

ORIGINAL RESEARCH ORJİNAL ARAŞTIRMA

DOI: 10.5336/nurses.2025-108326

# Associations Between Perceived Environmental Stress Factors and Comfort by Patients in the Surgical Intensive Care Units: Cross-sectional Descriptive Study

## Cerrahi Yoğun Bakım Ünitelerinde Yatan Hastaların Algıladıkları Çevresel Stresörlerin Konfor Düzeyi ile İlişkisi: Kesitsel Tanımlayıcı Çalışma

 Meryem TUNÇ<sup>a</sup>,  Özge İŞERİ<sup>b</sup>

<sup>a</sup>Ondokuz Mayıs University Faculty of Medicine, Department of Internal Medicine, Samsun, Türkiye

<sup>b</sup>Ondokuz Mayıs University Faculty of Health Sciences, Department of Nursing, Department of Surgical Nursing, Samsun, Türkiye

This study was prepared based on the findings of Meryem Tunç's thesis study titled "Investigation of the relationship of environmental stressors perceived by patients in surgical intensive care units and comfort level" (Samsun: Ondokuz Mayıs University; 2023).

**ABSTRACT** Objective: The aim of this study was to determine the relationship between perceived environmental stressors and patient comfort in surgical intensive care units (ICUs). Material and Methods: This research was a cross-sectional descriptive design. The research was conducted in the surgical ICUs of a university hospital. Data were collected between November 2021 and March 2022 (n=108) using the Participant Identification Form, the ICU Environmental Stressors and the General Comfort Scales (GCS). Data were analysed using the SPSS, v. 22.0 with a significance level of 0.05. Results: 58.3% of the participants were female, 77.8% were married and 80.6% were on their 3rd day in the unit. In addition, 63% had never been admitted to an ICU and 60.2% were satisfied with the care they received. The mean total score for the Environmental Stressors Scale was  $139.1 \pm 17.2$ , while the GCS was  $129.4 \pm 11.2$ . The number of days spent in the unit, the presence of chronic diseases and the presence of environmental stressors significantly influenced perceived stressors. Gender, marital status, previous experience, being affected by environmental stressors and satisfaction with care influenced comfort. However, it was found that there was no statistically significant relationship between the overall comfort score and the perceived environment score ( $p > 0.05$ ). Conclusions: It was found that patients' comfort is ensured when their satisfaction with care is high despite environmental stressors. Therefore, it is very important for nurses to plan individualised care that provides patients' comfort and reduces environmental stressors.

**ÖZET Amaç:** Çalışma yoğun bakım ünitesinde (YBÜ) yatan hastaların algıladıkları çevresel stres faktörleri ile konfor arasındaki ilişkiyi belirlemek amacıyla yapılmıştır. **Gereç ve Yöntemler:** Bu çalışma tanımlayıcı kesitsel tasarımdadır. Çalışma bir üniversite hastanesinin cerrahi YBÜlerinde gerçekleştirilmiştir. Veriler Kasım 2021 ve Mart 2022 tarihleri arasında (n=108) Katılımcı Tanımlama Formu, YBÜ Çevresel Stresörleri ve Genel Konfor Ölçekleri (GKÖ) kullanılarak toplanmıştır. Veriler SPSS 22.0 programı ile analiz edilmiştir. Tüm analizlerde  $p < 0,05$  değeri anlamlı kabul edilmiştir. **Bulgular:** Katılımcıların %58,3'ü kadın, %77,8'i evli ve %80,6'sının üniteye geçirdiği 3. gündü. Hastaların %63'ü daha önce hiç YBÜ'de yatmamıştı ve %60,2'si bakımdan memnundu. Çevresel Stresörler Ölçeği için ortalama toplam puan  $139,1 \pm 17,2$  iken, GKÖ için  $129,4 \pm 11,2$  idi. Üniteye geçirilen gün sayısı, kronik hastalık varlığı ve çevresel stres faktörlerinden etkilenme algılanan stres faktörlerini önemli ölçüde etkilemiştir ( $p < 0,05$ ). Cinsiyet, medeni durum, önceki deneyim, çevresel stres faktörlerinden etkilenme ve bakımdan memnuniyet ise konforu etkilemiştir ( $p < 0,05$ ). Ancak toplam genel konfor skoru ile algılanan çevresel skor arasında istatistiksel olarak anlamlı bir ilişki olmadığı belirlenmiştir ( $p > 0,05$ ). **Sonuç:** Hastaların çevresel stres faktörlerine rağmen bakımdan memnuniyeti yüksek olduğunda konforlarının sağlandığı saptanmıştır. Bu nedenle hemşirelerin hasta konforunu sağlayacak ve çevresel stresörleri azaltacak bireysel bakımı planlamaları oldukça önemlidir.

**Keywords:** Comfort; environmental stress; intensive care; nursing

**Anahtar Kelimeler:** Konfor; çevresel stres; yoğun bakım; hemşirelik

**Correspondence:** Özge İŞERİ

Ondokuz Mayıs University Faculty of Health Sciences, Department of Nursing, Department of Surgical Nursing, Samsun, Türkiye

E-mail: ozgepekiniseri@gmail.com



Peer review under responsibility of Türkiye Klinikleri Journal of Nursing Sciences.

Received: 08 Jan 2025

Accepted: 09 May 2025

Available online: 21 May 2025

2146-8893 / Copyright © 2025 by Türkiye Klinikleri. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Intensive care units (ICUs) are specialised areas where life-threatening health conditions are closely monitored and equipped with invasive monitoring techniques to provide the best treatment and care.<sup>1</sup> Modern medical developments have increased the need for intensive care monitoring after surgery, resulting in patients staying in the ICU for longer periods of time. Staying in a surgical ICU can be a process that affects patients' physical and psychological recovery both during and after treatment. This is because these high-tech environments contain many physical, emotional and environmental stressors for individuals.<sup>1,2</sup> Experiences during this process can be either positive or negative.<sup>2</sup> Negative experiences are perceived as stressors by patients.<sup>3</sup> Environmental stressors in the surgical ICU include various factors such as inadequate water intake, frequent monitoring of vital signs, uncomfortable beds, light and noise, being connected to tubes, nurses not introducing themselves, hurried behaviour of the team, unfamiliar technological equipments, frequent examinations, use of oxygen masks, not being able to see loved ones, inadequate explanation of procedures and treatments, not knowing the time and day, being influenced by other patients, male and female patients staying in the same area, experiencing pain.<sup>3-9</sup> These experienced stressors in the surgical ICU have been shown to lead to longer hospital stays, decreased comfort and decreased patient satisfaction.<sup>7,10</sup> As surgical ICUs are areas of the highest level of care, it is crucial to identify patients' environmental stressors and reduce risks to ensure their comfort.<sup>11</sup> There are studies in the literature that focus on patients' perceived environmental stressors related to their ICU experience, emphasising the relationship with sleep quality, examining their impact on anxiety levels.<sup>12-14</sup> However, it has been noted that only one study has specifically examined the relationship between perceived environmental stressors and comfort levels.<sup>15</sup> However, this study was conducted in medical ICUs, which are different and more stable than surgical ICUs. Surgical ICUs are unstable and highly stressful units with planned and unplanned interventions, high levels of acute pain that may be experienced, and restrictions on basic physiological needs such as eating and drinking. But the effect of

environmental conditions on patient comfort is a topic that has not been extensively studied, particularly for surgical patients.<sup>16</sup>

Kolcaba defines comfort as "a complex outcome with physical, psycho-spiritual, social and environmental dimensions in the context of meeting individual needs, providing tranquillity and overcoming problems". As noted here, environmental stressors are a concept related to one of the many sub-dimensions of comfort.<sup>17</sup> Berntzen et al investigated comfort and discomfort in ICUs.<sup>10</sup> Güner and Karakoç Kumsar conducted a study on the comfort of patients undergoing lung cancer surgery. These studies found that supportive nursing care was effective.<sup>18</sup> When nurses provide patient-specific, holistic care and make necessary environmental improvements, they can help to reduce patients' psychological, physical and environmental discomfort, as well as their perceived stressors, ultimately leading to an increase in their comfort level.<sup>10</sup> In this case, it can contribute to patient recovery, prevent over-hospitalisation and speed up discharge. However, a review of the literature has shown that there are no studies that simultaneously examine environmental stressors and comfort in the surgical ICUs. The aim of this study is to determine the relationship between perceived environmental stressors and patient comfort in the surgical ICU. In this context, it is important to understand the relationship between environmental stressors and patient comfort in order to individualise care and provide a holistic approach.

#### Research Questions

1. What are the environmental stressors perceived by patients?
2. Which sociodemographic and clinical characteristics influence patients' perceived environmental stressors?
3. What is the comfort level of patients?
4. Which sociodemographic and clinical characteristics influence patient comfort?
5. Is there a relationship between environmental stressors perceived by patients in the surgical ICU and their level of comfort?

## MATERIAL AND METHODS

### DESIGN AND SETTING

This research adopted a cross-sectional and descriptive design to determine the relationship between perceived environmental stressors and patient comfort in surgical ICUs. The research was conducted in November 2021 and March 2022 at the university hospital.

### ETHICAL CONSIDERATIONS

Prior to the collection of study data, approval was obtained from the ethics committee (date: August 27, 2021, no: KAEK 2021/638) and institutional approval (date: November 04, 2021, no: 166430). Participants were informed of the aim of the study and their consent to participate was obtained. The study adhered to the tenets of the Declaration of Helsinki.

### POPULATION AND SAMPLE

This was a cross-sectional study. The data were collected between November 5, 2021 and March 30, 2022 in general surgical ICUs. The sample size was determined using G\*Power software (3.1.9.7). The ICU Environmental Stressors Scale (ICUESS) used in the study by Çapanoğlu and the General Comfort Scale (GCS) used in the study by Koç were used as references in the power analysis.<sup>6,19</sup> The significance level ( $\alpha$ ) was set at 0.05, the effect size was set at 0.5, and the power of the study ( $1-\beta$ ) was set at 0.80. Based on the analysis, the minimum sample size was calculated to be 102 using the study of Çapanoğlu as a reference, and the minimum sample size was calculated to be 82 using the study of Koç as a reference.<sup>6,19</sup> The study was completed with 108 participants. Inclusion criteria were being 18 years or older, being conscious, not having any psychiatric diagnosis or treatment, not having any hearing or vision impairment, and receiving treatment and care in an ICU for 24-72 hours. The reason for choosing 24-72 hours is to have at least 24 hours of exposure to the surgical ICU, to be able to identify stressors, and to exclude the delirium criterion with a maximum of 72 hours. Exclusion criteria included being mechanically ventilated, having initially consented to participate and later withdrawing consent, having incomplete data forms, and having delirium.

The data were collected by the first researcher through face-to-face interviews with the patients in the surgical ICU. After obtaining written informed consent from the patients to participate in the study, the data were collected along with the relevant descriptive forms and scales, which the participants read and answered themselves. The first researcher provided necessary explanations in areas that were not understood. The forms of the patients who could not complete the forms themselves were read and marked by the researcher. Data collection took approximately 15-30 minutes per participant.

### DATA COLLECTION TOOLS

**The Participant Identification Form:** This form was designed with nine questions that may be relevant to the topic, supported by the literature.<sup>3,7</sup> The form includes the patient's gender, level of education, age, length of stay in the surgical ICU, marital status, previous ICU experience, presence of chronic diseases, presence of environmental stressors, and level of satisfaction with care.

**The ICU Environmental Stressors Scale (ICUESS):** It was developed by Ballard and revised by Cochran and Ganong.<sup>20,21</sup> The scale was translated into Turkish by Çınar and her colleagues in 2011 and validity and reliability studies were completed.<sup>22</sup> The scale consists of 42 items that are rated on a 4-point Likert type scale from “does not affect at all (1)” to “affects greatly (4)”. The scale has no sub-dimensions and the possible score ranges from a minimum of 42 to a maximum of 168 points. Higher patient scores indicate a higher level of stressors experienced. The Cronbach alpha coefficient for the scale has been found to be 0.94, and in this research it is reported to be 0.92.<sup>22</sup> Permission to use the scale was obtained from the authors who conducted the validity and reliability study.

**GCS:** It was developed by Kolcaba in 2001 using a 4-point Likert-type scale.<sup>17</sup> Kuşuoğlu and Karabacak adapted the scale to Turkish and completed its validity and reliability studies.<sup>23</sup> The scale consists of a total of 24 negative and 24 positive items. The lowest score is 48, while the highest score is 192. Higher scores indicate a higher level of comfort. The level is calculated by dividing the patient's

total score by 48, and the resulting score ranges from 1 to 4. If the patient has a low level of comfort, it is expressed as 1, and if the patient has a high level of comfort, it is expressed as 4. The scale has 4 sub-dimensions: physical, psycho-spiritual, environmental and socio-cultural comfort. The Cronbach alpha was found to be 0.88 in Kolcaba's study, while Kuğuoğlu and Karabacak reported a Cronbach alpha of 0.85.<sup>17,23</sup> In this study, the Cronbach alpha is reported to be 0.708. Permission to use the scale was obtained from the authors who conducted the validity and reliability study.

## STATISTICAL ANALYSIS

The Statistical Programme for Social Sciences (SPSS) version 22 was used. Data on continuous variables were presented as mean, standard deviation or median. Parametric assumptions were tested using the Kolmogorov-Smirnov test. Group differences were assessed using one-way analysis of variance (ANOVA) or independent samples t-test for parametric cases, and p-values less than 0.05 were considered statistically significant. The reliability of the scales was calculated using Cronbach alpha reliability coefficients. The relationship between sociodemographic characteristics and ICUESS and GCS as dependent variables was assessed using multiple regression analysis. Correlation analysis was used to assess the relationship between the 2 scales.

## RESULTS

The mean age of the participants was 58.2±17.2 years. Of the patients, 58.3% were female, 77.8% were married, 63.9% had a primary school education, 80.6% were on their 3<sup>rd</sup> day in the ICU, 63.0% had never been in the ICU, 52.8% had no chronic diseases, 59.3% were not affected by environmental stressors, and 60.2% were satisfied with their care and treatment (Table 1).

The patients had a mean total score of 139.1±17.2 on the ICUESS and a mean total score of 129.4±11.2 on the GCS. The mean scores for the sub-dimensions of the GCS were as follows: physical comfort 28.2±5.1, psycho-spiritual comfort 39.6±4.5, sociocultural comfort 34.0±3.7, and environmental comfort 27.5±2.6 (Table 2).

**TABLE 1:** The distribution of sociodemographic characteristics of patients (n=108)

	$\bar{X} \pm SD$	Minimum	Maximum
Age	58.28±17.17	19	90
	n		%
Gender			
Female	63		58.3
Male	45		41.7
Marital status			
Married	84		77.8
Single	24		22.2
Level of education			
Primary school	69		63.9
Middle school	12		11.1
High school	18		16.7
University	9		7.3
Length of stay in the intensive care unit			
2 days	21		19.4
3 days	87		80.6
Previous intensive care unit experience			
Yes	40		37.0
No	68		63.0
Presence of a chronic disease			
Yes	51		47.2
No	57		52.8
Status of being affected by environmental stressors*			
Yes	44		40.7
No	64		59.3
Satisfaction with the care and treatment			
Very satisfied	28		25.9
Satisfied	65		60.2
Undecided	15		13.9

\*Disliking the food, feeling bored, not being able to see family and friends, experiencing pain, not having personal belongings, noise, room temperature); SD: Standard deviation

The model generated from the analysis shown in Table 3 is statistically significant ( $F=5.575$ ;  $p<0.05$ ). The analysis showed that, compared to the reference groups, the number of days spent in the ICU being 3 days ( $\beta=0.198$ ;  $p<0.05$ ), having a chronic illness ( $\beta=0.201$ ;  $p<0.05$ ), and being affected by environmental stressors ( $\beta=0.213$ ;  $p<0.05$ ) significantly predicted the mean ICUESS scores. Patients who had been in the ICU for 3 days had an ICUESS total score which was 8,602 units higher than those who had been there for 2 days. Furthermore, the participants with chronic illnesses had an ICUESS total score which was 6,911 units lower than the score of those without chronic illnesses. In addition, the total



**TABLE 2:** The ICUESS total score and The GCS total and subscale scores of the patients (n=108)

	Minimum-maximum	$\bar{X} \pm SD$	Median
ICUESS score	89-168	139.1 $\pm$ 17.2	140.00
GCS-Physical subscale	19-43	28.2 $\pm$ 5.1	30.00
GCS-Psychospiritual subscale	28-48	39.6 $\pm$ 4.5	22.50
GCS-Sociocultural subscale	24-40	34.0 $\pm$ 3.7	25.00
GCS-Environmental subscale	20-37	27.5 $\pm$ 2.6	32.50
GCS total score	104-157	129.4 $\pm$ 11.2	128.50

ICUESS: The Intensive Care Unit Environmental Stressors Scale;

GCS: General Comfort Scale; SD: Standard deviation

ICUESS score was 7,445 units lower in those exposed to environmental stressors than in those not exposed.

The model generated from the analysis shown in Table 4 is statistically significant ( $F=4.702$ ;  $p<0.05$ ). According to the model, previous ICU experience (yes) ( $\beta=-0.211$ ;  $p<0.05$ ), the patient's status of being affected by environmental stressors (yes) ( $\beta=-0.342$ ;  $p<0.05$ ), and satisfaction with care (undecided) ( $\beta=-0.290$ ;  $p<0.05$ ) significantly predicted the GCS score. The participants who had previously been in the ICU had a GCS score that was 4.878 units lower than the score of those who had not been in the ICU. In addition, the GCS score of the participants who were exposed to environmental stressors was 7,765 units lower than the score of those who were not exposed. Additionally, the GCS score of the participants who were undecided about their satisfaction with care was

9,620 units lower than the score of those who were very satisfied. It was found that there was a statistically high level of positive correlation between all sub-dimensions of the GCS scale. Statistical analysis revealed that there was no statistically significant relationship between the total GCS score and the total ICUESS score ( $r=0.058$ ;  $p=0.549$ ) (Table 5).

## DISCUSSION

In the study, the mean ICUESS score of the patients was found to be high. Similar mean scores have been reported in the literature.<sup>6,9</sup> Based on these data, it can be concluded that surgical ICUs are places where environmental stressors for patients are high. The reason for the high mean ICUESS score may be that the research was conducted during the coronavirus disease-19 (COVID-19) pandemic period.

As the number of days spent in the ICU increases, so do the perceived environmental stressors.<sup>24</sup> This study found a similar relationship between the number of days spent in the surgical ICU and environmental stressors, and found this to be an important predictor of comfort. However, Karaer and Özsaker did not find a significant relationship between length of stay in the ICU and environmental stressors.<sup>4</sup> This discrepancy in results is thought to be due to differences in the characteristics of the participants and the ICU environment in the respective studies.

**TABLE 3:** The evaluation of the impact of the sociodemographic characteristics of patients on their ICUESS score through regression analysis (n=108)

Model	Non-standardized coefficients		Standardized beta		t value	p value	Confidence interval for B (%95)		VIF
	$\beta_0$	Standard error	$\beta_1$				Lower limit	Upper limit	
Constant	138.469	4.278			32.371	<b>&lt;0.001</b>	129.986	146.951	
Length of stay in the intensive care unit*									
3 days	8.602	3.999	0.198	2.151		<b>0.034</b>	0.672	16.533	1.022
Presence of a chronic disease**									
Yes	-6.911	3.170	-0.201	-2.180		<b>0.031</b>	-13.197	-0.625	1.021
Patient's status of being affected by environmental stressors***									
Yes	-7.445	3.188	-0.213	-2.336		<b>0.021</b>	-13.766	-1.124	1.000

\*Reference Group: Patients who have stayed in the ICU for 2 days; \*\*Reference Group: Those without a chronic disease; \*\*\*Reference Group: Those not affected by environmental stressors; Dependent Variable: Intensive Care Unit Environmental Stressors Scale Mean Score;  $F=5.575$ ;  $R^2=0.139$ ; Corrected  $R^2=0.114$ ; Durbin-Watson=2.054;  $\beta_0$ : Non-standardized Beta coefficient;  $\beta_1$ : Standardized Beta coefficient; ICUESS: The Intensive Care Unit Environmental Stressors Scale; t: Independent Samples Test; p: value significant at 0.05; VIF: Variance Inflation Factor

**TABLE 4:** The evaluation of the impact of the sociodemographic characteristics of patients on their GCS score through regression analysis (n=108)

Model	Non-Standardized Coefficients		Standardized Beta( $\beta_1$ )	t value	p value	Confidence Interval for B (%95)		VIF
	$\beta_0$	Std. Error				Lower Limit	Upper Limit	
Constant	138.262	2.895		47.761	<b>&lt;0.001</b>	132.517	144.007	
Gender	3.803	1.948	0.168	1.952	0.054	-0.063	7.669	1.04
Marital status	-4.387	2.443	-0.163	-1.796	0.076	-9.235	0.461	1.163
(a)Previous ICU experience								
Yes	-4.878	2.058	-0.211	-2.371	<b>0.020</b>	-8.961	-0.795	1.113
(b)Patient's status of being affected by environmental stressors								
Yes	-7.765	2.968	-0.342	-2.617	<b>0.010</b>	-13.655	-1.876	2.397
(c)Satisfaction with the care and treatment								
Satisfied	-3.654	2.452	-0.160	-1.49	0.139	-8.521	1.212	1.624
(d)Satisfaction with the care and treatment								
Undecided	-9.620	3.276	-0.290	-2.937	<b>0.004</b>	-16.12	-3.12	1.365

Dependent Variable: General Comfort Scale mean score;  $F=4.702$ ;  $R^2=0.302$ ; Corrected  $R^2=0.237$ ; Durbin-Watson=2.054; GCS: General Comfort Scale;  $\beta_0$ : Non-standardized Beta coefficient;  $\beta_1$ : Standardized Beta coefficient; t: Independent Samples Test; p: value significant at 0.05; VIF: Variance Inflation Factor

(a) Reference Group: Those without ICU experience

(b) Reference Group: Those not affected by environmental stressors

(c) Reference Group: Those very satisfied with the care and treatment

(d) Reference Group: Those very satisfied with the care and treatment

**TABLE 5:** The correlation between the ICUESS total score and the GCS total and subscale scores

		GCS-Psychospiritual subscale score	GCS-Sociocultural subscale score	GCS-Environmental subscale score	GCS total score	ICUESS total score
GCS-Physical subscale score	r value	0.228	0.237	0.255	0.690	-0.037
	p value	<b>0.018</b>	<b>0.014</b>	<b>0.008</b>	<b>&lt;0.001*</b>	0.705
GCS- Psychospiritual subscale score	r value		0.482	0.372	0.755	0.161
	p value		<b>&lt;0.001*</b>	<b>&lt;0.001*</b>	<b>&lt;0.001*</b>	0.097
GCS- Sociocultural subscale score	r value			0.330	0.711	-0.017
	p value			<b>&lt;0.001*</b>	<b>&lt;0.001*</b>	0.862
GCS- Environmental subscale score	r value				0.611	0.069
	p value				<b>&lt;0.001*</b>	0.481
GCS total score	r value					0.058
	p value					0.549

r: Pearson correlation coefficient; p value significant at 0.05; ICUESS: The Intensive Care Unit Environmental Stressors Scale; GCS: General Comfort Scale

Patients without chronic conditions tend to perceive environmental stressors more intensely.<sup>24</sup> Similarly, this study found that participants without chronic conditions perceived environmental stressors more intensely than those with chronic conditions, and the presence of a chronic condition was identified as a significant predictor of comfort. However, there are also studies that did not find a significant difference.<sup>4,7</sup> The lack of difference is thought to be due to the lower average age of the participants in the study and the lower prevalence of chronic conditions in the younger group.<sup>25</sup>

When examining the patient's state of being affected by environmental stressors and perceived environmental stressors, the literature on this topic is limited. In this study, participants who were affected by environmental stressors during their stay in the unit perceived lower levels of environmental stressors than those who were not affected, and being affected by environmental stressors was identified as a significant predictor of comfort. The reason for this may be that the participants had a high level of satisfaction with the care they received during their stay in

the surgical ICU, and because of their high level of satisfaction they may have overlooked other stressors.

Participants' overall comfort levels were found to be above average. Similar findings have been reported.<sup>26</sup> The reason for the participants' above-average overall comfort levels despite perceived stressors may be their satisfaction with the care they received. When participants' comfort levels were examined according to sub-dimensions, the study by Akdag Karaagac and Bal Ozkaptan found that the highest levels of comfort were associated with psychospiritual and sociocultural comfort, while the lowest levels were associated with environmental comfort.<sup>15</sup> In the study by Kubat Bakır and Yurt, the highest level of comfort was associated with sociocultural comfort, while the lowest level was associated with environmental comfort. In this study, the highest level of comfort was observed in the psychospiritual sub-dimension, while the lowest level was observed in the environmental comfort sub-dimension.<sup>27</sup> This finding suggests that patients are affected by environmental stressors and nurses prioritise the psychospiritual aspect over the physical environment. These results also suggest that comfort in the surgical ICU is not only influenced by environmental factors. Some studies suggest that although ICU patients are exposed to high levels of environmental stressors, the impact on patient comfort is not always apparent. For example, when examining the effects of environmental stressors in the ICU on anxiety and depression, Gezginci et al found that not all stressors had a direct and significant effect on psychological outcomes.<sup>9</sup> This finding supports the results of our study. This suggests that the effects of environmental stressors may be related to individual differences, the individual's general health status, individual coping skills, quality of care and psychosocial support.

The study found that participants who had previously received care in an ICU were significantly more comfortable than those who had not. This difference was also identified as a significant predictor. This suggests that re-experiencing the ICU is an important experience for patients and that familiarity with the environment and procedures may increase their comfort. This study found that participants who

were affected by environmental stressors during their stay in the surgical ICU had lower levels of comfort, and this was identified as a significant predictor. Therefore, it is believed that controlling environmental stressors is crucial to improving comfort. Care satisfaction has been identified as a significant predictor of comfort. Kubat Bakır and Yurt demonstrated a positive relationship between satisfaction with care and comfort.<sup>27</sup> Furthermore, studies in the literature have discussed that the provision of high quality care by nurses can lead to increased patient comfort and satisfaction with care.<sup>10,28</sup> Nursing interventions based on comfort theory for ICU patients have been found to be effective in reducing patients' perceived environmental stressors. Patients' anxiety in stressful environments such as ICUs has been found to be reduced and their satisfaction with care and comfort levels increased.<sup>19</sup> Therefore, based on this research, it is suggested that high patient satisfaction with care has a positive effect on comfort.

In the literature, only one study has examined the relationship between ICUESS and GCS, and this study reported a significant negative relationship between the 2 variables.<sup>15</sup> However, in this study, no significant relationship was found between the scales. This may be due to the high level of satisfaction with surgical ICU care and the nurses' prioritisation of the psychospiritual aspect over the environmental aspects of the surgical ICU, which is in line with the participants' expectations.

Another point that stands out in the results of the study is that the physical, psychospiritual, sociocultural and environmental sub-dimensions of the GCS are significantly and positively related to each other. This shows that comfort is a multi-dimensional structure and that environmental factors are only one part of the perception of comfort.<sup>29</sup> These findings indicate that comfort cannot be explained by environmental stressors alone and that the physical, psychological and social needs of individuals should be addressed holistically. Therefore, ICU practice should emphasise individualised care, ensuring satisfaction with care and psychosocial support practices, as well as reducing environmental stressors.

## LIMITATIONS

The limitations of the study are that it was conducted in a single province and centre, and that the data were collected during the COVID-19 pandemic.

## CONCLUSION

Patients perceived environmental stressors at a high level, while their comfort was above average. Satisfaction with care was significant for comfort. Providing holistic and high quality care despite environmental stressors in the surgical ICU is important to ensure patient comfort. For these reasons, it is recommended that nurses conduct an assessment of patients' perceived environmental stressors and comfort, and the factors that influence them. They should implement and evaluate interventions aimed at reducing stressors and improving comfort. Monitoring and follow-up forms related to these variables should be developed and integrated into patient care.

## Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

## Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

## Authorship Contributions

**Idea/Concept:** Özge İşeri, Meryem Tunç; **Design:** Özge İşeri, Meryem Tunç; **Control/Supervision:** Özge İşeri, Meryem Tunç; **Data Collection and/or Processing:** Meryem Tunç; **Analysis and/or Interpretation:** Meryem Tunç, Özge İşeri; **Literature Review:** Meryem Tunç, Özge İşeri; **Writing the Article:** Meryem Tunç, Özge İşeri; **Critical Review:** Özge İşeri, Meryem Tunç; **References and Fundings:** Meryem Tunç, Özge İşeri; **Materials:** Meryem Tunç, Özge İşeri.

## REFERENCES

1. Resmî Gazete (21.8.2020, Tebliğ No: 31220) Yataklı Sağlık Tesislerinde Yoğun Bakım Hizmetlerinin Uygulama Usul Ve Esasları Hakkında Tebliğde Değişiklik Yapılmasına Dair Tebliğ; 2020.
2. Krampe H, Denke C, Gülden J, Mauersberger VM, Ehlen L, Schöthaler E, et al. Perceived severity of stressors in the intensive care unit: a systematic review and semi-quantitative analysis of the literature on the perspectives of patients, health care providers and relatives. J Clin Med. 2021;10(17):3928. PMID: 34501376; PMCID: PMC8432195.
3. Gültekin Y, Özçelik Z, Akıncı SB, Yorgancı HK. Evaluation of stressors in intensive care units. Turk J Surg. 2018;34(1):5-8. PMID: 29756097; PMCID: PMC5937660.
4. Karaer H, Ozsaker E. Environmental stressors perceived by patients in the surgical intensive care unit and their level of satisfaction with nursing care. J Perioperative Nursing. 2018;34(4):29-37. <https://doi.org/10.26550/2209-1092.1151>
5. Berber E, Kızıltan B. Identification of perceived environmental stressors in patients undergoing treatment in the cardiovascular surgery intensive care unit. J Cardiovasc Nurs. 2022;13(31):91-8. doi: 10.5543/khd.2022.211422
6. Çapanoğlu DK. Açık Kalp Cerrahisi Geçiren Hastalarda Yoğun Bakım Çevresel Stresörleri ile Yoğun Bakım Deneyimleri Arasındaki İlişkinin İncelenmesi [Yüksek lisans tezi]. İzmir: Ege Üniversitesi; 2020. [https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=4J\\_FzTwlrMCH4qBR0pXPH2zKyqgLAZNHo3HnPSVi7eml74W\\_t2FG2ERTCrQU-W2](https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=4J_FzTwlrMCH4qBR0pXPH2zKyqgLAZNHo3HnPSVi7eml74W_t2FG2ERTCrQU-W2)
7. Candan Dönmez A, Demir Korkmaz F, Geçit S. Yoğun bakım ünitesindeki çevresel stresörlerin hastalar tarafından algılanması [Perception of environmental stressors in intensive care unit by patients]. Türkiye Klinikleri J Nurs Sci. 2020;12(2):190-7. doi: 10.5336/nurses.2019-72255
8. Gencer A, Karakoç Kumsar AK. Yoğun bakım ünitesinde tedavi gören hastaların algıladıkları çevresel stresörlerin uyku kalitesine etkisi [The impact of perceived stressors on sleep efficiency in patients undergoing treatment in the intensive care unit]. OTSBD. 2020;5(3):434-43. doi: 10.26453/otjhs.694088
9. Gezgin E, Goktas S, Orhan BN. The effects of environmental stressors in intensive care unit on anxiety and depression. Nurs Crit Care. 2022;27(1):113-9. PMID: 32954635.
10. Bertzen H, Bjørk IT, Storsveen AM, Wøien H. "Please mind the gap": a secondary analysis of discomfort and comfort in intensive care. J Clin Nurs. 2020;29(13-14):2441-54. <https://doi.org/10.1111/jocn.15260>
11. Olsson S, Fridh I, Lindahl B, Torkildsen AB. The meaning of comfort in the intensive care unit. Crit Care Nurs Q. 2019;42(3):329-41. PMID: 31135483.
12. Bulbuloglu S, Çınar F, Çürük GN. the effect of environmental stressors on patient experience in medical, surgical, and COVID-19 intensive care unit. J Patient Exp. 2022;9:23743735221092545. PMID: 35434297; PMCID: PMC9008315.
13. Koyuncu F, Yılmaz Şahin S, İyigün E. Genel cerrahi yoğun bakım ünitesinde tedavi gören hastaların algıladıkları çevresel stresörlerin uyku düzenine olan etkisinin incelenmesi [Investigation of the impact of perceived environmental stressors on sleep patterns in patients undergoing treatment in the general surgical intensive care unit]. Yoğun Bakım Hemşireliği Dergisi. 2021;25(3):152-9. <https://dergipark.org.tr/tr/download/article-file/1846126>
14. Akdag Karaagac A, Bal Ozkaptan B. The effect of environmental stressors in intensive care unit on the comfort level of the patients. Int J Caring Sci. 2020;2(3):16(1):312-24. [https://www.internationaljournalofcaringsciences.org/docs/30\\_2020zark-tan.pdf](https://www.internationaljournalofcaringsciences.org/docs/30_2020zark-tan.pdf)



15. Soytürk İ. Yoğun bakıma hasta seçimi, yatış çıkış kriterleri ve taburculuk. Doğanay Z, Soylu GV, Demir U, Taşkın Ö, Yılmaz A, Kurada G, et al. editörler. Yoğun Bakım Multidisipliner Cerrahi Yaklaşımlar. Lyon: Livre de Lyon; 2022. p. 9-18. [http://www.utsakcongress.com/kitaplar/cerrahi\\_yaklasimlar\\_Tammetin\\_.pdf](http://www.utsakcongress.com/kitaplar/cerrahi_yaklasimlar_Tammetin_.pdf)
16. Kolcaba K. Evolution of the mid range theory of comfort for outcomes research. *Nurs Outlook*. 2001;49(2):86-92. PMID: 11309563.
17. Güner A, Karakoç Kumsar A. Akciğer kanseri nedeniyle ameliyat olan hastalarda konfor düzeyi ve konforu etkileyen faktörler [Comfort levels and factors influencing comfort in patients undergoing surgery for lung cancer]. *OTSBD*. 2021;6(2):155-62. doi: 10.26453/otjhs.763680
18. Koç F. Yoğun Bakım Hastaları İçin Konfor Kuramına Göre Yapılandırılmış Destekleyici Hemşirelik Bakımı [Yüksek lisans tezi]. Sakarya: Sakarya Üniversitesi; 2021. [https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=5XiSE4yCP\\_gmnukpMEp65YnTmDb0YYW6VK7qURXoJ-OGFfCmG-P22s9z2WYvrfX](https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=5XiSE4yCP_gmnukpMEp65YnTmDb0YYW6VK7qURXoJ-OGFfCmG-P22s9z2WYvrfX)
19. Ballard KS. Identification of environmental stressors for patients in a surgical intensive care unit. *Issues Ment Health Nurs*. 1981;3(1-2):89-108. PMID: 6909159.
20. Cochran J, Ganong LH. A comparison of nurses' and patients' perceptions of intensive care unit stressors. *J Adv Nurs*. 1989;14(12):1038-43. PMID: 2613957.
21. Çınar S, Aslan F, Kurtuluş T. Yoğun bakım ünitesi çevresel stresörler ölçeği: geçerlik ve güvenirlik çalışması [Intensive care unit environmental stressors scale: validity and reliability study]. *Yoğun Bakım Hemşireliği Dergisi*. 2011;15(2):61-6. <https://dergipark.org.tr/tr/download/article-file/260144>
22. Kuşuoğlu S, Karabacak Ü. Genel konfor ölçeğinin Türkçe'ye uyarlanması [Adaptation of the general comfort scale to Turkish]. *İÜFN Hem. Derg.* 2008;16(61):16-23. <https://dergipark.org.tr/tr/download/article-file/95252>
23. Şahin M, Köçkar Ç. Bir stresör olarak yoğun bakım [Intensive care unit as a stressor]. *Yaşam Becerileri Psikoloji Dergisi*. 2018;2(4):207-14. <https://doi.org/10.31461/ybpd.453981>
24. Kogan AC, Wilber K, Mosqueda L. Person-centered care for older adults with chronic conditions and functional impairment: a systematic literature review. *J Am Geriatr Soc*. 2016;64(1):e1-7. PMID: 26626408.
25. Ören B. Göğüs cerrahisi uygulanan hastaların konfor ve anksiyete düzeyini etkileyen faktörler [Comfort and anxiety measurements in patients undergoing thoracic surgery]. *HSP*. 2018;5(3):324-32. doi: 10.17681/hsp.409359
26. Kubat Bakır G, Yurt S. Cerrahi operasyon geçiren hastaların konfor düzeyinin değerlendirilmesi [Evaluation of the comfort level of the post-surgical patients]. *Journal of Health and Society*. 2020;30(3):158-65. <https://ssyv.org.tr/wp-content/uploads/2020/12/18-Cerrahi-Operasyon-Geciren-Hastalarin-Konfor-Duzeyinin-Değerlendirilmesi.pdf>
27. Wensley C, Botti M, McKillop A, Merry AF. Maximising comfort: how do patients describe the care that matters? a two-stage qualitative descriptive study to develop a quality improvement framework for comfort-related care in in-patient settings. *BMJ Open*. 2020;10(5):e033336. PMID: 32430447; PMCID: PMC7239554.
28. Kolcaba K. *Comfort Theory and Practice: A Vision for Holistic Health Care and Research*. 1st ed. New York: Springer Publishing Company; 2003.