

Original article

Work-related Stress and Most Common Stressors for Surgical Nurses

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Abstract

Aim: The objective of this research was to determine the stress level in nurses at the Department of Surgery, Clinical Hospital Osijek, and to identify the most common stressors.

Methods: The research included 105 nurses, 29 (28%) were men and 76 (72%) of them were women. It was conducted anonymously, by standardized questionnaire Occupational Stress Questionnaire for Hospital Health Care Workers.

Results: The total scale of stress was 3.2 (interquartile range from 2.6 to 3.7) with no significant differences by gender. The results showed no statistically significant differences in the level of stress in terms of age, total length of service and level of education. The most common stressors in surgical nurses are insufficient number of employees, work overload, administrative work, a 24-hour responsibility, inappropriate public criticism, fear of infection, conflict with superiors, night and overtime work and pressure of set deadlines.

Conclusion: The greatest stress in surgical nurses, was connected with the work organization and financial issues, and in a group of women, a large share of stress was connected with the public criticism and litigation.

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Introduction

Stress at work has been recognised worldwide as the greatest challenge for workers' health and for their organisations (1). McGrath (1973) defines stress as a significant imbalance between the demands and the ability to meet them, in a situation where a failure to satisfy the requirements has, according to the workers' estimations, significant consequences (2). Stress at work is a specific type of stress originating in the work environment. Medical profession is classified as a high-stress profession due to a high level of responsibility for human lives and health, exposure to specific stressors, such as chemical, biological and physical hazards, and shift work (3). Unlike the majority of other people, nurses face real suffering, pain and death on a daily basis. Nursing is, by its nature, an extremely stressful profession (4). Members of surgical teams are exposed to common stressors, such as overtime work, shift work and extremely demanding requirements (5). At the same time, good leadership, close cooperation and teamwork, as the essential qualities of the members of a surgical team, can impose additional work-related requirements, consequently accumulating more work-related stress (6). Work in the operating room is one of the most exciting and demanding activities performed by the nurse, but it is also one of the most stressful health care jobs. Teamwork is the key element of working in the operating room and it has been increasingly recognised that acute stress has a harmful effect on teamwork and communication between team members (7). Operating nurses should have a high level of psychophysical stability and use constructive stress-response strategies, as those are considered the essential qualities of nurses working in the operating room (8). Development of medicine and technology has increased the scope of work performed by nurses working in the operating room. As efficiency and promptness are the most important requirements and the staff is constantly under stress, the OR department should therefore

increase the amount and quality of stress relief courses (8).

Nurses working in intensive care units are exposed to a higher level of stress than those working in other departments (9). A research conducted in intensive care units in Brazil examined the presence of work-related stress and dissatisfaction with activities that are considered critical for intensive care units. Symptoms related to cardiovascular, digestive and musculoskeletal disorder, present in nurses working in intensive care units, are closely connected with the characteristics of particular health areas, which causes dissatisfaction and stress symptoms (10). Burnout syndrome is a state of mental, physical or mental and physical exhaustion caused by excessive and prolonged stress (11). A study among nurses has shown that higher levels of burnout caused by work-related stress are associated with lower job satisfaction (12). Surgical nurses have indicated different factors of job satisfaction (13) and stress (9) in comparison with other nurses and they also expressed higher motivation (14).

The objective of the study is to determine (I) the stress level and (II) the most common stressors for nurses at the Department for Surgery of the Clinical Hospital Osijek and (III) to determine the differences in the impact of stress among nurses in relation to their gender, age, education and length of service.

Subjects and Methods

A cross-sectional survey among health care workers, operating nurses employed at the Department of Surgery in the intensive care units and operating rooms at the Clinical Hospital Osijek was conducted in May and June 2015. Research included 105 participants, of which 29 (28%) were men and 76 (72%) were women. The majority of participants, 79 (76.7%) of them, had secondary education qualifications. The mean age of participants was 38 years (the interquartile range of 30-48 years) and the mean

length of service was 16.5 years (the interquartile range of 8-26 years), with no significant differences by gender. The participants were informed about the research in written and oral form. Before the survey was conducted, the participants had read the instructions as an introduction to the main objective of the research. In the instructions, it was also emphasised that participation in the research was anonymous and voluntary. Afterwards, the respondents gave their written consent for participation in the study. It took fifteen to twenty minutes for the participants to complete the questionnaires. Completed questionnaires were submitted to the examiner personally in an envelope in order to ensure anonymity of the research. The Ethics Committee of the Clinical Hospital Osijek gave its consent to conduct the research.

The standardised Occupational Stress Questionnaire for Hospital Health Care Workers developed by Milan Milošević (2009), which consists of 37 workplace stressors, was used in this research (15). Based on a preliminary research, it was estimated that some issues (fear of exposure to cytostatics, constant responsibilities during 24-hour shifts and time limits for patient examination) were not particularly relevant for the study because the participants do not work with cytostatics, do not work in 24-hour shifts and do not perform patient examinations.

The first part of the questionnaire included 34 workplace stressors classified under six factors. The stressors were related to work organisation

and financial issues, public criticism and litigation, occupational risks and hazards, conflicts and poor communication, shift work and professional requirements. The participants estimated the stressors on the Likert scale by rating them from 1 to 5, where 1 was (not stressful at all), 2 (rarely stressful), 3 (occasionally stressful), 4 (stressful) and 5 (extremely stressful). The second part of the questionnaire consisted of general data relating to socio-demographic characteristics (gender, age, education and total length of service).

Statistical methods

Figures were described by a median and interquartile range. Categorical variables were described in absolute and relative frequencies. Fisher's exact test and the Mann-Whitney test were used to examine the differences between independent groups (by age, gender and education). The level of significance was set at $\alpha = 0.05$. Data analysis was done by the SPSS software system for Windows (version 13.0).

Results

The study included 105 participants, of which 76 (72%) were women. Table 1 presents the comprehensive data about the participants' age, length of service and education qualifications categorised by gender (Table 1).

Table 1. Participants by characteristics and gender

	Men	Women	Total	p
Total	29 (28%)	76 (72%)	105 (100%)	
Age*	40 (28–49.5)	38 (31.5–47)	38 (30–48)	0.985 [†]
Length of service*	19 (7.5–28)	16 (8.5–25)	16.5 (8–26)	0.894 [†]
Qualifications				
secondary school qualifications	24 (82.8%)	55 (74.3%)	79 (76.7%)	0.770 [‡]
college qualifications	4 (13.8%)	15 (20.3%)	19 (18.4%)	
university qualifications	1 (3.4%)	4 (5.4%)	5 (4.9%)	
Age groups				
up to 30 years	10 (34.5)	16 (21.1)	26 (24.8)	0.348 [‡]
31 – 40	6 (20.7)	27 (35.5)	33 (31.4)	
41 – 50	8 (20.7)	23 (30.3)	31 (29.5)	
51 and over	5 (17.2)	10 (13.2)	15 (14.3)	
Length of service - groups				
up to 10 years	11 (37.9)	20 (26.3)	31 (29.5)	0.286 [‡]
11 – 20	5 (17.2)	26 (34.2)	31 (29.5)	
21 – 30	8 (27.6)	22 (28.9)	30 (28.6)	
31 and over	5 (17.2)	8 (10.5)	13 (12.4)	

* Median (interquartile range); † Mann-Whitney test; ‡ χ^2 test

The majority of participants stated that stress related to work organisation and financial issues is caused mostly by an insufficient number of

workers (49 participants, i.e. 46.7%) and work overload (40 participants, i.e. 38.8%). Besides that, 23 participants (21.9%) rated public criticism as extremely stressful (Table 2).

Table 2. Participants by level of stress related to work organisation and financial issues and to the public criticism and litigation

	Number (%) of participants					Total
	Not stressful at all	Rarely stressful	Occasionally stressful	Stressful	Extremely stressful	
WORK ORGANISATION AND FINANCIAL ISSUES						
Inadequate income	3(2.9)	14(13.5)	29(27.9)	39(37.5)	19(18.3)	105(100)
Inadequate financial resources	2(1.9)	10(9.5)	30(28.6)	46(43.8)	17(16.2)	105(100)
Inadequate workspace	5(4.8)	25(23.8)	33(31.4)	32(30.5)	10(9.5)	104(100)
Little opportunity for promotion	9(8.7)	22(21.2)	42(40.4)	18(17.3)	13(12.5)	105(100)
Poor communication with superiors	8(7.6)	33(31.4)	33(31.4)	18(17.1)	13(12.4)	105(100)
Insufficient number of workers	3(2.9)	7(6.7)	17(16.2)	29(27.6)	49(46.7)	105(100)
Poor work organisation	8(7.7)	21(20.2)	25(24)	27(26)	23(22.1)	103(100)
Unexpected situations on a daily basis	4(3.8)	12(11.4)	35(33.3)	34(32.4)	20(19)	103(100)
Administrative work	5(4.8)	3(2.9)	29(27.6)	29(27.6)	39(37.1)	105(100)
Work overload	4(3.9)	5(4.9)	12(11.7)	42(40.8)	40(38.8)	105(100)
PUBLIC CRITICISM AND LITIGATION						
Threat of lawsuits	12(11.4)	16(15.2)	27(25.7)	29(27.6)	21(20)	105(100)
Inadequate expectations of patients	7(6.7)	13(12.4)	40(38.1)	29(27.6)	16(15.2)	105(100)
Inappropriate public criticism	4(3.8)	16(15.2)	29(27.6)	33(31.4)	23(21.9)	104(100)
Misinforming patients	5(4.8)	19(18.1)	47(44.8)	22(21)	12(11.4)	105(100)
Conflicts with patients	6(5.7)	27(25.7)	34(32.4)	25(23.8)	13(12.4)	105(100)
Non-separation of professional from private life	15(14.4)	20(19.2)	45(43.3)	16(15.4)	8(7.7)	105(100)
24-hour shifts	11(10.6)	13(12.5)	18(17.3)	37(35.6)	25(24)	103(100)

Conflict with superiors was rated as an extremely stressful event by 21 participants (20%). An equal number of the participants rated night work as either extremely stressful (24.8%) or not stressful at all (20%) (Table 3). Considering professional requirements, the pressure arising

from imposed time limits represented the most significant stressor for 20 participants (19%), whereas 15 participants (14.3%) rated the introduction of new technology as not stressful at all (Table 3).

Table 3. Participants by level of stress related to occupational risks and hazards, to conflict and poor communication and to shift work and professional requirements

	Number (%) of participants					Total
	Not stressful at all	Rarely stressful	Occasionally stressful	Stressful	Extremely stressful	
OCCUPATIONAL RISKS AND HAZARDS						
Fear of ionizing radiation	17(16.2)	35(33.3)	22(21)	22(21)	9(8.6)	105(100)
Fear of inhalation anaesthetics	29(28.2)	33(32)	24(23.3)	10(9.7)	7(6.8)	105(100)
Fear of infection	13(12.4)	29(27.6)	24(22.9)	28(26.7)	11(10.5)	104(100)
Fear of injury with a sharp object	13(12.5)	32(30.8)	25(24)	19(18.3)	15(14.4)	105(100)
Facing incurable patients	7(6.7)	17(16.2)	37(35.2)	26(24.8)	18(17.1)	105(100)
CONFLICTS AND POOR COMMUNICATION						
Conflicts with colleagues	9(8.6)	23(21.9)	35(33.3)	25(23.8)	13(12.4)	105(100)
Conflicts with other associates	10(9.5)	21(20)	41(39)	22(21)	11(10.5)	105(100)
Poor communication with colleagues	14(13.3)	20(19)	39(37.1)	22(21)	10(9.5)	104(100)
Conflicts with superiors	15(14.3)	20(19)	26(24.8)	23(21.9)	21(20)	105(100)
SHIFT WORK						
Night work	21(20)	18(17.1)	18(17.1)	22(21)	26(24.8)	105(100)
Shift work	14(13.5)	26(25)	22(21.2)	24(23.1)	18(17.3)	105(100)
Overtime	16(15.2)	20(19)	21(20)	24(22.9)	24(22.9)	104(100)
PROFESSIONAL REQUIREMENTS						
Introduction of new technologies	15(14.3)	22(21)	40(38.1)	12(11.4)	16(15.2)	105(100)
Overload of information from profession	11(10.5)	21(20)	45(42.9)	12(11.4)	16(15.2)	105(100)
Lack of appropriate permanent education	13(12.4)	20(19)	44(41.9)	19(18.1)	9(8.6)	104(100)
Unavailability of literature	12(11.4)	25(23.8)	46(43.8)	10(9.5)	12(11.4)	105(100)
Pressure of imposed time limits	6(5.7)	18(17.1)	25(23.8)	36(34.3)	20(19)	105(100)

Total rating on the scale of stress was 3.2 (interquartile range from 2.6 to 3.7) and there were no significant differences by gender. The most significant stressors were related mostly to work organisation and financial issues, whereas female respondents stated that a considerable amount of stress arises from public criticism and litigation (Mann-Whitney test, $p = 0.046$) (Table 4).

Table 4. Average rating on stress scale by gender

	Median (25% - 75%) by gender			p*
	Men	Women	Total	
Work organisation and financial issues	3.5 (2.8-3.8)	3.5 (3.1-4)	3.5 (3.1-4)	0.137
Public criticism and litigation	2.9 (2.4-3.7)	3.4 (2.8-3.9)	3.4 (2.6-3.9)	0.046
Occupational risks and hazards	2.4 (1.8-3.7)	2.9 (2.3-3.6)	2.8 (2-3.6)	0.352
Conflicts and poor communication	3 (2.3-3.8)	3 (2-4)	3 (2-3.8)	0.829
Shift work	3 (2-4)	3 (2-4)	3 (2-4)	0.738
Professional requirements	3 (2.3-3.4)	3 (2.4-3.6)	3 (2.4-3.6)	0.291
Total rating	3 (2.5 - 3.6)	3.3 (2.7-3.8)	3.2 (2.6-3.7)	0.167

* Mann-Whitney Test

Occupational risks and hazards were the sources of stress for participants aged between 31 and 40. Although some variations were

observed, they were not particularly significant (Table 5).

Table 5: Average rating on stress scale by age

	Median (25% - 75%) by age groups				Total	p*
	up to 30 years	31 - 40	41 - 50	51 and over		
Work organisation and financial issues	3.3 (3-3.7)	3.6 (3.1-3.9)	3.5 (3.1-4)	3.9 (3.5-4.2)	3.5 (3.1-4)	0.111
Public criticism and litigation	2.9 (2.6-3.4)	3.6 (2.6-4.1)	3.4 (2.4-3.7)	3.7 (3-4.3)	3.4 (2.6-3.9)	0.069
Occupational risks and hazards	2.7 (2.2-3.5)	3 (2.1-3.7)	2.8 (1.8-3.5)	2.6 (2-4)	2.8 (2-3.6)	0.988
Conflicts and poor communication	2.9 (2-3.5)	3 (2.1-4)	3 (2-3.8)	3.3 (2.3-4.3)	3 (2-3.8)	0.368
Shift work	2.8 (2-3.8)	3 (2.3-4.2)	3.3 (1.7-4)	3.7 (2.3-4.3)	3 (2-4)	0.451
Professional requirements	3 (2.4-3.3)	3 (2.3-3.5)	3.2 (2.2-3.8)	3.4 (2.8-3.8)	3 (2.4-3.6)	0.368
Total rating	3 (2.5-3.4)	3.2 (2.8-3.8)	3.3 (2.5-3.8)	3.5 (2.8-3.8)	3.2 (2.6-3.7)	0.264

* Mann-Whitney Test

According to the participants with secondary education qualifications, the greatest source of stress lies in work organisation and financial

issues. There were no statistically significant differences based on the level of education (Table 6).

Table 6. Average rating on stress scale by level of education

	Median (25% - 75%) by level of education				p*
	secondary	college	university	Total	
Work organisation and financial issues	3.5 (3-3.9)	4 (3.2-4.5)	3.2 (3.1-4.4)	3.5 (3.1-4)	0.051
Public criticism and litigation	3.4 (2.6-3.8)	3.4 (2.7-4.1)	2.7 (1.9-4.1)	3.4 (2.6-3.9)	0.607
Occupational risks and hazards	2.8 (2.2-3.6)	2.6 (1.4-3.6)	2.6 (1.6- 4.1)	2.8 (2-3.6)	0.800
Conflicts and poor communication	3 (2.3-3.8)	3.3 (2-4)	2.5 (1.9-4.4)	3 (2-3.8)	0.974
Shift work	3 (2-4)	2.3 (1.7-4.3)	4 (3.3-4.5)	3 (2-4)	0.240
Professional requirements	3 (2.4-3.6)	3 (2.2-3.6)	3.2 (2.7-4.4)	3 (2.4-3.6)	0.626
Total rating	3.2 (2.7-3.6)	3.1 (2.5-4.1)	3 (2.5-4.2)	3.2 (2.6-3.7)	0.963

* Mann-Whitney Test

Participants with the shortest length of service (up to 10 years), rated work organisation and financial issues as the most significant sources of stress were, whereas occupational risks and

hazards were rated as the least significant sources of stress by the participants with 30 or more years of service (Table 7).

Table 7. Average rating on stress scale by length of service

	Median (25% - 75%) by the length of service				Total	p*
	up to 10 years	11 - 20	21 - 30	30 years and over		
Work organisation and financial issues	3.5 (3-3.6)	3.6 (3.1-4)	3.6 (3.2-4)	3.9 (3.5 - 4.1)	3.5 (3.1-4)	0.144
Public criticism and litigation	2.9 (2.6-3.6)	3.3 (2.7-4)	3.5 (2.7-3.8)	3.7 (2.9 - 4.1)	3.4 (2.6-3.9)	0.229
Occupational risks and hazards	2.8 (2.2-3.4)	2.8 (1.8- 3.6)	2.7 (2-3.9)	2.8 (2.1 - 3.7)	2.8 (2-3.6)	0.997
Conflicts and poor communication	2.8 (2-3.5)	3 (2.5-4)	3 (2-4)	3.3 (2.6 - 4.1)	3 (2-3.8)	0.258
Shift work	2.7 (2-4)	3 (2-4)	3.7 (1.6-4.3)	3.3 (2.5 - 4.2)	3 (2-4)	0.634
Professional requirements	3 (2.4-3.2)	3 (2.4-3.6)	3.3 (2.4-3.9)	3 (2.6 - 3.7)	3 (2.4-3.6)	0.275
Total rating	3 (2.5-3.5)	3.2 (2.7-3.7)	3.4 (2.5-3.9)	3.5 (3 - 3.8)	3.2 (2.6-3.7)	0.316

* Mann-Whitney Test

Discussion

The results of our research indicate that the participants working in operating rooms and intensive care units are exposed to a wide range of work stressors. Golubić et al. (2009) identified the six following major groups of occupational stressors among Croatian nurses: organisation of work and financial issues, public criticism, occupational hazards, interpersonal conflicts at workplace, shift work and professional and intellectual demands (16). Due to a lack of staff, nurses who take care of patients come under more pressure. As a result, such pressure causes concern and stress for nurses, whereas the lack of staff causes an excess of administrative tasks and overtime work, usually not paid by the State (17). Despite the lack of staff, the job has to be done, which leads to fatigue and exhaustion, thus further increasing the level of stress and keeping nurses in an ever-expanding vicious cycle. It has been found that temporary contract nurses suffer from higher stress levels than permanent contract nurses (9). All around the world, nurses have recognised a small number of workers as one of their greatest problems (18). In the countries in transition, there has been an increase in the number of nurses leaving the nursing profession (19). Work organisation and financial issues are significantly more stressful for nurses in comparison to any of the other factors mentioned in the research (20). The most common causes of stress for Chinese nurses are the imbalance between investment and gain, poor image of nursing in society and organisational issues (21).

When it comes to public criticism and litigation, the main stressors are constant responsibilities during 24-hour shifts, inappropriate public criticism and the threat of litigation. Women are exposed to significantly higher levels of stress, above all because of public criticism and litigation. It has been suggested that such higher stress levels result from multiple and complex roles that women have to perform – the role of an employee, wife, mother and housekeeper (22). Also, in a research conducted among Croatian nurses, Knežević (2009) pointed out that the stressors related to public criticism are the most common stressors for nurses working

in non-surgical professions, followed by those working in surgical professions (23).

Regarding occupational risks and hazards, the most significant stressors are coping with incurable patients, fear of infection and fear of injury from sharp objects. These are the main sources of stress for nurses and the situation has not changed even after thirty years (24). In a research conducted among Croatian nurses, Golubić et al. (2009) concluded that nurses with secondary education qualifications perceived occupational hazards as statistically significantly more stressful than nurses with a college degree, as well as that offering educational and career prospects can contribute to decreasing nurses' occupational stress levels (16).

Conflict between nurses and health care staff includes the power of superiors, the ability to work in a team, interpersonal relations and skills and expectations at different levels (25). A study on nurses conducted in Iran presented the factors that have an impact on conflicts (the nature of work, working conditions, work environment, hospital structure, management style and individual characteristics of employees) and that can improve or worsen the situation. The majority of nurses pointed out that they suffer from psychological stress due to misunderstandings between nurses and other staff (26). It is believed that good communication skills are required to create an effective relationship, which is why a lack of such skills can have a negative effect on nurses and their colleagues at work (27).

Certain personality traits can also affect occupational stress. "Screening" before employment, used for identification and presentation of one's "personality" and stress perception, can be considered a part of a particular employment strategy aimed at resolving the issues related to stress, illness and absence from work (28).

The most common factors causing burnout are as follows: work overload, lack of control, insufficient rewards, poor labour relations, injustice and conflict between values (29). A research in Belgium from 2015 showed that besides the softer work characteristics – such as

decision latitude, social capital and team cohesion – more insight and knowledge of the hard work characteristic workload is essential (30). Education, training and career opportunities can reduce occupational stress experienced by nurses and at the same time contribute to maintaining their working capacity (31). Overtime, shift and night work, responsibility in decision-making, contact with patients and their families and emotional exhaustion (burnout) of health care workers contribute to increased morbidity from mental disorders and psychosomatic diseases (32). In surgery, cognitive symptoms of stress include problems in concentration and memory, resulting in a risk for a patient's safety (33). A study conducted in China has also indicated that a lack of nurses, excessive paperwork, increased number of operations, imposed time limits and night shifts are factors associated with stress that have a negative impact on patient care (34). Serious problems and difficulties in patient care may cause crises in nurses' work and lead to various stressors, such as criticism at work, crisis between superiors and subordinates and job dissatisfaction. All of the above leads to symptoms related to cardiovascular, digestive and musculoskeletal changes as sources of stress (10).

Overall, the greatest sources of stress for the participants in the study are work organisation and financial issues, with shift work as the most significant stressor for nurses with college education qualifications. Occupational risks and hazards are the sources of stress for respondents aged 31-40. Although some variations were observed, they were not statistically significant. A study of causes of stress among nurses in Iran showed that work-related factors were more relevant in causing occupational stress than demographic and other

factors (35). However, a study conducted in Serbia yielded opposite results (36). Besides that, much research conducted among nurses has also shown that there is a connection between particular diseases and work-related stress, such as emotional exhaustion (37), physical exhaustion (32) and lower back pain (38).

Conclusion

In the summary of the results of this research, we conclude that total rating on the stress scale was 3.2 (interquartile range from 2.6 to 3.7). The most common stressors among surgical nurses are insufficient number of employees, work overload, administrative work, constant responsibilities during 24-hour shifts, inappropriate public criticism, fear of infection, conflicts with superiors, night and overtime work and pressure of imposed time limits. Results showed no statistically significant differences in the level of stress with regard to the participants' age, total length of service and level of education. Regarding female respondents, a considerable amount of stress arises from public criticism and litigation.

Better work organisation, supportive work environment, continuous education and stress management programs are essential for critical care and operating room nurses. Based on the above-mentioned facts, it is clear that further research on this matter must be conducted.

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