



STRESS, MUSCULOSKELETAL PAIN & QUALITY OF SLEEP AMONG HEALTHCARE PROFESSIONALS: A CROSS-SECTIONAL STUDY

Occupational Therapy

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ABSTRACT

Stress is a physical, mental, or emotional factor that causes bodily or mental tension. When the body is under stress, the nervous system releases a hormone called cortisol, which can increase inflammation and cause pain. Musculoskeletal Pain affects the bones, muscles, tendons, ligaments and nerves. Stress and musculoskeletal pain are reported to significantly impact quality of life. The perception of sleep quality is complex and associated with various subjective factors such as fatigue, work stress, or other emotional factors in addition to objective sleep quality. This study aimed at to investigate correlation between Stress, Musculoskeletal Pain and Quality of Sleep among Healthcare Professionals. A cross-sectional survey study was carried out to assess for Stress, Musculoskeletal Pain, Quality of Sleep by using paper-based version of Perceived Stress Scale (PSS), Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) & Pittsburgh Sleep Quality Index (PSQI) respectively among Health-Care Professionals. There was moderate level of stress, prevalence of musculoskeletal pain in neck, low back, knee and lower leg with poor quality of sleep observed. There was a correlation between PSS & CMDQ for neck, shoulders & knees, PSQI & CMDQ for neck, shoulders & knees, PSS & PSQI which is markedly positive with significant p value <0.05. A positive correlation was observed between total score of PSS and CMDQ neck, shoulder & knees. This study showed correlation of Stress, Musculoskeletal Pain and Quality of Sleep among Healthcare Professionals.

KEYWORDS

Stress, Musculoskeletal Pain, Quality of Sleep, Healthcare Professionals

INTRODUCTION

Stress is a physical, mental, or emotional factor that causes bodily or mental tension. Stresses can be external (from the environment, psychological, or social situations) or internal (illness, or from a medical procedure). Health-care professionals face a lot of stressors like work over-load, excessive working hours, sleep deprivation, repeated exposure to emotionally charged situations, dealing with difficult patients, conflicts with other staffs. Musculoskeletal Pain affects the bones, muscles, tendons, ligaments and nerves.¹ Musculoskeletal pain is physiological, psychological, behavioral, genetic or a combination of these is unknown.^{1,2} In this sense, the routine of the health-care professional with movement of loads, execution of repetitive movements and the organization of work; accompanied by high demands of work, adoption of inadequate body postures, lifting heavy loads and transferring patients out of bed and from the floor low control of activities and social support, have contributed to the onset of musculoskeletal disorders.³ Stress and musculoskeletal pain are reported to significantly impact quality of life, cause loss of work time or absenteeism, increase work restriction, disability, higher turnover, early retirement, lower productivity, and lower quality of services or products and affect the overall well-being of the person.⁴ The impact of sleep on function and participation is incorporated into the repertoire of occupational therapy practitioners and addressed across the lifespan. The perception of sleep quality is complex and associated with various subjective factors such as fatigue, work stress, or other emotional factors in addition to objective sleep quality.⁵

Considering limitations of previous research in this field, this study, which is situated in a health care setting in India, investigates both musculoskeletal and subsequently sleep as a possible result of or rather in association with both physical (work) load and psychological (work) stress. The study thereby takes into account not only nurses but also physicians, OT/PT, and other health professionals working in

private hospital. Therefore, study aims to investigate stress, musculoskeletal pain and quality of sleep among health-care professionals.

METHODS

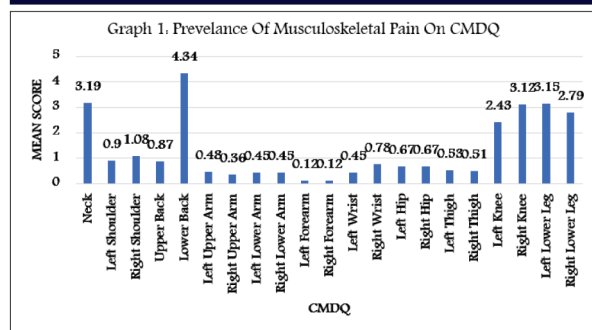
A cross-sectional survey design was used to conduct the research. The study was conducted adhering to the principles of 'Declaration of Helsinki'. Informed consent was taken and participants were assessed for Stress, Musculoskeletal Pain, Quality of Sleep by using paper-based version of Perceived Stress Scale (PSS)⁶, Cornell Musculoskeletal Discomfort Questionnaire (CMDQ)⁷, Pittsburgh Sleep Quality Index (PSQI)⁸ respectively. The data was collected over a time period of November 2020 to May 2021 (6 Months) and analysed by using appropriate statistical methods. The inclusion criteria in order to choose the participants with relevant data were: Licensed Health-Care Professionals, Age range: 25 to 50 years, both male & female; whereas pregnant women, person with disability & neuro-degenerative disorders were excluded.

RESULTS

All data were analysis using window-based IBM SPSS Statistics 23. Table 1 shows gender wise Stress Level & Sleep Quality, in which moderate level of stress with poor sleep quality in healthcare professionals.

Table 1: Gender wise Stress Level & Sleep Quality

Table 1		No. of subjects	No. of Female	No. of Male	Percentage
Stress Level	High	10	2	8	5.3%
	Moderate	94	59	35	71.9%
	Low	28	10	18	22.7%
Sleep Quality	Good	63	36	27	47.7%
	Poor	69	35	34	52.2%



Graph 1 shows prevalence of musculoskeletal pain on CMDQ, in which higher levels of pain found in neck, lower back, knees & legs.

Karl Pearson's Correlation test was used for correlation between variables for 3 groups as statistical tests of significance. Table 2 shows correlation between PSS & CMDQ for neck, shoulders & knees, PSQI & CMDQ for neck, shoulders & knees, PSS & PSQI which is markedly positive with significant p value < 0.05 .

Table 2: Correlation between Stress Level, Musculoskeletal Pain & Sleep Quality

Table 2	CMDQ					PSQI
	NECK	RIGHT SHOULDER	LEFT SHOULDER	RIGHT KNEE	LEFT KNEE	
PSS	r	0.251	0.239	0.227	-	0.495
	p	0.004***	0.006***	0.009***		0.000**
PSQI	r	-	0.348	0.310	0.1773	0.2436
	p	-	0.000***	0.000***	0.041**	0.004*

** Significant, *** Highly Significant

DISCUSSION

There was total 132 subjects that met the inclusion criteria of the study Out of which 71 were females and 61 were males. PSS, CMDQ & PSQI for assessing Stress, Musculoskeletal pain and Sleep respectively were administered. The population distribution of male and female health-care professionals is 46.2% & 53.7% respectively.

It was found that the prevalence of musculoskeletal pain was higher in females as compared to males. Increased prevalence of musculoskeletal pain in female is likely due to combination of influences including physiological, socio-cultural & psychological factors (high workload, perceived stress, high psychological job demands).⁹ These findings are supported by a study done by Rollman et al on Sex Differences in musculoskeletal pain, in which they stated that Physical and psychosocial stress as crucial factors such that psychosocially, women may experience greater stress than men, due to psychosocial risk factors, such as low work content, low social support, time pressure, low job control. Whereas, the prevalence of poor sleep quality was more in male as compared to female health-care professionals, which could be due to on-call duties, longer working hours, higher workload, work related stress in junior male residents. These findings are supported by study done by Maryam Adam Ali on Assessment of Sleep Quality Among Doctors with On-Call Duties in Bahrain Defence Force Hospital, which concluded that the significant correlation was found between doctors' ranks and sleep quality, as 62.55% junior residents had poor sleep quality.¹⁰

In this study, the prevalence of low back pain was the highest among health-care professionals, followed by knee, neck, lower leg, shoulder & upper back. MSDs were associated with workload (work hours per week, break times during workday), psychological factors (psychological fatigue, mental stress), employment status and ergonomic factors. Regarding the ergonomic factors, lower back MSDs were associated with bending the trunk frequently, heavy or awkward lifting, and bending or twisting the neck; knee MSDs were associated with walking or standing for long periods of time; and shoulder & Neck MSDs were associated with maintaining shoulder abduction for long periods of time and bending or twisting the neck.¹¹

This is also supported by a study on Work related musculoskeletal disorders among hospital nurses in rural Maharashtra, India: a multi-Centre survey by Anap DB et al., which could be due to working postures like working in same position for long time, bending, twisting, lifting and treating excessive number of patients were strongly associated with WMSDs.¹² It was found that the prevalence of musculoskeletal pain in the neck and shoulder showed moderate to weak correlation with stress. Prolonged psychological & physiological stress, however, leads to a dysfunctional response with muscle atrophy, compromised tissue growth & repair, autonomous dysfunction, cognitive changes & structural changes in the brain.⁹ These findings are supported by a systemic review & meta-analysis on Investigation of psychological factors on upper limb musculoskeletal disorders and the prevalence of its musculoskeletal disorders among nurses by Zare A et al concluded that psychosocial factors affecting the prevalence of upper limb musculoskeletal disorders were identified which included monotonous work, inadequate staffing, job demands, insufficient support, time pressure, decision latitude, job dissatisfaction, and job stress. There is strong evidence of significant relationship between psychological factors and prevalence of musculoskeletal disorders in the shoulder and neck.¹³

This study shows high prevalence of lower back pain, but due to least severity of scores it has no significant correlation with stress and quality of sleep. It was found that the prevalence of musculoskeletal pain in neck, shoulder and knee showed weak correlation with quality of sleep; these findings are supported by a study Association of Musculoskeletal joint pain with obstructive sleep apnea, daytime sleepiness and poor sleep quality in men by Joule J Li et al, which concluded that there is an association between pain in the shoulder, back and knee with poor sleep quality; which could be due to psychological distress and job demands.¹⁴

In this study, there was moderate correlation between stress and quality of sleep among health-care professionals; which could be due to work shifts, job title, managerial position. These findings is supported by a study on Evaluation of the correlation between job stress and sleep quality in community nurses by Deng X et al (2020) concluded that as nurses job-stress scores increased, sleep quality became progressively worse.¹¹

The study was concluded on a small sample size with unequal proportion of male and female & short duration. There was disproportionate ratio among professionals working in various departments in only one private health-care setting.

CONCLUSION

There was moderate level of stress, prevalence of musculoskeletal pain in neck, low back, knee and lower leg & poor quality of sleep observed. There was a correlation between stress, musculoskeletal pain & sleep among healthcare professionals.

REFERENCES

- Watson, S. (2021) *Musculoskeletal pain: Causes, symptoms, treatment, Healthline*. Available at: <https://www.healthline.com/health/tgct/musculoskeletal-pain> (Accessed: 15 July 2023).
- (N.d.). Retrieved from https://www.researchgate.net/publication/279473607_Stress_Among_Health_Care_Professionals_-_The_Need_for_Resiliency
- Alnaami, I., Awadalla, N. J., Alkhairi, M., Alburidi, S., Alqarni, A., Algarni, A., Mahfouz, A.A.(2019).Retrieved from <https://bmcmusculoskeletaldisord.biomedcentral.com/articles/10.1186/s12891-019-2431-5>
- (N.d.a). Retrieved from <https://www.semanticscholar.org/paper/A-Study-to-Determine-the-Effectiveness-of-Ergonomic-Kavitha/fca3f47999c9f1485746f9148619a902fa208881>
- Vinstrup, J., Jakobsen, M. D., Calatayud, J., Jay, K., & Andersen, L. L. (2018). Association of Stress and Musculoskeletal Pain With Poor Sleep: Cross-sectional study among 3,600 hospital workers. *Frontiers in Neurology*, 9. doi:10.3389/fneur. 2018. 00968.
- (N.d.). Retrieved from [https://www.das.nh.gov/wellness/ Docs/Perceived%20Stress %20Scale.pdf](https://www.das.nh.gov/wellness/Docs/Perceived%20Stress%20Scale.pdf)
- (N.d.-a). Retrieved from <https://ergo.human.cornell.edu/ahmsquest.html>
- (N.d.-a). Retrieved from [https://www.sleep.pitt.edu/wp-content/uploads/Study_ Instruments_Measures/PSQI-Instrument.pdf](https://www.sleep.pitt.edu/wp-content/uploads/Study_Instruments_Measures/PSQI-Instrument.pdf)
- Hopkins, H. L., & Hrgs, H. H. L. (1993). Willard and Spackman's occupational therapy. Philadelphia: Lippincott.
- Assessment of sleep quality among doctors with on-call duties in Bahrain Defence Force Hospital. (2020). *Journal of the Bahrain Medical Society*, 32(2), 1–7. doi:10.26715/ jbm.32_2020_2_1
- Deng, X., Liu, X., & Fang, R. (2020). Evaluation of the correlation between job stress and sleep quality in community nurses. *Medicine*, 99(4). doi:10.1097/md.000000 0000018822.
- Anap, D., Iyer, C., & Rao, K. (2013). Work related musculoskeletal disorders among hospital nurses in rural Maharashtra, India: A multi centre survey. *International Journal of Research in Medical Sciences*, 1(2), 101. doi:10.5455/2320-6012.ijrms 20130513
- Zare, A., Choobineh, A., Hassanipour, S., & Malakoutikhah, M. (2021a).

- Investigation of psychosocial factors on upper limb musculoskeletal disorders and the prevalence of its musculoskeletal disorders among nurses: A systematic review and meta-analysis. *International Archives of Occupational and Environmental Health*, 94(5), 1113–1136. doi:10.1007/s00420-021-01654-6.
14. Li, J. J., Appleton, S. L., Gill, T. K., Vakulin, A., Wittert, G. A., Antic, N. A., ... Hill, C. L. (2017). Association of Musculoskeletal Joint pain with obstructive sleep apnea, daytime sleepiness, and poor sleep quality in men of. *Arthritis Care & Research*, 69(5), 742–747. doi:10.1002/acr.22994