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## Orijinal Araştırma

# Examining the Level of Collaboration Among Nurses Working in Intensive Care Units Yoğun Bakım Ünitelerinde Çalışan Hemşireler Arasındaki İş Birliği Düzeyinin İncelenmesi

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## ABSTRACT

**Aim:** This study was conducted to examine the levels of nurse-nurse collaboration among nurses working in intensive care units.

**Method:** The population of the research consisted of 100 nurses working in intensive care units of a university hospital between November 2021 and February 2022. The sample of the research consisted of 85 nurses who voluntarily agreed to participate in the study. Data were collected using a "Nurse Introduction Form" and the "Nurse-Nurse Collaboration Scale". In the analysis of data, descriptive statistics, Mann-Whitney U test and Kruskal Wallis test were used.

**Results:** 74.1% of the nurses participating in the study were female. The mean age was 32.14±5.83; the mean duration of employment in the profession was 8.94±6.08 years; the mean duration of employment in the intensive care unit was 7.54±5.83 years. Of the nurses, 40% worked in the Anesthesia Intensive Care Unit; 91.8% had a bachelor's degree; 65.9% were married; 82.4% worked in shifts; 48.2% were satisfied with the intensive care unit they worked in; 62.4% stated that they did not want to change the unit they worked in; 80% thought that nurse-nurse collaboration was adopted in the unit they worked. The mean total score of the nurses on the "Nurse-Nurse Collaboration Scale" was 3.00±0.28. As a result of the statistical analysis, the mean total Nurse-Nurse Collaboration Scale score of nurses who were satisfied with the intensive care unit they worked in and who did not want to change it was found to be significantly higher compared to other nurses (p<0.05).

**Conclusion:** As a result, it was seen that the level of nurse-nurse collaboration among intensive care nurses was high. In line with these results, it is recommended to organize and periodically repeat in-house training programs, provide opportunities to support nurses' participation in team decisions under the leadership of manager nurses, make initiatives to increase the collaboration level of nurses by the hospital management, and repeat the research by considering different variables in a larger sample in order to improve the communication skills of intensive care nurses.

**Keywords:** Nurse, Nurse-Nurse Collaboration, Collaboration, Intensive Care Nurse.

## ÖZET

**Amaç:** Bu çalışmada; yoğun bakım ünitelerinde çalışan hemşirelerin hemşire- hemşire iş birliği düzeylerinin incelenmesi amaçlanmıştır.

**Yöntem:** Araştırmanın evrenini, Kasım 2021-Şubat 2022 tarihleri arasında bir üniversite hastanesinin yoğun bakım ünitelerinde çalışan 100 hemşire oluşturdu. Araştırmanın örneklemini ise araştırmaya katılmayı gönüllü kabul eden 85 hemşire oluşturdu. Araştırma verilerinin toplanmasında "Hemşire Tanıtım Formu" ve "Hemşire-Hemşire İş Birliği Ölçeği" kullanıldı. Verilerin analizinde; tanımlayıcı istatistikler, Mann-Whitney U" testi ve "Kruskal Wallis" testi kullanıldı.

**Bulgular:** Araştırmaya katılan hemşirelerin %74.1'i kadın olup, yaş ortalaması 32.14±5.83 yıl, meslekte çalışma süresi ortalaması 8.94±6.08 yıl, yoğun bakımda çalışma süresi ise 7.54±5.83 yıl olarak bulundu. Hemşirelerin %40'ı Anestezi Yoğun Bakımı'nda çalıştığını, %91.8'i lisans mezunu olduğunu, %65.9'u evli olduğunu, %82.4'ü nöbetli vardiya şeklinde çalıştığını, %48.2'si çalıştığı yoğun bakım ünitesinden memnun olduğunu, %62.4'ü çalıştığı üniteyi değiştirmeyi istemediğini ve %80'i çalıştığı birimde hemşire-hemşire iş birliğinin uygulandığını düşündüğünü ifade etti. Araştırmaya katılan hemşirelerin "Hemşire-Hemşire İş Birliği Ölçeği" toplam puan ortalaması 3.00±0.28 olarak hesaplandı. Yapılan istatistiksel analiz sonucunda; çalıştığı yoğun bakım ünitesinden memnun olan ve değiştirmeyi düşünmeyen hemşirelerin Hemşire-Hemşire İş Birliği Ölçeği toplam puan ortalaması diğer hemşirelere göre anlamlı düzeyde yüksek bulundu (p<0.05).

**Sonuç:** Yapılan bu çalışma sonucunda; yoğun bakım hemşirelerin hemşire-hemşire iş birliği düzeylerinin yüksek olduğu görüldü. Bu sonuçlar doğrultusunda; yoğun bakım hemşirelerinin iletişim becerilerini geliştirmek için kurum içi eğitimlerin düzenlenmesi ve belli aralıklarla tekrarlanması, yönetici hemşireler önderliğinde hemşirelerin ekip içi ortak kararlara katılımını destekleyici fırsatların sunulması, hastane yönetimi tarafından hemşirelerin iş birliği düzeylerini arttırmaya uygulamaların yapılması ve araştırmanın daha geniş bir örneklemede farklı değişkenleri de ele alarak tekrarlanması önerilmektedir.

**Anahtar Kelimeler:** Hemşire, Hemşire-Hemşire İş Birliği, İş Birliği, Yoğun Bakım Hemşiresi.

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## INTRODUCTION

In the delivery of today's health services, collaboration has an important role in providing quality care and patient safety. Collaboration is defined as interpersonal relations between colleagues based on sharing authority, power, decision making, knowledge, and experiences (Dougherty and Larson, 2010; Mulvale et al., 2016; Unaç Koçak, 2019). Collaboration between nurses is explained as a process that includes the relations and interactions within the healthcare team working together to achieve a common goal (patient) and including members from different fields (Dougherty and Larson, 2010; Mulvale et al., 2016; Unaç Koçak, 2019).. Collaboration between nurses is considered a determinant of nursing ability as well as a standard of nursing practice (Çalışkan Alkan, 2020). The basic elements of collaboration between nurses are awareness of roles and responsibilities, mutual trust and respect, teamwork, sharing the process, professionalism, problem-solving, effective communication skills, and willingness to collaborate (Aktaş, 2020; Lemetti, 2019).

Nurses, who constitute the most basic component of the healthcare process, have an important place in the patient care process and are a part of the team that provides holistic and safe care to patients. Nurses are considered people who interact with all employees during the care process and are responsible for the collaboration that occurs throughout the care process (Çelik Durmuş and Yıldırım 2016). The collaboration process in care is expressed as a process that provides a shared communication and decision-making among collaborators where there is no hierarchical relation and is respect for others' characteristics, and healthy life goal for patients (Şahbaz and Çelik Durmuş, 2021). In this entire process, the collaboration between nurses is considered to be one of the most important indicators in the management of events and competent nursing practices (Gustavsson, 2021; Şahbaz and Çelik Durmuş, 2021).

In collaboration, which requires effective teamwork, communication and working conditions must also be good. In studies, it was stated that the level of communication and collaboration is low and the stress level is high in teams with

poor working conditions (Çakıcı, 2020; Dougherty and Larson, 2010; Eyi, 2016). Nurses, who spend the most time with patients, can also continuity in patient care by collaborating with other members of the health care team (Dougherty and Larson, 2010; Eyi, 2016; Hatip, 2017; Yağız, 2019). In the literature, it was emphasized that the tendency for medical errors is low in teams in which the collaboration between nurses is good and the level of professionalism is high (Çakıcı, 2020; Dougherty ve Larson, 2010; Gustavsson, 2021; Hatip, 2017; Şahbaz and Çelik Durmuş, 2021).

According to the studies conducted on collaboration between nurses, Dougherty and Larson (2010) found that collaboration between nurses working in the intensive care unit could prevent 86% of medical errors before they occur. In the same study, they emphasized that an increase in the collaboration between nurses would make it easier to ensure patient safety. Moore et al. (2019) stated in their study that it is important to include collaborative teamwork in the curriculum of nursing faculty education and provide the opportunity to practice in clinical practice (Moore et al., 2019). In the study conducted by Ylitörmänen et al. (2019), the level of collaboration among Finnish and Norwegian nurses was compared and it was seen that there was a positive perception in both countries. However, it was stated that Finnish nurses were more willing to work collaboratively on conflict management. In the study of Unaç Koçak (2019), it was determined that the increase in the level of collaboration between nurses positively affected their job satisfaction. As a result of the study conducted by Aktaş (2020) with nurses working in Adana, it was stated that some variables of nurses affect collaboration among colleagues. Similar results were reached in the study conducted by Durmuş and Yıldırım (2016). As a result of research conducted by Hatip and Seren (2021) in a university hospital, it was determined that nurses' nurse-nurse collaboration levels were generally above the average.

When the studies in the literature are examined, a limited number of studies was reached in our country examining the level of collaboration among nurses and the factors affecting it. For this reason, it is necessary to examine

the variables affecting the collaboration levels of nurses and determine the factors that prevent collaboration. In this context, it was thought that determining the level of collaboration between nurses working in intensive care units, which are considered the most intensive areas of care, and the affecting variables will be of importance in terms of providing the opportunity to make positive interventions for the safety of patients. Compared to other studies, this study was conducted in a university hospital, only intensive care nurses were included in the sample, and the study highlights the relationship between nurse satisfaction and level of collaboration. These features make this study an original work. For this reason, the findings obtained from this study will contribute to the literature. In this direction, this study aimed to examine the level of collaboration among nurses working in intensive care units and determine the affecting factors.

### Research Questions

1. What is the level of nurse-nurse collaboration among intensive care nurses?
2. Do independent variables such as gender, marital status, education level, type of intensive care unit, satisfaction with the intensive care unit, and status of receiving training on nurse-nurse collaboration affect levels of nurse-nurse collaboration among intensive care nurses?

## METHOD

### Research Type

This descriptive study aimed to examine the nurse-nurse collaboration levels of nurses working in intensive care units.

### Research Place

The research was carried out with nurses working in Anesthesia and Reanimation, General Surgery, Cardiovascular Surgery, and Neurosurgery intensive care units affiliated with Bursa Uludağ University Applied Research Center for Health (SUAM). Anesthesia and Reanimation Intensive Care Unit affiliated with SUAM has 13 beds; General Surgery Intensive Care Unit has 7 beds; Cardiovascular Surgery Intensive Care

Unit and Neurosurgery Intensive Care Unit have 8 beds each. Approximately 100 nurses work in these intensive care units.

### Research Population and Sample

The population of the research consisted of 100 nurses working in intensive care units of Bursa Uludağ University Health Application and Research Center between November 2021 and February 2022. In the study, it was aimed to reach the entire universe. No sample selection was made. The sample of the study consisted of 85 nurses who voluntarily agreed to participate in the study (Participation rate: 85%).

### Data Collection Tools

In the study, data were collected using a Nurse Introduction Form and the Nurse-Nurse Collaboration Scale.

### Nurse Introduction Form

The form was developed by researchers and includes questions about age, gender, marital status, education level, duration of employment in the profession and intensive care, intensive care unit, weekly working hours and working style, the status of choosing the department voluntarily, and satisfaction with the department (Aktaş, 2020; Çelik Durmuş and Yıldırım, 2016; Çelik Durmuş et al., 2018; Hatip and Seren, 2021; Koçak, 2019).

### Nurse-Nurse Collaboration Scale (NNCS)

The scale was developed by Dougherty and Larson (2010) in the USA. In 2016, a Turkish adaptation, validity, and reliability study was carried out by Çelik Durmuş and Yıldırım (2016) in a group of nurses working with a bachelor's degree who had been working in a clinic. The validity and reliability study was repeated in another nurse sample by Temuçin et al. (2019). The scale consists of 5 subdimensions and 25 items. These subdimensions are conflict management, communication, process sharing, coordination, and professionalism. In this four-point Likert type scale, the response options are strongly disagree (1), disagree (2), agree (3), and strongly agree (4) for each item and an increase in the total scale score indicates good communication between nurses. The total scale score is calculated by averaging the scores of all 25 items. The lowest score obtainable from the

scale is one and the highest score is four. An increase in the scale score indicates that the collaboration between nurses is good (Temuçin et al., 2019). The Cronbach alpha reliability coefficient for the entire original scale was 0.89 (Temuçin et al., 2019). In this study, the Cronbach alpha reliability coefficient was calculated as 0.79.

### Data Collection Method

The nurses were informed that all of the data would be used for scientific study and that the answers would not affect their professional lives. Nurses who agreed to participate in the study were informed about the study and their consent was taken. Then, data collection forms were distributed to each participant nurse by the researcher. Attention was paid that the time in which the forms were filled in did not affect the working hours of the nurses (they were asked to fill in the forms at home or during free times such as lunch breaks and tea breaks and return them). The forms were taken back from the nurses and evaluated. The nurses filled out the questionnaires in 15 minutes on average. During the collection of research data, COVID-19 protection measures (such as wearing a mask during the interviews, washing hands before and after distributing questionnaires, etc.) were taken.

### Data Evaluation

Statistical analysis of the research data was made in the Statistical Package for Social Science (SPSS) 23.0 package program. In the analysis of data, the data did not show normal distribution with descriptive statistics; therefore, “Mann-Whitney U” test was used to compare the scale scores of two independent groups and the “Kruskal Wallis” test was used to compare the scale scores of three or more independent groups. Statistical significance was taken as 0.05.

### Ethical Aspects

The necessary approval (Dated 10.27.2021, Decision no: 2021-09) was received from Bursa Uludağ University Health Sciences Research and Publication Ethics Committee, and verbal consent was taken from the nurses participating in the research. Moreover, written permission was taken from the authors, who conducted the Turkish validity and reliability

study of the Nurse-Nurse Collaboration Scale (NNCS), via e-mail.

## RESULTS

Of the nurses participating in the study, 74.1% were female; 65.9% were married; 91.8% had a bachelor's degree. The mean age was  $32.14 \pm 5.83$  years. The mean duration of employment of the nurses in the profession was  $8.94 \pm 6.08$  years and the mean duration of employment in the intensive care unit was  $7.54 \pm 5.83$  years. Of the nurses, 40% worked in Anesthesia Intensive Care; 48.2% worked 40 hours a week; 82.4% worked in shifts; 48.2% were satisfied with the intensive care unit they worked in; 62.4% did not want to change the unit they worked in; 72.9% did not receive training on nurse-nurse collaboration, and 80% thought that nurse-nurse collaboration was achieved in the unit they worked in (Table 1).

**Table 1. Distribution of Nurses' Sociodemographic Characteristics**

		Age (Year)	32.14±5.83
		Duration of Employment in the Profession (Year)	8.94±6.08
		Duration of Employment in the Intensive Care Unit (Year)	7.54±5.83
		n	%
Gender	Male	22	25.9
	Female	63	74.1
Marital Status	Married	56	65.9
	Single	29	34.1
Education Level	Vocational school of health	1	1.2
	Bachelor's	78	91.8
	Master	5	5.8
	Doctorate	1	1.2
Type of Intensive Care Unit	Anesthesia and Reanimation Intensive Care	34	40.0
	General Surgery Intensive Care	20	23.5
	Cardiovascular Surgery Intensive Care	17	20.0
	Brain and Nerve Surgery Intensive Care	14	16.5

**Table 1. Distribution of Nurses' Sociodemographic Characteristics (Continue)**

Weekly Total	40 hours	41	48.2
Working Hours	48 hours	25	29.4
	40-48 hours	19	22.4
Working Type	Days, continuous	13	15.3
	Nights, continuous	2	2.3
	Work on duty	70	82.4
Satisfaction with the Unit	Yes	41	48.2
	No	10	11.8
	Partially	34	40.0
Thinking about Changing the Unit	Yes	32	37.6
	No	53	62.4
Receiving Training on Nurse-Nurse Collaboration	Yes	23	27.1
	No	62	72.9
Achievement of Nurse-Nurse Collaboration in the Unit	Yes	68	80.0
	No	17	20.0

When the mean subdimension and total scores of the NNCS were examined, the mean score of the nurses was 3.26±0.41 for the conflict management subdimension, 2.79±0.33 for the communication subdimension, 2.85±0.48 for the process sharing subdimension, 2.95±0.46 for the coordination subdimension, 3.17±0.43 for the professionalism subdimension. The mean total scale score was 3.00±0.28 (Table 2).

**Table 2. Distribution of Mean Total NNCS and Subdimension Scores**

NNCS and Its Subdimensions	Mean	Standard deviation	Median	Minimum	Maximum
Conflict Management	3.26	0.41	3.25	2.25	4.00
Communication	2.79	0.33	2.75	1.75	3.75
Process Sharing	2.85	0.48	2.75	1.50	4.00
Coordination	2.95	0.46	3.00	2.00	4.00
Professionalism	3.17	0.43	3.00	2.00	4.00
Total	3.00	0.28	2.96	2.48	3.78

The sociodemographic characteristics of the nurses and the distribution of the mean scores on NNCS and its subdimensions are presented in Table 3. As a result of the statistical analysis, the mean “process sharing” subdimension score of the nurses who voluntarily chose the department they worked in, the mean “coordination” subdimension score of the

nurses who received training on nurse-nurse collaboration, and the mean “process sharing and professionalism” subdimensions scores of the nurses who thought that nurse-nurse collaboration was achieved in the unit they worked in were statistically significant compared to other nurses (p<0.05). In addition, the mean “process sharing, professionalism, and total NNCS” scores of the nurses who did not want to change the department they worked in and were satisfied with the unit they worked in were significantly higher compared to the other nurses (p<0.05). On the other hand, there was no statistically significant difference between the variables of gender, marital status, education level, and intensive care unit and the mean scores on NNCS and its subdimensions (p>0.05).

**Table 3. Distribution of Nurses' Sociodemographic Characteristics and Mean Scores on NNCS and Its Subdimensions**

Variables	Conflict Management	Communication	Process Sharing	Coordination	Professionalism	Total NNCS Score
<b>Gender</b>						
Female	3.25±0.41	2.77±0.34	2.86±0.46	2.95±0.48	3.14±0.43	2.99±0.28
Male	3.29±0.42	2.84±0.30	2.82±0.55	2.94±0.42	3.24±0.45	3.03±0.28
Statistical Analysis	Z: -0.766 p: 0.444	Z: -0.624 p: 0.535	Z: -0.375 p: 0.708	Z: -0.102 p: 0.919	Z: -0.911 p: 0.362	Z: -0.532 p: 0.595
<b>Marital Status</b>						
Married	3.21±0.43	2.79±0.31	2.85±0.44	2.87±0.41	3.14±0.39	2.97±0.26
Single	3.34±0.380	2.79±0.36	2.85±0.56	3.10±0.53	3.21±0.51	3.06±0.31
Statistical Analysis	Z: -1.358 p: 0.175	Z: -0.322 p: 0.747	Z: -0.85 p: 0.932	Z: -1.983 p: 0.047	Z: -0.687 p: 0.492	Z: -1.075 p: 0.282
<b>Education Level</b>						
Vocational school of health	2.75±	3.00±	2.75±	2.40±	3.00±	2.78±
Bachelor's	3.27±0.42	2.79±0.33	2.84±0.48	2.94±0.44	3.16±0.43	3.00±0.27
Master	3.10±0.13	2.75±0.35	3.00±0.68	2.88±0.65	3.10±0.48	2.96±0.40
Doctorate	3.50±	2.50±	3.25±	4.00±	4.00±	3.45±
Statistical Analysis	K-W: 3.542 p: 0.315	K-W: 2.445 p: 0.485	K-W: 1.717 p: 0.633	K-W: 4.477 p: 0.214	K-W: 3.262 p: 0.353	K-W: 2.757 p: 0.431
<b>Willingness to Choose the Department</b>						
Yes	3.25±0.41	2.83±0.29	2.97±0.46	3.04±0.52	3.21±0.42	3.06±0.30
No	3.27±0.42	2.75±0.35	2.76±0.49	2.88±0.40	3.14±0.45	2.96±0.26
Statistical Analysis	Z: -0.207 p: 0.836	Z: -1.405 p: 0.160	Z: -1.227 p: 0.026	Z: -1.334 p: 0.182	Z: -0.406 p: 0.684	Z: -1.523 p: 0.128
<b>Thinking about Changing the Unit</b>						
Yes	3.18±0.40	2.74±0.42	2.60±0.47	2.85±0.35	2.96±0.35	2.87±0.22
No	3.30±0.42	2.82±0.25	3.00±0.43	3.01±0.51	3.29±0.44	3.08±0.28
Statistical Analysis	Z: -1.175 p: 0.240	Z: -0.607 p: 0.544	Z: -3.460 p: 0.001	Z: -1.251 p: 0.211	Z: -2.803 p: 0.005	Z: -3.429 p: 0.001
<b>Receiving Training on Nurse-Nurse Collaboration</b>						
Yes	3.38±0.37	2.82±0.40	2.80±0.59	3.14±0.37	3.14±0.56	3.06±0.27
No	3.21±0.42	2.77±0.30	2.87±0.44	2.87±0.47	3.18±0.38	3.08±0.28
Statistical Analysis	Z: -2.274 p: 0.112	Z: -0.754 p: 0.451	Z: -0.319 p: 0.750	Z: -2.899 p: 0.004	Z: -0.050 p: 0.960	Z: -1.162 p: 0.245
<b>Achievement of Nurse-Nurse Collaboration in the Unit</b>						
Yes	3.26±0.41	2.86±0.40	2.91±0.44	2.97±0.46	2.83±0.38	3.03±0.29
No	3.23±0.45	2.77±0.31	2.60±0.55	2.94±0.46	3.25±0.41	2.98±0.28
Statistical Analysis	Z: -0.186 p: 0.853	Z: -1.435 p: 0.151	Z: -1.451 p: 0.016	Z: -0.423 p: 0.672	Z: -3.495 p: 0.000	Z: -1.324 p: 0.185

**Table 3. Distribution of Nurses' Sociodemographic Characteristics and Mean Scores on NNCS and Its Subdimensions (Continue)**

Type of Intensive Care Unit						
Anesthesia and Reanimation ICU	3.22±0.43	2.75±0.36	2.81±0.52	3.00±0.53	3.03±0.43	2.96±0.30
General Surgery ICU	3.25±0.37	2.88±0.24	2.98±0.33	2.89±0.46	3.28±0.37	3.05±0.22
Cardiovascular Surgery ICU	3.23±0.45	2.70±0.23	2.80±0.56	2.98±0.43	3.16±0.47	2.98±0.28
Brain and Nerve Surgery ICU	3.39±0.41	2.85±0.41	2.82±0.48	2.85±0.31	3.35±0.41	3.05±0.29
Statistical Analysis	K-W: 1.901	K-W: 4.250	K-W: 3.795	K-W: 7.603	K-W: 0.917	K-W: 3.012
	p: 0.593	p: 0.236	p: 0.284	p: 0.055	p: 0.821	p: 0.390
Satisfaction with the Unit						
Yes	3.34±0.39	2.82±0.28	3.04±0.45	3.06±0.48	3.33±0.45	3.12±0.29
No	3.02±0.47	2.75±0.54	2.45±0.53	2.82±0.45	2.86±0.31	2.78±0.14
Partially	3.23±0.41	2.75±0.31	2.74±0.40	2.84±0.42	3.06±0.38	2.93±0.23
Statistical Analysis	K-W: 3.813	K-W: 0.680	K-W: 11.344	K-W: 5.358	K-W: 9.412	K-W: 15.469
	p: 0.149	p: 0.712	p: 0.003	p: 0.069	p: 0.009	p: 0.000

Z: Mann-Whitney U Test, K-W: Kruskal Wallis Test

## DISCUSSION

Nurses involved in the healthcare team are the health professionals who spend the most time with patients. For this reason, it is important for nurses working in health institutions to collaborate and be up for collaboration in order to provide safe and high-quality care and treatment (Jacqueline, 2018; Türe Yılmaz and Yıldırım, 2018). Collaborative work of nurses, especially in intensive care units, has a direct impact on the quality of care and may reduce the infection and mortality rates of patients with life-threatening conditions (Al-Ajarmeh et al., 2021; Kim et al., 2015). In this direction, as a result of this study which was conducted to determine the nurse-nurse collaboration levels of nurses working in intensive care units and the affecting variables, it was found that the mean total NNCS score of the nurses was  $3.00\pm 0.28$ . In the evaluation of the scale, item-total score averages were used. Therefore, considering that the lowest score obtainable from the scale is one and the highest score is four, it was observed that the level of collaboration among intensive care nurses was above average. This result shows that nurses in intensive care units usually have a positive perception of their collaborative situation.

In the study conducted by Hatip and Seren (2021) with nurses in a university hospital, the mean NNCS score of nurses was found to be  $3.14\pm 0.46$  and it was determined that their

level of collaboration was above average. In the study conducted by Aktaş (2020) to evaluate the nurse-nurse collaboration of nurses working in internal medicine units, it was determined that the mean total NNCS score of the nurses was  $3.09\pm 0.33$ . As a result of a study conducted by Çelik Durmuş et al. (2018) with 859 nurses working in different hospitals, the mean score of level of collaboration among nurses was found to be  $3.09\pm 0.39$  and it was stated that the level of collaboration was high. When the above study results were compared, it was seen that our study results are similar to those in the literature. Sheehan (2016) emphasized that in cases where collaboration is not sufficient, job satisfaction and, accordingly, the quality of care may decrease. In this direction, the high level of collaboration among nurses working in intensive care units, which are considered the areas where care and treatment are most intense, is considered a positive result. In line with the above-mentioned studies, the high level of collaboration among the nurses who participated in our study brought to mind the possibility that they had a high level of satisfaction with the unit they worked in. Furthermore, the fact that the majority had a bachelor's degree and that the sample was in the young age group suggested that they did not experience burnout much.

Dougherty (2009) explained collaboration under five sub-headings: conflict management/problem-solving, communication, coordination, process sharing, and professionalism. When the nurses participating in the study were examined in terms of their mean scores on the subdimensions of NNCS, it was determined that the highest mean score was reached on the "conflict management" subdimension ( $3.26\pm 0.41$ ) and this score was higher than the mean total scale score. Similar results were found in the studies of Aktaş (2020) and Çelik Durmuş (2015). On the other hand, some studies reported that the nurses received the lowest score on the problem-solving subdimension (Al-Ajarmeh et al., 2021; Çelik Durmuş et al. 2018; Koçak, 2019; Tadayon et al., 2020). It was thought that this difference between these studies and our study may be due to the differences in samples. Conflict may arise in the work environment as a result of various factors such as complexity in the work environment, various role expectations, limitations in the decision-making

process, limited resources, unclear work boundaries, and personality differences, possibly leading to many effects on nurses such as stress, job dissatisfaction, and burnout (Erdenk, 2017; Johansen, 2016; Labrague et al., 2018). Furthermore, conflict among nurses is associated with insufficient collaboration, lack of communication, and destructive behaviors and has the potential to negatively influence teamwork (Kim et al., 2015). Developing problem-solving/conflict management skills, which are the focus of nursing practice, is important in terms of quality patient care (Koçak, 2019). For this reason, the fact that the nurses participating in the research scored above the average on the “conflict management” subdimension reveals that the level of collaboration among nurses is high and that they adopt a more constructive collaborative attitude in practice.

It was determined that the nurses included in the study had the lowest mean score on the “communication” subdimension ( $2.79 \pm 0.33$ ). In the studies of Aktaş (2020) and Hatip and Seren (2021), similar results were obtained. Communication ranks first among the factors that negatively affect nurse-nurse collaboration in the clinical setting. Effective communication between members of the healthcare team is very important in terms of timely information-sharing. Effective team communication is a vital aspect of nursing practices associated with improved patient outcomes (Aktaş, 2020; Apker et al., 2006). Communication problems between the healthcare team are the main causes of practical and medical errors. These mistakes lead to prolongation of the hospitalization period, an increase in mortality and morbidity, and legal problems due to the damage suffered by patients and their relatives (Reeves, 2017; Ylitörmänen, 2019). Moreover, in cases where effective communication is not achieved, the quality of patient care and the service provided are affected adversely. Therefore, effective communication between nurses is very important (Türe Yılmaz and Yıldırım, 2018). In addition, communication problems between nurses negatively affect nurse-nurse collaboration. For this reason, the fact that the nurses participating in the study reached the lowest score on the communication subdimension is considered a very thought-provoking finding.

The concept of process sharing refers to the autonomous and effective participation of nurses in the decision-making process in the team in order to increase the quality of patient care and provide professional satisfaction. Sharing responsibilities in this way not only increases the quality of care but also increases nurses' collaboration and job satisfaction (Koçak, 2019). In this research, the mean score on the process sharing subdimension point was significantly higher among nurses who voluntarily chose the unit they worked in, who thought that collaboration was achieved in the unit they worked, who did not think of changing the department they worked in, and who were satisfied with the unit they worked in compared to the other nurses (respectively;  $p: 0.026$ ,  $p: 0.016$ ,  $p: 0.001$ ,  $p: 0.003$ ). As a result of the study conducted by Koçak (2019) to determine the effect of nurse-nurse collaboration of nurses working in a university hospital on their job satisfaction levels, it was determined that the nurses who were satisfied with the department they worked in and who stated that they collaborated in the clinic they worked in had significantly higher scores on NNCS and its subdimension compared to other nurses. In our study, it was seen that the difference, which was found to be significantly higher, was only in the process sharing subdimension. Although there are differences between the studies, the fact that nurses are satisfied with the unit they work and collaborate is considered a positive development indicating that their interpersonal communication increases, that the effective decision-making process is supported within the team, and that collaboration is ensured.

As a result of this study, it was seen that the mean coordination subdimension score of the nurses who received training on collaboration was significantly higher than that of the other nurses ( $p: 0.004$ ). In the study of Koçak (2019), in which a similar scale was used, it was concluded that the nurses who received training on collaboration had higher mean scores on BBCS and its subdimensions compared to other nurses. In the same study, it was stated that the collaboration training given to the nurses affected the collaboration level positively. In the literature, collaboration is briefly explained as enabling nurses to coordinate patient care with other health professionals (Aydemir, 2018; Aktaş, 2020). Implementation of nursing activities requires effective coordination. Therefore,

the study underlines that the training received on nurse-nurse collaboration has a very important role in increasing teamwork, coordination skills, and collaboration among nurses.

In the changing and developing world, many business and professional groups have started to need professional people in order to increase quality and efficiency and have attached importance to professionalism (Çalışkan Alkan, 2020). Nursing is a profession consisting of science and art. Today, advances in health care technologies and social and political changes have affected many fields as well as nursing and necessitated professionalism. The importance of professionalism in the nursing profession, which is affected by many changes and developments, is increasing day by day (Yılmaz and Karaman, 2021). The mean professionalism subdimension scores of the nurses who thought that collaboration was achieved in the unit they worked and who were satisfied with the unit they worked were found to be higher than the other nurses (respectively;  $p: 0.000$ ,  $p:0.009$ ). This result is similar to the findings of the study conducted by Koçak (2019). Nurses should demonstrate their professional knowledge and skills while working in collaboration with other health professionals in providing patient care (Orchard, 2010). For this reason, nurses are expected to exhibit a more collaborative attitude in professional practices. According to the results obtained in the study, it can be said that the nurses' satisfaction with the unit they work in and the implementation of collaboration are important parameters in the positive attitude of nurses towards collaboration.

According to the results obtained in this study, it was seen that the variables of gender, marital status, education level, and type of intensive care unit in which intensive care nurses worked did not affect the mean scores on NNCS and its subdimensions ( $p>0.05$ ). It is striking that there are differences between the results of the relevant studies. In some studies, nurses' education level, the unit they work in (Çavuşoğlu and Gün, 2022; Koçak, 2019), gender (Aktaş, 2020; Çavuşoğlu and Gün, 2022; Çelik Durmuş et al., 2018; Sheehan, 2016) and marital status (Aktaş, 2020; Al-Ajarmeh et al., 2021; Çelik Durmuş et al., 2018; Sheehan, 2016) did not affect nurses' collaboration levels. These study results are consistent with the

results of our study. On the other hand, in some studies, some factors such as education level of nurses (Aktaş, 2020; Çavuşoğlu and Gün, 2022; Çelik Durmuş et al., 2018; Karadaş et al., 2022), gender (Al-Ajarmeh et al., 2021; Ylitörmänen et al., 2019), the unit they work in (Aktaş, 2020; Al-Ajarmeh et al., 2021; Çelik Durmuş et al., 2018; Karadaş et al., 2022; Tadayon et al., 2020; Ylitörmänen et al., 2019) were found to affect nurses' collaboration levels. These differences between the above-mentioned study findings and our study results might be due to variables such as the sample, country, and working conditions. In addition, the facts that the number of male nurses participating in our study was low, that the majority of nurses had a bachelor's degree, that only nurses working in intensive care units were included in the sample, and that the nurses fulfilled similar responsibilities in the units may have affected the level of collaboration among nurses.

### Strengths and Limitations

The fact that the rate of participation in the research was 85% and that the study was carried out in intensive care units were the strengths of the research. The limitations of the research are that the research was conducted in a single center; the questions in the data collection forms were based on nurses' statements; the reasons for nurses' satisfaction with the unit they worked in and the physical and psychological problems they experienced were not questioned.

### CONCLUSION

In conclusion, it was observed that the nurse-nurse collaboration levels of nurses working in intensive care s were above the average. When the collaboration levels of the nurses were examined, it was found that the highest mean score was obtained on the "conflict management" subdimension and the lowest mean score was obtained on the "communication" subdimension. It was also seen that the variables of satisfaction with the department where the nurses work, voluntarily choosing the department they work, receiving training on collaboration, and achieving nurse-nurse collaboration in the unit they work in positively affect the level of collaboration of nurses. In line with these results, it is recommended to organize in-house training sessions and repeat them regularly in order to improve the communication skills of intensive care nurses,



provide opportunities to support the participation of nurses in team decisions under the leadership of manager nurses, organize motivational activities to increase the level of collaboration among nurses, support the participation of nurses in scientific meetings such as congresses, symposiums courses, take measures (such as improving working hours and reducing the number of patients per nurse) to increase nurses' job satisfaction, and carry out further research in larger samples with in-depth analysis.

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