ORIGINAL ARTICLE

THE PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AND STRESS LEVEL AMONG HOSPITAL NURSES

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ABSTRACT

Hospital nurses receive enormous amounts of physical and mental workload which causes them to develop work-related musculoskeletal disorders (WRMSDs) and occupational stress. In this research, a cross-sectional study was carried out to identify the prevalence of WRMSDs, to evaluate the level of stress, and also to investigate the relationship between musculoskeletal complaints (MSCs) and stress level among one hundred and eight hospital nurses (n=108) in a government hospital. Data collection was done using three instruments, namely Nordic Musculoskeletal Questionnaire (NMQ), Workplace Ergonomic Risk Assessment Tool (WERA), and Stress Overload Scale Instrument (SOS). Based on the results obtained, a majority of the nurses suffer lower back pain whereas in terms of stress level, the nurses face relatively high stress level from their work. The relationship between MSCs and stress level was found to be absent. WRMSDs and stress are both multifactorial thus making it hard to conclude that the WRMSDs experienced by the nurses are caused by stress. Because of that, further study in relation to WRMSDs and stress is required to explore this issue.

Keywords: *WRMSDs, NMQ, WERA, SOS*

INTRODUCTION

Nursing is a profession within the health care sector that focuses on the care of individuals, families, and communities so they may attain, maintain, or recover optimal health and quality of life. On average, hospital nurses work an average of 8 hours every day, 5 days a week. Nurses always involve with heavy physical work activities such as lifting heavy loads, working in awkward postures, transferring patients and operating hazardous equipment. They work under mental overload, engaging in multitasking and coming across frequent interruptions. Working under physical overload due to long work hours and patient handling demands, leads to a high risk of developing WRMSDs (Sukadarin et.al., 2016). Recent evidence also showed that nurses are exposed to the risk of WRMSDs on several parts of body such as neck, shoulders and back, upper back, hips or and ankles (Daraiseh et al., 2003). According to Warming et al., (2009), nurses also have both a high prevalence of low back pain and neck pain and a considerable high prevalence of knee pain. Many researchers also found that the most prevalence issue among hospital nurses is low back pain (Smith et al., 2004; Tinubu et al., 2010; Anap et al., 2013). Other studies showed that WRMSDs are also prevalent in the neck region (Barkhordari et al., 2013) and also the shoulders region (Smith et al., 2006; Kee & Seo, 2007).

Occupational stress is a psychosocial risk factor in occupational field and it is present when occupational demands overcome the ability to address or control the situation (Eleni et al., 2008). Reports from nurses, who feel stressed in a teaching hospital in Porto Alegre has confirmed nursing as the fourth most stressful of occupations (Negeliskii & Lautert, 2011). Nursing is linked with a range of different demands; these include physical, emotional, and social demands (McCarthy et al., 2010). Nurses are also at risk for violence and abuse in the workplace, either from the co-workers, their superiors or from the patients themselves. This contributes to the stress level of the nurses, besides the long and stressful working hours.

In terms of the correlation between MSCs and stress level among hospital nurses, past researches had managed to prove the existence of relationship between these two elements. Warming et al. (2009) conducted a research to examine whether patient handling tasks and psychosocial factors were associated with MSCs and they concluded that there are a significant relationship between work factors and MSCs from data collected using logbook registries. Another study by Munabi et al. (2014) using NMQ also found that mental exhaustion is associated with WRMSDs with an almost 2 fold increase. Therefore, the objectives of this study are (1) to identify the prevalence of WRMSDs among hospital nurses, (2) to evaluate the level of

stress among hospital nurses throughout their routine work and (3) to investigate the relationship between MSCs and stress level.

METHODS

Participants

A cross-sectional study was done among one hundred and eight (n=108) hospital nurses of different age, gender, race, education level, household income, and working departments. The respondents were randomly selected to answer the questionnaires.

Instrumentations

Nordic Musculoskeletal Questionnaire (NMQ) (Kuorinka et al., 1987) is used to collect data on MSCs. The questionnaire studies the MSCs according to body regions which are the neck, shoulders, elbows, wrists/hands, upper back, lower back, hips/thighs, knees, and ankles/feet. Stress Overload Scale Instrument (SOS) is used to collect data on stress level among the nurses (Amirkhan, 2012). SOS categorizes the scores obtained into four ascending stress-severity categories namely low stress, challenged, fragile, and high stress. The scores are obtained through summation of likert-scale-based scoring of 24 questions in the questionnaire where the odd-numbered items (scale 1) are defined under Personal Vulnerability Scale (PVS) whereas the even-numbered items (scale 2) are defined under Event Load Scale (ELS).

Workplace Ergonomic Risk Assessment Tool (WERA) (Rahman et al., 2011) is used to conduct postural analysis on the nurses during their work tasks. The WERA tool categorizes the level of risk according to the way job tasks are carried out. The risk levels obtained could either be low (score: 18-27), medium (score: 28-44), or high (score: 45-54) and the classified risk levels suggest the recommended actions to be taken in order to decrease the risk of developing WRMSDs.

Data Analysis

All data acquired were analysed using Statistical Package for Social Sciences (SPSS) software to obtain frequency, value, min and percentage. Normality tests were conducted for all three instruments (NMQ, WERA and SOS) in order to check for normality of data distribution. Pearson's Chi-Square Test (x^2) was then conducted between NMQ – SOS to investigate the association between MSCs and stress level among hospital nurses.

RESULTS

The demographic information includes age, gender, race, education level and household income are presented in Table 1.

Table 1 Demographic information (n=108)

Age (Years)	**n**	**%**
20-29	37	34.26
30-39	34	31.48
40-49	18	16.67
50-59	19	17.59
Gender	**n**	**%**
Female	81	75.00
Male	27	25.00
Race	**n**	**%**
Chinese	11	10.19
Indian	7	6.48
Malay	84	77.78
Others	6	5.56
Education Level		
SPM	11	10.19
Matriculation	1	0.93
Diploma	71	65.74
STPM	8	7.41
Bachelor's Degree	16	14.81
Master's Degree	1	0.93
Household Income	**n**	**%**
<RM1000	2	1.85
RM1000-RM3000	38	35.19
RM3000-RM5000	57	52.78
>RM5000	11	10.19

WRMSDs among Hospital Nurses in a goverment hospital

Table 2 shows the frequency of MSCs among nurses. From the table 2 , it can be seen that the most prevalent MSCs among hospital nurses is lower back pain, thus supporting various other researches done on nurses such as Smith et al. (2004), Tinubu et. al (2010), and Anap et. al. (2013). The neck is also considered to show one of the highest prevalence of MSCs, supporting a study conducted by Barkhordari et al. (2013). Other than that, the shoulders region shows a high frequency of MSCs as well among the nurses, supporting two other previous studies conducted by Smith et al. (2006) and Kee & Seo (2007). From this study, it is also found that the upper back, knees, and ankles/feet regions are also susceptible to WRMSDs. The frequency of MSCs arranged in ascending order is as follows: elbows (6.48%), wrists/hands (28.70%), hips/thighs

(32.41%), shoulders (42.60%), neck (43.52%), ankles/feet (43.52%), knees (45.37%), upper back (50.93%) and lower back (62.96%).

Table 2 Frequency of MSCs among nurses in a goverment hospital (n=108)

Body Region	n (%)
Neck	47 (43.52)
Shoulders	46 (42.60)
Elbows	7 (6.48)
Wrists/Hands	31 (28.70)
Upper Back	55 (50.93)
Lower Back	68 (62.96)
Hips/Thighs	35 (32.41)
Knees	49 (45.37)
Ankles/Feet	47 (43.52)

Postural Analysis of Hospital Nurses in a goverment hospital

Table 3 shows the frequency of WERA scores among nurses in a goverment hospital. Out of the 108 nurses, 60 nurses (55.6%) obtained a low WERA risk level. These scores obtained are from analysis of job tasks such as observation of vital signs, documentation, answering phone, bed-making, assisting the doctor, pushing wheelchair, and administering medicine. These job tasks are considered to be low risk as not much force is extended on the body when they are carried out by the nurses. However, they do involve some occasional bending and and awkward postures but only in a short time. The remaining 48 nurses (44.4%) obtained a medium WERA risk level. The scores obtained are from job tasks such as sponging, dressing, pushing bed, patient bed-transfer, and helping patient walk. These job tasks require a bit of force to carry out, such as patient bed-transfer where the nurses are required to manually lift the patients up from the bed to transfer them to different beds. Some tasks such as sponging and dressing, require some repetitive movements and bending of the body to carry out, thus making them a bit hazardous to be carried out. None of the nurses observed obtained a high WERA risk level, meaning that none of the job tasks are unacceptable in terms of their handling risk.

Table 3 Frequency of WERA scores among nurses in a goverment hospital (n=108)

WERA Score	n	%
Low (18-27)	60	55.56
Medium (28-44)	48	44.44
High (45-54)	-	-

Stress Level among Hospital Nurses in a goverment hospital.

Table 4 shows the frequency of SOS scores among nurses in a goverment hospital. From the table 4, 39 nurses (36.11%) obtained scores under the low stress category, which is the lowest risk of stress signifying very little to no stress. Other than that, 11 nurses (10.19%) scored under challenged category whereas 20 of them (18.52%) scored under the fragile category. The challenged and fragile categories are categories signifying presence of low risk of stress. A total of 38 nurses (35.19%) scored under the high stress category, which signifies presence of high risk of stress.

Table 4 Frequency of SOS scores among nurses in a government hospital (n=108)

SOS Score	n	%
Low Stress (Lowest Risk)	39	36.11
Challenged (Low Risk)	11	10.19
Fragile (Low Risk)	20	18.52
High Stress (High Risk)	38	35.19

Relationship Between MSCs and Stress Level among Hospital Nurses in a government hospital

Results of SOS survey showed that, 35.19% of total respondents fall under high stress category. MSCs among them also found that, back area (lower and upper) shows significant highest numbers among other area. Because of that, relationship between MSCs and stress level were further explored. Pearson's chi-square analysis is used to find the relationship between MSCs and stress among hospital nurses by comparing NMQ index (MSCs) with SOS scores (stress level). From the analysis, result found that p-values = 0.329, x^2 = 36.012 , df = 33 which the p value

higher than 0.05 ($p > \alpha$). The incidence of p-value being higher than the alpha level proves that there is no relationship between MSCs and stress level among hospital nurses.

According to Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR), 50% of the serious accidents occurring in nursing homes are results of manual handling. Although after conducting postural analysis among hospital nurses using WERA indicated that the respondents exposed to the low and medium ergonomics risk level, the result found is still in doubt. Not only manual handling task, hospital nurses also involve with awkward posture, working in the same position for a long period of time, and repetition of movements. Nurses sometimes have to do a lot of awkward bending while standing in order to carry out job tasks such as administering medicines on the patients and taking and checking blood of patients lying on the bed. In addition, nurses also do a lot of repetitive movements for a long period of time too such as during sponging and dressing whereby repetitive movements of the hand is needed. These activities, if done in moderation, would not be harmful on the nurses, but in this case, the nurses have to do the same job tasks on many patients repeatedly. Due to that, there is no surprise, the study respondents, complaint alot at several parts of their body.

High level of stress among respondents indicates that something need to be done. Occupational stress in nursing contributes to decrease of efficiency among nurses due to health problems (Wanjiku 2011). One way to reduce occupational stress among nurses is to train them with stress management strategies applicable to the nursing environment (Onasoga 2013). Stress intervention programmes also seems should be introduced in nursing colleges, whereby nurses will be trained on how to recognize impending stress and how to manage it. Job rotation or shift work would also help to prevent or minimize job burnout among hospital nurses, which eventually leads to occupational stress.

CONCLUSION

Hospital nurses are at risk of developing WRMSDs due to their routine work on a day-to-day basis. From the findings and analysis, the most prevalent MSCs among nurses is lower back pain. In addition, the stress level obtained from the analysis came to a conclusion that the most significant stress level faced by the nurses in terms of frequency, is low stress level, followed very closely behind by high stress level. This high frequency of these two opposite stress levels signifies that there are a lot of factors that play roles in causing occupational stress. For example, different nurses have different stress-handling capabilities eventhough they carry out the same job tasks or are given the same work pressure. Stress-handling capabilities can be influenced by a lot of factors such as age, gender, education level, and household income. Work load may also be a risk factor in giving such result as nurses in different departments may face different amount of work loads which signifies occupational stress. Furthermore, the data analysis also showed that there is no correlation between MSCs and stress level among hospital nurses. This may be due to WRMSDs and stress are both multifactorial thus making it hard to conclude that the WRMSDs experienced by the nurses are caused by stress at work or that the stress faced by the nurses are caused by the WMSDs they are having instead of other factors.

ACKNOWLEDGEMENTS

This study was supported by Universiti Malaysia Pahang (UMP). We would like to express our gratitude to the Faculty of Engineering Technology (FTek), UMP Malaysia for the support in this study. Not to forget, our sincerest gratitude to all respondents who took part in this research.

COMPETING INTERESTS

There is no conflict of interest.

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