

## Understanding the Night Shift Stress of Nurses: A Point Prevalence Study

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### Abstract

#### Objective

This study aims to investigate the stress levels and stressors experienced by nurses during the night shift.

#### Material and Method

This point prevalence study was designed as a descriptive and cross-sectional study, and it was conducted with 73 nurses in a university hospital. The study data were collected with a personal information form that was designed by the researchers and a nurse stress identification form.

#### Results

It was concluded that the stress levels of nurses were above the average, with 106 points (27 lowest and 164 highest). Nurses who were frequently working at

night shifts were found to have higher stress levels compared to those working less at night shifts. Besides, it was also noted that those who were satisfied with their jobs had lower stress levels. The most significant stress sources for nurses were understaffing, heavy workload, and limited career opportunities.

#### Conclusion

It was consequently reported that this study presented evidence based data on nurses' stress levels and their stress sources as well as potential precautions to prevent job stress. It was recommended to regularly conduct point prevalence studies to determine the levels of stress and stressors to develop solution based approaches.

**Keywords:** Job stress, nurse, nursing, shift work.

### Introduction

Nurses make vital contributions the universal health care in terms of protecting and improving public health and preventing diseases. For nurses who comprise more than half of the medical personnel around the world, the job poses a significant stress source (1,2).

Job stress is commonly defined as a state of negative emotional status, distress, or anxiety caused by the stress factors at a job (3,4).

Job stress proves to be a serious issue that affects nurses' health and efficiency (5). Kane (2009) found that stress considerably increases psychosomatic

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disorders like anger, anxiety, forgetfulness, gastrointestinal problems, backache, stiff neck, and shoulders (6). Applebaum et al. (2010) similarly reported that stress was among the major causes of quitting a job for nurses (7). Additionally, stress results in lower quality of nursing care and increases costs for medical institutions by causing nurses to get sick and therefore to miss workdays and take sick leaves (6). Virtanen et al. (2009) correlated higher levels of job stress and long work hours with the increase in hospital infections (8). Moreover, stress is known to decrease concentration, decision-making, and assessment skills while adversely affecting care quality (9).

Nurses frequently work at night shifts to provide 7/24 care for individuals from a variety of age groups, genders, and cultural backgrounds (3,10). However, nurses working at night shifts have limited sources in terms of personnel backup and equipment, and receive considerably less managerial support in comparison to those working at the day shift (11). Therefore, it has been widely reported that nurses had higher levels of stress at night shifts (12,13). In a study comparing stress levels of day shift nurses and night shift nurses, it was stated that cortisol levels of nurses working at night shifts were found to be higher at the end of their shifts, which confirmed the correlation between higher levels of cortisol and physiological stress (12). Furthermore, nurses working at night shifts reported more sleeping disorders, attention deficiency, and concentration problems, and lower job performance (14). In relevant studies, it was also found that nurses working at night shifts had considerable stress and that increasing levels of stress negatively influenced their health and well-being (15-17).

It has been suggested that acute stress in nurses can lead to psychosomatic disorders and medical errors, and cause feelings of compassion fatigue, fear, sadness, and grief (18-20). However, it has also been reported that long-term exposure to stress may also cause chronic problems such as burnout, posttraumatic stress, grief, and disorders (6,9,21). In this regard, acute stress must be prevented and carefully managed so as not to result in devastating chronic stress.

It has been widely reported that relevant studies have compared the stress levels of day shift nurses and night shift nurses (12,13) and focused on job stress sources of nurses (4,6,9,22). Nevertheless, no particular study has been reported on the stress sources of nurses working at night shifts and evaluating the acute stress of night shift nurses. This study, therefore, aimed

to investigate the stress levels of nurses working at night shifts and their stress sources. It was suggested that the results of this study would contribute to the scientific literature and help to improve solution based strategies and approaches.

## Material and Method

### Study Design

This point prevalence study was designed as a descriptive and cross-sectional study.

### Sample

The study universe was composed of 450 nurses working in Turkey at a university hospital. The researchers did not use a sampling method, and they aimed to conduct the study with 80 nurses working at the night shift on that day. And they completed the study with 73 nurses who consented to participate in the study.

### Data Collection Tools

The study data were collected with a personal information form, a stress identification form, and a stress sources form via face to face interviews on 15.11.2021.

The personal information form was designed by the researchers in line with the recent literature, and it basically interrogates the demographic characteristics and the worklife variables that affect their stress levels (4,13,16).

The nurse stress identification was designed by Üstün and Kanbay (2009) in order to map out the stress factors for the job environment of nurses (23). The form originally included 18 questions, but the question regarding their losses was taken out with the permission of the authors. Therefore, the form used in this study had 17 questions. The questions in the form are scaled between 0-10, and higher points indicate higher levels of stress. The points for each stress factor are evaluated as low between 0-3, moderate between 4-7, and high between 8-10. The Cronbach's alpha reliability value of the scale was calculated as 0.88.

In addition to the stress identification form, the stress sources form was designed by the researchers based on the recent literature and their own job experiences in order to determine the stress factors that nurses may encounter at work (4,6,9,22).

### Validity and Reliability of the Questionnaire

Eight nurses were asked to fill in the questionnaire form in order to test the clarity of the form. According

to the results of the pilot study, the items No windows in nurses' rest rooms and Inadequacy to cover own needs (nutrition, toilet, sleep, etc.) were added to the "Stress Sources of Nurses" form with the suggestions of the nurses. The questionnaire form was finalized after their suggestions. These nurses were not included in the main study.

### Study Procedure

The study data were collected by the researchers during a night shift (16:00-08:00) after conducting a pilot study and being granted the necessary permissions from the institution. The participant nurses were asked to fill in the questionnaire form considering the conditions only on that particular day.

### Statistical Analysis

The study data were analyzed with SPSS 20.0 (SPSS

Inc., Chicago, IL, USA). In the study, the fitness of the data to the normal distribution was evaluated with the Shapiro-Wilk and Kolmogorov-Smirnov tests. The researchers also used conducted from descriptive statistical methods (mean, standard deviation, frequency) as well as Mann-Whitney U and Kruskal-Wallis H tests to correlate study groups. For the correlative analysis of study environment and stress scores, Spearman Correlation Analysis was used. The significance level was taken as  $p < 0.05$ .

## Results

### The Descriptive Characteristics of Nurses

The descriptive and clinical characteristics of the participants' nurses, including their demographic characteristics and work life, are given in Table 1 and Table 2. Accordingly, it was noted that 13.7%

**Table 1** Descriptive characteristics of nurses (n=73)

Characteristics	n	%
<b>Age</b>		
22-24 years old	14	19.2
25-29 years old	26	35.6
30-39 years old	23	31.5
40 years old and over	10	13.7
<b>Gender</b>		
Female	58	79.5
Male	15	20.5
<b>Educational Status</b>		
High school	14	19.2
College	9	12.3
Undergraduate	41	56.2
Graduate	9	12.3
<b>Marital Status</b>		
Married	41	56.2
Single	32	43.8
<b>Having Children</b>		
Yes	37	50.7
No	36	49.3
<b>Dependant Family Members</b>		
Yes	12	16.4
No	61	83.6

**Table 2** Clinical characteristics of nurses (n=73)

Characteristics	n	%
<b>Job Experience</b>		
1-5 years	25	34.2
6-10 years	23	31.6
11 years and over	25	34.2
<b>Experience in Their Current Unit</b>		
≤ 1 years	32	43.9
2-5 years	25	34.2
6 years and over	16	21.9
<b>Unit</b>		
Internal diseases	20	27.4
Surgery	16	21.9
Intensive care	25	34.3
Operation room	3	4.1
Outpatient	3	4.1
Emergency room	6	8.2
<b>Satisfied with Their Unit</b>		
Satisfied	46	63
Not Satisfied	27	37
<b>Satisfied with Their Job</b>		
Satisfied	58	79.5
Not satisfied	15	20.5
<b>Work Order</b>		
Day	3	4.1
Night	6	8.2
Shift (Day + Night)	64	87.7
<b>Their Shift Preference if They had a Choice</b>		
Day	38	52.1
Night	17	23.3
Shift	18	24.6
<b>Monthly Number of Night Shifts</b>		11.18 ± 2.73
<b>Weekly Work Hours</b>		51,63 ± 10,08
<b>Feeling Anxious About the Care of Their Children When Working at Night Shifts</b>		
Yes	34	46.5
No	39	53.5
<b>Feeling Anxious About the Care of Their Dependant Family Members When Working at Night Shifts</b>		
Yes	17	23.3
No	56	76.7

**Table 3** Factors that identify nurses' stress levels (n=73)

Stress Factors		Low		Moderate		High	
		n	%	n	%	n	%
1	Heavy workload	5	6.8	13	17.8	55	75.4
2	Clash with doctors	27	37	27	37	19	26
3	Clash with other nurses	33	45.2	23	31.5	17	23.3
4	Clash with head nurses	38	52.1	15	20.5	20	27.4
5	Changes in clinic rules and policies	25	34.2	27	37	21	28.8
6	Unsupportive seniors	37	50.7	15	20.5	21	28.8
7	Overcrowded units	11	15.1	16	21.9	46	63
8	Fear of making mistakes	37	50.7	20	27.4	16	21.9
9	Clinic environment (physical conditions, noise, lights, etc.)	18	24.7	17	23.3	38	52.1
10	Understaffed nurses	4	5.5	8	11	61	83.5
11	Limited career opportunities	8	11	13	17.8	52	71.2
12	Verbal or physical assault	13	17.8	20	27.4	40	54.8
13	Professional risks	8	11	19	26	46	63
14	Patients and their relatives (attendans, their behaviors, etc.)	10	13.7	22	30.1	41	56.2
15	Losses of patients (patient arrests)	24	32.8	21	28.8	28	38.4
16	Feeling insufficient	48	65.7	18	24.7	7	9.6
17	Understaffed assisted services	9	12.3	14	19.2	50	68.5

\*0-3 points low, 4-7 points moderate, 8-10 points high

of the nurses were 40 years old and older, 79.5% of them were female, 56.2% of the nurses were married, 50.7% of them had children, 83.6% of them had no dependent family member, and 56.2% of the participants had an undergraduate degree. It was further reported that 34.2 of the nurses in the study had a nursing experience of 1-5 years or 11 years or over job experience, 43.9% of them were working in their current unit for less than a year, 34.3% of the participants were working in the intensive care units, 63% of the nurses were satisfied with their current unit, 79.5% of them were satisfied with their jobs, 87.7% of them working in shifts, and finally 52.1% of them would prefer to work day shifts if they had a choice. It was also found that the monthly number of night shifts was  $11.18 \pm 2.73$ , and their average weekly working hour were  $51.63 \pm 10.08$  (Table 1, Table 2).

### Stress Sources of Nurses

Factors that identify nurses' stress levels are given in Table 3, which demonstrates that the participant

nurses had higher levels of stress due to understaffed nurses (83.5%), heavy workloads (75.4%), limited career opportunities (71.2%), understaffed assisted services (68.5%), overcrowded units and professional risks (63%), patients and patient relatives (56.2%), verbal or physical assaults (54.8%), and clinic environment (52.1%), (Table 3). Moreover, the major sources of stress for nurses were found to be low wages (80.8%), insufficient break times (80.8%), no windows in nurses' rest rooms (67.1%), lack of medical equipment and other equipment (61.6%), and finally, inadequacy to cover their own needs (nutrition, toilet, sleep, etc.), (57.5%), (Table 4).

### A Correlative Analysis between Nurses' Descriptive Characteristics and Total Stress Scores

A correlational analysis between nurses' descriptive Characteristics and total stress scores is demonstrated in Table 5. The total stress score of nurses was reported to be 106 (27-164), which indicated that the participant nurses had above the average stress.

**Table 4** Stress sources of nurses (n=73)

Situations*	n	%
Lack of medical equipment and other equipment	45	61.6
Providing care for terminal patients	24	32.9
Arrest interventions	24	32.9
Being called for urgently	19	26
Low wages	59	80.8
Insufficient break times	59	80.8
New patient admissions	37	50.7
No windows in nurses' rest rooms	49	67.1
Inadequacy to cover own needs (nutrition, toilet, sleep, etc.)	42	57.5

\*Nurses chose more than one option.

**Table 5** Correlation between the descriptive characteristics of nurses and total stress scores

Characteristics	Stress Total Score 106 (27-164)
Satisfied with their jobs	
Satisfied	98.50 (27-164)
Not satisfied	120 (93-162)
<b>Test value</b>	U: 257.000
<b>p</b>	0.015
Monthly Number of Night Shifts	11.18 ± 2.73
<b>Test value</b>	r: 0.259
<b>p</b>	0.027

\*U: Mann Whitney U Test, r: Spearmen Correlation

It was further found that the total stress scores of nurses were correlated with their satisfaction with their jobs (U: 257.000,  $p < 0.05$ ) and the monthly number of night shifts ( $r: 0.027$ ,  $p < 0.05$ ). In other words, the participant nurses who were satisfied with their jobs and had a lower number of night shifts also had lower stress levels. On the other hand, there was no correlation between total stress scores and nurses' other descriptive characteristics ( $p > 0.05$ ) (Table 5).

## Discussion

It has been widely acknowledged that working night shifts could be a stressful experience for nurses (12). Nurses might be exposed to a variety of stress sources besides the natural stress caused by night shifts. Therefore, this point prevalence study was carried out to investigate the stress levels and stress sources of nurses on night shifts. The results of



the study showed that nurses had above-average stress (106 points). The top three stress sources of nurses with regard to their job stress scores were understaffing, heavy workloads, and limited career opportunities. In a relevant study on the stress levels of medical personnel working on day and night shifts, it was reported that those who were working on night shifts were noted to have higher levels of stress in comparison to those who were working on day shifts, which, nevertheless, didn't yield a significant statistical difference (13).

The descriptive characteristics of nurses who participated in the study were analyzed and it was reported that only 13.7% of nurses were 40 years old and older, 68.5% of them had an undergraduate degree, a majority of them didn't have a dependent family member (83.6%) or children (49.3%). Similarly, Buja et al. (2013) pointed out that nurses who were working night shifts were much younger, more educated, and had no dependents or children (16). They also noted that nurses working night shifts had less job experience, and they were either single or divorced. The results of our study indicated that the nurses who participated in the study had a variety of job experiences, and a majority of them were married, which was also found to be weak indicators for determining the stress levels of nurses working night shifts. It was concluded that it stemmed from the fact that individual characteristics were neglected since the number of nurses was not sufficient to maintain a work plan.

The most frequent stress source for nurses in our study was understaffing. It was considered to be unsurprising considering the recruitment of nurses in Turkey and other countries. According to the OECD Health Statistics Report 2024, around 60% of European Union-27 countries report a shortage of nurses (24). On the other hand, Powell (2013) conducted a study on the nursing experiences of nurses who were working night shifts, which included a nurse's statement that "I felt we are not important enough to think that we need more personnel". It suggested that it was of utmost significance to hire more nurses and to support them while managing the stress levels of nurses (25).

Heavy workload was the second most frequent stress source for the nurses in our study. Buja et al. (2013) argued that nurses who worked night shifts didn't have only a higher workload but also lower decision-making authority, which eventually increased the stress levels of nurses (16). In a similar study, it was indicated that nurses working night shifts had to

make critical decisions without having a chance to consult with head nurses or doctors (22). The results of our study urged that certain stress sources, such as understaffed nurses and heavy work, should not be considered only numerical data but rather crucial significant factors that would affect nurses' health, care quality, and safety.

The nursing profession requires a professional education and expertise. However, nurses need more respect and independence as well as better payment to overcome substantial challenges (heavy workload, being treated as only allied healthcare personnel, working too many hours, and limited career opportunities) (26). In our study, the participant nurses reported that the main sources of stress for them were low wages (80%) and limited career opportunities (71%), which was noteworthy in the sense that it highlighted the concerns of nurses regarding professional development and decent payment.

In the university hospital where our study was conducted, nurses were working in shifts (night-day). During the night shift when the study data were collected, almost one fourth of the nurses preferred to work at night shifts and more than half of the nurses especially preferred to work at only day shifts if they had a choice, which resulted from the fact that most of the nurses in the study were married with children. The study results demonstrated that the participant nurses with children had concerns about the care of their children during night shifts. It was similarly stated that personal and familial factors had a profound influence over nurses' shift choices (27). In a study conducted in Iran, it was also reported that nurses and society in general had a negative attitude towards working at night shifts (28). It was further noted in a relevant study that medical personnel who voluntarily worked at shifts had higher levels of job satisfaction, and they reported fewer complaints about working at shifts (29). It would be reasonable to argue that none of these work orders can be ideal, but it would be much more favorable for the employees if they were given an opportunity to choose their shifts (30).

The International Labor Organization (ILO) and the American Nurses Association (ANA) equally recommend that nurses should not work more than 40 hours a week, paid or otherwise (31,32). Nurses in Turkey are recruited as civil servants according to the Civil Servants Law No. 657 and the Labour Code No. 4857. The weekly work hours of nurses were determined as 40 hours according to the Civil Servants Law and 45 hours according to the Labor Code. To

compensate for overtime work, nurses are granted daily leaves in line with their extra working hours (33). Caruso (2014) reported that working more than 40 hours a week adversely affected nurses' health and patient safety (17). The results of our study showed that nurses' weekly working hours were higher than the recommended hours ( $51,63 \pm 10,08$ ). Besides, the number of night shifts a month ranged from 8 to 14. The results of our study also indicated that the weekly working hours of nurses did not significantly affect stress levels, but the increasing frequency of night shifts was correlated with stress levels of nurses. The results of our study further suggested that nurses who worked more frequently at night shifts had higher levels of stress when compared to those who did not, which could refer to the fact that they had fewer days off due to frequent night shifts, and they often suffered fatigue. It was similarly reported that nurses who worked fewer hours had lower levels of stress and they more successfully managed stress (34). It was stated in a relevant study on the influences of working hours on the stress levels of nurses that the stress levels of nurses increased with the working hours and that 15% of nurses who worked more than 40 hours a week had higher stress levels (35).

It has also been noted that senior nurses, especially those who were 40 years old and over, were more affected by the effects of night shifts, and that they could not adjust to the conditions of night shifts and reported sleeping disorders (36). The results of our study indicated that age and job experience were not correlated with stress levels and nurses' stress sources. The results were also confirmed by a study conducted by Kane (2009), who found that age or seniority did not deliberately reduce the stress levels of nurses (6). However, in a relevant qualitative study, it was argued that senior nurses who worked night shifts were not supported by inexperienced nurses and felt quite isolated. It was additionally suggested that they had difficulties in making decisions at work and could not cope with such uncertainties, which eventually caused higher levels of stress (19,37).

A majority of the participant nurses found their units overcrowded and inconvenient in terms of clinic environment (physical conditions, noise, light, etc.), unventilated (as there were no windows in nurses' rest rooms), which caused high levels of stress. In a similar study, it was reported that receiving sunlight at least 3 hours a day resulted in less stress and higher levels of satisfaction (15). Moreover, most of the nurses in our study complained about the lack of medical equipment and other equipment as a source of stress, which might stem from their concerns about

ensuring the patient's safety and optimum care quality.

It was also noted that the participant nurses worked 8 hours in day shifts and 16 hours in night shifts. It is vitally important to establish a work environment to best respond to the needs of nurses while managing the stress levels of nurses who were working for long hours at night shifts. More than half of the nurses in our study stated that they were unable to cover their own physical needs, such as nutrition, toilet, sleep, etc., which consequently enhanced their stress. In a study on sleep quality, it was reported that night shifts negatively affected sleep quality and medical personnel working in shifts had lower levels of sleep quality in comparison to those who worked only day shifts (13). It was considered that nurses were unable to take care of their own needs because of understaffed in the units, heavy workloads, and longer work hours at night shifts.

Recent studies on the stress sources of nurses have usually focused on the physical conditions of workplaces. On the other hand, it can be presumed that future studies would certainly take into consideration both job related factors and other factors that affect the stress levels of nurses to produce a more sophisticated identification of stress sources (1). The study results also showed that the nurses' perception of stress sources was not correlated with having a dependent in the family or having children. Although it has been previously reported that nurses had a "secondary stress source" when they had to care take care of children, the elderly, or their family members outside of their work, these secondary sources haven't been widely analyzed in nursing studies so far (38).

More than half of the nurses in our study reported the attitudes of patients or their relatives and verbal or physical assault as a major source of stress. Nurses play a crucial role in providing health care, and they have to deal with the demands of patients and their relatives, which may not be included in their job description. Sometimes, conflicts may arise when nurses do not, or can not, meet the expectations of demanding patients, which naturally causes even more stress for nurses. It has also been noted that some patients or their relatives tend to be aggressive and violent (6). The results of our study indicated that stress management should address the needs of patients and their relatives as well as medical personnel.

Vicente et al. (2016) reported that the main cause of stress for nurses when providing quality care was the feeling of inadequacy to meet challenging



expectations, to deal with insufficient resources, and to perform within limited periods (22). The nurses in our study reported several stress sources, but they did not regard themselves as inadequate to work night shifts. However, a majority of nurses stated that they were generally satisfied with their jobs. It was further found that those who were satisfied with their jobs had lower stress levels, which can be evaluated as a result of the fact that nurses were capable of coping with stress and they were satisfied with their jobs.

### Conclusion and Recommendations

Valizadeh et al have concluded that stress levels of nurses are, and should be, a major concern for a healthy nursing practice and quality patient care (5). The stress levels of nurses were found above the average with major stress sources like understaffed, heavy work load and limited career opportunities.

It is recommended that stress sources and stress levels of nurses can be easily managed, provided that hospital management and nursing managers attentively listen to the nurses' demands, support them, and integrate them into the decision-making processes. For instance, nurses' preferences and needs can be taken into account when organizing shifts in the hospital. Additionally, the physical work environment can be ameliorated to reduce the stress levels of nurses. Considering that the nursing profession already causes a large amount of stress, they can be incorporated into education programs focusing on coping with stress. Such measures will certainly prevent acute stress situations from becoming more devastating chronic stress situations.

This study provided substantial evidence-based data to explore stress levels and stress sources of nurses and to ensure legal or institutional regulations. Given that stress sources at work may vary depending on the institutional structure of medical institutions, these institutions are advised to regularly implement point prevalence studies in order to assess stress sources and to develop solution-based approaches.

### Study Limitations

The stress levels of nurses were based on their self-report rather than the results of biochemical blood analysis. Therefore, the reliability of the study data was limited by the reliability of their statements. This study was implemented in only one hospital, with the participation of nurses who were working on the night shift when the study was carried out by the researchers. Thus, the results represented only those who participated in the study.

### Conflict of Interest Statement

Written informed consent to participate and publish was obtained from all individual participants included in the study.

### Ethical Approval

The permission to implement the study was granted by the Süleyman Demirel University Research and Application Hospital (Date:15/12/2021, Issue: E-26515734- 605.01-181076) and the Board of Ethics at the Süleyman Demirel University Faculty of Medicine (Date: 15/09/2021, Issue: 72867572-050.01.04-114341). All nurses were informed about the purposes of the study, and the researchers sought oral consent from all nurses who consented to participate in the study. To use forms, the researchers also asked for the permission of the author. The study was conducted in line with the principles of the "Helsinki Declaration".

### Consent to Participate and Publish

Written informed consent to participate and publish was obtained from all individual participants included in the study.

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### Availability of Data and Materials

Data available on request from the authors.

### Artificial Intelligence Statement

The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

### Authors Contributions

HCE: Conceptualization; Methodology; Formal analysis; Writing - Original draft preparation; Writing - Reviewing and Editing.

TC: Conceptualization; Methodology; Formal analysis; Writing - Original draft preparation; Writing - Reviewing and Editing.

AO: Methodology; Writing - Original draft preparation; Investigation; Writing - Reviewing and Editing.

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