Perceived and sources of occupational stress in surgical intensive care nurses

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Abstract
Aim: The study aimed to determine sources of stress and stress levels of nurses working in surgical intensive care units in addition to understanding the stress level in nurses, drawing attention and raising awareness.

Material and methods: The study was conducted using a descriptive design with the participation of nurses (n=132) working in surgical intensive care units of a university hospital. The data were collected through the source of stress identification form and perceived stress scale. The data obtained in the study were transferred to a computer environment, and for statistical analyses, the package for social sciences for Windows 25 software was used. In the analyses of the data, descriptive statistics, independent t-test, one-way analysis of variance and regression analysis, and the Bonferroni test were employed.

Results: It was also determined that 28.8% of the surgical nurses were working in an organ transplant intensive care unit and 25% worked in an anaesthesia intensive care unit, that 49.3% had professional experience of between 6 and 11 years and that 92.4% worked on both day and night shifts. In the study, the rate of nurses who perceived a high level of stress was found to be 45.5%, and it was identified that 78.8% needed training in stress management.

Conclusion: Imperative funding and human resources should be provided in order to give nurses problem-solving abilities and a stress management course. The financial support of the managers and spiritual support of health professionals and organising regular meetings with nurses can help nurses to experience less stress.

Keywords
Occupational stress, surgical intensive care unit, surgical nurses

Introduction
Stress is an individual’s inability to adapt to difficult environmental conditions and the consequent onset of mental, physical and physiological confrontation processes. Stress is an atypical physiological reaction process that develops in the body in response to stimulators that are caused by imaginary and real injuries.1–3 Imbalance between work and private life, being unable to set aside time for the self, and not catching up with social life are all causes of stress for all working people. Within the whole health sector, nursing is the occupational group which is primarily exposed to high levels of work stress.4,5 The UK National Health Service (NHS) reported that more than 38% of staff nurses are exposed to work-related stress.6

Nurses in their work lives are frequently faced with long working hours, having to manage time continuously, insufficient break time, inadequacy of staff and physically poor working conditions.7,8 It has been stated in the literature that work-related stress causes a decrease in performance and quality of life in nurses.9,10 Psychological and physiological destruction and conflict11 and absenteeism from work.12

Being exposed to daily stress at the workplace for long periods leads to burnout and lethargy in showing mercy and providing satisfaction.13 Nurses experiencing burnout face emotional void, depersonalisation and decreased social relations triggered by chronic stress.14 Fatigue of mercy caused by burnout can be summarised as the decrease in showing mercy, which is a required trait of a caregiver and an increase in desperation.15 Over time, fatigue of mercy evolves into a type of personality problem in which individuals withdraw themselves from social settings.15 Consequently, nurses’ being exposed to high stress levels for long periods diminishes the quality of care and patient safety.
Surgical units are working settings which require the highest level of attention, care quality and patient and environment safety. However, it is estimated that surgical nurses are exposed to higher levels of stress compared to other units.\textsuperscript{16,17} Surgical intensive care units (ICUs) are the surgical units where patients stay for long periods. For this reason, nurses in surgical ICUs apply a higher variety and number of works and procedures. This situation necessitates that the stress levels of nurses working in surgical ICUs be investigated meticulously. In the study, we aimed to examine the stress levels of nurses working in surgical ICUs and the factors that cause stress in addition to understanding the stress level in nurses, drawing attention and raising awareness.

**Methods**

**Research design and participants**

The study was conducted using a descriptive design to investigate the sources of stress and stress levels of surgical ICU nurses working at a university hospital. The study was carried out in surgical ICUs between December 2019 and February 2020. The inclusion criterion for the study was determined as ‘working as a nurse in any surgical intensive care unit of the hospital where the study is conducted.’ Sample selection was done by a random sampling method. All surgical nurses who volunteered were included in the study.

Prior to the study, written approvals were taken from the hospital of the research and Malatya ethical board for clinical research. The population of the study is composed of 153 individuals. For various reasons such as annual leave, sick report, maternal leave and not volunteering to participate in the research, 132 surgical nurses participated in the research. Following the approval of the ethical board and verbal consent obtained from the participants, the data were collected through a questionnaire method. In the research, 86% of the population was accessed.

**Data collection tools**

As data collection tools in the study, an eight-item personal information form developed by the researcher by screening the literature and seeking expert opinion, 10-item stress source identification form and 14-item perceived stress scale\textsuperscript{19} were used. Information about the perceived stress scale (PSS) is presented below.

**Perceived stress scale**

The PSS was developed by Cohen et al.\textsuperscript{18} A Turkish validity and reliability study was performed by Eskin et al., and the reliability coefficient was found to be 0.84.\textsuperscript{19} The reliability coefficient for the sub-scale PSS-10 was found to be 0.82, and it was determined as 0.66 for PSS-4. The PSS, which consists of 14 items, was designed to measure how stressful an individual perceives certain situations in his/her life. The participants assess each item over a 5-point Likert-type scale ranging from ‘never (0)’ to ‘very often (4).’ Seven of the items which contain positive statements are scored reversely. In addition to the 14-item long form, 10-item and four-item forms of the PSS are also available. The scores to be obtained from PSS-14 range between 0 and 56, while PSS-10 scores range from 0 to 40 and PSS-4 scores are between 0 and 16. A high score indicates a high level of an individual’s perceived stress. In the study, the reliability coefficient for PSS-14 was calculated as 0.84. The subscales of PSS-10 and PSS-4 reliability coefficients were determined to be 0.82 and 0.49, respectively.

**Data analyses**

The findings obtained in the study were transferred to a computer environment, and the statistical package for social sciences (SPSS) for Windows 25 package program was used for statistical analyses. In the evaluation of the study data, descriptive statistical methods (frequency, mean, standard deviation) were employed. Cronbach’s alpha coefficient was calculated for the reliability and validity analyses of the scales. The results were evaluated at a 95% confidence interval and significance level of $P<0.05$. In order to investigate the relationship between variables, the independent t-test, one-way analysis of variance (ANOVA) and regression analyses were done, and the Bonferroni test was used so as to examine the difference between variables.

**Findings**

**Identifying information of the surgical nurses**

The study was carried out in order to assess the stress levels of surgical ICU nurses. When the identifying information of the participant nurses was examined (Table 1), it was determined that 35% were between 25 and 30 years old, 57.6% were women, 47.7% were single and 81.8% had undergraduate degrees. It was also identified that 28.8% of the surgical nurses worked in an organ transplant ICU, 13.6% in a general surgery ICU, 12.9% in a cardiovascular surgery ICU, 25% in a reanimation ICU, 7.6% in an adult burns unit and 12.1% in a brain surgery ICU. It was found that 49.3% of the surgical nurses had occupational experience of between 6 and 11 years, 92.4% worked on both day and night shifts and 51.5% had chosen nursing as an occupation unwillingly (Table 1).

**The distribution of sources of stress according to surgical nurses**

In the study, when the distribution of sources of stress was examined according to the surgical nurses, it was identified that 50% of the surgical nurses were not satisfied with the unit they worked in, 72.7% worked more than 40 hours per week, 75% had more than three patients per nurse, 78% experienced a heavy workload, 82.5% were affected by the worsening clinical condition of the patient and 80% were exposed to negative environmental conditions and therefore experienced stress (Table 2).

**Perceived stress levels of surgical nurses and their opinions about coping with stress**

In the study, it was found that the rate of the participants with a high level of stress perceived by the nurses was 45.5%, and
that 78.8% needed training in stress management and 12.9% were in need of training in death process management. According to the data of the study, 79.5% of the surgical nurses needed psychosocial support, and 53.8% held the opinion that reducing system and organisational problems is necessary to cope with stress (Table 3). In the study, the total Cronbach’s alpha coefficient for perceived social support was determined to be 0.847, and the average age of the participants was 30.53 years. There is no statistical difference between perceived social support and gender, marital status, educational status and training for coping with stress (P<0.05).

Evaluation of the participants’ perceptions of perceived social support in terms of variables

There exists a statistically significant difference between income status and perceived social support (P<0.05). The reason for the difference was identified through the Bonferroni test. Accordingly, the mean score of those with low income levels (x̄=42.26) is higher than that of those with medium income levels (x̄=37.80).

There is a statistically significant difference between the stress level and perceived social support (P<0.05). Accordingly, the mean score of those with a high level of stress (x̄=42.15) is higher than that of those with a medium level of stress (x̄=35.73).

There is a statistically significant difference between psychosocial support and perceived social support (P<0.05). Accordingly, the mean score of those who receive psychosocial support (x̄=40.00) is higher than that of those who do not receive psychosocial support (x̄=33.70) (Table 4).

Regression analysis results for variables that affect perceived social support perception

It is seen that psychosocial support, stress level and educational status explain R=0.517 adjusted R²=0.244 (F=11.565, P=0.000, Durbin Watson 1.132) of the difference in perceived social support. One unit increase in the need for psychosocial support causes a decrease of 5.886 in perceived social support, while one unit increase in the stress level leads to an increase of 5.968 in social support (Table 5).

Discussion

According to the results of this study, 28.8% of the surgical nurses were working in organ transplant, that 49.3% had

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Table 1. Identifying information of the surgical nurses.

| Identifying information       | Number of surgical nurses (n=132) | Percentage of surgical nurses (%) |
|------------------------------|----------------------------------|----------------------------------|
| **Age, years**               |                                  |                                  |
| 20–25                        | 23                               | 17.4                             |
| 25–30                        | 46                               | 35                               |
| 30–35                        | 42                               | 31.8                             |
| 35–40                        | 21                               | 15.9                             |
| **Gender**                   |                                  |                                  |
| Female                       | 76                               | 57.6                             |
| Male                         | 56                               | 42.4                             |
| **Marital status**           |                                  |                                  |
| Single                       | 63                               | 47.7                             |
| Married                      | 69                               | 5.3                              |
| **Educational status**       |                                  |                                  |
| Associate                    | 6                                | 4.5                              |
| Undergraduate                 | 108                              | 81.8                             |
| Postgraduate                  | 18                               | 13.6                             |
| **Working unit**             |                                  |                                  |
| General surgery ICU          | 18                               | 13.6                             |
| Organ transplant ICU         | 38                               | 28.8                             |
| Cardiovascular surgery ICU   | 17                               | 12.9                             |
| Brain surgery ICU            | 16                               | 12.1                             |
| Reanimation ICU              | 33                               | 25                               |
| Adult burns unit             | 10                               | 7.6                              |
| **Occupational year of experience** |                          |                                  |
| Between 0-5 years            | 51                               | 38.6                             |
| Between 6-11 years           | 65                               | 49.3                             |
| 12 Years and above           | 16                               | 12.1                             |
| **Shift type**               |                                  |                                  |
| Permanently day shift        | 10                               | 7.6                              |
| Day and night shift          | 122                              | 92.4                             |
| **Status of choosing nursing occupation willingly** | 64   | 48.5                             |
| Chose willingly              | 68                               | 51.5                             |

ICU: intensive care unit.

Table 2. The distribution of sources of stress according to surgical nurses.

| Situations causing stress^a| n=132 | Percentage (%) |
|----------------------------|-------|----------------|
| Not being satisfied with the unit where they work | 66 | 50 |
| Working more than 40 hours per week | 96 | 72.7 |
| Patients per nurse being more than three patients in the ICU they work in | 99 | 75 |
| Workload | 103 | 78 |
| Insufficiency of materials and equipment | 52 | 39.4 |
| Bad clinical condition of the patient | 109 | 82.5 |
| Insufficient salary | 23 | 17.4 |
| Lack of team harmony in the unit they work in | 47 | 35.6 |
| Being exposed to negative environmental conditions in the unit they work in (loud noise, low temperature, miscommunication, etc.) | 106 | 80 |
| Experiencing transportation problems between home and hospital | 34 | 25.8 |

^aMore than one response was provided (n=132).
The study, which aimed to identify the stress levels of nurses working in surgical ICUs and sources of stress, was carried out with the participation of 132 surgical ICU nurses. It was seen that most of the participating nurses were married women with a bachelor’s degree and their average age was 30 years. It was also determined that the highest participation was from the nurses working in organ transplant and reanimation ICUs.

When the sources of stress in surgical nurses are examined, it is doubtless that weekly working hours being more than 40 hours requires a high tempo both physically and mentally. It is remarkable that 72.7% of the participants in the study work more than 40 hours per week. When the literature in Turkey is examined, it is noteworthy that there are hospitals where nurses are made to work over 40 hours per week, and that this situation started years ago and still continues to exist.20–22

It was determined in the study that surgical nurses saw factors such as workload and giving care to a high number of patients as well as long working hours as sources of stress, and that 17.4% believed that they were underpaid. In a similar study, 17.4% of the nurses considered being underpaid as a source of stress.21

In the present study, it was found that 80% of the nurses evaluated negative environmental conditions as a source of stress, while 39.4% said the source of stress was lack of materials. In a study conducted in Turkey, nurses saw extreme noise, the low number of windows and shortage of equipment as stressors.23 In another study, sources of stress were expressed as lack of staff and shortage of medication and equipment necessary for care.24

In the study, it was determined that 45.5% of the nurses perceived stress at a high level, that the mean score of those with a high level of stress was $x=42.26$, and that as the level of stress increased, there occurred a significant difference in

| Table 3. Perceived stress levels of surgical nurses and their opinions about coping with stress. |
|---|---|---|---|---|---|
| Stress level and their opinions about coping | n=132 | Percentage (%) |
| The status of perceiving a high level of stress | 60 | 45.5 |
| Need for training in stress management | 104 | 78.8 |
| Need for psychosocial support | 105 | 79.5 |
| Need for training in death process management | 17 | 12.9 |
| Fixing system and organisational problems | 71 | 53.8 |
| *More than one response was provided (n=132).*

| Table 4. Evaluation of the participants’ perceptions of perceived social support in terms of variables. |
|---|---|---|---|---|---|
| Variables | N | Mean | Standard deviation | t/F value | P value | Bonferroni |
| Gender* | | | | | | |
| Female | 76 | 38.68 | 7.74 | 0.056 | 0.955 | – |
| Male | 56 | 38.60 | 7.91 | – | – | – |
| Marital status* | | | | | | |
| Married | 63 | 37.49 | 7.46 | –1.645 | 0.102 | – |
| Single | 69 | 39.71 | 7.97 | – | – | – |
| Educational status* | | | | | | |
| Associate | 6 | 35.00 | 10.97 | 0.865 | 0.423 | – |
| Undergraduate | 108 | 38.65 | 7.89 | – | – | – |
| Postgraduate | 18 | 39.83 | 7.54 | – | – | – |
| Income status* | | | | | | |
| Low (1) | 23 | 42.26 | 7.35 | 3.099 | 0.048 | 1>2 |
| Medium (2) | 67 | 37.80 | 8.26 | – | – | – |
| High (3) | 42 | 38.02 | 6.76 | – | – | – |
| Stress level* | | | | | | |
| Medium | 72 | 35.73 | 7.46 | 0.932 | 0.000 | – |
| High | 60 | 42.15 | 6.68 | – | – | – |
| Training for coping with stress* | | | | | | |
| Yes | 28 | 38.50 | 7.71 | 0.234 | 0.908 | – |
| No | 104 | 38.69 | 7.84 | – | – | – |
| Psychosocial support | | | | | | |
| Yes | 105 | 40.00 | 6.87 | 4.194 | 0.000 | – |
| No | 27 | 33.70 | 8.93 | – | – | – |

*P<0.05.
*Independent t-test.
*One-way analysis of variance analysis.

| Table 5. Regression analysis results for variables that affect perceived social support perception. |
|---|---|---|---|
| Perceived social support | Non-standard B | t | P value |
| Need for psychosocial support | −50.886 | −3.841 | 0.000 |
| Stress level | 50.968 | 4.987 | 0.000 |
| Age | −0.036 | −0.261 | 0.794 |
| Educational status | 0.242 | 0.165 | 0.869 |

$R=0.517$, adjusted $R=0.244$, $F=11.565$, $P=0.000$, Durbin Watson 1.132.
perceived social support (P<0.05). Accordingly, the mean score of those with a high level of stress (x̄=42.15) is higher than the mean score of those with a medium stress level (x̄=35.73). In similar studies, it was identified that nurses experienced stress at low and medium levels, and that sources of stress were generally work related.25–27

The nursing occupation generally aims to provide care and training to individuals in health and sickness, to give consultation and to increase patients’ life quality and comfort. However, stress, which has become an occupational disease for nurses, causes the work orientation and emotional well-being of the nurses to be disrupted.

In literature reviews, it has been stated that promoting emotional health should be emphasised in order to protect the general health level.27,28 The most important parameter for this is minimising work-related stress and developing preventive strategies. In the study, 79% of surgical nurses expressed that they needed psychosocial support.

The study constitutes an important source of information in that it identifies the stress levels of surgical nurses and it suggests preventive strategies. Based on the data of the study, being aware of the needs and strengthening support systems related to stress management are socially important. The fact that the research was carried out in one centre was considered a limitation of the study.

Conclusion
The data obtained in the study contain opinions about helping nurses with work-related stress which they are exposed to, sources of stress and coping with that stress. According to the findings of the study, it is of great importance to obtain more information about stress and to investigate its causes. It is also equally important to take action in terms of prevention, control, treatment, appropriate training and skills in order to cope with stress and to examine the underlying factors behind this phenomenon. Necessary funding and human resources should be provided in order to give nurses problem-solving skills and stress management training and to organise sports clubs and healthy entertainment. The financial support of the managers and spiritual support of health professionals and organising regular meeting with nurses can help nurses to experience less stress.

In future studies, researchers are recommended to investigate actions and strategies that will improve surgical nurses’ physical and emotional health and that will reduce work-related stress.

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Authors’ contributions
All the author(s) took part in the formulation of the concept, data collection, data analysis and interpretation of results. All the authors reviewed and edited the manuscript and approved the final version of the manuscript. SB, GK and SS researched the literature. SB, GK and SS performed the data collection. SB, GK and SS performed the data analysis. SB wrote the first draft of the manuscript, and all authors reviewed and edited the manuscript and approved the final version.

Availability of data and materials
The datasets generated and/or analysed during the current study are available from the corresponding author.

Conflict of interest
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval
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Informed consent
Informed consent was not sought for the present study because waiver of informed consent was approved by the Singhealth CIRB based on ethical consideration.

Trial registration
This clinical trial was not registered because it was initially conceived as a quality improvement project.

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