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Knowledge Levels of Nursing Students About Robotic Surgery and Robotic Surgery Nursing

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ABSTRACT

This descriptive study was conducted to determine the knowledge level of the Nursing Department's students about robotic surgery and robotic nurses. The study was carried out with 478 nursing students between March 2022 and May 2022 in a foundation university. The study data were collected through face-to-face interviews via a questionnaire form. Data were analyzed using the descriptive statistical methods, Mann-Whitney U Test and Kruskal Wallis test. It was found that 84.3% of the students were interested in technology and 79.3% of the students heard of the term robotic surgery before. Most of the students stated that their knowledge level about robotic surgery and robotic surgery nursing was partially sufficient (73%). It was also found that more than half of the students (56.7%) knew about the existence of the field of robotic surgery in nursing. Although most of the students heard the term robotic surgery, majority of the student's level of knowledge was partly sufficient and they got knowledge mostly from the internet. Informing nursing students about robotic surgery will help students gain professional and technological knowledge and skills in the nursing profession and help them in their career planning.

Keywords: Nursing students, robotic surgery, surgical nursing.

Hemşirelik Öğrencilerinin Robotik Cerrahi ve Robotik Cerrahi Hemşireliği Hakkındaki Bilgi Düzeyleri

ÖZET

Bu tanımlayıcı araştırma, Hemşirelik Bölümü öğrencilerinin robotik cerrahi ve robotik hemşireler hakkındaki bilgi düzeylerini belirlemek amacıyla yapılmıştır. Araştırma, bir vakıf üniversitesinde Mart 2022 ile Mayıs 2022 tarihleri arasında 478 hemşirelik öğrencisi ile gerçekleştirilmiştir. Araştırmanın verileri, anket formu aracılığıyla yüz yüze görüşme yoluyla toplanmıştır. Veriler, tanımlayıcı istatistiksel yöntemler, Mann-Whitney U Testi ve Kruskal Wallis-H Testi kullanılarak analiz edilmiştir. Öğrencilerin %84.3'ünün teknolojiye ilgi duyduğu ve %79.3'ünün robotik cerrahi terimini daha önce duyduğu saptanmıştır. Öğrencilerin çoğunluğu robotik cerrahi ve robotik cerrahi hemşireliği ile ilgili bilgi düzeylerinin kısmen yeterli olduğunu (%73) belirtmiştir. Ayrıca öğrencilerin yarısından fazlasının (%56.7) hemşirelikte robotik cerrahi alanının varlığından haberdar olduğu saptanmıştır. Öğrencilerin çoğu robotik cerrahi terimini duymasına rağmen, öğrencilerin bilgi düzeylerinin kısmen yeterli olduğu ve çoğunlukla internetten bilgi edindiği görülmüştür. Hemşirelik öğrencilerine robotik cerrahi hakkında bilgi verilmesi, öğrencilerin hemşirelik mesleğine ilişkin mesleki ve teknolojik bilgi ve becerileri kazanmalarına ve kariyer planlamalarına yardımcı olacaktır.

Anahtar Kelimeler: Hemşirelik öğrencileri, robotik cerrahi, cerrahi hemşireliği.

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INTRODUCTION

Today, with the effects of the developments in computer technologies taking place in surgical fields, robotic technologies have begun to be used in surgeries in addition to traditional methods (Karaismailoğlu & Çilingir, 2020; Okgün Alcan et al., 2019). Robotic surgery is defined as surgical interventions which allow physicians to control surgical instruments remotely, which are managed through a control unit and performed by computer-based robots and through which complex surgical procedures can easily be performed (Karaismailoğlu & Çilingir, 2020; Morris, 2005; Okgün Alcan et al., 2019; Uslu et al., 2019; Yavuz-Karamanoğlu & Demir-Korkmaz, 2013).

Robotic surgery practices are commonly used in the world in general surgery, orthopaedic surgery, thoracic surgery, urological surgery, cardiovascular surgery, gynaecological surgery, plastic surgery, and otolaryngological surgery around the world (Kılınç-Akman et al., 2022; Mack, 2001; Palep, 2009; Shah et al., 2014; Watanebe, 2014). The reason why robotic surgery has progressed so rapidly and is accepted in almost all fields of surgery is due to the many advantages of these interventions (Yavuz-Karamanoğlu & Demir-Korkmaz, 2013). It is known that robotic surgery practices provide minimal scarring and improvement in cosmetic appearance with smaller surgical incisions, they reduce hospital stay and nursing care costs by reducing the risk of pain, infection and haemorrhage and the practice facilitates access to organs, tissues and nerves and provides ergonomic position to surgeons by allowing three-dimensional imaging (Cepolina & Razzoli, 2022; Martins et al., 2019; Okgün-Alcan et al., 2019; Ak et al., 2017). Besides the advantages of robotic surgical interventions, factors such as the high cost in buying, installing and maintaining robotic surgery systems, large instruments, long period of set up, difficulty in changing camera and port locations and requiring a long time to change the position of the patient during surgery, physicians' working without a sense of touch and their lack of experience, and lack of knowledge among nurses constitute the disadvantages of these interventions (Kılınç-Akman et al., 2022; Martins et al., 2019; Porto & Çatal, 2021).

When its advantages and disadvantages are considered, robotic surgery makes surgery easier (Okgün Alcan et al., 2019). It has been stated that best results in this aspect can be achieved with robotic surgery team and there should be perioperative nurses, surgeons, surgical assistants, and anaesthetists in this team (Giedelman et al., 2021). For this reason, for robotic surgery to be used more effectively and to get better results, the whole team should have knowledge on the subject and participate in training programs on robotic systems (Kang et al., 2016; Karaismailoğlu & Çilingir, 2020).

As a result, considering that the use of robots with different features in surgical field will increase today and, in the future, it is important to evaluate the knowledge levels of especially health professionals on this topic. Because of the innovation of this technology, the role of nurses in robotic surgery is both exciting and challenging (Ak et al., 2017; Lichosik et al., 2015; Porto & Çatal, 2021). It has been found that there are limited numbers of studies in literature evaluating the perceptions of healthy individuals, patients, and surgeons about robotic surgery (Fischer & Hoffman, 2010) and examining the views of nurses and nursing students about robotic surgery (Ak et al., 2017; Kang et al., 2016; Okgün Alcan et al., 2019; Porto & Çatal, 2021).

It is important for healthcare professionals, especially nurses, to adapt to this rapidly developing technology and to find out the views of students about robotic surgery and robotic surgery nursing during their nursing education. It is thought that there is a need for new studies examining the knowledge levels of nurses and nursing students about robotic surgery. For this reason, this study was conducted to indicate the knowledge levels of nursing students on robotic surgery and robotic surgery nursing. With this study, it was aimed to contribute to the lack of literature in the field of nursing.

Research Questions

1. What is the knowledge level of nursing department students about robotic surgery and robotic surgery nursing?
2. Do knowledge levels of nursing department students about robotic surgery and robotic surgery nursing differ in terms of their year of study?

3. Do nursing department students' 'Robotic Surgery and Robotic Surgery Nursing Knowledge Level Questionnaire' mean scores differ in terms of their views on robotic surgery and robotic surgery nursing?

MATERIAL AND METHOD

Study Type

This study had descriptive design and the study was conducted to find out the knowledge levels of nursing education students on robotic surgery and robotic surgery nursing.

Population and Sampling

The population of this study consisted of 600 Nursing Department's students. The Foundation University, which constitutes the study population, has a hospital where students do internships for nursing practices. Robotic surgery applications are performed in this hospital. Nursing students follow the robotic surgery applications in the operating rooms in the surgery lesson in the 2nd year and for internship in the 4th year. Considering the accessibility of the universe in the study, all students who volunteered to participate were included in the study without making a sample selection. The sample of the study; 478 nursing students who agreed to participate in the study after verbal information about the purpose of the study were included. All students who volunteered to participate were included in the study. Thus, 79.6% of the study population has been reached.

Data Collection Tools

Data were collected via a participants information form and students' knowledge levels were collected via a questionnaire form.

The Participants' Information Form: (With two sections) It was used to collect the following data in order to identify the characteristics of the participants: (i) The students' sociodemographic characteristics, such as age, gender, academic level, last graduation level, longest living place, and (ii) indicators of students' opinions, such as interested in technology, hearing the term robotic surgery, sources of information about robotic surgery, evaluating the level of robotic surgery knowledge, robotic surgery fields, preferring robotic surgery, knowing the robotic surgery field and wanting to be robotic surgery nurse.

Robotic Surgery and Robotic Surgery Nursing Knowledge Level Questionnaire (RS&RSN-KLQ): There is no measurement tool in the literature that measures robotic surgery nursing and knowledge levels on this subject. For this reason, the questionnaire form prepared by the researchers in line with the literature information and was presented to ten expert in the field of surgery nursing and robotic surgery. The Content Validity Index (CVI) was calculated as 0.97 as a result of the evaluation distributions given by 10 experts to each question as 'very appropriate', 'quite appropriate but minor changes are required', 'the item needs to be adjusted appropriately' and 'not appropriate'. With these findings, it was seen that all the questionnaire items were at an acceptable level in line with expert opinions. As a result, the questionnaire included 15 questions evaluating the knowledge levels of nursing students about robotic surgery and robotic surgery nursing (Çelik, 2011; Çetin, 2018; Okgün Alcan et al., 2019; Yavuz-Karamanoğlu & Demir-Korkmaz, 2013). In addition, considering Wilson et al.'s (2012) Content Validity Criterion (CVC) critical values table calculated for 5-40 experts, the CVC value was determined as 0.520 for 10 experts at the α=0.05 significance level (for one-way test) (Wilson et al., 2012). The Questionnaire Scoring was done as: agree, 2 points; Neither agree nor disagree, 1 point; Disagree, 0 points. It was determined that the RS&RSN-KLQ total score average was 30 points, and the significance level was evaluated over 2 points, and the Cronbach's alpha (α) coefficient calculated for RS&RSN-KQ was 0.87, and this calculated reliability level was highly reliable (0.8-1). Additionally, statistical consultancy was obtained for data analysis.

Data Collection

Data were collected via face-to-face interview between March 2022 and May 2022 in a foundation university.

Data Analysis

Data were analyzed using the Statistical Package of Social Sciences SPSS (IBM Corporation, Armonk, NY, USA) version 25.0. While deciding on the analysis technique to be applied, the results of the normality test of the relevant data group were considered. The Kolmogorov-Smirnov test was used to test the normality of continuous variables. in addition to descriptive statistical methods (number, percentage, mean, median, standard deviation, etc.) since the data showed non-parametric distribution, the Mann-Whitney U Test and Kruskal Wallis-H Test were used to test the quantitative difference between the groups. Multiple comparisons were made with Bonferroni correction in groups where the difference in Kruskal Wallis-H Test results was significant. The relationship between two continuous variables were examined using the Spearman Correlation Test. The results were evaluated at the 95% confidence interval and the significance level was $p<0.05$.

Limitations of The Study

Conducting the research in a single university constitutes was the first limitation of this research. The second limitation of this study is the lack of a scale with validity and reliability to be used in the study. Another limitation is that the questionnaire was prepared and applied by the researchers in line with the literature.

Ethical Committee Approval

This study was approved by a University Ethics Committee in Istanbul (Date: February 2022, Approval number: E-10840098-772.02-1212). The study was started after obtaining the permission of the ethics committee. Before data collection, verbal and informed written consent was also obtained from students.

RESULTS

The mean age of 478 students was 21.46±2.56 (min:18 max:40) years and 85.6% of students were female. According to the academic level, 24.1% of the students were first year, 25.1% were second year, 24.9% were third year, 25.9% were fourth year students. It was concluded that 79.1% of the students were graduated from Anatolian or general high school and 74.9% of the students lived the longest in city (Table 1).

Table 1. Nursing Students' Sociodemographic Characteristics (n=478)

Variables	n	%	Mean±SD	Min.-Max.
Age	478	100.0	21.46±2.56	18-40
Gender				
Female	409	85.6		
Male	69	14.4		
Academic level				
1st year	115	24.1		
2nd year	120	25.1		
3rd year	119	24.9		
4th year	124	25.9		
The last graduation level				
Medical career college	66	13.8		
Anatolian high school/General high school	378	79.1		
Associate degree	34	7.1		
Longest living place				
Province	358	74.9		
District	97	20.3		
Village/town	23	4.8		

Abbreviation: SD, standard deviation; Min., Minimum; Max., Maximum.

In the study, 84.3% of the students were interested in technology, 79.3% of the students heard of the term robotic surgery before, 77.8% of them accessed information about robotic surgery through the internet. The student's level of knowledge on robotic surgery was found partly sufficient (73%). It was also found that the students (56.7%) knew about the existence of the field of robotic surgery in nursing and wanted to be a robotic nurse in the future. 73.8% of the students would prefer robotic surgery in case of a possible surgery in the future (Table 2).

Table 2. Nursing Students' Views on Robotic Surgery and Robotic Surgery Nursing (n=478)

Variables	Categories	n	%
State of interest in tecnology	Yes	403	84.3
	No	75	15.7
Hearing the term robotic surgery	Yes	379	79.3
	No	99	20.7
Sources of information related to robotic surgery (n=379)*	Internet	295	77.8
	Education	124	32.7
	Research/congress/scientific meeting	70	18.5
	Clinical applications	143	37.7
Level of knowledge about robotic surgery	Sufficient	16	3.3
	Partially sufficient	349	73.0
	Insufficient	113	23.6
Fields where robotic surgery applied*	General surgery	392	82.0
	Urological surgery	203	42.5
	Gynecological surgery	175	36.6
	Cardiovascular surgery	320	66.9
	Otolaryngology surgery	194	40.6
	Orthopedic surgery	216	45.2
	Plastic surgery	246	51.5
	Thoracic surgery	160	33.5
	All	84	17.6
The situation of preferring robotic surgery in case of a possible surgery	Yes	353	73.8
	No	125	26.2
The state of knowing the robotic surgery field	Yes	271	56.7
	No	207	43.3
The state of wanting to be a robotic surgery nurse in the future	Yes	271	56.7
	No	207	43.3

* More than one answer has been given.

According to RS&RSN-KLQ 90% (n=430) of the students agreed with the expression 'Robotic surgery nurse should pay attention to surgeon's wishes and make sure that the instruments are given safely'. 12.8% (n=61) of the students disagreed with the expression 'Robotic surgery causes decrease in postoperative level of pain'. The mean total score of RS&RSN-KLQ was 24.99±4.75 out of 30 points, and the significance level score was 1.67±0.32 out of two points (Table 3).

Table 3. Students' Rates of Agreeing with The Expressions in RS&RSN-KLQ (n=478)

Items	Agree n(%)	Neither agree nor disagree n(%)	Disagree n(%)
Robotic surgery provides smaller scarring and cosmetic superiority.	348(72.8)	123(25.7)	7(1.5)
Robotic surgery reduces the risk of infection.	313(65.5)	146(30.5)	19(4.0)
Healing time is reduced with robotic surgery.	267(55.9)	166(34.7)	45(9.4)
Quick return to daily life is achieved with robotic surgery.	322(67.4)	134(28.0)	22(4.6)
Robotic surgery shortens hospital stay.	337(70.5)	122(25.5)	19(4.0)
Robotic surgery reduces the incidence of complications.	247(51.7)	202(42.3)	29(6.1)
Perioperative bleeding is reduced with robotic surgery.	261(54.6)	178(37.2)	39(8.2)
Robotic surgery causes decrease in postoperative level of pain	218(45.6)	199(41.6)	61(12.8)
The robotic nurses should know the parts of the hardware of the robot used in robotic surgery, the installation and settings of the parts.	369(77.2)	96(20.1)	13(2.7)
The robotic nurses should know how to maneuver the robotic arms, put a sterile cover on the robot arms and camera.	410(85.8)	57(11.9)	11(2.3)
Robotic surgery nurse should pay attention to surgeon's wishes and make sure that the instruments are given safely.	430(90.0)	43(9.0)	5(1.0)
The robotic nurses should maintain the black and white balance of the camera and laparoscopes.	380(79.5)	89(18.6)	9(1.9)
The robotic nurses should know with all emergency procedures to manually open the robotic instrument when needed.	396(82.8)	68(14.2)	14(2.9)
The robotic nurses must coordinate the surgery list and provide the necessary supplies for the surgery.	418(87.4)	56(11.7)	4(0.8)
The robotic nurses are responsible for positioning the robot in the operating room before the operation day, making its connections, technical controls, calibrating the optical system and making it ready for use.	373(78.0)	90(18.8)	15(3.1)
Total score, Median±SD		24.99±4.75	
Significance level score*, Median±SD		1.67±0.32	
Total score, median (minimum-maximum)		26(0-30)	
Cronbach's Alpha(α)		0.87	

*SD: Standard Deviation.
Significance level score*: Item total score was calculated by dividing by the number of items.

The students' RS&RSN-KLQ mean scores was statistically significant according to the academic level of the students (p=0.035), according to the Bonferroni correction, this difference was between the first-year students' group and the third- and fourth-year students group, and it was determined that the level of knowledge of first year students was lower. It was determined that the mean score of the students was statistically significant according to the last graduation level (p=0.001), and according to the Bonferroni correction, this difference was caused by the student group who graduated from medical career college, and their knowledge level was higher. It was concluded that the place where students lived the longest was city and the students who lived in cities had statistically significantly higher level of knowledge than another place (p<0.001) (Table 4).

Table 4. RS&RSN-KLQ Mean Scores in Terms of Sociodemographic Characteristics

Variables	n	RS&RSN-KLQ Median±SD	r/Z/ K-W$_{\chi 2}$	P value
Age	478	-	r=-0.042	0.362
Gender				
Female	409	25.10±4.34	Z=-0.434	0.664
Male	69	24.38±6.72		
Academic level				
First year	115	23.83±5.37	**K-W$_{\chi 2}$=8.594**	**0.035***
Second year	120	24.45±5.59	**significance=1<3,4**	
Third year	119	25.74±3.68		
Fourth year	124	25.88±3.85		
The last graduation level				
Medical career college	66	26.71±4.07	**K-W$_{\chi 2}$=13.033**	**0.001***
Anatolian high school/General high school	378	24.83±4.75	**significance =1>2,3**	
Associate's degree college	34	23.50±5.28		
Longest living place				
City	358	25.66±3.88	**Z=-3.556**	**<0.001***
District/Village/Town	120	23.02±6.34		

*SD: Standard Deviation, *Z:* Mann-Whitney U Test, *K-W$_{\chi 2}$*: Kruskal Wallis-H Test, *r:* Spearman Correlation Test, *: p<0.05.

It was found that students who heard the term robotic surgery had statistically significantly higher than those who did not hear the term (p<0.001). The mean scores of students who thought robotic surgery interventions could be applied to all surgical fields were statistically significantly higher than who did not think it, and mean scores of students who preferred robotic surgery in case of a possible surgery were statistically significantly higher than who did not prefer (p<0.001). It was determined that the mean scores of the students who knew that there was a robotic surgery nursing field and wanted to be a robotic nurse in the future were statistically significantly higher than who did not want (p=0.012) (Table 5).

Table 5. Students' RS&RSN-KLQ Mean Scores in Terms of Their Views on Robotic Surgery and Robotic Surgery Nursing

Variables	n	RS&RSN-KLQ Median±SD	Difference test Z/ K-W$_{\chi 2}$	p value
Interest in technology				
Yes	403	25.21±4.54	Z=-1.827	0.068
No	75	23.84±5.66		
Hearing the term robotic surgery				
Yes	379	25.66±4.19	**Z=-5.339**	**<0.001***
No	99	22.44±5.84		
Level of knowledge about robotic surgery				
Sufficient	16	22.25±5.92	K-W$_{\chi 2}$=3.747	0.154
Partially sufficient	349	25.04±4.71		
Insufficient	113	25.23±4.62		
Thinking robotic surgery can be applied to all surgical fields				
Yes	84	26.20±4.17	**Z=-2.949**	**0.003***
No	294	24.74±4.83		
Preferring robotic surgery in case of a possible surgery				
Yes	353	26.01±4.08	**Z=-8.021**	**<0.001***
No	125	22.14±5.35		
Knowing the robotic surgery field				
Yes	271	25.50±4.35	**Z=-2.502**	**0.012***
No	207	24.33±5.18		
Wanting to be a robotic nurse in the future				
Yes	271	25.50±4.35	**Z=-2.502**	**0.012***
No	207	24.33±5.18		

*SD: Standard Deviation, Z: Mann-Whitney U Test, K-W$_{\chi 2}$: Kruskal Wallis-H Test. *:p<0.05.

DISCUSSION

According to the results found in the present study in which knowledge levels of nursing students on robotic surgery and robotic surgery nursing were examined, it was found that 85.6% of the students were female (Table 1). In studies conducted on nursing department students, it has been found that the number of female students is higher than the number of male students (Ak et al., 2017; Cingöl et al., 2018; Gündoğdu et al., 2020; Kürtüncü & Kurt, 2020). It is stated that in Turkey, the nursing profession is generally preferred due to economic concerns, and it is seen as a female profession (Başaran & Köşgeroğlu, 2020; Kahraman et al., 2015; Yaşar et al., 2018).

When students' views on robotic surgery and robotic surgery nursing were examined, it was found that 84.3% of the students were interested in technology (Table 2). In the comparative descriptive study of Ak et al. (2017) conducted with 200 nurses and 200 nursing students, it was concluded that nurses are aware of current and technological developments and have more knowledge in the field of robotic surgery (Ak et al., 2017). In another study conducted with nurses in intensive care units, it has been reported that technology is a must for intensive care units, it increases the quality of patient care and workload decreases thanks to technological devices used (Terkeş et al., 2018). The fact that the results of the present study are similar to results in literature may be related to students' desire to follow technology constantly due to constantly developing computer technologies.

While a large majority of the students who participated in the study evaluated their level of knowledge on robotic surgery as partly sufficient (73%), it was found that students mostly (77.8%) accessed information about robotic surgery through the internet (Table 2). In a study, it was concluded that 67.5% of the nurses and students did not have knowledge about robotic surgery (Ak et al., 2017). In another study conducted by Okgün Alcan et al. (2019) evaluating the views of nurses about robotic surgery, it was found that nurses had partly sufficient level of knowledge on robotic surgery, and they mostly accessed information about robotic surgery through the internet (Okgün Alcan et al., 2019). The findings were found to be compatible with the literature.

In the study, it was found that the students agreed with the expression 'Robotic surgery nurse should pay attention to surgeon's wishes and make sure that the instruments are given safely' with a rate of 90% (Table 3). This expression is among the different specific duties of operating room nurses in robotic surgery (Porto & Çatal, 2021; Raheem et al., 2017; Uslu et al., 2019). The participation of nursing students in this statement, which is among the roles and responsibilities of robotic surgery nurses, may be related to students' following technology, nursing students' knowing the duties, authorities and responsibilities of scrub and circulating operating room nurses, and their observations in operating room practices.

It was found that students disagreed with the expression 'Robotic surgery causes decrease in postoperative level of pain' with a rate of 12.8% (Table 3). In order to compare the results of this study, similar study results could not be reached in the literature. However, Ak et al. (2017), in the study which nurses and students were compared, it was concluded that 12 nurses out of 200 thought that pain was reduced among the advantages of robotic surgical interventions (Ak et al., 2017). The low level of response to this statement is compatible in line with the literature.

In the present study, it was found that first year nursing students had low and statistically significant level of knowledge about robotic surgery and robotic surgery nursing when compared with the 3rd year and 4th year nursing students ($p=0.035$) (Table 4). Although no similar study results were found in the literature to compare the results of this study, the fact that the surgical nursing practice was given in the 2nd year at the Foundation University, where the study was conducted, and the surgical practice internships were carried out after the 2nd year may have affected the results of the study. Moreover, it is thought that as their year of study increases, students' level of knowledge also increases since practical courses, internship and researches about nursing also increase.

In the present study, when the school students graduated from were examined, it was found that students who graduated from medical career college had statistically higher level of knowledge about robotic surgery and robotic surgery nursing when compared with students who graduated from other high schools and colleges ($p=0.001$) (Table 4). In Mankan and Kaşıkçı's (2015) study, no difference was

found between nurses' level of education and level of knowledge (Mankan & Kaşıkçı, 2015). In the present study, the result that medical career college students had higher level of knowledge than students of other high school and college programs can be attributed to the fact that these students access subjects on health earlier than their university education, during their high school education. In addition, medical career college students go to nursing practice at earlier ages and encounter more surgical procedures as per their school curriculum. It was thought that this situation can affect that students' knowledge levels may be higher.

According to the study data, it was concluded that the place where students lived the longest was city and the students who lived in cities had statistically significantly higher level of knowledge about robotic surgery and robotic surgery nursing ($p<0.001$) (Table 4). Similarly, in a study conducted with nursing department students, it was found that students who lived in cities had high level of knowledge (Başar et al., 2019). According to these results, it can be thought that students who live in central places can access information more easily. The Foundation University where the study was conducted has a hospital for nursing practices and robotic surgery is applied in this hospital. Therefore, students also have the opportunity to observe in the operating room where robotic surgery is applied during internships.

According to the results, it was found that 79.3% of the students heard of the term robotic surgery before (Table 5). It was concluded that students who heard about the term robotic surgery ($p<0.001$), those who knew about the field of robotic surgery nursing ($p=0.012$) and those who wanted to be robotic surgery nurse in the future ($p=0.012$) had statistically significant knowledge level about robotic surgery and robotic surgery nursing. It was found that 90.6% of the nurses heard about the term robotic surgery in a study conducted by Okgün Alcan et al. (Okgün Alcan et al., 2019), while 75% of the students heard about the term robotic surgery in another study conducted by Markar et al. (Markar et al., 2012). In the present study, the high rates of hearing about the term robotic surgery, the high rates of knowing about robotic surgery and the rates of students wanting to choose this field in the future are in parallel with the literature.

It was found that students who thought robotic surgery interventions could be applied to all surgical fields had statistically significant level of knowledge about robotic surgery and robotic surgery nursing ($p=0.003$) (Table 5). In a study Okgün Alcan et al. conducted on 286 nurses, it was found that 55 nurses did not know in which areas robotic surgery is applied and a high percentage of nurses knew that robotic surgery could be applied to all fields (Okgün Alcan et al., 2019). In another study, the knowledge of the group, who had knowledge about robotic surgery, about the application fields of robotic surgery was questioned and ıt was seen that robotic surgery application fields were determined correctly by the group (Ak et al., 2017). In the present study, the result that students who thought robotic surgery interventions could be applied to all surgical areas had high level of knowledge about robotic surgery and robotic surgery nursing can be attributed to the fact that they were interested in technology and open to learning about robotic nursing. It may also depend on their being aware of developments at the university.

Most of the students who participated in the study (73.8%) stated that they would prefer robotic surgery method in case of a possible surgery in the future and it was found that the students who stated that they would prefer robotic surgery had statistically significant level of knowledge about robotic surgery and robotic surgery nursing ($p<0.001$) (Table 5). In a study conducted by Okgün Alcan et al. (2019), it was found that in case of a possible surgery in the future, more than half of the students wanted to choose robotic surgery method (Okgün Alcan et al., 2019). Similarly, it was found that healthy individuals had a high probability of choosing robotic surgery method in case of a possible surgery (Fischer & Hoffman, 2010). In a study conducted by Sutherland and Fischer (Sutherland & Fischer, 2011), the most important factors affecting individuals' decision to prefer robotic surgery method were shorter recovery time and high success rate. In the present study, it is thought that students who had high level of knowledge about robotic surgery and robotic surgery nursing stated that they would prefer robotic surgery method in case of a possible surgery since they knew about its advantages such as providing cosmetic superiority, decreasing the risk of infection, shortening the recovery period and reducing the level of postoperative pain.

It was also found that more than half of the students (56.7%) knew about the existence of the field of robotic surgery in nursing (Table 5). It is stated in literature that there are not sufficient training programs for nurses on robotic surgery (Kang et al., 2016) and the trainings are usually for surgeons (Raheem et al., 2017). In our study, the results that students had partly sufficient level of knowledge on robotic surgery, they mostly accessed information through the internet and robotic surgery nursing were not sufficiently known by the students show that there is a need for training programs on robotic surgery in nursing education. It was found that the mean scores of the students who wanted to be a robotic nurse in the future were significantly higher than who did not want (p=0.012) (Table 5). In the study of Ak et al. (2017) conducted with 200 nurses and 200 nursing students, it was concluded that Y generations nurses wanted to work in this field (Ak et al., 2017). The results of this study were in with the literature.

CONCLUSIONS

In conclusion, although most of the students heard the term robotic surgery, the majority of the students stated that their knowledge level about robotic surgery and robotic surgery nursing was partially sufficient, and they stated that they got knowledge mostly from the internet. The first year Nursing Department students' knowledge levels was the lowest according to questionnaire. It was concluded that the factors that affected students' level of knowledge were the state of being interested in technology, the state of having heard about robotic surgery, the state of thinking that robotic surgery interventions can be applied to all surgical fields, the state of preferring robotic surgery in case of a possible surgery, the state of knowing that there is a field as robotic surgery nursing and the state of wanting to be a robotic surgery nurse in the future. The present study is important in terms of determining nursing department students' level of knowledge about robotic surgery and robotic surgery nursing and it will be a guide for other studies to be conducted on the subject.

In line with the results of the study, it is recommended to find out robotic surgery and robotic surgery nursing knowledge level of students studying in other universities and to get their views on the subject. It is also important to inform university students and to organize trainings so that they can make career plans, to encourage students to participate in seminars and congresses related to the subject, to increase studies on robotic surgery nursing and to conduct evidence-based practices in terms of facilitating health care professionals' and students' accessing information about robotic surgery nursing.

ETHICAL COMMITTEE APPROVAL

This study was approved by İstanbul Medipol University Ethics Committee (Date: February 2022, Approval number: E-10840098-772.02-1212).

AUTHOR'S CONTRIBUTION

Idea/concept: KÖY, MÖD; Design: KÖY, MÖD; Consultancy: KÖY, MÖD; Data collection and/or Data processing: KÖY, MÖD; Analysis and/or interpretation: KÖY, MÖD; Literature review: KÖY, MÖD; Writing of the article: KÖY, MÖD; Critical review: KÖY, MÖD.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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