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Determination of Nurses' Stress Levels and Interpersonal Problem Solving Skills*

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Abstract: This study aims to identify the stress levels experienced by nurses in providing healthcare services and their interpersonal problem-solving skills. A cross-sectional design was employed, and data were collected between March and May 2023 via face-to-face interviews with participants who had provided written informed consent. One hundred twenty nurses participated voluntarily in this study by completing the Nurse Information Form, Interpersonal Problem-Solving Inventory, and Nurse Stress Scale. Information gathered indicated that the nurses had an average age of 28.58± 4.92 years, with 82.5% of respondents being female and 64.2% were single. Additionally, 66.7% had a bachelor's degree, 50.8% had 1-5 years of professional experience, and 79.2% worked on a rotating shift schedule. Furthermore, 73.3 % of nurses chose their profession voluntarily, and 27.5% worked between 46-50 hours per week. The study discovered that nursing professionals have moderate stress levels and interpersonal problem-solving skills.

Keywords: Interpersonal Communication, Nurse-Patient Interaction, Stress.

JEL Classification: I1, I12, I31

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Hemşirelerin Stres Düzeyleri ve Kişilerarası Problem Çözme Becerilerinin Belirlenmesi

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Öz: Bu çalışmanın amacı, hemşirelerin sağlık hizmeti sunarken yaşadıkları stres düzeylerini ve kişilerarası problem çözme becerilerini belirlemektir. Kesitsel bir tasarım kullanılmış ve veriler Mart-Mayıs 2023 tarihleri arasında yazılı bilgilendirilmiş onam veren katılımcılarla yüz yüze görüşmeler yoluyla toplanmıştır. Yüz yirmi hemşire, Hemşire Bilgi Formu, Kişilerarası Problem Çözme Envanteri ve Hemşire Stres Ölçeği'ni doldurarak bu çalışmaya gönüllü olarak katılmıştır. Elde edilen bilgiler, hemşirelerin yaş ortalamasının 28.58± 4.92 yıl olduğunu, katılımcıların %82.5'inin kadın ve %64.2'sinin bekâr olduğunu göstermiştir. Ayrıca, %66,7'si lisans derecesine, %50,8'i 1-5 yıl arası mesleki deneyime sahipti ve %79,2'si dönüşümlü vardiya düzeninde çalışıyordu. Ayrıca, hemşirelerin %73,3'ü mesleklerini gönüllü olarak seçmiş ve %27,5'i haftada 46-50 saat arasında çalışmıştır. Çalışma, hemşirelerin orta düzeyde stres seviyesine ve kişilerarası problem çözme becerilerine sahip olduğunu ortaya koymuştur.

Anahtar Kelimeler: Hemşire-Hasta Etkileşimi, Kişilerarası İletişim, Stres.

JEL Sınıflandırması: I1, I12, I31

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GENİŞLETİLMİŞ ÖZ

Araştırma Problemi

Araştırma, hemşirelerin stres düzeylerinin kişilerarası problem çözme düzeylerine olan etkisini belirlemek amacıyla gerçekleştirilmiştir.

Araştırma Soruları

Hemşirelerin stres düzeyleri nedir? Hemşirelerin kişilerarası problem çözme düzeyleri nedir? Hemşirelerin sosyodemografik ve mesleki deneyim özellikleri stres ve kişilerarası problem çözme beceri düzeylerini etkilemekte midir? Hemşirelerin stres ile kişilerarası problem çözme düzeyleri arasında anlamlı bir ilişki var mıdır?

Literatür Taraması

Araştırmacılar literatürü stres ve kişilerarası problem çözme becerileri olmak üzere iki başlık altında incelemiştir. Yapılan literatür taraması sonucunda hemşirelerde stres ile ilgili çok sayıda çalışmanın olduğu; ancak hemşirelerin kişilerarası problem çözme düzeyleri ile ilgili bir çalışmaya rastlanmadığı belirlenmiştir.

Metodoloji

Araştırmacılar, Türkiye'deki bir kamu hastanesinde çalışan yüz yirmi hemşire ile kesitsel tanımlayıcı bir çalışma yürütmüştür. Veriler, gönüllü onam veren hemşirelerle yüz yüze görüşülerek Hemşire Bilgi Formu, Kişilerarası Problem Çözme Envanteri ve Hemşire Stres Ölçeği kullanılarak elde edilmiştir. Araştırmada elde edilen veriler SPSS 24.00 programı ile analiz edilmiştir.

Bulgular ve Sonuç

Stres ile probleme olumsuz yaklaşma, sorumluluk almama ve kendine güvensizlik arasındaki pozitif yönlü ilişki saptanmıştır. Bu bulgu, hemşirelerin stres düzeyleri arttıkça kişilerarası bir problemle karşılaştıklarında orta düzeyde çaresizlik, karamsarlık ve üzüntü gibi olumsuz duygu ve düşünceler geliştirdikleri, problemin çözümünde sorumluluk almadıkları, karşılaşılan problemin çözümüne yönelik güvensizlik deneyimledikleri şeklinde yorumlanabilir. Diğer yandan hemşirelerin kişilerarası problem yaşadıklarında problemin etkili ve yapıcı biçimde çözümüne katkı sağlayan duygu, düşünce ve davranış düzeylerinin yüksek olduğu belirlenmiştir. Elde edilen bulgular, stres ve kişilerarası ilişkilerin çok faktörlü yapısı göz önünde bulundurularak dikkatle değerlendirilmelidir. Bu çalışma hemşirelerin kişilerarası problem çözme düzeylerini inceleyen bilinen ilk çalışma olup; çalışma sonuçlarının araştırmacılara, hemşirelere ve hemşire yöneticilere fayda sağlayacağı düşünülmektedir. Çalışmanın sınırlılıkları, örneklem büyüklüğünün nispeten küçük olması, stres ve kişilerarası ilişkilerin birden fazla faktörden etkilenebilmesi ve hemşirelerin kişilerarası problem çözme düzeylerine ilişkin literatür eksikliği şeklindedir. Bu sınırlılıklar araştırma sonuçlarının yorumlanmasını güçleştirmektedir.

INTRODUCTION

Stress has an adverse impact on an individual's mental alertness, decision-making abilities, problem-solving skills, productivity, and work efficiency. The scientific term 'stress' was introduced in the 1930s to describe the human condition, and stress term was used in nursing in the 1950s (Lyon, 2011). Nursing is characterized by significant emotional and work-related stress, with nurses are one of the most stressful occupational groups (Lee et al., 2021; Watanabe et al., 2019). Nurses face high psychological pressures in their workplaces as the primary healthcare providers offering continuous healthcare services around the clock to consumers. They experience more stress than their counterparts in other healthcare professions. This situation adversely impacts the well-being of nurses and the standard of care they offer (Emadikhalaf et al., 2023).

2. BACKGROUND

Occupational stress is a notable health concern in current societies and detrimentally affects individuals' physical, emotional, psychological, social, and spiritual well-being in multifarious ways, irrespective of the source. Batalla et al. (2019) and Taelman et al. (2011) note that it is accountable for 40-50% of all work-related losses (Batalla et al. 2019; Taelman et al. 2011). The nursing profession has encountered work-related problems and health hazards since the past and to date, as observed by Letvak (2013). Within healthcare, nurses face a range of stressors, including pain and mortality, professional duties and concerns, patient and family requirements, violence and threat, work environment and conditions, organizational structure and characteristics, working patterns, professionalization processes and the perception of nursing as a female-dominated field (Çevik, 2018; Sasaki et al., 2009).

Nurses reportedly experience considerable stress that may result in depression, sleep and somatic disorders, job dissatisfaction, and burnout (Abdollahi et al., 2014; Alkhawaldeh et al., 2020). The adverse effects of stress are not limited to the nurses' health and well-being but also affect the nursing profession's functionality (Lim et al., 2010). According to studies, the prevalence of nurses experiencing high levels of stress ranged from 69% to 72% (Koç et al., 2017). Stress and its adverse effects on nurses negatively impact the healthcare they provide, hindering sustainable healthcare services and achieving a healthy society comprising healthy individuals.

Interpersonal relationships play a crucial role in the nursing profession (Kaplan and Ançel, 2021). Nurses regularly confront intricate situations, including patient care, teamwork, and organizational challenges, that necessitate effective problem-solving abilities (Yüksel, 2015). Effective utilization of interpersonal problem-solving skills improves nurse-patient relationships, leading to transparent and clear communication based on trust. This situation enhances patient satisfaction and engagement, improving treatment adherence and nursing quality. Thus, nurses are expected to consistently display emotions, thoughts, and behaviors while fulfilling their professional responsibilities and building interpersonal relationships, utilizing effective communication and problem-solving abilities (Kaplan and Ançel, 2021).

According to a literature review, effective management of the problem-solving process among nurses can address negative emotions, thoughts, and behaviors and lead to the identification of healthy solutions, which in turn improves the quality of care offered (Pamuk-Cebeci and Köşgeroğlu, 2020). Moreover, practical problem-solving skills improvement among nurses enhances their efficiency in providing services that promote better community health and quality of life. Individuals who employ fewer problem-solving strategies experience elevated stress levels, as indicated by previous studies (Abaan and Altintoprak, 2005; Tyson et al., 2002). Although several investigations

have focused on nurses' problem-solving abilities (Aydınöz et al., 2020; Çelenk and Topoyan, 2017; Ulusoy vd., 2023), only a small proportion of research has centered primarily on their interpersonal problem-solving skills (Ay et al., 2020; Gökdere-Çınar and Baykal, 2022).

Nurses play a critical role in identifying the stress levels arising from their work environment and interpersonal problem-solving abilities. This situation is integral to developing stress prevention and control interventions, improving interpersonal communication skills, and enhancing the quality of nursing care. Nurses provide uninterrupted healthcare services around the clock, making their objectivity and precise language essential in maintaining the quality of care. Therefore, this research aims to investigate the correlation between stress levels and interpersonal problem-solving skills among nurses. No prior study has investigated the connection between work environment-induced stress levels of nurses and their ability to solve interpersonal problems. Consequently, this study is anticipated to fulfill this gap in the literature and serve as a foundation for subsequent research. Additionally, this study aims to aid in developing interventions that decrease nurses' stress levels while also providing them with practical interpersonal problem-solving abilities.

3. MATERIALS AND METHODS

The study is cross-sectional descriptive research. The reporting of the study adheres to the STROBE checklist. To ensure high-quality reporting of observational studies, the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines were developed in 2004. They are designed to assist in the presentation of the observational study conducted to ensure adequate reporting, as well as an assessment of the strengths and weaknesses of the study. The STROBE guidelines allow readers to critically evaluate the study (Cuschieri, 2019).

The research aims to determine nurses' stress levels and interpersonal problem-solving skills and determine the relationship between stress levels and interpersonal problem-solving skills.

3.1. Sample

The study was carried out at a public hospital in Turkey with attending nurses. Data was gathered from March to May 2023 through face-to-face completion of data collection tools by participating nurses who met the inclusion criteria. The inclusion criteria comprised being 18 years or older, currently employed as a nurse at the public hospital where the study was performed, and having a minimum of one year of nursing experience. No methods besides the inclusion criteria were employed in selecting participants.

The Epiinfo programme was used to calculate the sample before the study. In Warnakulasooriya and Arnol's study, it was found that 73.2% of the nurses had moderate and high levels of stress according to the NSS scale (Warnakulasooriya and Arnold, 2021). It is also known that the number of people in the population was 410. According to the power calculation, assuming a type I error rate of 5%, a pattern effect of 1 and a power level of 80%, it was recommended to include at least 98 people in the study. A sample size of 120 was achieved in the research.

3.2. Data Collection

Data were collected between March and May 2023 using the Nurse Information Form, Interpersonal Problem-Solving Inventory (IPSI), and Nurse Stress Scale (NSS). After obtaining written informed consent through face-to-face interviews with participants, they were provided with the data collection instruments to complete. No payment

was offered to participants for completing the data collection instruments.

Nurse Information Form: The authors Aksoy (2021) and Zengin (2021) developed this form based on the literature. It comprises ten questions that gather information on nurses' sociodemographic characteristics, such as age, gender, educational level, marital status, and professional experience (Aksoy, 2021; Zengin, 2021).

Interpersonal Problem-Solving Inventory (IPSI): The IPSI is a survey tool developed by Çam and Tümkaya (2007) that comprises five subscales and 50 items. Validity and reliability studies have been conducted to support its effectiveness. The subscales in the inventory include 'Approaching problems in a negative way' (16 items), 'Constructive problem-solving' (16 items), 'Lack of self-confidence' (7 items), 'Unwilling to take responsibility' (5 items), and 'Insistent-persevering approach' (6 items). The inventory employs a 5-point Likert scale ranging from 'Not at all appropriate' (1) to 'Completely appropriate' (5). A higher score on the scale indicates higher interpersonal problem-solving skills. There are no reversed items in the scale. Each subscale is evaluated separately, and a total score is not used. Cronbach's alpha internal consistency values for the subscales range from .67 to .91, and test-retest stability coefficients range from .69 to .89 (Çam and Tümkaya, 2007). Validity and reliability studies for the adult sample of the inventory were conducted by Çam, Tümkaya, and Yerlikaya (2011). In the study, Cronbach's Alpha internal consistency values for the subscales ranged from .67 to .90. The inventory is reported to be suitable for measuring adults' interpersonal problem-solving skills (Çam et al., 2011).

Characteristics of the subscales are as follows:

- *Approaching problems in a negative way (APNW):* This subscale relates to intense negative emotions and thoughts such as helplessness, pessimism, and sadness when encountering an interpersonal problem.
- *Constructive Problem Solving (CPS):* The subscale contributes to the effective and constructive resolution of interpersonal problems involving emotions, thoughts, and behaviours when faced with a problem.
- *Lack of Self-Confidence (LSC):* This relates to a lack of confidence in solving the encountered problem.
- *Unwilling to take responsibility (UR):* This relates to not taking responsibility for solving the problem.
- *Insistent-Persevering Approach (IPA):* It relates to thoughts and behaviours concerning resolving interpersonal relationship problems. It involves persistently addressing the problem until it is solved and striving to conclude when solving it (Çam and Tümkaya, 2007).

Nurse Stress Scale (NSS): The "Nurse Stress Scale," developed by Gray-Toft and Anderson (1981), has been adapted and validated in Turkish by Mert et al. (2021). The scale consists of a total of 34 items and seven subscales. The subscales are as follows: 'Uncertainty Concerning Treatment' (8 items), 'Workload' (6 items), 'The Death of a Patient' (5 items), 'Conflict with a Physician' (5 items), 'Conflict with Peers' (5 items), 'Insufficient Support' (3 items), and 'Suffering Patient' (2 items). The scale uses a 4-point Likert scale, and participants are asked to select the most appropriate option for themselves from the options: (1 point) Never, (2 points) Sometimes, (3 points) Often, (4 points) Very often. The total score is calculated by summing up the responses to all items given by the participant, measuring the nurse's overall frequency of stress. A higher score indicates that the nurse experiences stress more frequently in individual stress-related issues in the physical, psychological, and physical environments. A lower score indicates that a nurse experiences less stress in the same situations (Mert et al., 2021). In this study, the obtained Cronbach's alpha values are as follows: 0.95 for stress level, 0.86 for uncertainty concerning treatment, 0.89 for workload, 0.83 for the death of a patient, 0.87 for conflict with a physician, .88 for conflict with peers, 0.85 for

insufficient support, and 0.77 for suffering patient.

Characteristics of the subscales are as follows:

• *Uncertainty Concerning Treatment:* This subscale covers stressful situations where there is uncertainty about the patient's treatment. When the doctor is unable to provide the nurse with adequate information about the patient's condition, this is associated with stressful situations experienced when the nurse does not know what to tell the patient or the patient's family about the condition and its treatment. Another potentially stressful situation occurs when a doctor is not present during a medical emergency. The 'Insufficient preparation' subscale, which covers the stress experienced when nurses are not adequately prepared to respond to the emotional needs of patients and their families on the original scale, is also included in this subscale.

• *Workload:* This subscale includes stressful situations resulting from the nurse's workload, staffing and scheduling problems, and inadequate time to complete nursing tasks and provide emotional support to patients.

• *The Death of a Patient:* This subscale appears to largely measure stressful situations resulting from the suffering and death of patients.

• *Conflict with a Physician*: This subscale covers stressful situations caused by the nurse's interactions with doctors. Criticism of the doctor covers the stress experienced in situations of conflict with the doctor, fear of making treatment mistakes in the doctor's absence, and disagreement with the doctor about treatment.

• *Conflict with Peers*: This subscale is associated with decision-making situations that arise between nurses and supervisors. Conflict or criticism with a supervisor is associated with stress experienced in situations such as conflicts with nurses in the same or other hospital units.

• *Insufficient Support:* This subscale measures the nurse's assessment of the extent to which there are opportunities to share experiences with other nurses and to express negative feelings such as anger and frustration. The lack of such opportunities can cause stress for nurses.

• *Suffering Patient:* This subscale is associated with patients who cannot recover or are suffering. Performing painful procedures on patients is also potentially stressful. The items in the "Death of the Patient" subscale in the original scale were included in a new subscale called "Suffering Patient" in the Turkish validity and reliability study (Mert et al., 2021).

3.3. Data Analysis

SPSS Statistics 24.00 was utilized to analyze the data. Results were deemed statistically significant at a P-value of ≤0.05. Descriptive statistics, percentages, and frequencies were used to analyze sociodemographic data. After investigating the variables' skewness and kurtosis values, analysis techniques were chosen, assuming normality for values within ±1.5 standard deviations from the mean (Fidell et al., 2013). If gender, marital status, work schedule, and the selection of the nursing profession followed a normal distribution, an independent samples t-test was utilized to compare interpersonal problem-solving inventory, nurse stress scale, and subscale scores. Otherwise, the Mann-Whitney U test was implemented. For assessing educational attainment, total professional experience, and weekly workload, if scores for the Interpersonal Problem-Solving Inventory, Nurse Stress Scale, and its subscales followed a normal distribution, a one-way ANOVA and post hoc Tukey HSD tests were used. In cases where scores did not follow a normal distribution, the Kruskal Wallis H test was used. The Pearson correlation was implemented if the distribution was normal for analyzing the correlation between continuous variables, whereas Spearman correlation

analysis was used if the distribution was non-normal.

3.4. Validity and Reliability

The NSS used in this study has been utilized in numerous studies as a valid and reliable measurement tool adapted to different languages and cultures (Abualrub et al., 2009; Emami et al., 2022; Hetzel-Riggin et al., 2020; Landa et al., 2008; Nowrouzi et al., 2015). Previous studies have reported Cronbach's alpha values for NSS between 0.89 and 0.96 (Abualrub et al., 2009; Emami et al., 2022; Hetzel-Riggin et al., 2020). The IPSI, another measurement tool used in this study, has been employed as a valid and reliable measurement tool in several studies (Ergin and Dağ, 2013; Işık and Yıldız, 2014; Kaplan, 2020; Yılmaz and Dost, 2016). Previous studies have reported Cronbach's alpha values for IPSI subscales ranging from 0.68 to 0.91 (Ergin and Dağ, 2013; Kaplan, 2020; Yılmaz and Dost, 2016). These scales are valid and reliable within the Turkish culture (Çam et al., 2011; Mert et al., 2021).

3.5. Ethical Considerations

Ethical approval for the research was obtained from the Istanbul Kültür University Ethics Committee with the decision dated 14.10.2022 and numbered 2022/128. Permission was obtained from the public hospital where the research was conducted and the provincial health directorate to conduct the research. Permission was obtained via email from the owners of the scales used in the research. Written and verbal informed consent was obtained from all participants. The research was conducted following the Helsinki Declaration.

4. RESULTS

The participants' sociodemographic characteristics identified that the mean age was 28.58 ± 4.92 years, the majority were female (82.5%), single (64.2%), and had a bachelor's degree (66.7%) (see Table 1). The majority of the participants voluntarily chose the nursing profession (73.3%), working 51 hours or more per week (35%), working in a mixed working schedule (79.2%), and working in specialized units (operating rooms and intensive care units) (64.2%) (see Table 1).

Table 1. Sociodemographic and Professional Characteristics of Nurses

	Mean ± SD	*Median [min-max]*
Age	28.58 ± 4.92	28 [23-46]
	Frequency	***Percent***
Gender		
Woman	99	82.5 %
Male	21	17.5 %
Education Status		
High school	10	8.3 %
College	18	15.0 %
Bachelor's degree	80	66.7 %
Master's degree or doctoral degree	12	10.0 %
Marital Status		
Married	43	35.8 %
Single	77	64.2 %
Working Time		
Daytime	21	17.5 %
Night	4	3.3 %
Mixed	95	79.2 %
Duration of Professional Experience		

1-5 years	61	50.8 %
6-10 years	42	35.0 %
11-15 years	11	9.2 %
Over 15 years	6	5.0 %
Choosing a Profession Willingly		
Yes	88	73.3 %
No	32	26.7 %
Weekly Working Time		
40 hours	24	20.0 %
41-45 hours	21	17.5 %
46-50 hours	33	27.5 %
Over 50 hours	42	35.0 %
Working Unit		
Specialized unit	77	64.2 %
Other	43	35.8 %
Total	120	100.0 %

SD: *Standard deviation,* ***Min:*** *Minimum,* ***Max:*** *Maksimum,* ***Specialized Unit:*** *Operating room, surgical intensive care unit, internal medicine intensive care unit, pediatric intensive care unit, cardiovascular surgery intensive care unit;* ***Other:*** *Surgery clinic, internal medicine clinic, pediatrics clinic, administrative departments.*

The mean score for the IPSI subscale of approaching problems in a negative way was 40.13 ± 13.86, constructive problem-solving was 52.35 ± 9.60, lack of self-confidence was 15.04 ± 5.72, unwilling to take responsibility was 11.98 ± 4.24, and insistent-persevering approach was 19.98 ± 3.95. The skewness and kurtosis values of the subscale scores for interpersonal problem-solving were within ±1.5, indicating a normal distribution (see Table 2).

The average stress level of nurses was 78.27 ± 19.79. The subscale scores were as follows: uncertainty concerning treatment 17.13 ± 4.90, workload 16.35 ± 4.68, the death of a patient 10.83 ± 3.48, conflict with a physician 10.93 ± 3.59. Conflict with peers 11.59 ± 4.15, insufficient support 6.79 ± 2.41, and suffering patient 4.64 ± 1.63. The total stress level, workload, the death of a patient, conflict with a physician, conflict with peers, insufficient support, and suffering patient scores showed skewness and kurtosis values within ±1.5, indicating a normal distribution. However, the skewness and kurtosis values for uncertainty concerning treatment were not within ±1.5 and revealed a non-normal distribution (see Table 2).

Table 2. Scale Sub-Dimension and Total Scores

		Mean ± SD	***Median [min-max]***
Nurse Stress Scale (NSS)	***Uncertainty concerning treatment***	17.13 ± 4.90	16 [8 - 32]
	Workload	16.35 ± 4.68	17 [6 - 24]
	The death of a patient	10.83 ± 3.48	10 [5 - 20]
	Conflict with a physician	10.93 ± 3.59	10 [5 - 20]
	Conflict with peers	11.59 ± 4.15	11 [5 - 20]
	Insufficient support	6.79 ± 2.41	6 [3 - 12]
	Suffering patient	4.64 ± 1.63	4 [2 - 8]
	NSS total	78.27 ± 19.79	76 [35 - 136]
Interpersonal Problem-Solving Inventory (IPSI)	***Approaching problems in a negative way***	40.13 ± 13.86	38 [16 - 76]
	Constructive problem solving	52.35 ± 9.60	51 [27 - 80]
	Lack of self-confidence	15.04 ± 5.72	14 [7 - 33]
	Unwilling to take responsibility	11.98 ± 4.24	11,5 [5 - 22]
	Insistent-persevering approach	19.98 ± 3.95	20 [10 - 30]

SD: *Standard deviation,* ***Min:*** *minimum,* ***Max:*** *maksimum*

When examining the correlations between NSS and IPSI scores, it was observed that there was a positive weak correlation between approaching problems in a negative way and the death of a patient (r= 0.32, p< 0.01), conflict with a physician (r= 0.40, p< 0.01), conflict with peers (r= 0.35, p< 0.01), insufficient support (r= 0.36, p< 0.01), and suffering patient (r= 0.30, p< 0.01). A moderate positive correlation was observed between stress level (r= 0.43, p< 0.01), uncertainty concerning treatment (r= 0.45, p< 0.01), and approaching problems in a negative way (see Table 3).

A positive weak correlation was found between constructive problem-solving and workload (r= 0.25, p< 0.01). A very weak positive correlation was identified between lack of self-confidence and conflict with peers (r= 0.20, p< 0.05). There was a weak positive correlation between stress level (r= 0.35, p< 0.01), the death of a patient (r= 0.33, p< 0.01), conflict with a physician (r= 0.29, p< 0.01), insufficient support (r= 0.29, p< 0.01), and suffering patient (r= 0.34, p< 0.01). A moderate positive correlation existed between lack of self-confidence and uncertainty concerning treatment (r= 0.52, p< 0.01) (see Table 3).

A weak positive correlation was observed between unwilling to take responsibility and uncertainty concerning treatment (r= 0.40, p< 0.01), the death of a patient (r= 0.35, p< 0.01), conflict with a physician (r= 0.38, p< 0.01), conflict with peers (r= 0.31, p< 0.05), insufficient support (r= 0.36, p< 0.01), and suffering patient (r= 0.36, p< 0.01). A moderate positive correlation was found between unwilling to take responsibility and stress level (r= 0.41, p< 0.01) (see Table 3).

Table 3. Interpersonal Problem-Solving Inventory (IPSI) and Nurse Stress Scale (NSS) Score Correlation

			Interpersonal Problem-Solving Inventory (IPSI)					**Nurse Stress Scale (NSS)**							
n=120			Approaching problems in a negative way	Constructive Problem Solving	Lack of Self-Confidence	Unwilling to take responsibility	Insistent-Persevering Approach	**NSS Total**	Uncertainty Concerning Treatment	Workload	The Death of a Patient	Conflict with a Physician	Conflict with Peers	Insufficient Support	Suffering Patient
Interpersonal Problem-Solving Inventory (IPSI)	Approaching problems in a negative way	r	1												
	Constructive problem solving	r	0.26*	1											
	Lack of self-confidence	r	0.74*	0.18	1										
	Unwilling to take responsibility	r	0.75*	0.20**	0.79*	1									
	Insistent-persevering approach	r	0.25*	0.68*	0.19**	0.19**	1								
Nurse Stress Scale (NSS)	**NSS Total**	r	0.43*	0.15	0.35*	0.41*	0.02	1							
	Uncertainty concerning treatment	r	0.45*	-0.05	0.52*	0.40*	-0.05	0.79*	1						
	Workload	r	0.17	0.25*	0.06	0.10	0.02	0.70*	0.37*	1					
	The death of a patient	r	0.32*	0.08	0.33*	0.35*	-0.05	0.75*	0.59*	0.38*	1				
	Conflict with a physician	r	0.40*	0.09	0.29*	0.38*	0.07	0.87*	0.70*	0.48*	0.55*	1			
	Conflict with peers	r	0.35*	0.15	0.20**	0.31*	0.04	0.86*	0.54*	0.53*	0.58*	0.75*	1		
	Insufficient support	r	0.36*	0.10	0.29*	0.36*	0.01	0.79*	0.53*	0.46*	0.47*	0.74*	0.71*	1	
	Suffering patient	r	0.30*	0.11	0.34*	0.36*	0.05	0.75*	0.49*	0.42*	0.59*	0.68*	0.63*	0.61*	1

n: *number,* ***r:*** *Pearson Correlation, Spearman Correlation,* ****:*** *significance at p<.01 level,* *****:*** *significance at p<.05 level*

The age of nurses did not show a significant relationship with stress level (r= 0.13, p> 0.05), uncertainty concerning treatment (r= 0.09, p> 0.05), the death of a patient (r= 0.02, p> 0.05), conflict with a physician (r= 0.10, p> 0.05), conflict with peers (r= 0.12, p> 0.05), insufficient support (r= 0.10, p> 0.05), and suffering patient (r= 0.16, p> 0.05). However, a weak positive correlation was observed between age and workload (r= 0.24, p< 0.01) (see Table 4).

Age did not show a significant relationship with interpersonal problem-solving (r= -0.13, p> 0.05), constructive problem-solving (r= 0.01, p> 0.05), lack of self-confidence (r= -0.09, p> 0.05), unwilling to take responsibility (r= -0.13, p> 0.05), and insistent-persevering approach (r= 0.08, p> 0.05). However, a very weak negative correlation was noted between age and approaching problems in a negative way (r= -0.20, p< 0.05) (see Table 4).

An analysis of nurses' total work experience revealed statistically significant differences in stress level (F=3.421; p=0.04), workload (F=4.117; p=0.02), and conflict with peers (F=3.152; p=0.04) scores. Nurses with a total work experience of 6-10 years exhibited higher stress levels, workload, and conflict with peers than those with 1-5 years of experience. Additionally, nurses with 1-5 years of experience demonstrated higher scores in approaching problems negatively, lack of self-confidence, and unwillingness to take responsibility, while nurses with more than 11 years of experience showed higher scores in constructive problem-solving and insistent-persevering approach. The analysis results indicated that there were no statistically significant differences in IPSI subscale scores based on nurses' total work experience (p> 0.05) (see Table 4).

When examining the effect of sociodemographic and professional experience characteristics on interpersonal problem-solving skills and stress levels, it was determined that gender, marital status, educational background, work schedule, deliberate career choice, and weekly working hours did not have a significant impact on nurses' interpersonal problem-solving skills and stress levels (see Table 4).

Table 4. The Effect of Sociodemographic and Occupational Characteristics of Nurses on IPSI and NSS Scores

		NSS								IPSI				
		Uncertainty Concerning Treatment	*Workload*	*The Death of a Patient*	*Conflict with a Physician*	*Conflict with Peers*	*Insufficient Support*	*Suffering Patient*	*NSS Total*	*Approaching problems in a negative way*	*Constructive Problem Solving*	*Lack of Self-Confidence*	*Unwilling to take responsibility*	*Insistent-Persevering Approach*
Age		0.09	0.24**	0.02	0.10	0.12	0.10	0.16	0.13	-0.20*	0.01	-0.09	-0.13	0.08
	n	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***	***Mean ± SD***
Gender														
Woman	99	17.31±4.84	16.39±4.55	10.81±3.37	11.14±3.61	11.88±4.13	6.89±2.35	4.70±1.54	79.12±19.32	40.96±13.72	52.28±8.93	15.00±5.67	12.16±4.16	19.92±3.82
Man	21	16.24±5.19	16.14±5.37	10.95±4.07	9.95±3.40	10.24±4.07	6.33±2.69	4.38±2.04	74.24±21.94	36.19±14.22	52.67±12.58	15.24±6.08	11.10±4.61	20.29±4.61
Test statistics; p-value		Z=-.621 p=0.54	T=-.223 p=0.82	T=.172 p=0.86	T=-1.384 p=0.17	T=-1.659 p=0.10	T=-.960 p=0.34	T=-.804 p=0.42	T=-1.027 p=0.31	T=-1.438 p=0.15	T=.166 p=0.87	T=.173 p=0.86	T=-1.046 p=0.30	T=.385 p=0.70
Marital Status														
Single	77	16.77±4.73	16.09±4.57	10.60±3.41	10.68±3.52	11.08±4.05	6.53±2.33	4.51±1.64	76.25±18.98	40.74±13.40	52.52±9.26	14.52±5.49	12.08±4.19	19.94±4.04
Married	43	17.77±5.19	16.81±4.89	11.26±3.61	11.40±3.70	12.51±4.22	7.56±2.51	4.88±1.61	81.88±20.92	39.02±14.76	52.05±10.30	15.98±6.06	11.79±4.38	20.07±3.82
Test statistics; p-value		Z=-1.086 p=0.28	T=-.811 p=0.42	T=-.993 p=0.32	T=-1.054 p=0.29	T=-1.834 p=0.07	T=-1.588 p=0.12	T=-1.215 p=0.23	T=-1.504 p=0.14	T=.649 p=0.52	T=.258 p=0.80	T=-1.344 p=0.18	T=.354 p=0.72	T=-.178 p=0.86
Education Status														
High school	10	17.10±5.71	14.80±5.16	11.20±2.86	9.60±3.53	11.00±3.53	6.50±2.42	4.50±1.51	74.70±20.92	42.80±15.92	52.30±12.31	15.20±4.42	12.10±4.48	19.70±4.06
College	18	17.44±4.33	16.94±5.04	10.22±3.77	11.11±3.94	11.89±4.63	6.44±2.36	4.44±1.82	78.50±20.70	41.72±12.79	53.11±10.45	14.50±5.81	11.44±4.16	20.28±4.66
Bachelor's degree	80	16.81±4.65	16.38±4.52	10.88±3.51	11.04±3.44	11.41±4.15	6.85±2.42	4.66±1.65	78.03±19.13	40.04±13.65	52.01±8.85	15.33±5.90	12.16±4.24	19.95±3.83
Master's degree or doctoral degree	12	18.75±6.72	16.58±5.13	11.17±3.69	11.08±4.32	12.83±4.09	7.17±2.59	4.92±1.51	82.50±23.64	36.08±15.86	53.50±11.79	13.83±5.69	11.42±4.60	20.00±4.05
Test statistics; p-value		H=1.315 p=0.73	F=.467 p=0.71	F=.257 p=0.86	F=.498 p=0.69	F=.501 p=0.68	F=.28 p=0.84	F=.226 p=0.88	F=.291 p=0.83	F=.538 p=0.66	F=.125 p=0.95	F=.295 p=0.83	F=.214 p=0.89	F=.051 p=0.99

Duration of Professional Experience														
1-5 years	61	16.48±4.28	15.23±4.69[a]	10.34±3.26	10.52±3.59	10.72±4.14[a]	6.44±2.34	4.33±1.67	74.07±17.94[a]	42.08±13.55	51.95±9.48	15.89±5.67	12.39±3.95	19.41±3.99
6-10 years	42	18.17±5.11	17.83±4.17[b]	11.43±3.62	11.60±3.46	12.76±4.01[b]	7.36±2.36	5.10±1.45	84.24±19.31[b]	38.76±12.72	51.90±9.01	14.40±5.26	11.90±4.22	20.12±3.34
11 years and above	17	16.88±6.19	16.71±5.01[c]	11.12±3.89	10.76±3.87	11.82±4.02[c]	6.65±2.64	4.65±1.77	78.59±24.31[c]	36.47±17.10	54.88±11.53	13.59±6.75	10.65±5.22	21.71±4.82
Test statistics; p-value		H= 2.248 p=0.33	F=4.117 p=0.02* a<b	F=1.276 p=0.28	F=1.131 p=0.33	F=3.152 p=0.04* a<b	F=1.857 p=0.16	F=2.829 p=0.6	F=3.421 p=0.04* a<b	F=1.411 p=0.25	F=.685 p=0.51	F=1.487 p=0.23	F=1.137 p=0.32	F=2.336 p=0.10
Choosing a Profession Willingly														
Yes	88	17.06±4.60	16.60±4.68	10.86±3.45	10.90±3.50	11.58±4.12	6.89±2.35	4.69±1.67	78.58±18.89	40.27±14.30	53.13±9.94	15.24±5.92	11.95±4.13	20.16±4.07
No	32	17.31±5.72	15.66±4.69	10.75±3.65	11.03±3.88	11.63±4.29	6.53±2.59	4.50±1.55	77.41±22.41	39.72±12.79	50.22±8.39	14.50±5.17	12.03±4.61	19.50±3.63
Test statistics; p-value		Z=-.408 p=0.68	T=.980 p=0.33	T=.157 p=0.88	T=-.179 p=0.86	T=-.053 p=0.96	T=.713 p=0.48	T=.571 p=0.57	T=.286 p=0.78	T=.193 p=0.85	T=1.473 p=0.14	T=.624 p=0.53	T=-.087 p=0.93	T=.807 p=0.42
Weekly Working Time														
40 hours	24	16.13±5.40	15.58±4.41	10.83±3.47	10.29±4.08	10.83±4.40	6.63±2.60	4.63±1.61	74.92±21.35	39.88±15.14	54.08±10.42	14.83±6.36	11.96±4.60	19.92±4.05
41-45 hours	21	17.71±4.93	15.95±4.96	9.43±2.82	11.38±3.92	11.43±4.39	6.95±2.62	4.62±1.75	77.48±20.08	44.62±11.39	51.86±8.27	15.67±5.52	13.24±3.36	20.24±3.62
46-50 hours	33	17.64±5.12	16.58±5.06	11.58±3.89	11.21±3.31	12.42±3.84	7.15±2.12	4.85±1.58	81.42±20.26	41.24±14.05	54.33±8.69	15.45±5.84	12.55±4.63	20.27±3.88
51 hours and above	42	17.00±4.47	16.81±4.47	10.95±3.36	10.86±3.41	11.45±4.15	6.52±2.44	4.50±1.67	78.10±18.70	37.14±13.84	50.05±10.20	14.52±5.48	10.90±3.99	19.67±4.21
Test statistics; p-value		H=4.596 p=0.20	F=.420 p=0.74	F=1.682 p=0.18	F=.431 p=0.73	F=.732 p=0.54	F=.482 p=0.70	F=.279 p=0.84	F=.515 p=0.67	F=1.475 p=0.23	F=1.575 p=0.20	F=.262 p=0.85	F=1.742 p=0.16	F=.177 p=0.91
Working Order														
Daytime/Night	25	18.12±6.12	16.44±4.64	11.92±4.09	11.16±3.97	11.72±4.38	7.04±2.56	4.84±1.68	81.24±24.28	39.96±16.03	52.36±9.46	15.84±5.71	11.84±4.07	20.24±4.06
Mixed	95	16.86±4.53	16.33±4.71	10.55±3.27	10.87±3.51	11.56±4.11	6.73±2.38	4.59±1.63	77.48±18.51	40.17±13.33	52.35±9.69	14.83±5.73	12.01±4.31	19.92±3.94
Test statistics; p-value		Z=-.575 p=0.57	T=.108 p=0.91	T=1.768 p=0.08	T=.354 p=0.72	T=.173 p=0.86	T=.578 p=0.56	T=.681 p=0.50	T=.843 p=0.40	T=-.067 p=0.95	T=.006 p=1.00	T=.784 p=0.44	T=-.178 p=0.86	T=.364 p=0.72

n: *number,* ***SD:*** *Standard deviation,* ***r:*** *Pearson Correlation,* ***F:*** *One-Way Analysis of Variance,* ***H:*** *Kruskal Wallis H Test,* ***T:*** *Independent Sample T-Test,* ***Z:*** *Mann Whitney U Test,* ****p< 0.05****: Significant at Level,* *****p< 0.01:*** *Significant at Level,* ***p/p-value:*** *Significance Level,* ***NSS:*** *Nurse Stress Scale,* ***IPSI:*** *Interpersonal Problem-Solving Inventory*

DISCUSSION AND CONCLUSION

Nurses represent a distinct professional group given the diverse settings in which they work and the occupational stressors they encounter (Chen and Meier, 2022). Stress not only affects nurses individually but also impacts all individuals receiving care (Chana et al., 2015). It is reported that approximately one in five nurses use medication to control stress, and patient care-related stressful experiences contribute to problems such as fear, irritability, fatigue, indecision, and inadequacy in patient care (Emami et al., 2022). In addition, role stress, lack of supervisory support, interpersonal conflicts, communication problems, misplaced expectations, inadequate knowledge and decision-making skills, work overload and inadequate physical working conditions are other work-related stressors in the nursing profession (Garrosa et al., 2010). Detecting nurses' occupational stress levels and implementing interventions to reduce them are essential for providing sustainable, patient-centred, holistic care and promoting health. The results of the present study, which investigated nurses' stress levels and interpersonal problem-solving skills, are discussed below in the context of relevant literature.

The mean stress level score of nurses was found to be 78.27±19.79. Considering the possible minimum and maximum scores from the scale, it can be stated that nurses experience a moderate level of stress. When reviewing the literature, numerous studies indicate that nurses commonly experience a moderate level of stress (Koç et al., 2017; Labrague et al., 2018; Newman et al., 2020). These findings are consistent with the results of the present study. Nurses' experience of stress is influenced by many factors such as age, gender, educational status, marital status, the unit in which they work, the order of work, shortage of staff, time pressure and workload (Kiziloğlu and Karabulut, 2023; Mutua et al., 2023; Pinheiro et al., 2023). In this study, only age and duration of professional experience were found to have a significant effect on stress among the factors examined in the context of socio-demographic and professional characteristics of nurses.

The study found a weak positive correlation between nurses' age and workload-related stress. In addition, nurses with 6-10 years working experience reported significantly higher stress levels compared to those with 1-5 years working experience. According to these findings, nurses' workload-related stress levels increase with age, and their stress levels increase with increasing length of work experience. A review of studies on occupational stress in nurses reported that stress levels tend to increase with age (Landa et al., 2008; Nabirye et al., 2011) and that nurses with more years of work experience have higher stress levels (Labrague et al., 2018; Landa et al., 2008; Nabirye et al., 2011). Tuna and Baykal (2013) examined the occupational stress of oncology nurses and found that nurses aged 35 years and older had more occupational stress than nurses aged 24 years and younger, and that occupational stress increased as their working years increased (Tuna and Baykal, 2013). Similarly, another study reported that occupational stress levels of nurses increased with increasing age and working years (Karakuş, 2019). The fact that younger nurses have less work experience and are inexperienced may require older nurses to take on more responsibility and mentor younger nurses. This situation may cause older nurses to be more aware of the demands of their profession and work and therefore experience more occupational stress (Tuna and Baykal, 2013). Zaghini et al. (2020) found that nurses reported more emotional commitment as the number of years working in their current institution increased, and that higher levels of emotional labour were associated with higher levels of stress and burnout (Zaghini et al., 2020). Many studies report a positive relationship between occupational stress and burnout (Akkoç et al., 2021; Kim and Kweon, 2020; Lee et al., 2021), and burnout increases with age and years of work

experience (Camci and Kavuran, 2021; Zaghini et al., 2020). In the current study, the higher levels of stress experienced by nurses with increasing age and years of experience may be related to nurses experiencing more burnout over time.

Given the long working hours, shift work, high patient loads, and significant responsibilities inherent in the nursing profession, it is understandable that extended work experience correlates with higher levels of occupational stress. Besides the nature of the profession, nurses are expected to communicate effectively, be cheerful and understanding, and provide the highest quality care with limited resources and personnel. Additionally, the increasing violence against healthcare professionals in Turkey, inadequate recognition of their rights, low salaries, and the growing concern of institutions about patient satisfaction inevitably lead nurses to experience more stress over time.

The average scores for nurses' interpersonal problem-solving subscales were as follows: approaching problems in a negative way 40.13 ± 13.86, constructive problem-solving 52.35 ± 9.60, lack of self-confidence 15.04 ± 5.72, unwilling to take responsibility 11.98 ± 4.24, and insistent-persevering approach 19.98 ± 3.95. Considering the possible minimum and maximum scores for each subscale, it can be interpreted that nurses possess moderate approaching problems in a negative way, lack of self-confidence, unwillingness to take responsibility, and a high level of constructive problem-solving skills—this indicates that when facing interpersonal problems, nurses tend to develop feelings of helplessness, pessimism, and sadness, exhibit insecurity regarding problem resolution, avoid taking responsibility for solving the problem, and put less effort into resolving the issue until it is solved. In contrast, nurses exhibit high levels of practical and constructive emotions, thoughts, and behaviours when dealing with interpersonal problems. From these findings it can be said that nurses develop different solutions during the problem-solving process and approach problem-solving systematically with objective evaluations (Ulusoy et al., 2023).

The study identified a significant negative correlation between nurses' age and their approaching problems in a negative way. According to this relationship, as nurses' age increases, their approach to problems in a negative way decreases. The fact that nurses consider themselves to be more competent in their problem-solving skills as they get older (Çelenk and Topoyan, 2017) may be due to the decrease in their negative approach to problems. In fact, as nurses gain professional experience in parallel with their age, their knowledge, skills and experiences diversify and develop. It is quite understandable that this situation contributes to nurses' effectiveness and success in problem solving. Contrary to our findings, a study conducted with operating room nurses reported that age had no effect on nurses' interpersonal problem-solving skills (Ay et al., 2020). The difference between the research findings may be due to differences in the group of nurses in which the studies were conducted. In fact, the reasons why nurses working in patient clinics communicate one-to-one and more intensively with patients and their family members, the characteristics of the unit in which they work and the interpersonal problems that may arise are different and may affect nurses' interpersonal problem-solving skills in different ways.

The study revealed a moderate positive correlation between approaching problems negatively and being unwilling to take responsibility for stress levels. There was also a weak positive correlation between lack of self-confidence and stress levels. A study by Keleş and Yıldırım (2021) found that paediatric physicians and nurses lack confidence in problem-solving skills, exhibit avoidance behaviour, and have a low perception of problem-solving abilities (Keleş and Yıldırım, 2021). Nurses' lack of confidence in their problem-solving skills can lead to increased stress, avoidance of responsibility, a negative approach to problems and a lack of self-confidence.

When reviewing the literature, it is evident that numerous studies have investigated nurses' problem-solving skills, revealing that nurses tend to possess moderate levels of problem-solving skills (Aydınöz et al., 2020; Çelenk and Topoyan, 2017; Ulusoy et al., 2023). However, only two studies were found that focused on nurses' interpersonal problem-solving skills. The first of these studies investigated the effect of neurolinguistic programming techniques on conflict management and interpersonal problem-solving skills of nurse managers. The results of the study showed that the intervention had a positive effect on interpersonal problem solving through the improvement of nurses' interpersonal communication skills (Gökdere-Çınar and Baykal, 2022). Another study found that nurses' interpersonal problem-solving skills positively influenced their cognitive empathy skills (Ay et al., 2020). Furthermore, the literature review found that only two studies were conducted on the interpersonal problem-solving skills of nursing students. The first study found that nursing students had moderate interpersonal problem-solving skills but negative attitudes towards interpersonal problems (Kaplan, 2020). The other study investigated the effect of communication skills training on the interpersonal problem-solving skills of nursing students. The conclusion was that there was an improvement in students' skills in this area as a result of the training (Mercan et al., 2023). The limited number of studies investigating the interpersonal problem-solving skills of nurses and nursing students makes it difficult to discuss the results of this study. The multifactorial nature of occupational stress and the fact that interpersonal problem-solving skills are influenced by individual characteristics should be taken into account when evaluating the results of this study. However, our study is the first to examine the relationship between nurses' interpersonal problem-solving skills and occupational stress and it is believed that the findings will contribute to the literature.

Strengths and Limitations of the Study: This study is essential as the first known research examining nurses' interpersonal problem-solving skills and their levels of professional stress. The study's strengths are that it provides information about nurses' interpersonal problem-solving skills and fills a gap in the relevant literature.

Some of the significant limitations affecting the study's relatively small sample size include the relatively high number of items in the data collection tools, the frequent conduct of research on nurses in the hospital where the study was conducted, nurses' relatively low willingness to participate, and the study being confined to a single public hospital. These limitations restrict the generalisability of the research findings.

Recommendations for Further Research: Based on the study results, conducting more extensive and larger-sample studies is recommended to determine nurses' interpersonal problem-solving skills and levels of professional stress. Remarkably, developing intervention programmes to reduce and prevent nurses' professional stress, researching their effectiveness, and implementing successful programmes are advised.

Implications for Policy and Practice: The present study aimed at determining nurses' stress levels and interpersonal problem-solving skills and investigating the relationship between stress levels and interpersonal problem-solving skills; it was found that nurses possess a moderate level of interpersonal problem-solving skills and moderate levels of professional stress. Furthermore, an increase in nurses' interpersonal problem-solving skills was correlated with an increase in stress levels. Nurses' age and years of professional experience influenced their levels of professional stress and interpersonal problem-solving skills. As nurses' age increased, their negative problem-oriented attitudes decreased, while stress levels related to workload increased. Nurses who had worked 6-10 years exhibited higher stress levels related to workload and conflict with other nurses compared to those who had worked 1-5 years.

Incorporating skill-enhancement practices into nursing undergraduate and postgraduate education is suggested to enhance nurses' interpersonal problem-solving and coping skills. Planning and implementing in-service training programmes within clinical settings and support from supervisory and managerial nurses are believed to decrease levels of professional stress—this, in turn, can lead to increased job satisfaction, patient care quality, and satisfaction, as well as reduced staff turnover rates and patient care costs. Especially for nurses who have completed five years in their profession, regular training in interpersonal problem-solving, coping with stress, and intra-team communication is recommended. Additionally, implementing managerial measures to reduce nurse-to-patient ratios and alleviate stress levels due to workload is advised.

AUTHOR CONTRIBUTION STATEMENT

The authors' contribution rates in the study are equal.

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CONFLICT OF INTEREST STATEMENT

There is no conflict of interest with any institution or person within the scope of the study.

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