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Research Article

Association Between Work Related Musculoskeletal Pain and Quality of Sleep Among Work from Home Individuals

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Abstract

Background: The entire world is witnessing the impact of covid-19 today. In response to the ongoing global pandemic, most of the organizations have adopted work from home culture. With this work from home culture, there is a significant increase in incidences of musculoskeletal discomforts experienced by the working population. Also, a larger population is struggling with poor sleep owing to the increased physical and mental stress imposed by the global pandemic. Hence, there is a need to identify the consequences of WFH culture and extent to which it has impacted the quality of sleep-in working population.

Objective: The aim of the study is to check association between work related musculoskeletal pain and quality of sleep among work from home individuals.

Method- Due to the pandemic, an online survey is conducted and consent from participants will be obtained. The survey questionnaire will be prepared using Microsoft forms and will be distributed through WhatsApp to concerned population. Two standard questionnaires used- Orebro musculoskeletal pain screening questionnaire and Pittsburg Sleep Quality Index. Questionnaire includes questions based on work related discomforts and sleep patterns during the pandemic time. 101 individuals participated in the survey study out of which only 90 participants met the inclusion criteria of the study.

Results- The study revealed that 24.44% of the participants mentioned having pain and discomfort in neck and 23.33% of participants complained of pain in upper back followed by lower back (17.77%). Pain in shoulder, elbow, wrist and hand, knee, ankle and foot was mentioned by 10%, 2.22%, 10%, 4.44% and 2.22% participants respectively. The present study shows a weak correlation between the two outcome scales used and Pearson coefficient is found to be 0.250.

Conclusion: Majority of participants have reported having musculoskeletal pain in at least one region of the body during covid-19 pandemic. Since the pandemic has not only caused mental stress but has also increased the instances of physical pain and discomfort, it has raised the concern and requires intervention at the earliest.

Keywords: Musculoskeletal pain, Covid-19 pandemic, work from home, quality of sleep, PSQI, Orebro musculoskeletal pain screening questionnaire

Introduction

The corona virus outbreak has affected everyone's life in one or another way. From wearing masks to work from home, this new normal life has settled quite well [1].

Due to this ongoing global pandemic, the workplace has changed overnight from office settings to home environment. Working from home is currently a global scenario and also the need of the hour

considering the ongoing pandemic. Most of the organizations have chosen remote work in response to the pandemic.

In today's remote workplace, people are working at their desks most of the day, sitting for long hours on their laptops/computers and occasionally moving from their work space.

With a large population working from home during the ongoing pandemic, there is a significant increase in incidences of musculoskeletal pain and discomfort. The possible reasons behind this are the lack of ergonomic set-up, prolonged sitting hours, poor posture and lack of movement and physical activity [2].

Regarding the assessment of musculoskeletal discomfort at workplace, Phedy and Gatam (2016) conducted a study and collected the Nordic Musculoskeletal Questionnaire from 241 dentists. The results revealed that 63.5% of them had musculoskeletal discomfort in which 36.5% was fatigue and 24.9% was pain (25.7% in neck, 22.4% in upper back and 20.7% in lower back) [3].

Another study was performed by Celik., *et al*. (2018) in which data was collected through a questionnaire from 528 office workers to determine work associated musculoskeletal disorders in them. Results showed that workers experienced problem in lower back with 55.1%, neck with 52.5% and upper back with 53% [4].

But with this ongoing global pandemic when work is shifted from office settings to home, in addition to musculoskeletal pain and discomfort, the work from home individuals are also struggling with other work-related health issues like disturbed sleep, work associated stress and anxiety, fatigue, etc [5].

Continuous working hours without interim breaks has significantly contributed to a sedentary lifestyle. This work from home situation has increased both physical and mental stress among the remote workers.

Review of Literature

Condrowati., *et al.* in year 2020 conducted a study on musculoskeletal disorders among WFH workers during covid-19 pandemic. The study showed impact of work from home culture on development of musculoskeletal disorders in 104 Indonesian participants. Data was collected online through Nordic Musculoskeletal Questionnaire and results revealed that 86.3% of the workers experienced musculoskeletal disorders during last 12 months while 66.3% of workers experienced the problem during work from home. Also, most impacted regions were the neck, lower and upper back and shoulders [6].

Catherine Siengsukon, Nirmala Margaret., *et al.* in year 2016 carried out a study on relationship between low back pain and sleep quality. The study revealed that there was significant reduction in total sleep time, delay in onset of sleep and difficulty maintaining sleep in individuals with chronic LBP [7].

Seyda Toprak Celenay, Yasemin Karaaslan., *et al*. conducted a study on corona phobia, musculoskeletal pain and quality of sleep-in stay at home and continued working persons during the 3-month covid-19 pandemic lockdown. The study was conducted in year 2020 and it compared effects of 3 months nationwide lockdown in Turkey on sleep quality, musculoskeletal discomfort and fear of corona. For this study, data was collected through Nordic Musculoskeletal Questionnaire, Covid-19 Phobia Scale and Jenkins Sleep Scale from 375 individuals who were at home and 311 individuals who continued working at their work settings. It was revealed that people who were working showed more musculoskeletal symptoms than the other group mainly in neck, upper back, hip and shoulder region. However, quality of sleep remained similar in both groups [8].

Antimo Moretti, Fabrizio Menna., *et al.* carried out a study in year 2020 on characterization of home working population during covid-19 emergency. The study included 51 mobile workers and impact of home working on musculoskeletal problems, job satisfaction and work associated stress was assessed. Data was collected through Brief Pain Inventory and Utrecht Work Engagement Scale. 41.2% of respondents complained of LBP while 23.5% complained of neck pain. 39.2% of respondents declared that they were less productive but little stressed and equally satisfied while doing their work from home [9].

Gerding, Thomas, Syck., *et al.* conducted a study on assessment of ergonomic issues in the home offices of university employees sent home due to covid-19 pandemic in year 2021. They carried out a survey wherein 843 individuals including faculty, staff and administrators were questioned about their home office ergonomics and discomforts experienced by them during work. More than 40% of participants reported of moderate to severe discomfort (Back pain, shoulder pain, neck pain, headache and eye strain). 85% of

respondents were using laptops for their work while less than 45% revealed of having adjustable arm rests in their chairs [10].

Vijaykrishna Kumar, Sharon Maria Francis., *et al.* carried out a study in year 2020 on prevalence of musculoskeletal disorders among male IT professional telecommuters and male IT professional office goers during covid-19 pandemic. The study was carried out among 100 individuals of which 50 included individuals who were telecommuters and 50 included individuals who were daily office goers. Data was collected through Nordic MS questionnaire to assess prevalence of any discomfort among the 2 groups. Results showed that telecommuters are more prone to develop multiple MSD's in comparison to office goers due to work from home scenario owing to ongoing pandemic [11].

Jonas Vinstrup, Markus Due Jakobsen conducted a study on association of stress and musculoskeletal pain with poor sleep among hospital workers. The study was carried out in year 2018 and it included a total of 3593 Danish hospital workers who were questioned about their work and its impact on their health. Respondents replied to the Cohen's Perceived Stress scale and 3 questions on sleep characteristics. Association between the two was modeled using binary logistic regression it was found that both stress and musculoskeletal pain resulted in poor sleep among hospital workers [12].

Óscar Rodríguez-Nogueira, Raquel Leirós-Rodríguez., *et al*. carried out a study on musculoskeletal pain and teleworking in times of covid-19 in workers at 2 Spanish universities in year 2020. The study included 472 people including researchers, teaching staff and administrators of a Spanish university. Data was taken through Standardized Kuorinka Modified Nordic Questionnaire and Perceived Stress Scale. It was revealed that there were significant changes in lifestyle and in MS pain among the university workers owing to WFH culture during the covid-19 pandemic [13].

Dr. Tanvee Vora in year 2020 conducted a study on musculoskeletal symptoms associated with work from home culture in covid-19. There were a total of 482 individuals who replied to various questions based on their working conditions and impact of WFH on their MS system during covid-19 pandemic. Data revealed increased prevalence of musculoskeletal pain especially in neck and lower back among the professionals due to incorrect postures assumed by them while working from home [14].

Mary Jo Coiro, Kfir Asraf, Orna Tzischinsky., *et al.* carried out a study on sleep quality and covid-19 related stress in relation to mental health symptoms among Israeli and US adults. The study was conducted in year 2021. Data was collected from 2541 adults (between ages 18-70) from Israel and US. Respondents answered questions related to the pandemic associated stress, quality of sleep and symptoms of depression and anxiety. Results showed that there were high prevalence of anxiety and depression, adjustment difficulties and poor quality of sleep among participants from both countries. Pandemic related stress was revealed to be a major factor causing disturbances in sleep [15].

Taruna Verma, Rituraj Verma, Diksha Bameta., *et al.* conducted a study in year 2021 on prevalence of work from home on female IT workers on neck pain and its psychosocial effects during epidemic period. Total of 60 female IT professionals who had neck discomfort took part in this study and replied to a questionnaire having questions on prevalence of neck pain, working posture, duration of work, etc. Results showed that during the pandemic, long working hours on computer, prolonged sitting position and doing overtime resulted in increased MS discomfort [16].

Erdi, Kayabinar Busra, Onal, Birol., *et al.* carried out a study in 2021 on musculoskeletal problems and psychosocial status of teachers giving online education during the covid-19 pandemic. This study included 40 teachers who were involved in providing online education. Data was taken by Cornell Musculoskeletal Discomfort Questionnaire, ProFitMap-Neck questionnaire, Oswestry Disability Index (ODI), Upper Extremity Functional Index, Beck Anxiety Inventory and Beck Depression Inventory. Results showed that MS and psychosocial problems increased significantly in teachers during online education [17].

Lee Harrison, Sue Wilson and Marcus R Munafò carried a study in 2014 on association between sleep problems and chronic musculoskeletal pain in adolescents. The study was conducted to determine whether sleep problems during adolescence were related with musculoskeletal pain. Data was taken from 2493 participants and relationship between sleep problems and musculoskeletal pain was modeled using logistic regression. It was found that sleep disturbances including, night awakening, insomnia, etc. in adolescents was significantly associated with regional and widespread MS pain experienced by them [18].

Elham Zarean, Asma Azadeh., *et al.* conducted a study on association between depression, anxiety and insomnia with musculoskeletal pain in year 2021. The study included 450 patients with musculoskeletal pain. Participants were divided into 2 groups-individuals with unknown MS pain sources and individuals with known MS pain sources. Goldberg depression, Beck Anxiety Inventory and Morin Insomnia Severity Index questionnaires were used to collect data. It was found that there was a statistically significant relationship between insomnia and anxiety severity with MS pain source [19].

Dr. Atiya A Shaikh and Dr. Sujit R Kadrekar carried out a study on impact of work from home during covid-19 pandemic and musculoskeletal problems in IT professionals in year 2020. This study was conducted to determine the musculoskeletal problems faced by computer professionals while doing work from home during ongoing global pandemic. Questions about current and previous musculoskeletal problems and working conditions were circulated to IT workers. It was found that % of shoulder pain, elbow pain and wrist pain increased by double and there was a significant increase in % of headache, eye strain and back pain during pandemic [20].

Aims and Objectives

This study is conducted to check the association between work related musculoskeletal pain and sleep quality in work from home individuals.

- To study which region has developed more M-S pain/discomfort in work from home individuals
- To study the association between work related musculoskeletal pain and quality of sleep in work from home individuals using two different scales

Research Design and Methodology

Research design

Quantitative research design is used. It is a survey-based study with a closed ended questionnaire conducted among work from home individuals. The survey questionnaire is prepared using Microsoft forms and is distributed through WhatsApp to target population. A total of 101 individuals participated in the survey study out of which 90 participants met the inclusion criteria of the study. A non-probability sampling method is used. Responses from target population is collected and listed in form of a table. The data is sorted, analyzed and interpreted. MS Excel Pearson correlation coefficient is used to find the association.

Selection criteria

Inclusion criteria

- WFH individuals including IT professionals, teachers, etc
- Both male and female population
- Individuals having computer and desk related job
- Daily working hours is more than 6

Exclusion criteria

- Individuals not understanding English well
- Individuals who are sleep deprived due to any previously diagnosed medical condition
- Individuals with age > 50 years

Procedure

Participants were explained about the intention and motive of study and a written consent was obtained. Survey questionnaire was distributed through WhatsApp. WFH population having pain in one or more regions during the pandemic were identified by basic screening questions about their daily working hours, whether they have desk and computer related work, etc. Survey form consisted of 2 standard questionnaires-Orebro musculoskeletal pain screening questionnaire and Pittsburg Sleep Quality Index. Orebro musculoskeletal pain screening questionnaire was used to predict long term disability in working individuals who have developed acute/chronic musculoskeletal pain. Pittsburg Sleep Quality Index was used to determine sleep patterns of working individual in the past week. Pearson's correlation coefficient was used to find association between two scales mentioned above.

Results

Survey was filled by 101 participants out of whom 90 were eligible and were fulfilling the criteria of inclusion. The figure 1 shows the percentage of participants who complained of pain in the following regions of the body. Results revealed that 24.44% of the participants mentioned having pain and discomfort in neck and

23.33% of participants complained of pain in upper back followed by lower back (17.77%). Pain in shoulder, elbow, wrist and hand, knee, ankle and foot was mentioned by 10%, 2.22%, 10%, 4.44% and 2.22% participants respectively.

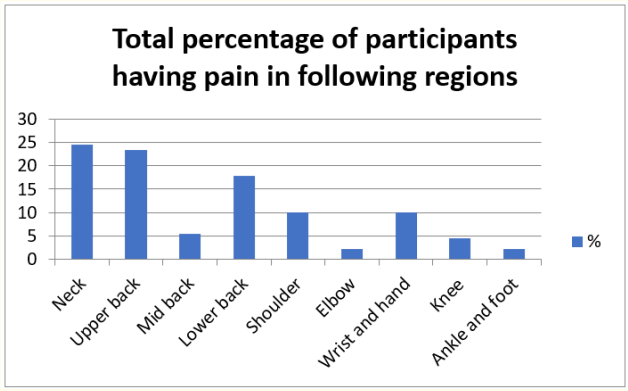

Figure 1

Figure 2 shows the most painful region as mentioned by the participants. The results show that pain in the neck is reported by 22 participants followed by pain in upper back reported by 21 participants. 16 participants mentioned having pain and discomfort in lower back. Pain in shoulder and wrist and hand was mentioned by 9 participants each. Discomfort and pain in mid back, elbow, knee, ankle and foot is mentioned by 5, 2, 4, 2 participants respectively.

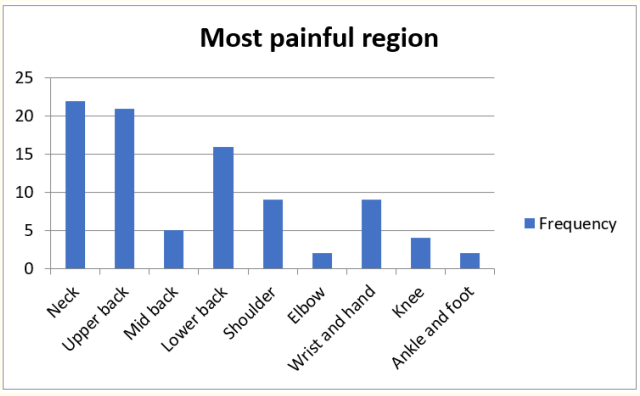

Figure 2

After the data was sorted and scoring was completed, the correlation was established using Pearson's correlation coefficient to find association between Orebro musculoskeletal pain screening questionnaire and Pittsburg Sleep Quality Index. The 'r' value was found to be 0.250 thus indicating a positive but weak correlation between the two scales used. Figure 3 indicates the same.

Figure 3

Discussion

The study checked the association between work associated musculoskeletal discomfort and sleep quality in individuals who are working from their homes during covid-19 pandemic.

From this study it is found that 3 most affected regions in the body that developed M-S discomfort during wfh included neck (24.44%), upper back (23.33%) and lower back (17.77%). This was confirmed by the study of Condrowati and Bachtiar (Jan 2020) wherein results revealed the most impacted regions that had developed musculoskeletal pain were the neck, lower and upper back and shoulders.

On assessing their sleep patterns during wfh it is found that sleep disturbances like night awakening, insomnia, etc. was significantly associated with regional and widespread MS pain.

Correlation established using Pearson's correlation coefficient to find association between Orebro musculoskeletal pain screening questionnaire and Pittsburg Sleep Quality Index is found to be 0.250 thus indicating a positive but weak correlation between the two scales used.

Conclusion

The corona virus outbreak has changed the workplace settings overnight. The workplace has shifted from office environment to home environment and work from home culture has been adopted by most of the individuals in response to the ongoing pandemic.

The new work culture has significantly impacted an individual's physical as well as mental wellbeing. This study has revealed that this WFH culture has added to incidences of musculoskeletal pain and discomfort and has impacted the sleep quality in most of the individuals to a notable extent. Also, the most impacted areas were neck, upper and lower back.

As people are still continuing with work from home culture, a detailed understanding of various social, behavioral and physical factors is instrumental in avoiding any work associated problems in them.

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