

Association of Physical Job Demands with Neck and Shoulder Pain in Nurses

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Abstract

Background and Objective: Musculoskeletal Disorders (MSDs) are common in nursing professionals as it is a physically demanding job. Some common risk factors causing work-related musculoskeletal disorders (WMSDs) are activities such as prolonged standing in one place, lifting or transferring heavy patients, and maintaining long periods of body awkward positions. The purpose of this study was to assess the association of physical job demands and neck and shoulder WMSDs in nurses.

Methodology: In this cross-sectional study, 100 nurses from various hospitals were selected based on the inclusion and exclusion criteria of the study. The research procedure was explained to the subjects and written consent was collected. The subjects reported their choices on a self-analytical physical demands' analysis form depicting their work-related activities and frequency level and also mark the intensity of pain on numeric pain rating scale, if present, for neck and each shoulder joint respectively. Goniometric assessment of neck and shoulder joints were done to analyse the effect of pain on Range of Motion. Odds Ratio (95% Confidence Interval) was used for data analysis.

Results: The results showed that there is significant association between high physical demands with neck and shoulder musculoskeletal disorders as compared to low physical demands depicted by higher odds ratio ranging between 1.03-1.93. The physical activity "Maintaining long periods of body awkward position" resulted in higher OR for neck pain (OR- 1.58) and right shoulder pain (OR- 1.93). Highest OR for left shoulder pain (OR- 1.61) was highlighted in the physical activity "lifting/moving heavy loads".

Conclusion: The study concluded that there is association between physical job demands and WMSDs of neck and shoulder joints

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respectively and there is also requirement to adopt corrective measures to prevent them in nurses for a quality patient care.

Keywords: Musculoskeletal Disorders; WMSDs-Work-Related Musculoskeletal Disorders; OR - Odds Ratio

Introduction

Nurses comprise of about 40-45% of total staff in hospitals [1]. Nursing staff is at higher risk of developing work-related musculoskeletal disorders (WMSDs) such as conditions of muscles, ligaments, joints, etc in isolation or combination in all age groups irrespective of the work experience [1,2,3]. These disorders are degenerative and inflammatory in nature [4,5].

Awkward body posture, excessive bending, lifting of heavy weights, patient transfers, patient paperwork, working in the same positions for long periods, treating an excessive number of patients in one day etc. are all work-related activities that act as risk factors for musculoskeletal disorders [6,4,7]. Neck, shoulder, lower back and knee are major areas of concern in the nursing staff [8,9] out of which lower back pain is more prevalent followed by shoulder and neck pain [2,4,10]. One reason speculated for this increased prevalence of WMSDs is that nurses must work in different shift timings including morning, evening and

night shifts¹. Night shift nursing staff has more chances of musculoskeletal disorders than nurses working in morning shifts [1]. Shift duties alter the circadian rhythm and thus nursing staff is not able to indulge in preventive activities other than the work-related activities [4]. The strength to cope with physical job demands reduces with age in nursing staff [8]. Elderly nurses are more prone to musculoskeletal disorders [8]. Quality of life of nursing staff is reduced due to musculoskeletal disorders [4]. However other studies have found workplace violence, anxiety/depression, perceived job physical demands, every 10 years increase of age and overweight, low mental health, physical health, lack of ergonomic knowledge and training and shortage of staff important factors associated with increased prevalence of WMSDs in nurses [5,11,12].

Lack of adequate and skilled medical and paramedical staff in India puts added demands on its human resources which also increases the risk of musculoskeletal disorders in current staff [4]. Majorly, females constitute majority of nursing staff in India, who also have added responsibility of household work and to look after their family which increases the physical demands on them, thus contributing to work-related physical demand and greater risk of musculoskeletal disorders [4]. Furthermore, the musculoskeletal disorders lead to absenteeism of staff from work which affects the quality of healthcare services which indirectly results in economic burden on organization and society [4].

which is affecting their health which also affects the quality of patient care and healthcare sector services.

The study will further assist in understanding the effect nursing job on WMSDs in hospitals

What measures can be taken to improve their condition to strengthen them and our health care sector.

The aim of the present study is to investigate the association between physical job demands and neck and shoulder pain in nurses.

Materials and Methods

In this cross-sectional study, 100 female nurses from various hospitals in Delhi participated in

January 2018. The participants had a minimum work experience of 3 years, were in the age group of 30-60 years. Nurses with any history of congenital skeletal deformity, neurological or cardiac problems, recent injury/surgery and cancer were excluded from the study.

The Research proposal was explained to the nursing staff and they were asked to sign the written consent form. The physical demands were assessed by "The Self-analytical Physical Demands Analysis Form" which depicted their work-related activities, the frequency and intensity of pain in neck and/or one/both shoulders was assessed by Numeric Pain Rating Scale (NPRS), goniometric assessment of cervical joint and shoulder joint range of motion was done to analyse effect of pain on range of motion of respective joints.

Statistical Analysis

Statistical analysis of data collected was done using Microsoft Excel 2007. Mean and standard deviation of age, work-experience, frequency of each physical activity, NPRS scores of Neck Joint and of both the Shoulder joints was calculated.

Odds ratio was calculated to show association between the frequency level of each activity to the NPRS scores of neck, left shoulder and right shoulder joint respectively.

Results

Demographic and occupational characteristics of nurses 100 subjects participated in the study where the mean age was 42.79±9.11 and work-experience was 18.04±9.48 as depicted in Table 1.

Table 1: Mean±SD of Age and Work-Experience

Descriptive statistics	Mean±SD
Age	42.79±9.11
Work Experience	18.04±9.48

To evaluate the level of work-related physical activities, frequency of 5 job related physical activities of each subject was noted and the mean and standard deviation of respective frequency of physical activity 1 is 3.81±1.02, physical activity 2 is 3.44±0.98, physical activity 3 is 3.26±1.19, physical activity 4 is 3.66±1.03 and physical activity 5 is 3.11±0.86 respectively as shown in Table 2.

Table 2: Mean±SD of Frequency of Physical Activities

Frequency of Physical Activities	Mean±SD
PA1 - Frequency of lifting/moving heavy loads	3.81±1.02
PA2 - Maintain long periods of body awkward positions	3.44±0.98
PA3 - Lift patients/objects from floor	3.26±1.19
PA4 - Work while bent or twisted on waist	3.66±1.03
PA5 - Stand in one place (>30mins)	3.11±0.86

The NPRS was used to depict the intensity of pain during the job related physical activities. The mean NPRS readings for neck pain is 1.138±0.45, for right shoulder pain is 1.1±0.54 and left shoulder pain is 1.154±0.47 respectively as shown in Table 3.

Table 3: Mean±SD for NPRS Neck joint, Right and Left Shoulder Joint

Numeric Pain Rating Scale	Mean±SD
Neck	1.138±0.45
Right shoulder Joint	1.1±0.54
Left shoulder Joint	1.154±0.47

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periods of body awkward position” for both Neck and Shoulder WMSDs. This finding of our study is congruent to the result of the study conducted by Alireza Choobineh et al which also reported that among all the perceived physical demands investigated, awkward posture was most frequently and strongly associated with WMSDs [9].

The finding of our study can also be ascertained with the result of the study performed by Alison M. Trinkoff et al where perceived physical demands involving awkward positions were strongly associated with reported WMSD of Neck and Shoulder [2].

Also, the result of our study is supported by the results of the study conducted by Apexa S. Raithatha and Daxa G. Mishra reported that among all the physical demand perception “in my job, I am working for long periods with my body in awkward positions” was significantly associated with any WMSD.

According to the study performed by Alireza Choobineh et al, the perceived physical activity-body awkward posture resulted in greater odds ratio for WMSD associated to shoulder [OR- 2.01] which also ascertains the result of our study which reported greater odds ratio for the same physical

Table 4: Association of physical activities with Neck, Left and Right Shoulder Pain

Physical Activities	Odds Ratio (95% Confidence Interval)		
	Neck Pain	Right Shoulder Pain	Left Shoulder Pain
PA1 - Frequency of lifting/moving heavy loads	1.33 (0.56-3.14)	1.1 (0.46-2.59)	1.61 (0.68-3.82)
PA2 - Maintain long periods of body awkward positions	1.58 (0.66-3.78)	1.93 (0.80-4.66)	1.30 (0.55-3.09)
PA3 - Lift patients/objects from floor	1.04 (0.47-2.31)	1.22 (0.54-2.72)	1.03 (0.46-2.30)
PA4 - Work while bent or twisted on waist	1.21 (0.53-2.78)	1.26 (0.53-2.98)	1.19 (0.52-2.70)
PA5 - Stand in one place (>30mins)	1.27 (0.57-2.85)	1.23 (0.55-2.75)	1.23 (0.54-2.77)

Discussion

This research was conducted to study the association of physical job demands and neck and shoulder pain in nurses in hospitals. A total of 100 nurses participated in the study wherein they filled “The Self-analytical Physical Demands Form” depicting job-related activities and levels of frequency at which that activity is performed. The NPRS was used to analyse the intensity of pain due to perceived physical demand activities.

The results of our study depicted greater odds ratio for physical activity- “Maintaining long

activity for MSD associated to shoulder [OR- 1.93] [9].

The results of our study reported that the physical activity- “Moving/Lifting Heavy Loads” has greater odds ratio for Neck MSD [OR- 1.33]. This result is congruent to the result of the study conducted by Alireza Choobineh et al that also reported greater odds ratio for Neck MSD [OR- 2.09] for the same physical activity [9].

Thus, the results of our study signify that high physical job demand is associated with Neck and Shoulder MSD in nurses, evident by greater odds ratio for high physical demand as compared to low

physical demand for all the job-related activities respectively. It also signifies that there is association of physical job demands to Neck and Shoulder pain in nurses. Same has been documented by other studies such as performed by Alison M. Trinkoff, Apexa S. Raithatha and Barbara Heiden [2,4,8].

Conclusion

The study results depicted that there is association between the frequency of physical activity and the chances of suffering from neck and shoulder pain. Higher frequency of physical demands on body in form of different activities put undue stress on body which results in pain. It is not necessary that age or work-experience play an important role in suffering from neck or shoulder pain as was evident by the study that individuals performing same level of activity reported different results for pain.

What this study helps in is to develop prevention programme for nurses at younger level and teach them ergonomic positions to prevent chances of suffering from any musculoskeletal disorder.

References

1. Mirsaeed Attarchi, Saeed Raeisi, Mohamad Namvar, Majid Golabadi. Association between shift working and musculoskeletal symptoms among nursing personnel. *Iran J Nurs Midwifery Res.* 2014 May-Jun;19(3):309-14.
2. Trinkoff AM, Lipscomb JA, Geiger-Brown J, Storr CL, Brady BA. Perceived Physical Demands and Reported Musculoskeletal Problems in Registered Nurses. *Am J Prev Med.* 2003 Apr;24(3):270-5.
3. Mamta Israni, Neeta J Vyas, Megha S Sheth. Prevalence Of Musculoskeletal Disorders Among Nurses. *Indian Journal Of Physical Therapy.* 2013 Jul-Dec;1(2).
4. Apexa S. Raithatha, Daxa G. Mishra. Musculoskeletal Disorders and Perceived Work Demands among Female Nurses at a Tertiary Care Hospital in India. *International Journal of Chronic Diseases.* Volume 2016, Article ID 5038381, 6 pages.
5. Tsekoura Maria, Koufogianni Andrianna, Billis Evdokia, Tsepis Elias. Work-Related Musculoskeletal Disorders Among Female And Male Nursing Personnel In Greece. *World Journal of Research and Review (WJRR).* 2017 Jan;3(1):8-15.
6. Shoko Ando, Yuichiro Ono, Midori Shimaoka, Shuichi Hiruta, Yoji Hattori, Fumiko Hori, Yasuhiro Takeuchi. Associations of self estimated workloads with musculoskeletal symptoms among hospital nurses. *Occup Environ Med* 2000;57(3):211-16.
7. Bolanle MS Tinubu, Chidozie E Mbada, Adewale L Oyeyemi, Ayodele A Fabunmi. Work-Related Musculoskeletal Disorders among Nurses in Ibadan, South-west Nigeria: a cross sectional survey. *BMC Musculoskeletal Disorders.* 2010;11:12.
8. Barbara Heiden, Matthias Weigl, Peter Angrer, Andreas Muller. Association of age and physical job demands with musculoskeletal disorders in nurses. Elsevier Ltd and The Ergonomics Society 2013.
9. Alireza Choobineh, Abdolreza Rajaefard, Masoud Neghab. Association Between Perceived Demands and Musculoskeletal Disorders Among Hospital Nurses of Shiraz University of Medical Sciences: A Questionnaire Survey. *International Journal of Occupational Safety and Ergonomics (JOSE).* 2006;12(4):409-16.
10. Smith DR, Kondo N, Tanaka E, Tanaka H, Hirasawa K, Yamagata Z. Musculoskeletal disorders among hospital nurses in rural Japan. *Rural Remote Health.* 2003 Oct-Dec;3(3):241
11. Thinkhamrop W, Laohasiriwong W. Factors Associated with Musculoskeletal Disorders among Registered Nurses: Evidence from the Thai Nurse Cohort Study. *Kathmandu Univ Med J (KUMJ).* 2015 Jul-Sep;13(51):238-43.
12. Lucy E. Joslin, Christopher R. Davis, Patricia Dolan, Emma M. Clark. Quality of Life and Neck Pain in Nurses. *International Journal of Occupational Medicine and Environmental Health.* 2014 April;27(2):236-42.