



## Life and Medical Sciences

### Impact of Cooperation Established Between Physicians and Nurses Working at Surgical Clinics on The Tendency of Nurses to Make Medical Errors

### Cerrahi Kliniklerde Çalışan Hekim ve Hemşire İşbirliğinin Hemşirelerin Tıbbi Hata Yapma Eğilimi Üzerine Etkisi

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#### Abstract

The aim of this study is to determine the effect of cooperation between physicians and nurses working in surgical clinics on the tendency of nurses to make medical errors. The research was carried out in a descriptive manner at Yozgat Bozok University Research and Application Center surgical units between April-May 2021. 130 surgical nurses and 40 surgeons were included in the study. In the evaluation of the data, independent two-sample t-test, Mann-Whitney U test, one-way analysis of variance, Duncan test, Kruskal Wallis test, Pearson correlation coefficient, and regression analysis were used. When the Jefferson Physician and Nurse Professional Collaboration Scale mean scores of physicians and nurses were examined; the mean score of nurses was  $52.2 \pm 5.8$ , and the mean score of physicians was  $50.7 \pm 4.6$ . Nurses' Malpractice Tendency Scale mean score was determined as  $236.1 \pm 16.5$ . It was determined that when the Jefferson Physician and Nurse Professional Collaboration Scale score of the nurses increased by one unit, the Malpractice Tendency Scale score increased by 1.247. Statistically, it was determined that there was a weak positive relationship ( $p < 0.05$ ). The existence of a healthy and effective cooperation system between physicians and nurses in surgical units is important in preventing medical errors. In our study, it was determined that the physician-nurse relationship in surgical units had an effect on the medical error tendency of nurses. In line with the data obtained, it is recommended to measure the reflections of the trainings on the cooperation in order to increase the effective trainings in changing the professional communication within the team on doctor-nurse cooperation in a positive way and to strengthen the concrete data.

**Keywords:** Collaboration, Medical Error, Surgeon, Nursing.

#### Özet

Bu çalışma cerrahi kliniklerde çalışan hekim ve hemşireler arasındaki iş birliğinin hemşirelerin tıbbi hata yapma eğilimlerine etkisini belirlemek amacıyla yapılmıştır. Araştırma, Yozgat Bozok Üniversitesi Araştırma ve Uygulama Merkezi cerrahi birimlerinde Nisan-Mayıs 2021 tarihleri arasında tanımlayıcı olarak gerçekleştirildi. Çalışmaya 130 cerrahi hemşiresi ve 40 cerrah dahil edildi. Verilerin değerlendirilmesinde bağımsız iki örneklemli t testi, Mann-Whitney U testi, tek yönlü varyans analizi, Duncan testi, Kruskal Wallis

testi, Pearson korelasyon katsayısı ve regresyon analizi kullanılmıştır. Doktor ve hemşirelerin Jefferson Hekim ve Hemşire Mesleki İş Birliği Ölçeği puan ortalamalarına bakıldığında; hemşirelerin puan ortalaması  $52.2 \pm 5.8$ , hekimlerin puan ortalaması  $50.7 \pm 4.6$  idi. Hemşirelerin Malpraktis Eğilim Ölçeği puan ortalaması ise  $236.1 \pm 16.5$  olarak belirlendi. Hemşirelerin Jefferson Hekim ve Hemşire Mesleki İş Birliği Ölçeği puanı bir birim arttığında Malpraktis Eğilim Ölçeği puanının 1.247 arttığı belirlendi. İstatistiksel olarak zayıf bir pozitif ilişki olduğu belirlendi ( $p < 0.05$ ). Cerrahi birimlerde hekim ve hemşireler arasında sağlıklı ve etkin bir iş birliği sisteminin varlığı tıbbi hataların önlenmesinde önemlidir. Çalışmamızda cerrahi birimlerde hekim-hemşire ilişkisinin hemşirelerin tıbbi hata eğilimleri üzerinde etkisi olduğu belirlendi. Elde edilen veriler doğrultusunda doktor-hemşire iş birliği konusunda ekip içi profesyonel iletişimin olumlu yönde değiştirilmesinde etkili eğitimlerin artırılması ve somut verilerin güçlendirilmesi için eğitimlerin iş birliğine yansımalarının ölçülmesi önerilmektedir.

**Anahtar Kelimeler:** İş birliği, Tıbbi Hata, Cerrah, Hemşirelik.

## Introduction

Cooperation between physicians and nurses is two occupational groups coming together to find joint solutions by sharing opinions to ensure effective patient care and solve problems with the patient [1]. This cooperation required physicians and nurses respect each other's opinions, share responsibilities, have confidence and agree with decisions [2]. Surgical units are a developing area of the health sector following technology and innovations and improving itself continuously. Thus, physicians and nurses working at surgical units must have properties such as being practical with patient monitoring, rapid thinking and deciding, and constantly improving oneself [3]. Medical error is defined as unintended consequences that take place due to a deficiency during health service presented to a sick individual [4]. The units where medical errors are seen the most frequently and that are defined to be complicated are surgical units [5].

Teamwork enables challenges are noticed, problems are solved, patients are monitored effectively and team motivation is established to increase quality of health service [6]. Low levels of motivation, decreasing efficiency, low concentration, and increased rate of errors are observed at surgical units where teamwork is not established [7]. In the literature it is stated that the most important cause of medical errors at surgical units is problems due to communication between physicians and nurses [8]. Correct planning might prevent errors due to contradictions.

This study aims at identifying the impact of cooperation between surgeons and surgical

nurses working at surgical units on the tendency of nurses to make medical errors.

## Material and Method

This descriptive study was conducted at surgical units of a university hospital (Yozgat Bozok University Research and Application Center) between April and May 2021. The study was conducted after obtaining approval (decision number; 2017-KAEK 189\_2020.10.14\_14) from Yozgat University Faculty of Medicine Clinical Research Ethics Committee.

### Population and sample

Sample of the study was 130 surgical nurses and 40 surgeons that fulfilled inclusion criteria and that agreed to participate in the study. Physicians and nurses with university degrees that were working at surgical units, that had no communication problems, and that agreed to participate in the study were included.

### Data collection tools

During collection of data Identifying Properties Information Form, Jefferson Scale of Attitudes towards Physician-Nurse Collaboration, and Malpractice Tendency Scale were used.

### Identifying properties information form

Created by the authors with literature scanning the form is composed of a total of 6 questions towards identifying properties of individuals such as age, sex, occupation, department of employment, and years of employment [9,10].

### JEFFERSON Scale of Attitudes towards Physician-Nurse Collaboration (JSAPNC)

The scale is composed of 15 items [11]. JSAPNC is a 4-point Likert scale with 15 items and

scored from 1 to 4 (Absolutely Agree=4, Agree=3, Do Not Agree=2, Absolutely Do Not Agree=1).

#### Malpractice Tendency Scale (MTS)

Malpractice Tendency Scale is created by Altunkan to measure tendency levels of medical employees that take direct part in patient care to make medical errors [12]. The scale is a 5-point likert scale and the score that can be received from the scale is between 49 and 245. The scale is composed of 49 items and 5 sub-scales

#### Data analysis

Findings of the study were analyzed using computer program.  $p < 0.05$  value was accepted for significance level of statistical tests. Descriptive statistics were used in analysis of all study data. Kolmogorov-Smirnov test, Shapiro-Wilk test, Mann-Whitney U test, Kruskal-Wallis variance analysis, Duncan test, Pearson correlation coefficient, Spearman's RHO correlation coefficient and linear regression analysis were used.

## Results

While average age of physicians was 39.5 and average age of nurses was 27.9. Average year of working was 13.1 for physicians while this figure was 5.7 for nurses [Table 1].

A statistically significant difference was found between average treatment vs. care scores received by physicians and nurses ( $p < 0.05$ ). Mean scores of physicians was  $9.7 \pm 1.6$  while mean scores of nurses was  $10.3 \pm 1.5$  ( $p < 0.05$ ). When mean score received from physician dominance was studied, it was found that average scores of nurses were higher than that of physicians and this difference was statistically significant ( $p < 0.05$ ). When nurse autonomy was studied, it is noted that the mean scores physicians and nurses received from nurse autonomy was equal. However, the total score nurses received from JSAPNC scale was higher [Table 2].

**Table 1.** Distribution of sociodemographic properties of physicians and nurses.

Sociodemographic properties	Physician		Nurse	
	n	%	n	%
Gender				
Woman	7	17.5	81	62.3
Man	33	82.5	49	37.7
Department				
Orthopedics	5	12.5	---	---
Urology	6	15.0	---	---
General surgery	2	5.0	---	---
Ear nose throat	4	10.0	---	---
Gynecology	5	12.5	---	---
Pediatric surgery	1	2.5	---	---
Cardiovascular surgeon	5	12.5	---	---
Brain surgeon	2	5.0	---	---
Eye diseases	8	20.0	---	---
Thoracic surgery	2	5.0	---	---
Worked unit	---	---		
Service	---	---	59	45.4
Intensive care	---	---	55	42.3
Operating room	7	17.5	16	12.3
Mean age	39.5 $\pm$ 9.8		27.9 $\pm$ 4.8	
Mean year of working	13.1 $\pm$ 10.4		5.7 $\pm$ 4.8	

**Table 2.** Comparison of JSAPNC total and sub-scores for physicians and nurses.

	Physician	Nurse	Test statistic	
JSAPNC total and sub-scores	Mean $\pm$ SD	Mean $\pm$ SD	Test	p
Joint training and teamwork standard	24.9 $\pm$ 2.4	25.1 $\pm$ 3.0	t=-0.425	0.671
Care versus treatment	9.7 $\pm$ 1.6	10.3 $\pm$ 1.5	t=-2.004	<b>0.047</b>
Nurse autonomy	10.1 $\pm$ 1.0	10.9 $\pm$ 1.4	t=0.039	0.969
Physician dominance	5.3 $\pm$ 1.6	5.9 $\pm$ 1.7	t=-2.14	<b>0.034</b>
JSAPNC total score	50.7 $\pm$ 4.6	52.2 $\pm$ 5.8	t=-1.608	0.112

SD: Standard deviation.

"Drug and transfusion applications" sub-scale score average of nurses in Malpractice Tendency Scale was 87.5 $\pm$ 6.2, "fallings" sub-scale mean score was 23.8 $\pm$ 2.0, "hospital infections" sub-scale mean score was 57.8 $\pm$ 4.9, "patient monitoring and equipment safety" sub-scale mean score was 42.8 $\pm$ 3.7, communication sub-scale score average was 24.2 $\pm$ 1.8 [Table 3].

Linear regression model was found to be statistically significant (F=29.871, p<0.001). As JSAPNC score increases, Malpractice Tendency Score also increases and when JSAPNC increases by one unit, score from Malpractice Tendency Scale increases and when JSAPNC score increases by one unit, score from Malpractice Tendency Scale increases by 1.247 (p<0.001) [Table 4]

**Table 3.** Distribution of Scores Nurses Received from Malpractice Tendency Scale Total and sub-scores

MTS total and sub-scores	Mean $\pm$ SD	Median	Minimum	Maximum
Drug and transfusion applications	87.5 $\pm$ 6.2	90.0	54.0	90.0
Falls	23.8 $\pm$ 2.0	25.0	15.0	25.0
Hospital infections	57.8 $\pm$ 4.9	60.0	35.0	60.0
Patient Monitoring and Material Safety	42.8 $\pm$ 3.7	45.0	27.0	45.0
Communication	24.2 $\pm$ 1.8	25.0	15.0	25.0
Malpractice tendency scale total score	236.1 $\pm$ 16.5	241.5	147.0	245.0

SD: Standard deviation.

**Table 4.** Assessment of the impact of JSAPNC scores of nurses on malpractice tendency scale using linear regression analysis.

	$\beta_0$	S. Deviation	$\beta_1$	t	p	%95 CI
Constant	171.055	11.973		14.286	<0.001	147.364-194.746
JSAPNC	1.247	0.228	0.435	5.465	<0.001	0.796-1.699

F=29.871. p<0.01. R<sup>2</sup>=0.189. R<sup>2</sup>=0.183.  $\beta_0$ : Non-standardized beta coefficient.  $\beta_1$ : Standardized beta coefficient.

## Discussion

When JSAPNC mean scores of physicians and nurses are studied, mean scores of physicians was found to be 50.7 $\pm$ 4.6 while mean scores of nurses was found to be 52.2 $\pm$ 5.8 (p>0.05). In the literature there are studies informing that physicians have more positive attitudes compared to nurses in terms of cooperation [13,14]. It is noted that these results are in contradiction with the result obtained in our study. A good cooperation between nurses and physicians

provides positive patient outcomes, increased quality of health services, as well as increased job satisfaction of health workers and reduced stress levels [14].

When the JSAPNC physician dominance sub-scale mean score was examined, it was determined that nurses (5.9 $\pm$ 1.7) scored higher than physicians (5.3 $\pm$ 1.6) and the difference between the averages was significant (p<0.05). This result differs from the study of Mahboube et al. (2019), they reported that physician

dominance sub-scale that was investigated within the scope of the study, did cause make a significant difference between the two groups [15]. It is considered that different results were obtained from other studies due to the inadequacy of regular meetings that would enable occupational groups to make joint decisions for the patient under equal conditions.

A statistically significant difference was found between the mean values of treatment vs. care scores received by physicians and nurses ( $p < 0.05$ ). The mean score received by physicians was  $9.7 \pm 1.6$ , while the mean score received by nurses was  $10.3 \pm 1.5$ . In the study of Filizli (2018), average scores of nurses were also found to be higher than that of physicians in terms of care versus treatment [16]. Results of this study were similar to results achieved by Filizli. Nursing care is a process that is resolved with nursing interventions according to basic needs of patients. In surgical interventions content of nursing care must vary according to properties of the clinic and must be in a quality that would meet patient needs [17]. Tendency to make medical errors of nurses was found to have mean averages of  $236.1 \pm 16.5$  and tendency to make medical errors is quite low. The low tendency could be explained by establishment of a good nursing care system in the sample hospital with effective implementation of in-service training on medical errors to the nurses.

A statistically significant difference was found between distribution of the scores received from the Malpractice Tendency Scale and the sub-scale scores of nurses according to the unit they were employed at ( $p < 0.05$ ). The median score received by nurses in the service from drug and transfusion practices sub-scale is lower than what was received by other groups. In the study of Vaziri et al. (2019), it was reported that the tendency to malpractice was higher in the intensive care unit compared to the study unit [18]. Results of this study were in contradiction with results of study by Vaziri et al. (2019). In the health center where our study was conducted, it is considered that the high number of nurses in terms of health quality in intensive care units may cause a low error rate.

The relationship between the years of employment of nurses and the total and sub-scale scores received from Malpractice Tendency Scale were examined. A statistically significant, negative and weak correlation was found between years of employment and hospital infections score ( $p < 0.05$ ). It was established that years of employment affects the mean rate of hospital infections. In the study by Cimiotti et al. (2012), it was stated that the increase in the years of employment decreased the tendency to infection [19]. Results of the study by the authors support results obtained by Cimiotti et al. (2012). As the years of employment increases, the tendency to infection decreases.

When the effects of JSAPNC scores received by nurses on the Malpractice Tendency Scale were examined, it was noted that as the JSAPNC score increased, the Malpractice Tendency Scale score increased, and when the JSAPNC score increased by one unit, the Malpractice Tendency Scale score increased by 1.247 ( $p < 0.001$ ). This result revealed that having a positive physician-nurse relationship according to nurses, had a statistically significant effect on reducing the tendency of medical errors in nurses. Surgical clinics are risky units where patients change rapidly, requiring acute care, and where the error rate is high. The existence of a healthy and effective cooperation system between physicians and nurses in surgical units is important to prevent medical errors. No studies were found in the literature investigating the effect of cooperation between physicians and nurses, which is important for surgical units, on medical errors. This study is an original effort in this respect. However, there are studies stating that communication has an effect on medical errors [20].

The low number of surgeons working at the hospital, in the department is the limitation of the study. The study included surgeons and surgical nurses at a hospital. Results of the study could be generalized to surgeons and surgical nurses working at the said hospital.

## Conclusion

Proper planning may prevent errors due to conflicts. Thus, the existence of a healthy and effective cooperation system between physicians

and nurses in surgical units is important in preventing medical errors. In-service training on physician-nurse cooperation in surgical units

should be emphasized to prevent medical errors due to lack of cooperation and renew the professional identity of surgical nurses.

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