2$  from the HMC sub-dimension,  $24.2 \pm 13.0$  from the FMN sub-dimension, and  $26.4 \pm 12.0$  from the FBM sub-dimension (Karataş, 2021).

In a study conducted with physiotherapy students, the mean scores of attitudes toward organ donation measured by the ODAS were  $99.26 \pm 13.44$  for the HMC,  $22.29 \pm 7.98$  for the FMN, and  $29.34 \pm 9.65$  for the FBM subdimensions, corresponding to a high level of attitude (Tuncer & Gurses, 2024).

Our research findings are similar to the literature knowledge before the education. A statistically significant increase in the positive attitudes of the physiotherapy students towards organ donation was observed after the education, while a statistically significant decrease in their negative attitudes was observed. The average scores obtained by the physiotherapy students on the sub-dimensions of the ODAS before the education were as follows:  $96.94 \pm 16.32$  for the HMC sub-dimension,  $20.62 \pm 7.67$  for the FMN

sub-dimension, and  $25.81 \pm 10.46$  for the FBM sub-dimension. After the education, the average scores were found to be  $105.44 \pm 13.29$  for the HMC sub-dimension,  $16.53 \pm 5.86$  for the FMN sub-dimension, and  $22.27 \pm 9.24$  for FBM sub-dimension.

### ***Having an Organ Donation Card***

Studies have shown that although students have positive attitudes towards organ donation, only a small number of them have organ donation cards (Fontana et al., 2017; Güler et al., 2020; Poreddi et al., 2016). In a study involving nursing students, it was found that while most students recognized the significance of organ donation for saving lives and promoting recovery, only 0.7% possessed an organ donation card (Güler et al., 2020). In a study exploring physician candidates' views on organ transplantation, it was reported that 72.3% of the students considered donating their organs, but only 14.1% had an organ donation card (Naçar et al., 2001).

In a study conducted on health management students, it was determined that 6 out of 118 students (5.1%) donated their organs (Soysal & Kaya, 2019). A study involving 352 nursing students, it was determined that 50.3% of the students considered donating their organs, while only 9.9% had an organ donation card (Özbek Yazıcı et al., 2015). As a result of a study carried out on university students studying in different faculties; it was found that 47.8% of the students considered organ donation, whereas only 4.2% of the students had declared organ donation by the date of the study (Kavurmacı et al., 2014).

In a study involving 504 university students, it was found that 30.1% of the students had considered donating an organ, while only 3.6% had actually donated. (Güler et al., 2017). In a study of nursing students, only 2.5% of them had a donor card (Yazıcı Sayın & Dağcı, 2022).

In a study of medical school students in Iran, the majority of students (73.8%) indicated their willingness to donate organs, but most of them (67.5%) yet a significant number (67.5%) were

unsure of how to acquire an organ donation card, and only 9.6% had obtained one as voluntary donors (Kolagari et al., 2022). Kose et al. reported that only 3.8% (n=4) of university students who held favorable views on organ transplantation actually had a certificate indicating they had donated their organs (Kose et al., 2015).

A study conducted on students studying in health sciences indicated that 6% of the students carried a legal donor card (Goz et al., 2006). In a study of undergraduate health sciences students in Turkey, it was found that 11.4% of them possessed an organ donor card (Sarı et al., 2023).

In a study conducted among medical students, it was reported that only three out of 171 students (1.8%) donated their organs. In addition, it was observed that although the number of students who wanted to donate their organs was high, few students donated their organs (Koçak et al., 2010).

In a study conducted among health college students, when organ donation status of the students was examined, it was determined that this rate increased to 12.1% after the education, while it was 2.7% before the education (Arslan et al., 2016).

In our study, having an organ donation card before the education is similar to the literature. In our study there were 2 individuals (2.1%) who had donated organs pre-education. However, the evaluation conducted one week after the education revealed that 15 individuals (15.6%) had donated organs, representing a 13.5% increase in organ donation rates. According to this result, it can be inferred that although students have a positive approach towards organ donation, they do not exhibit actual behavior towards donation. In line with the studies conducted, physiotherapy students should be informed about this issue by adding a course on organ donation and transplantation into the curriculum, and awareness should be created on this issue with pre- and post-graduation training. It is thought that all roles on this issue should be adopted starting from the student process and this situation will positively

affect the outcomes of organ donation and transplantation.

The major strength of this study is that, to our knowledge, it is the first study to assess the effectiveness of education given to physiotherapy students regarding organ donation and transplantation processes.

Collecting data from a single center is a limitation of our study. The findings of this study may not be generalizable to all physiotherapy students nationwide or globally.

## Conclusion

The findings of this study indicate that educational interventions significantly enhance physiotherapy students' knowledge, awareness, and attitudes towards organ donation and transplantation. The results demonstrate that targeted education can effectively address knowledge gaps, correct misconceptions, and positively alter attitudes regarding organ donation. Educational programs are essential for raising awareness, and enhancing public understanding of organ donation. Moreover, providing students with information about organ donation centers and transplant processes and increasing their awareness can potentially improve organ donation rates. Therefore, integrating organ donation education into university curricula, ensuring access to accurate and up-to-date information, and fostering a supportive environment for organ donation through public and health sector collaboration are essential. Educational and awareness-raising efforts should be considered fundamental strategies to encourage organ donation and address organ shortages.

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