

ORIGINAL PAPER

PSYCHOLOGICAL STRAIN BETWEEN NURSES

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Abstract

Aim: The aim of the study was to identify differences in perception of work (mental) workload among nurses providing acute and chronic nursing care. **Design:** Study design is cross-sectional and descriptive. **Methods:** The sample of respondents consisted of 97 nurses working in departments Neurology, Anesthesiology and Intensive Care Unit of the hospital St. James in Bardejov, University Hospital of L. Pasteur in Košice and University Hospital J. A. Reiman in Prešov. To measure psychological strain, Meister's questionnaire for neuropsychological strain was used. **Results:** Increased psychological strain was observed in nurses providing acute care versus nurses providing chronic care, particularly in job satisfaction, long-term tolerance, time constraints, high responsibility, nervousness, fatigue and satiety. In comparison with the population norm, nurses in acute care achieved significantly higher indicators of factor I (strain) and gross score as nurses in neurological care. A statistically significant relationship between psychological stress and age of nurses working in anesthesiology and intensive care departments was confirmed. Nurses with long term practical experience are exposed to intense mental stress (especially in the areas of strain and monotony). **Conclusion:** The results of our study suggest the reality that variable qualities of work related strain among nurses can lead to physical and emotional exhaustion.

Keywords: nurse workload, psychological stress, physical stress, sources of stress, Meister's questionnaire.

Introduction

In fulfilling the duties of a nursing practice, one is often confronted with many factors in the work place which eventually affect the adaptive capacity and subjective perception of work of nurses. The impetus for the realization of this study was numerous studies that show the frustration and dissatisfaction of nurses working in clinical practice in the context of the operational aspects.

Vévoda et al. (2013) defines psychological stress at work as *"a process of psychological treatment and coping with the requirements and working environments. Long-term psychological stress can result in health disorders such as certain psychosomatic diseases (ischemic heart disease, ulcer disease, hypertension) disorders of the mental health"*.

An aging population, the increasing pace of life, unstoppable technological progress, time and organizational pressure, increasingly higher demands on productivity and many other requirements in a global work environment, as well as in the medical field, are becoming a cause of stress. Nursing care under our conditions is constantly changing, whether legislatively, procedurally or organizationally. Nurses are trying to restore the long-term status and respect that they are due. Any change, however, according to forecasts should bring about an improvement, but health workers, including nurses, are under pressure and experience many stressful events.

In general, nurses' work is physically demanding. Many factors are associated with psychological work related stress such as overload or underutilization, high demands from work, time pressure, work intensity, monotony, fast pace of work, interpersonal conflicts, high material and organizational responsibility, shift work (continuous working schedule and night work) at a forced pace, adverse working conditions, health risks to themselves and others, impeded social interaction, long-term social isolation (Balogová, 2009; Kudlejová, 2005; Vévoda

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et al., 2013). Many selective authors present the primary stress contributing factors in the work of nurses as conflicts in interpersonal relations, time pressure associated with the inability to establish individual relationships with a high number of patients, the risk of failing professional defense when exposed to human suffering and pain – coping with feelings of helplessness, great responsibility for the results and consequences of their work, the need for rapid decision making and purposeful behavior even in the absence of information (Bartošíková, 2006; Vengľáková et al., 2011; Vévoda et al., 2013). Working in continuous operation is carried out at the expense of family and social relationships of nurses and disruption of circadian rhythm, potentially leading to sleep deprivation (Mlýnková, 2010). Apart from the stimulating effect of time pressure, flexible and effective decision making is connected with pressure from deadlines, which nurses face particularly when there is a reduced number of nurses necessary for normal operation of the department. The nurse finds herself in a situation where she must consider care for more patients and carry out all necessary interventions to satisfy the patients' needs. A nurses' work is linked to lifelong learning, and nurses are often presented with low financial and moral appraisalment (Balogová, 2009).

Aim

The aim of the study was to evaluate the perception of psychological stress in nurses working in selected workplaces, while focusing on tracking the relationship between psychological stress and socio-demographic factors (age, length of professional experience).

Methods

Design

The design of the work is cross-sectional, descriptive.

Sample

The sample of respondents consisted of 97 nurses working in residential health facilities in Prešov and Košice region, of which 46 (47.4%) nurses from the departments of Anesthesiology and Intensive Care Unit (hereinafter AIM) and 51 (52.6%) nurses from the neurology departments (hereinafter NEU). Three hospitals were addressed – Hospital and Polyclinic St. James, n.o., Bardejov (Department of Anesthesiology and Intensive Care, Department of Neurology), University Hospital of L. Pasteur in Košice (Department of Anesthesiology and Intensive Care, Rastislavova 43, I. Department of Anesthesiology and Intensive Care, Neurology, Class

1 SNP), University Hospital Polyclinic J. A. Reiman in Prešov (Department of Anesthesiology and Intensive Care, Clinic of Neurology), from which we obtained written consent for the realization of research. Sampling of respondents was systematic and deliberate. The criteria for inclusion in the research sample were nurses working for the inpatient section of the Department of Neurology (clinics and departments) Department of Anesthesiology and Intensive Care Unit with the minimum years of professional experience and willingness to cooperate. The collection of data from respondents was conducted from January 2014 to May 2014. During this period, we contacted a total of 110 (100%) nurses from selected health facilities. Thirteen nurses denied the opportunity to participate in the research. The response rate was 88%. The largest number of nurses working at both workplaces was aged 30–49 years (66%). The majority of nurses in the survey sample had professional experience ranging from 11 to 20 years (36.1%) and over 21 years (34%). In terms of education, 31% of nurses had achieved secondary education, six nurses (7.80%) with higher vocational education and 26% with university degree in nursing level the first, 22% with university education level the second.

Data collection

We evaluated our focus group with the help of Meister's questionnaire for neurophysical strain. The questionnaire was created by W. Meister from Zentralinstitut for Arbeitsmedizin in Berlin in 1975, and in the years 1976–1984, its verification was carried out. The questionnaire focuses on measuring subjective neurophysical strain at work. The Meister questionnaire contains ten stated questions to which workers express their views. The tool evaluates mental stress at work in three areas. Those being mental overload, stress from monotony, and non-specific stress (stress response). Individual factors are filled with relevant issues, namely: time pressure, low satisfaction, high responsibility, mind-numbing work, problems and conflicts, monotony, nervousness, supersaturation, fatigue and long-term capacity. The respondent chooses from responses: 1 – no, strongly disagree, 2 – tend to disagree, 3 – I do not know, sometimes yes, sometimes no, 4 – rather yes, 5 – yes, I fully agree. This is based on polytomous variables with complete choices to complete the selection (Hladký, Žídková, 1999).

Evaluation by questions

We realized the evaluation of mental strain of nurses using Meister's questionnaire in two ways, based on median values for each item in the questionnaire and on average values of monitored factors and gross

score set up by W. Meister for the working group. We compared our results with the critical values and median diameters, which for our population, were introduced by the authors Hladký, Žídková (1999). Via Meister's questionnaire, we determined 3 degrees of strain.

Data analysis

The obtained results of the survey were saved and stored on a database using Microsoft Office Word and Excel, the statistical program SPSS (Statistical Package for Social Sciences, version 21) were processed by descriptive statistics – the mean, standard deviation. To determine differences and mutual correlations, we used statistical tests, Student's two-sample t-test and Pearson's chi-square test of independence.

Results

Analysis of items on Meister's questionnaire

The orientation evaluation of stress factors was based on the transgressing critical values of the median (Table 1). In the items where the median exceeds the critical value, the group evaluated work negatively; and vice versa, in which the median values do not

reach the critical values, the group evaluated work rather positively.

In comparing median values with critical values, the result is nurses from group AIM evaluate negatively: little satisfaction (3.0) and long-term carrying capacity (3.0) which means that nurses are not satisfied with work, do not like to go to work, and meanwhile see work as so mentally difficult that they cannot perform their duties for years and with the same level of performance. At the same, nurses from group AIM, in relation to work, feel time pressure, high responsibility, nervousness, fatigue and supersaturation. Conversely, they do not perceive work as stupefying (2.0) and monotone (1.5), nor have problems and conflicts in the workplace (2.0).

Nurses from group NEU negatively evaluate long-term carrying capacity (3.0), similarly as nurses from group AIM. Their work is carried out under time pressure and high responsibility, resulting in feelings of nervousness and fatigue. Positively perceived areas for the group of nurses are areas such as low satisfaction (2.0), mind-numbing work (2.0), problems and conflicts (2.0), and monotony (1.0), since these items did not reach the critical value (2.5) of the median.

Table 1 Evaluation of items in Meister's questionnaire

Items	K	AIM Median value of files	NEU	Incorporated into factor
Time constraints	3.0	3.0	3.0	I.
Low satisfaction	2.5	3.0	2.0	II.
High responsibility	3.0	3.0	3.0	I.
Mind-numbing work	2.5	2.0	2.0	II.
Problems and conflicts	2.5	2.0	2.0	I.
Monotony	2.5	1.5	1.0	II.
Nervousness	3.0	3.0	3.0	III.
Supersaturation	3.0	3.0	2.0	III.
Fatigue	3.0	3.0	3.0	III.
Long term work	2.5	3.0	3.0	III.

K – critical values, AIM – departments of Anesthesiology and Intensive Care Unit, NEU – Neurology departments, Factor: I. – strain, II. – monotony, III. – unspecific factor

Factor analysis of Meister's questionnaire

In group evaluation of stress factors, the average value of three defined factors of stress are observed: I. monotony, II. strain, III. nonspecific factor, HS gross score. The individual factors contain respective entries from which the sum of mathematical averages show the level of stress in a given area. Exceeding the average critical values (compared with the population norm) indicates above average stress in one of the factors, inasmuch as the given critical values are established for the female population (Table 2).

The foregoing results show that not even one group exceeded the critical values in any of the factors. Comparing the subscales of Meister's questionnaire by t-test for two independent samples did not express any statistically significant difference between the groups ($p > 0.05$). At the same time, however, it may be concluded that the greater strain in the factors of overloading, monotony, non-specific factor (stress response) and gross score is present with AIM nurses, since the averages of the factors within this group are closer to the critical value norms when compared to the averages within NEU nurses group.

Table 2 Evaluation of factors of psychological stress in nurses

Factor	Name of factor	Norm		AIM		NEU		t	p
		mean	K	mean	SD	mean	SD		
I.	Strain	8.4	10	9.20	1.87	8.41	2.16	1.899	0.061
II.	Monotony	7.6	9	6.35	1.77	6.24	2.31	0.267	0.790
III.	Unspecific factor	11.7	14	11.59	3.10	10.88	3.46	1.052	0.295
HS	Gross score	25.0	29	27.13	5.52	25.53	6.88	1.256	0.212

K – critical value, SD – standard deviation, t – test of statistical significance, p – level of statistical importance, AIM – departments of Anesthesiology and Intensive Care Unit, NEU – Neurology departments

Note: For calculation of factor analysis: overload /I./ – item number 1+3+5, monotony /II./ – item number 2+4+6, nonspecific factor /III./ – item number 7+8+9+10, gross score /HS/ – sum I.+II.+III. factors.

On the whole, the acute care nurses are therefore exposed to higher mental stress levels related to time pressure, little job satisfaction, high responsibility for decision-making, nervousness and fatigue symptoms as well as to the sense of work overload. As far as the long-term carrying capacity is concerned, it may be anticipated that their work is more stressful than the work of the chronic care nurses.

Mental strain classification

The three-degree classification in Meister's questionnaire serves the purpose of assessing the sensorial and mental strain. The strain classification was based on the calculation of strain degrees related to medians, respectively averages of the items (Table 3).

Table 3 Strain degree

Group	K I.	K II.	K III.	Total	Strain degree
AIM	8.0	6.5	12.0	26.5	1–2
NEU	8.0	5.0	11.0	19.0	1

K – critical value, I. – overload, II. – monotony, III. – non-specific factor

On the basis of descriptive statistics, AIM group reached a numeric strain degree, or the respective strain tendency between degree 1 and 2, i.e. the tendency towards the combination of monotony and overload. Degree 1 is for AIM group interpreted as the mental strain which probably does not affect neither the health conditions, subjective conditions nor performance levels (this excludes coincidental, situation-dependent variations in the course of a work shift). Degree 2 means the mental strain which may cause regular effects on health conditions, and/or performance levels.

The classification degree for NEU group was defined by a numeric value of degree 1, i.e. the tendency towards overloading.

According to the strain degrees it may be concluded that the mental strain of the acute care nurses is greater than that of the chronic care nurses. Within

both assessed groups the strain leans towards overloading accompanied by time pressure, high responsibility, problems and conflicts at the workplace. However, the acute care nurses are faced with monotony – stereotype of their work, which is related to little job satisfaction as well as the mind-numbing nature of work.

Mental strain analysis by Meister's questionnaire in relation to respondent's age and years of professional practice

Table 4 represents a statistical relation between nurses' mental work strain and a number of years of service within the both compared group by means of *Pearson's correlation quotient (r)* and the data of Student's double-sample t-test with a significance degree (significance level) of 5 %, $p \leq 0.05$.

Table 4 Mental strain correlation between nurses' age and years of professional practice

Factor	NEU – AGE		NEU – PRACTICE		AIM – AGE		AIM – PRACTICE	
	p	r	p	r	p	r	p	r
I.	0.969	0.006	0.713	-0.053	0.043	0.300	0.833	0.032
II.	0.868	0.024	0.508	0.095	0.018	0.346	0.409	0.125
III.	0.735	-0.049	0.865	-0.024	0.543	0.092	0.432	-0.119
HS	0.885	-0.021	0.910	0.016	0.093	0.251	0.832	-0.032

I. – overload, II. – monotony, III. – non-specific factor, HS – gross score, p – significance level, r – correlation quotient /-1 - +1/

On the basis of the statistical significance level we found a statistically significant correlation between AIM nurses' age and the overload factor ($p = 0.043$) and the monotony factor ($p = 0.018$). With the other strain factors this very correlation was not statistically significant ($p > 0.05$). The simultaneously recorded positive correlation between all the factors (overloading, monotony, non-specific factor – stress response, gross score) in relation to nurses' age shows that the older the AIM nurses, the more obvious the mental strain factors. As far as the length of professional practice, there was not recorded any statistically significant correlation between the service and Meister's questionnaire mental strain factors. The values of Pearson's correlation quotient also point at a weaker positive correlation between the overload factor and monotony related to the professional practice, i.e. with a growing number of years served the overloading grows as does the monotony strain.

The outcome indicates that the nurses providing acute care are getting, with their growing age, mentally overloaded and face stereotype at their workplace. The same results might be found in relation to a growing number of years served, however, this has not been proven. It may be anticipated that, with a growing age and growing number of years of practice, the perception of mental strain might be more intensive.

As shown by the statistical indicators, for NEU group it may be concluded that the correlation between the age and years of professional practice and Meister's questionnaire strain factors is not statistically significant. The significant negative correlation between the strain and age/years served factors was not observed within the given group. On the contrary, it was found that there is a positive correlation between the monotony factor and the years of practice ($r = 0.095$), i.e. with a growing number of years served the monotony overload prediction is increasing as is the questionnaire overall gross score (a total of all the factors).

On the basis of this very outcome it is interpreted that the chronic care nurses, with growing age and number of years served, possess a higher risk of having a sense of monotony and routine work. The years served, however, may bring about an increase of mental strain in all the factors.

Discussion

Carayon and Gurses (2008) point to the heavy workload of the American Nurses Health. The nurses are faced with higher load levels than ever before for four main reasons: 1. the increased demand for nurses

due to aging populations, 2. insufficient "supply" of nurses, as education authorities are unable to keep up with the growing demands for education, 3. reduced number of nurses and increased overtime in connection with the rising cost of healthcare, and 4. reduced patient length of stay in the hospital, which is linked to reducing costs. Nurses are forced to intensively take care of more and more patients. We believe that these factors are relevant even in our conditions.

The results of our study are comparable with the results of other studies investigating the issue of work related stress in the largest group of health professionals – nurses.

According to Hodáčová et al. (2007), it is desirable to perform mental strain screenings in all professions and independently examine their genesis on each site to find and initiate an effective remedy. This statement is justified because during the analysis of mental workload in the profession of nursing, we have come to identify stress factors (long-term carrying capacity, little satisfaction), rising from exceeding critical values.

From an intergroup perspective, nurses providing acute and intensive care perceive their work as mentally demanding and the performance they once administered, declining over years. It is associated with negative feelings after arriving to work and achieving low satisfaction at work. AIM group equally perceive their work as interesting, non-stereotypical and without conflicts. In contrast, nurses providing chronic care see work as unbearable in the long term, as with AIM nurses. Care for neurological patients brings non-stereotypical, interesting work, and nurses experience an inner satisfaction. Both sets of nurses reached critical values in: time pressure, high responsibility, nervousness and fatigue. The perception of the stress generated by those items is borderline for nurses, therefore it can be assumed that with the passage of time nurses will assess the burden more negatively or more positively.

Through subjective perception of stress during research of many professions by Hodáčová et al. (2007), she found that time pressure is the most significant factor of work related stress in health care workers. Similar studies by Bubelová (2009) and Žídková (2002) confirm that time pressure and long-term carrying capacity are frequently occurring factors of nurses' work, which they assess negatively. Gurková and Macejková (2012) report that the negative evaluation of mental strain in a sample of nurses is contingent on the occurrence of fatigue, high responsibility and time pressure. Persistent time

pressures at work in general burden an employee which ultimately negatively effects health and work efficiency (Reider, Faedo, Reinhard, 2012).

The study highlighted the differentiation in perception of mental strain factors in nurses' work in terms of its performance in clinical conditions. Nurses working in clinics AIM compared to the nurses in Neurology are to a greater extent subject to stressors such as overload or monotony and their stress response to strain is also higher. Střížová (2010) achieved similar results, in which the mental stress in a set of monitored nurses in the intensive care unit reached level 1–2. We note that sudden changes in the patient's condition, constant monitoring of physiological functions and patient condition are potential sources of high stress and time pressure, necessary for nurses concentration. Providing emergency care requires fast and flexible thinking, decision making and implementation of numerous interventions.

The issue of mental workload and stress among nurses working in intensive care units has been evaluated in numerous studies. Among specific stressors in departments AIM and JIS, we consider higher mortality of patients, dying of young people in acute illness or injury, and observing instruments and properly recognizing the changes. Sudden changes in health condition of the patient also cause stress in these workplaces (Sovářiová-Soósová, Varadyová, 2012). We identified of the same stressor in AIM sisters in our research.

The opposite result was found by Vidličková (2013), in her work where she assayed the level of mental strain of nurses working in a modified system in intensive and subsequent care units in relation to age, experience, and education of nurses. Data analysis shows the resulting degree of psychological stress in intensive care units reached level 1 and in subsequent care units, level 2. Nurses in the monitored group most often reported a feeling of time pressure and long-term carrying capacity.

The work of nurses working in AIM department is perceived as stressful, challenging and diverse, but bringing about job satisfaction and satisfaction in performance. However, even variables like marital status, number of children or length of service do not play a significant role in creating burnout syndrome (Libigerová, 1999). Rybářová and Stejskalová (2010) reported that nurses from AIM are predisposed by nature of the work to burnout syndrome compared with nurses from standard departments.

Psychological stress to which nurses are exposed, emerges not only from the commitment of the health care provider, but also from the quality of social

interaction and communication in the workplace. A positive finding of our study was nurses were rated as having harmonious relations and a favorable working climate. Many authors state that inappropriate behavior and communication of medical staff (in vertical and horizontal planes) in the workplace can lead to collective frustration and disruption of interpersonal relationships that can have a significant impact on the quality of health care provided (Bártlová 2006; Kudlejová, 2005; Wolfová, Chaloupka, 2009).

We believe that nurses with higher age and practice more intensively perceive stimuli in the working environment. The results of Hašová (2010), in which the MBI questionnaire was used to determine dependence between the length of occupation and level of burn-out in all areas (emotional exhaustion, depersonalization, personal satisfaction) showed that burnout scores for nurses grew proportionally with increasing length of professional experience. Using the same research tool in the study by Dimunová and Nagyová (2012), a statistically significant relationship between the rate of burnout and length of professional practice was confirmed. In the sample of 844 respondents, we recorded a significantly higher incidence of burnout with length of professional practice from 1 to 3 years and from 5 years. Klimánková (2013), in her research aimed at identifying the work related stress of nurses working on acute and standard wards, monitored factors caused by workload of nurses in relation to age, education and experience. The relationship between strain, age, and education were not significantly confirmed, but the relationship has been demonstrated between strain and the length of practice, despite the fact that the level of work related stress in the surveyed sample did not differ. Vidličková (2013), in her research on nurses monitored in different departments and analyzed by Meister's questionnaire, found a statistical correlation between seniority, age and education in factor I (overload). Our study did not show a statistically significant correlation between the length of professional experience and occupational psychological burden. We consider it necessary to monitor mental strain of nurses at set intervals, as the psychological well-being, and regeneration of strength in nurses can have a positive impact on the quality of care and health of the patient. Equally, significant psychological burdens on nurses can lead to health risks to patient, and at the same time the nurses themselves.

The findings of our survey indicate a higher mental stress on nurses providing acute care, because of the high demands and the intensity work. In terms of

physical demands, significant differences among nurses was not determined, but relatively frequent statements showed higher physical stress among nurses providing chronic care. Likewise, the findings show that nurses providing chronic care are exposed to a greater variability of stressors that can lead to a loss of motivation and interest, increasing physical and mental stress, all of which can result in a departure from the workplace.

Limitation of study

Calculated sampling of respondents, regional specificity (Eastern Slovakia), and the use of a single research tool for detecting mental stress are considered limitations of the study.

Conclusion

Our research has shown differences in perception of mental strain of nurses depending on the type of work. Based on the results we conclude that psychological stress is higher among nurses providing acute patient care. We assume that the said fact is related to the specificities of care for critically ill patients. The results of our studies suggest that variable qualities of work related stress can lead to physical and emotional exhaustion among nurses. The consequences of a persistent negative subjective state of nurses may lead ultimately to dissatisfaction with life, psychosocial problems in the family, deteriorating quality of service, loss of work motivation, and a high work turnover rate. For the requirements of future research issues, we agree with the recommendations of many authors, to carry out research on a nationwide representative sample of nurses (including a plurality of clinical departments), and use of multiple research tools according to the orientation of the pre-defined variables (eg. psychological stress of nurses, depression, burnout, job satisfaction).

Ethical aspects and conflict of interest

The authors declare that the work has no conflict of interest and for its processing, fully complied with ethical aspects of research. The use of tools during the research was approved, while submission to data collection was based on the positive opinion of the surveyed institutions. All participants in the research expressed their willingness to cooperate with confirmed consent.

Author contribution

Conception and design (AO, DM, LM, MH, MK), analysis and interpretation of data (AO, DM, LM),

processing the draft manuscript (AO, MH, MK), critical revision of the manuscript (AO, LM), finalization of the article (AO).

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