

WORK-RELATED STRESS FACTORS IN NURSES AT SLOVENIAN HOSPITALS - A CROSS-SECTIONAL STUDY

STRESNI DEJAVNIKI MED MEDICINSKIMI SESTRAMI V SLOVENSkih BOLNIŠNICAH - PRESEČNA RAZISKAVA

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ABSTRACT

Keywords:

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Background: Surveys conducted among healthcare workers revealed that nursing staff often face various stressors associated with occupational activities, which reduce their work efficiency. The aim of the study was to establish the level of stress in nurses working at hospitals in Slovenia and to identify stress-related factors.

Methods: A cross-sectional epidemiological design and a standardized instrument called the "Nursing stress scale" were used. The sample included 983 nurses from 21 Slovenian hospitals. The research was conducted in 2016.

Results: Prevalence of high level of stress was 56.5% of respondents (M (median)=75). Prevalence of high level of stress and stress factors may be statistically significant attributable to dissatisfaction at work ($p < 0.001$), disturbing factors at work ($p < 0.001$), inability to take time off in lieu after working on weekend ($p = 0.003$), shorter serving ($p = 0.009$), fixed-term work ($p = 0.007$), and an increased number of workdays on Sunday ($p = 0.030$).

Conclusion: The stress rate and stress factors are substantially influenced by variables reflecting work organization, competences and skills of healthcare management to work with people. Results reflect the need for nursing management and policy makers to design strategies to ensure adequate staffing, efficient organization and an encouraging work environment.

IZVLEČEK

Ključne besede:

stresorji, veljavnost,
delovna obremenitev,
presečne študije

Uvod: Raziskave, opravljene med zdravstvenimi delavci, so pokazale, da se zaposleni v zdravstvu pogosto srečujejo z različnimi stresorji, povezanimi s poklicnimi dejavnostmi, kar zmanjšuje učinkovitost dela. Cilj raziskave je bil ugotoviti stopnjo stresa medicinskih sester v bolnišnicah v Sloveniji in opredeliti dejavnike, povezane s stresom.

Metode: Metoda raziskovanja je bila presečna epidemiološka raziskava in modificiran standardiziran instrument »lestvica stresa med medicinskimi sestrami«. V vzorec je bilo vključenih 983 medicinskih sester iz 21 slovenskih bolnišnic. Raziskava je bila izvedena leta 2016.

Rezultati: Prisotnost stresa je opredelilo 56,5% anketirancev (M (mediana) = 75). Prisotnost stresa in dejavniki stresa so lahko statistično pomembne posledice nezadovoljstva pri delu ($p < 0,001$), motečih dejavnikov na delovnem mestu ($p < 0,001$), nezmožnosti koriščenja prostih dni po delovnem vikendu ($p = 0,003$), krajšega delovnega časa ($p = 0,009$), dela za določen čas ($p = 0,007$) in števila delovnih nedelj v enem mesecu ($p = 0,030$).

Zaključek: Na stopnjo stresa in dejavnike stresa znatno vplivajo spremenljivke, ki odražajo organizacijo dela, kompetence in veščine vodenja v zdravstvu za delo z ljudmi. Rezultati odražajo potrebo, da menedžment zdravstvene nege in oblikovalci politike oblikujejo strategije za zagotavljanje kompetentnih zaposlenih, učinkovitosti organizacije in ustreznega delovnega okolja.

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1 INTRODUCTION

Occupational stress mostly results from unexpected situations or issues requiring personal engagement and undertaking tasks that do not comply with one's knowledge, expertise, or expectations, resulting in person's inability to manage the situation (1).

Surveys conducted among healthcare workers revealed that nursing staff often face various stressors associated with occupational activities, which reduce work efficiency (2). According to the ANA (American Nurses Association) (3) stress in healthcare arises from work assignments, job roles, material and social environment such as lifting patients, needle stick injuries or other sharps injuries, physical and psychological assault committed by patients or their relatives, exposure to infectious diseases and toxic chemicals.

Exploring stress in nurses is of key importance in order to eliminate the sources of stress. By defining risks to health and safety in healthcare, the European Commission (4) also focuses on stress in healthcare workers. Studies investigating stress in nurses are well accessible to professionals on a global level; however, this kind of survey has not yet been conducted in Slovenia.

Stress is an important aspect for nurses, associated with the constant challenge to ensure proper care for patients and their families. However, stress levels in healthcare exceed the capacities of many nurses. An infrastructure that is not supportive of ensuring healthcare quality is often referred to as a stress factor in healthcare (5). As a result, there is a lack of encouragement in the work organization. The following factors are considered as stress factors: lack of break time (6) poor salaries (7), poor social and peer support (5), role conflicts in healthcare teams (7) poor access to physicians (2), lack of information and work equipment, delayed problem solving, lack of resources to perform tasks, unrealistic goals, high expectations related to work carried out on time, and in line with standards (6). Important factors for stress occurrence in nursing care are night work, shift work and overtime (8, 9).

Management often increases the workload in nursing care (9) and does not ensure sufficient staff resulting in a high operating speed (6) as well as varied workload in units (10). Overload reduces the capabilities of staff in solving emotional distress in patients, coping with death (7) and communication with family members. Poorly developed teamwork often leads to poor work relationships. Unfulfilled needs in the process of acquiring new knowledge are also of great importance as well as experiencing feelings of injustice, uncertainty around expectations at work, and inadequate rewards (11). Employees often consider difficulties in balancing between work and private life as the most common

stressors, conflicts among peers and vague values in an organization (2), poorly addressed daily work issues as well as the establishment of conditions for a safety culture by managers (12, 13).

2 METHODS

The aim of the study was to identify the level of occupational stress among nurses working at hospitals in Slovenia and to identify stress-related factors. A cross-sectional epidemiological design was used.

All Slovenian public hospitals were invited to participate in the research (N=26), 21 hospitals confirmed their participation. The study covered a large systematic sample, nurses who have completed at least upper secondary education (N=8787) in 21 Slovenian hospitals. A total of 1802 (20.5%) questionnaires were distributed, the response rate was 55% (983). A cross-sectional way of distribution was used. We decided to use at least 10% of the population consisting of 10.000 units (14). Questionnaire 19 demographic and 24 items job characteristics.

Nursing Stress Scale (NSS) (18) was compiled to capture stress-related data at workplace. For the purposes of this study, the questionnaire was translated from English into Slovene language and adjusted to only 24 statements out of 34 so that it adapts to a daily nursing practice in Slovenian hospitals. The original NSS was already used in several previous researches (15-18). After the pilot test (n=30), it was not modified. Respondents were asked to rate given situations on a 5-points scale (1=not stressful to 5=extremely stressful). 24-48 points mean low stress levels, 49-72 medium stress levels, and 73-120 points high stress levels. Before the distribution of the Slovene version of the questionnaires, the draft was initially submitted to experts as well as to a group of respondent (n=30) to ensure face and content validity. After the pilot test, it was not modified. Respondents were asked to rate given situations on a 5-points scale (1=not stressful to 5=extremely stressful). 24-48 points mean low stress levels, 49-72 medium stress levels, and 73-120 points high stress levels. Cronbach's Alpha reliability coefficient (α) for NNS 24 items was 0.935. A factor analysis delivering 4 factors was conducted (Table 3), which explaining the variances of 62% and the loading factors of all items within each scale exceeded 0.5. The research was conducted from March to July 2016.

2.1 Statistical Analysis

Descriptive and inferential statistics were obtained using the SPSS 20.0 for Windows. We used descriptive, correlational and exploratory linear regression methods. Principal Axis Factoring with Direct Oblimin rotation was performed to identify an optimal factor structure

of the 24-item Adapted NSS. Items with factor loadings <0.400 and cross-loadings >0.200 between primary and secondary loading were excluded to obtain convergent and discriminant validity (19). Examination of scree plot and initial eigen values were used to determine the optimal number of factors. Kaiser-Meyer-Olkin (KMO) and the Bartlett's test indicated appropriateness of the data structure for applying factor analysis (KMO=0.906; Bartlett: $\chi^2(105)=8531.781$; $p<0.005$) (20).

3 RESULTS

The sample represents 11.18% of nurses in 21 Slovenian hospitals (Table 1).

Table 1. Sample (frequencies).

Type of work	Category	N	N%
Highest level of nursing education	PNs	461	46.9%
	RN or BSc Nur	492	51.1%
	Master's degree	28	2.8%
	PhD	2	0.2%
Job position	PN	461	46.9%
	RN or BSc Nur	416	42.3%
	Professional Dpt. Head of Nursing / Dpt./Unit Head Nurse	77	7.8%
	Professional Div. Head of Nursing /Div. Head Nurse	3	0.3%
	Other	26	2.6%
Employment status	Temporary job	96	9.8%
	Permanent job	886	90.1%
	No reply	1	0.1%
Overtime	Yes	771	78.4%
	No	207	21.1%
	No reply	5	0.5%

Legend: PN - practical nurse, RN - Registered nurse, BS - bachelor's degree, PhD - doctorate

3.1 Respondents' Job Characteristics

In the study, monthly, respondents work 0 to 5 Saturdays and 0 to 4 Sundays. Following a weekend-shift, 164 respondents can take a day off, 542 respondents occasionally take a day off, and 129 respondents never take a day off after working a weekend-shift. Overtime was done by 771 respondents. 327 respondents consider them as occasionally present disturbing factors, 390 respondents consider them as frequently present, and 199 respondents consider them as continuously present disturbing factors. Nevertheless, 815 respondents are satisfied with their job, 165 respondents are dissatisfied with their job, and 3 respondents did not submit their answer.

Table 2. Characteristics of a sample.

Variable	N	M	SD
Age	983	39.94	10.18
Years of Service	983	18.53	11.31
Years of Service (Institution)	983	16.81	11.43
Number of working Sunday peer month	873	1.72	0.73
Number of working Saturday peer month	881	1.94	0.88

Legend: N - Number of valid cases, M - Mean, SD - Standard deviation

A factor analysis delivering 4 factors were conducted (Table 3).

Table 3. Descriptive characteristic of Adapted Nursing Stress Scale and Cronbach's α for observed factors.

Factor / item	N	M	SD	Me	Sk	Ku
Cronbach α = 0,910, explains the variance of 62%						
Factor 1 - Organizational Stress Factors Cronbach α = 0.842, explains the variance of 42.1%	979	3.22	0.79	3.17	-0.105	-0.150
Factor 2 - Conflictual Communication among Peers Cronbach α = 0.929, explains the variance of 9.6%	982	2.90	1.07	3.00	0.185	-0.779
Factor 3 - Poor Relationships with patients and family Cronbach α = 0.826, explains the variance of 6.2%	982	3.31	0.92	3.33	-0.129	-0.507
Factor 4 - Management Requirements Cronbach α = 0.742, explains the variance of 4.2%	977	2.87	0.94	3.00	-0.013	-0.359

Legend: N - Number of valid cases, M - Mean on 5-point scale, SD - Standard deviation, Me - Median, Sk - Skewness, Ku - Kurtosis

3.2 Adapted Nursing Stress Scale (A-NSS)

A high level of stress was determined by 56.5% of respondents ($M=75$, $SD=16.7$). The total average value for each four factors delivered a mean value. Differences between genders were significant for Management Requirements (F4), where women had a significantly higher mean value than men ($p=0.040$). Differences between temporary and permanent jobs were significant for Organizational Stress Factors (F1) ($p=0.025$) and Conflictual Communication among Peers (F2) ($p=0.027$), where temporary jobs had a significantly higher mean value. Differences between Satisfied with Job or Dissatisfied with Job were significant for all factors with a significantly higher mean value for Satisfied with Job (Table 4).

Table 4. Comparison of NSS-A factor's mean values between groups.

	S		Factor 1		Factor 2		Factor 3		Factor 4	
<i>Categorical Variables (dichotomous)</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
Gender (male)	0.840	0.401	0.341	0.733	1.394	0.164	-0.793	0.428	2.052	0.040
Employment status (Temporary)	2.198	0.028	-2.239	0.025	2.216	0.027	1.145	0.253	1,693	0.093
Job satisfaction? (Yes)	7.863	<0.001	-9.822	<0001	4.005	<0.001	5.248	0.000	3.200	0.001
<i>Categorical Variables (more than 2 categories)</i>			<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
Job Role	0.573	0.564	0.212	0.809	4.998	0.007	1.317	0.268	0.247	0.781
Institution	5.541	0.004	8.129	<0.001	1.791	0.167	0.861	0.487	0.895	0.409
Department	1.716	0.144	0.981	0.417	1.991	0.094	5.091	0.007	3.136	0.016
<i>Continuous Variables</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Years of Service (Institution)	-0.001	0.983	-0.010	0.744	-0.041	0.198	0.052	0.104	0.072	0.024
Years of Service (Department)	-0.002	0.948	-0.006	0.860	-0.068	0.033	0.041	0.200	0.063	0.048
The average number of workdays on Sundays in a month	0.069	0.046	0.065	0.055	-0.063	0.064	0.161	<0.001	0.006	0.868
The average number of workdays on Saturdays in a month	0.062	0.072	0.043	0.203	-0.064	0.056	0.132	<0.001	-0.005	0.883
<i>Ordinal variables</i>	<i>r_s</i>	<i>p</i>	<i>r_s</i>	<i>p</i>	<i>r_s</i>	<i>p</i>	<i>r_s</i>	<i>p</i>	<i>r_s</i>	<i>p</i>
Highest level of nursing education	0.034	0.298	0.021	0.503	0.118	<0.001	-0.053	0.099	-0.010	0.761
After working a weekend shift can you have time off in lieu?	0.129	<0.001	0.128	<0.001	0.084	0.013	0.099	0.003	0.065	0.056
On a scale from 1 - 5, how would you rate the presence of disturbing factors in your job?	0.367	<0.001	0.349	<0.001	0.221	<0.001	0.287	<0.001	0.238	<0.001

Legend: Factor1 - Organizational Stress Factors, Factor 2 - Conflictual Communication among Peers, Factor 3 - Poor Relationships with Patients and Family, Factor 4 - Management Requirements, t - , p - p-value, r - Pearson's correlation coefficient, r_s - Spearman's correlation coefficient

ANOVA was used to test the differences in factor's mean values between three or more independent groups. We found significant differences in Conflictual Communication among Peers (F2), and the mean values between respondents working in different work positions (p=0.007). Differences were also significant in Organizational Stress Factors (F1) mean values (p<0.001), where the group University Medical Centre had significantly higher mean values compared to others. Differences were also significant in Management Requirements (F4) mean values (p=0.016), where the group Care Unit had a significantly higher mean value compared to the group Intensive Care Unit, Clinic, and Emergency.

The Spearman correlation coefficient was used to compute how factors correlate with ordinal variables (Table 4). Variables for Highest Level of Nursing Education and Free Days after Working at Weekend significantly correlated with some factors, but all correlations were relatively small (p<0.001). The variable Assessment of Doing Your Job Without Disturbing Factors had weak, but statistically significant positive correlation with Organizational Stress Factors (F1) (p<0.005), Conflictual Communication with co-workers (F2), (p<0.005), Insufficient Relationships with Patients and Family (F3) (p<0.005) and Management Requirements (F4) (p<0.005).

The condition for inclusion into the regression model was a significant correlation between the independent and dependent variables using the Enter method (Table 5).

Table 5. Results of the multiple linear regression analyses for stress levels and factors obtained.

Characteristics	(R ² =0.169) Level of Stress achieved				(R ² =0.181) Factor 1				(R ² =0.089) Factor 2				(R ² =0.100) Factor 3				(R ² =0.061) Factor 4			
	b	SE _b	B	p	b	SE _b	B	p	b	SE _b	B	p	b	SE _b	B	p	b	SE _b	B	p
Gender (male)																	-0.137	0.099	-0.047	0.166
Employment status (<i>Temporary</i>)	-3.331	1.799	-0.060	0.064	-0.147	0.082	-0.055	0.073	-0.340	0.126	-0.093	0.007								
Job satisfaction? (<i>Yes</i>)	-7.870	1.410	-0.185	<0.001	-0.481	0.065	-0.235	<0.001	-0.243	0.095	-0.087	0.010	-0.246	0.079	-0.110	0.002	-0.187	0.083	-0.076	0.025
Job position																				
RN and BSc Nur									0.177	0.254	0.082	0.486								
Practical Nurse									0.017	0.255	0.008	0.948								
Professional Head of Nursing Care / Head Nurse of Dpt. / Division									0.340	0.282	0.088	0.228								
Years of Service (<i>Institution</i>)									-0.009	0.003	-0.092	0.009					0.005	0.005	0.066	0.270
Years of Service (<i>Department</i>)													0.128	0.059	0.099	0.030	0.000	0.005	-0.002	0.976
Number of workdays on Sundays in a month.	0.646	0.754	0.028	0.392									0.022	0.046	0.022	0.626				
													0.133	0.090	0.052	0.138				
Number of workdays on Saturdays in a month.													0.412	0.065	0.226	<0.001				
Time off in lieu after work at weekend (<i>never</i>).	4.499	1.502	0.098	0.003	0.200	0.068	0.092	0.003	0.320	0.100	0.105	0.001								
Job without disturbing factors (<i>1-5 Scale</i>).	9.204	1.120	0.273	<0.001	0.403	0.050	0.253	<0.001	0.400	0.074	0.182	<0.001					0.329	0.066	0.170	<0.001

R²=Adjusted R-Squared, b=Regression coefficient, SE_b=Standard regression coefficient error, B=Standard regression coefficient, p=p value, Factor1 - Organizational Stress Factors, Factor 2 - Conflictual Communication among Peers, Factor 3 - Poor Relationships with patients and their Families, Factor 4 - Management Requirements

Three variables can be used to explain the stress level in 16.9%, the same number of variables can be used to explain Organizational Factors (F1) in 18.1%, Conflictual Communication among Peers (F2) in 8.9% using 5 variables, Insufficient Relationships with Patients and Family (F3) 10.1% using 3 variables, and Management Requirements (F4) in 6.1% using 2 variables. The following are the independent and statistically significant variables to clarify the stress levels and the background of stress: Dissatisfaction with the Job affects the stress level; to Perform Work without any Disturbing Factors has a positive impact on all response variables; Inability to have a day off after working at weekend has a positive impact on the stress level and Organizational Stress Factors (F1) as well as on Conflictual Communication among Peers, while the Fixed-Term Employment has a negative impact on Conflictual Communication among Peers (F2). Years of Service has a negative impact on Conflictual Communication among Peers (F2), the number of workdays on Sundays in a month has a positive impact on the Insufficient Relationships with Patients and Family (F3).

4 DISCUSSION

This study investigated the level of stress in nurses working at hospitals in Slovenia and to identify stress-related factors. Key findings of the study are that the overall occurrence of stress levels among respondents working as nursing staff at Slovenian hospitals are high and comparable with research undertaken in other hospitals (21, 22). Stress levels in our study can be explained by the levels of job satisfaction, performing work without disturbing factors and a possibility to have a day off in lieu after working overtime, which has a significant impact on stress perception in Slovenian hospitals. In addition, comparable stress factors were highlighted by other authors as well (23), who used different measuring scales.

By means of the adapted NSS scale, stress was also specified using four reliable factors. Organizational stress factors could best explain the source of stress using the NSS scale (16-18, 24, 25). Organizational stress factors in our study were explained by working conditions not including disturbing factors, job satisfaction, and

possibilities to take time off in lieu after working overtime, which was not emphasized by other authors as well (8, 9). Stress is explained to a smaller extent by the remaining three factors, which identified the importance of good relationships among nurses' work environment, appropriate relationship with patients and their families, and direct management operations. The study (25) concluded that poor work organization and conflictual communication among peers have a negative impact on the wellbeing of employees. The findings of our study were confirmed by previous studies (27) highlighting work load as the most stressful factor.

Our study finds important observation for demographic variables. Female respondents rated the significantly important higher stress levels in relation to "Management Requirements", which is in line with the results of other studies investigating stress and confirming the gender role in the perception of stress levels (21, 22).

Temporary jobs have a statistically significant positive correlation to stress levels. "Conflictual Communication with Peers" has a statistically significant negative correlation to "Organizational Stress Factors" confirming the results of previous studies (23, 24). Respondents who are not satisfied with their jobs in hospitals evaluated/rated the stress levels as statistically significant with all factors, hence the results are in line with the findings of other studies (25, 26). Respondents working as PNs rate their jobs as less stressful compared to RNs or BSc Nur, who consider "Conflictual Communication with Peers" and "Insufficient Relationships with patients and family". This can be explained by the Slovene educational structure in nursing care, as there are 8.6 nurses per 1000 people of which only 2.5 are RN or BSc Nur, with completed higher education in accordance with EU directives (2013/55/EU, 2005/36/E). The rest are PNs with completed secondary education, which places Slovenia at the bottom of the list of European countries. The research shows that RN or BSc Nur - as nursing care pillars - has an increased workload and are therefore more exposed to stress (27). This confirms the results of previous studies (28) that education levels have an impact on job satisfaction. The institution or department itself can also affect stress levels. Staff employed at university hospitals evaluated the presence of stress as statistically significant compared to staff employed at general hospitals or specialized hospitals in view of "Organizational Stress Factors" (29). Staff working at a hospital department rated the presence of stress as statistically significant in view of "Management Requirements", whereby previous studies highlighting Intensive Care Units (ICUs) and Emergency Departments (30-36) could not have been confirmed.

Because the instruments were translated into Slovenian prior to validation, there is a possibility of slight differences in the local terminology compared to the original instruments. In research, the original questionnaire was not used in its entirety. The sample is not balanced in terms of participants' educational achievement, but this reflects the actual educational structure of employees in Slovenian hospitals, where the share of RNs or BSc Nur does not correspond to comparable studies. The entire population of nurses working at 21 Slovenian hospitals was included in the study; all employees had the chance to participate. It is possible that the respondents were overly positive or negative towards stress factors; therefore, caution should be applied if generalizing the findings. This is especially relevant for international comparisons because the share of nurses with a higher education in Slovenia is significantly lower compared to other EU countries. Finally, the accuracy of self-report survey techniques may be limited as nine items were excluded due to low factor loadings, high cross-loadings or both. FA as part of the comparative research featuring 34 statements delivered seven subscales, whereas the adapted NSS delivered four subscales.

5 CONCLUSION

Stress in hospital nurses is related to work organization. The research shows that the nursing in Slovenian hospital has a high level of stress. Stress is one of the factors that contributes to inefficiency, increasing staff turnover and sick leave, and reduces the quality and quantity of care, affecting health costs and diminishing work satisfaction. It would be helpful to pursue research in specific areas where caregivers define the presence of stress to the greatest extent, and how in these areas patients define quality and safe treatment.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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ETHICAL APPROVAL

Research includes human data, which have been performed in accordance with the Declaration of Helsinki and have been approved by the Republic of Slovenia National Medical Ethics Committee (No. 0120-10/2017-4). Before interviews, the nature and the purpose of the study were explained, and full confidentiality was assured to all participants. All participants were informed about their right not to participate in the study and gave their oral consent before the study. Design of the study and interviewing with oral consent was approved by the Republic of Slovenia National Medical Ethics Committee.

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