International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Correlation of Musculoskeletal Disorders and Sleep Quality among Office Workers

Drashti R Mistry[1], Dr. Alpa Purohit[2]

[1]PG student, Physiotherapy department, Ahmedabad Institute of Medical Sciences
[2]Principal, Physiotherapy department, Ahmedabad Institute of Medical Sciences

ABSTRACT

Background: Office workers are at higher risk for musculoskeletal disorders as they spend long time working in front of computers. Long-term sitting, static postures, repetitive work, computer work, and poor environmental condition lead to the development of MSD.

Aim of the study: Musculoskeletal pain (MSP) can negatively affect subjective sleep quality & cause sleep disturbance due to persistent pain. Poor sleep quality makes MSP worse, resulting in a vicious cycle of sleep disturbance & pain. So, here the need arises to evaluate the frequency of MSD among office workers & their relationship with sleep quality.

Materials and Methods: In this observational study, 60 office workers will be selected according to inclusion criteria. A NORDIC musculoskeletal questionnaire & Pittsburgh Sleep Quality Index (PSQI) will be used to collect the data. **Result:** Data was analysed in SPSS Statistics software. The normality of the distribution was examined by Shapiro-wilk test. Spearman's correlation coefficient was used to examine the correlation between the variables.

Conclusion: This study shows office workers have body pain and poor sleep quality but there is negligible correlation between these characteristics.

Keywords: Musculoskeletal Disorders, Sleep Quality, Nordic Questionnaire, Pittsburgh Sleep Quality Index, Office Workers

INTRODUCTION

Musculoskeletal disorders (MSDs), affecting the body's movement system, are a leading cause of work-related illness globally, recognized as a significant concern since the 1600s [1]. These conditions are characterized by pain and limitations in physical function [2]. Research indicates that MSD-related pain is a major factor in employee absenteeism [3]. Several elements, including work environment, occupation, age, gender, physical activity habits acquired over time, and stress, can influence sleep quality [4]. Sleep disorders are especially prevalent among healthcare workers, though many factors, such as demographics and job type, can play a role [4]. Office workers, due to extended periods spent at computers, face a heightened risk of MSDs. Factors like prolonged sitting, awkward postures, repetitive tasks, computer use, and poor working conditions contribute to MSD development. Musculoskeletal pain (MSP) can disrupt sleep quality by causing sleep disturbances due to constant pain. In turn, inadequate sleep can exacerbate MSP, creating a cycle of pain and sleep problems. Sleep disturbances can further impact employee well-being, potentially leading to anxiety, depression, reduced daytime function, lower quality of life (QOL), increased work accidents, and decreased job performance. Sleep quality, in turn, plays a vital role in

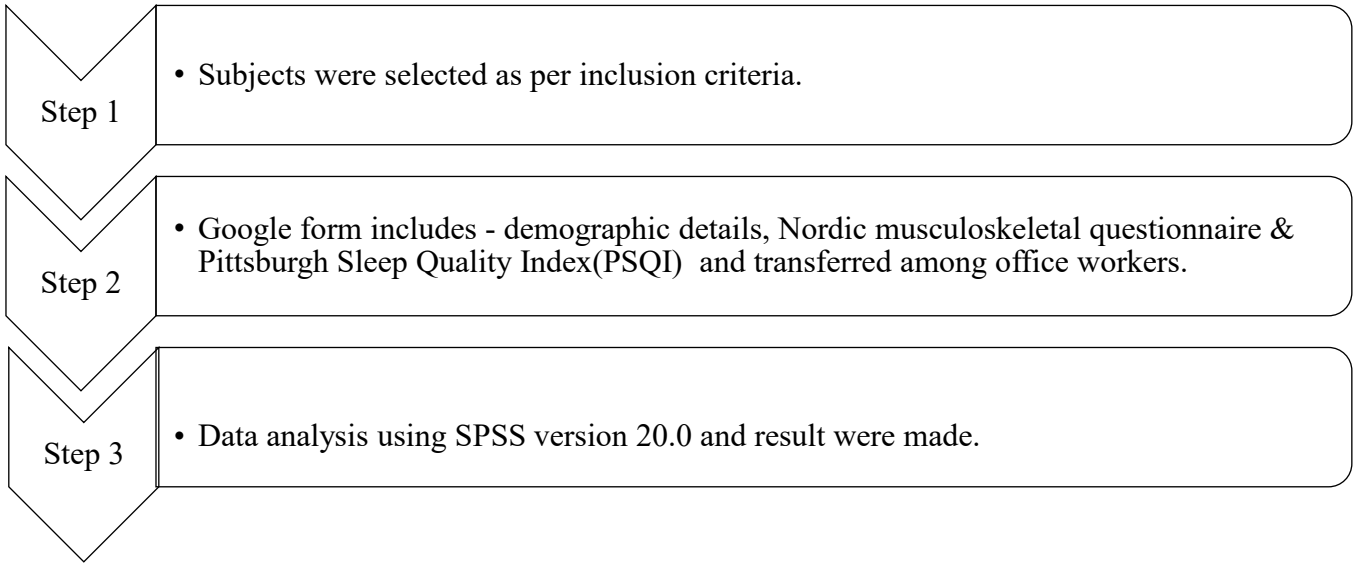
recovery, pain perception, and overall productivity. Despite the clear interplay between physical discomfort and sleep disturbances, limited research has been conducted to explore the direct correlation between musculoskeletal issues and sleep quality, particularly in office-based occupational settings. Therefore, here need arises to assess the prevalence of MSDs among office workers and their connection to sleep quality.

- Nordic musculoskeletal questionnaire:[5] The Nordic Musculoskeletal Questionnaire (NMQ) is a standardized tool used to assess musculoskeletal pain and limitations in ergonomic or occupational settings. The NMQ focuses on nine body regions and evaluates musculoskeletal pain in two ways: prevalence (how often it is experienced) over the past year and the past week, and how often it limited usual activities at work or home during the past year.
- Pittsburgh Sleep Quality Index (PSQI): [6] The PSQI uses a combination of 19 self-reported questions and five additional questions completed by the respondent's bed partner or roommate. These additional five questions are for clinical purposes only and are not included in the final PSQI score discussed in this article. The 19 self-reported questions explore various aspects of sleep quality, such as how long it typically takes to fall asleep, how many hours of sleep are typically obtained, and how often certain sleep disturbances occur. These 19 questions are categorized into seven different areas, with each area scored on a scale of 0 to 3 (with 0 indicating no problems and 3 indicating the most severe problems). The scores from these seven areas are then added together to create a total PSQI score. This total score can range from 0 to 21, with higher scores reflecting poorer sleep quality.

MATERIALS AND METHOD:

- Study Design: An Observational study
- Study Setting: Study was conducted among office workers residing in different cities of India.
- Sample Design: Convenient Sampling
- Sample Size: 60
- Outcome Measure: (1) Nordic Musculoskeletal Questionnaire (2) Pittsburgh Sleep Quality Index
- Selection Criteria:

Inclusion Criteria	Exclusion Criteria
• Both males & females. • Age: 18-60 years • Working experience minimum 2 years. • Working hours minimum 2 hours/day	• Recent history of trauma and post-surgical complications in past 6 months. • Severe musculoskeletal disorder and deformity • Severe neurological or cardiovascular disorders • Cardiac pacemaker

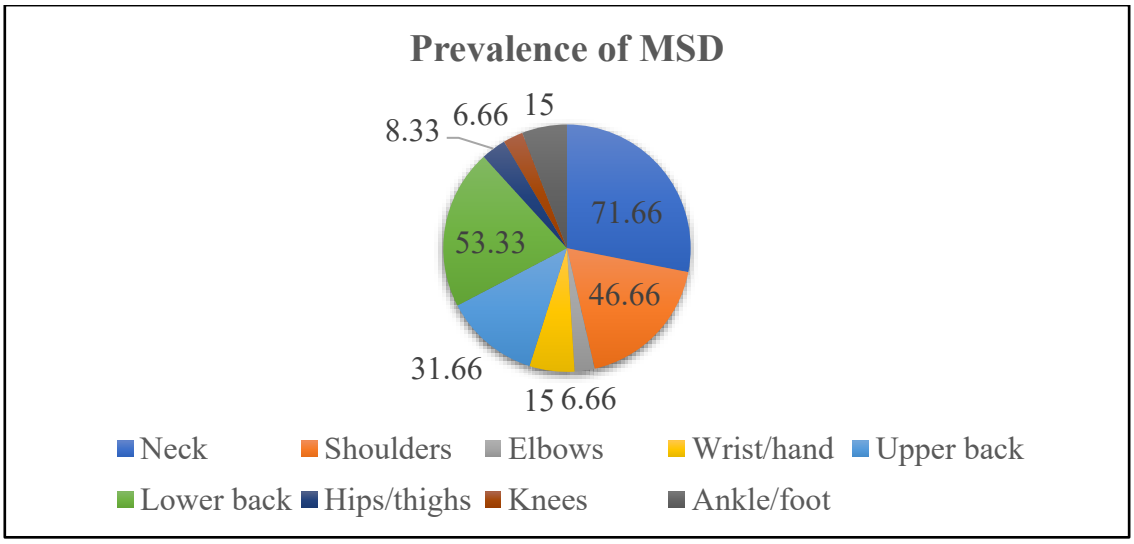


RESULT:

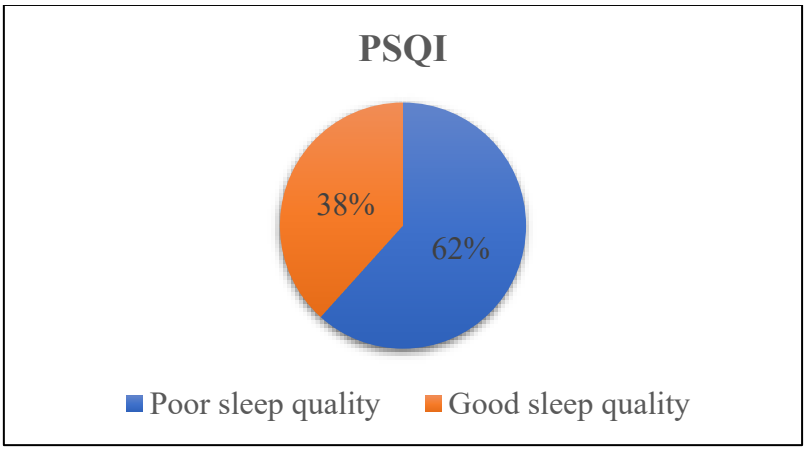
Total 60 samples were included with 75% males and 25% females. Table 1 shows mean values of Demographic Details of subjects. Figure 1 shows Prevalence of musculoskeletal disorders and Figure 2 shows Sleep Quality of office workers. Normality tests were done and data was not normally distributed. So, Spearman's Correlation Coefficient was used to correlate body regions having pain and sleep quality. Table 2 shows negligible correlation between total body areas having pain and global PSQI scores.

[Table 1: Demographic **Details** of subjects]

Characteristics	**Mean ± SD**
Age (Years)	32.5 ± 4.94
Height (cm)	163.5 ± 2.12
Weight (Kgs)	71 ± 12.72
BMI (Kg/m^2)	26.50 ± 4.07
Males (%)	75% (45)
Females (%)	25% (15)
Working experience 2-5 years 5-15 years >15 years	 36.66% (22) 46.66% (28) 16.66% (10)
Working Hours 2-5 hours >5 hours	 28.33% (17) 71.66% (43)



[Figure 1: Prevalence of MSD]



[Figure 2: PSQI score]

[Table 2: Spearman's Correlation]

Correlations

			global PSQI	total body area	age	BMI
Spearman's rho	global PSQI	Correlation Coefficient	1.000	.033	-.229	.037
		Sig. (2-tailed)	.	.805	.078	.781
		N	60	60	60	60
	total body area	Correlation Coefficient	.033	1.000	.086	-.055
		Sig. (2-tailed)	.805	.	.512	.676
		N	60	60	60	60
	age	Correlation Coefficient	-.229	.086	1.000	.206
		Sig. (2-tailed)	.078	.512	.	.111
		N	60	60	61	61
	BMI	Correlation Coefficient	.037	-.055	.206	1.000
		Sig. (2-tailed)	.781	.676	.111	.
		N	60	60	61	61

DISCUSSION:

- In this study,71.66% individuals participating in the study had pain in the neck, 53.33% in the lower back, 46.66% in the shoulder, 6.66% in the knee, 31.66% in the upper back, 15% in the ankle, 15% in the wrist, 8.33% in the hip and 6.66% in the elbow.
- According to, Pittsburgh Sleep Quality Index (PSQI) 62% individuals have poor & 38% individuals have good sleep quality.
- There was a negligible correlation between the age, BMI, number of body areas where the pain was reported and the PSQI score.
- Contrary to these studies, Katsifaraki et al. (2018) found no relationship between PSQI scores and pain. Even in that study, other sleep-related factors such as daytime sleepiness and insomnia were associated with MSD.[7] Sleep quality is a crucial factor for health. Poor sleep quality can lead to MSP. Insufficient sleep can lead to an increase in both pain and fatigue. This is an interactive relationship. The presence of MSP is associated with shorter sleep hours and lower sleep quality. [1]
- In this study, it was found that those who had pain in the shoulder, neck, lower back, knee, and ankle regions had a higher mean PSQI score than those who did not. In addition, it was found that the PSQI score increased as the number of pain regions increased.[1] In a systematic review that investigated the relationship between back pain and neck pain and physical activity; no clear relationship between physical activity and low back pain was found. [8]
- Office work often requires long hours of computer use and desk work, which requires long sitting durations. Prolonged sitting may cause a decrease in joint mobility and muscle strength. Weak lumbar mobility and muscle strength are considered as the risk factors for lumbar pain. [9] In addition, a previous study reported that being overweight was associated with disc degeneration in the lumbar spine. In our study, we found a close correlation between BMI and duration of pain. [9]
- Limitation of this study are Less sample size and it was not possible to comment on whether the pain or the sleep disturbance was the cause or the result of the vicious circle between these two phenomena since it was self-reported by the respondents which may lead to some inaccurate answers. Since the present study was performed on office workers, the results of the study cannot be generalized to other groups of employees.
- In Future, this study can be done with higher number of individuals as some literature review correlation between total body areas having pain and sleep quality. And also, can be planned to investigate both physical and psychosocial factors that may cause sleep disorders in office workers.
- Ergonomic consideration to improve posture and prevent further risk factors can be given clinically.

CONCLUSION:

As per this study, musculoskeletal pain has high prevalence among office workers, especially neck and lower back. PSQI shows 62% of individuals have poor sleep quality and 38% of individuals have good sleep quality. But there was negligible correlation between age, BMI, total body areas having pain and global PSQI score.

REFERANCES:

1. Hoe VC, Urquhart DM, Kelsall HL, Zamri EN, Sim MR. Ergonomic interventions for preventing work-related musculoskeletal disorders of the upper limb and neck among office workers. Cochrane Database Syst Rev 2018; 10(10): CD008570

2. Seeberg KGV, Andersen LL, Bengtsen E, Sundstrup E. Effectiveness of workplace interventions in rehabilitating musculoskeletal disorders and preventing its consequences among workers with physical and sedentary employment: systematic review protocol. Syst Rev 2019; 8(1): 1-7
3. Valipour Noroozi M, Hajibabaei M, Saki A, Memari Z. Prevalence of Musculoskeletal Disorders Among Office Workers. Jundishapur J Health Sci. 2015;7(1): e27157. https://doi.org/10.5812/jjhs.27157.
4. Güngördü N, Kurtul S, Erdoğan MS. Evaluation of Sleep Quality, Work Stress and Related Factors in Hospital Office Workers. Med Lav. 2023 Jun 12;114(3): e2023023. doi: 10.23749/mdl. v114i3.14033. PMID: 37309883; PMCID: PMC10281069.
5. Joanne O. Crawford, The Nordic Musculoskeletal Questionnaire, *Occupational Medicine*, Volume 57, Issue 4, June 2007, Pages 300–301, https://doi.org/10.1093/occmed/kqm036
6. Daniel J. Buysse, The Pittsburgh sleep quality index: A new instrument for psychiatric practice and researchhttps://doi.org/10.1016/0165-1781(89)90047-4
7. Katsifaraki M, Nilsen KB, Wærsted M, Knardahl S, Lie J-AS, Bjorvatn B et al. The association of sleepiness, insomnia, sleep disturbance and pain: a study amongst shift working nurses Sleep Biol Rhythms 2018; 16(1): 133-140
8. Sitthipornvorakul E, Janwantanakul P, Purepong N, Pensri P, van der Beek AJ. The association between physical activity and neck and low back pain: A systematic review. Eur Spine J 2011; 20:677–89.
9. Keskin et al., Correlation Between Sitting Duration and Position and Lumbar Pain among Office Workers / doi: 10.14744/hnhj.2019.04909