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Research Article

Musculoskeletal Pain among Work from Home Population during the COVID-19 Pandemic - A Cross Sectional Study

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A B S T R A C T

Background: The COVID-19 pandemic and the subsequent lockdowns had brought many changes in the working patterns of the people. Work from home, which has been becoming the new normal is suspected to increase the prevalence of musculoskeletal disorders and stress.

Aim: To assess the prevalence of musculoskeletal pain among the work from home population and hence bring the required changes to ergonomics.

Methods and Materials: This is a cross-sectional study, conducted among the urban population (IT employees) of Chengalpattu district. A total of 180 participants were included in the study. Standardized Nordic Musculoskeletal Questionnaire, adapted to fit the current study was used as a self-administered online questionnaire to collect data from the participants.

Results: Prevalence of musculoskeletal disorders among work from home population was found to be 84% with low backache being the most common musculoskeletal pain. Around 50% of the participants either had an increase in pain (18.9%) or reported that the pain started only during the lockdown (30.6%). Majority of the participants (55.6%) had more than 8 hours of work per day, which may be attributed to the increase in musculoskeletal pain. Perceived stress levels were found to be increased during the work from home period.

Conclusion: The absence of ergonomic office furniture may lead to increased faulty posture increasing the musculoskeletal pain, hence awareness on factors like right posture, using the right furniture should be ensured among home working population. By bringing out the required changes in ergonomics for the home working population, the prevalence of musculoskeletal disorders and stress can be reduced.

Keywords: Musculoskeletal Pain, Work, COVID-19

Introduction

During the COVID-19 pandemic, there has been many changes in the working patterns of the people. The Government of India announced the first nationwide lockdown on 24 March 2020 following which there have been subsequent lockdowns and interruptions in the normal living and work patterns of the people. One such sector affected was the IT (Information Technology) sector. IT jobs are positions in the fields of computer science, hardware, data storage/retrieval and computer support and most of these IT companies have adopted the work from home mode for their professionals. Schools and colleges have turned to online teaching methods. Work from home, teleworking or remote work can be defined as "an employment arrangement in which employees do not commute to a central place of work, such as an office building, warehouse, or retail store. It is facilitated by technology such as collaborative software, local area networks, virtual private networks, conference calling, videotelephony, internet access, cloud computing, Voice over internet protocol, mobile telecommunications technology such as a Wi- Fi-equipped laptop or tablet computers, smartphones and desktop computers with landline phones."[1] With the increased duration of usage of screens and computer monitors adverse effects on health have also creeped in. "Musculoskeletal disorders (MSD) are injuries or disorders of the muscles, nerves, tendons, joints, cartilage, and spinal discs. Work-related musculoskeletal disorders are conditions in which the work environment and performance of work contribute significantly to the condition and/or the condition is made worse or persists longer due to work conditions".[2]

Recent analysis of the Global Burden of Disease data showed that approximately 1.71 billion people globally have musculoskeletal conditions.[3] Musculoskeletal conditions are the leading contributor to disability worldwide, with low back pain being the single leading cause of disability in 160 countries.[4] In addition, studies have reported that the prevalence of musculoskeletal pain is high among software professionals and people who work with computer monitors for long durations.[5-8] Ergonomics plays an important role in the causation of musculoskeletal disorders.[2] This study is done to assess the prevalence of musculoskeletal pain among the work from home population and hence bring the required changes to ergonomics. We also aim to analyse the predictors of musculoskeletal issues among the work from home population and to evaluate the perceived stress levels among the home-working population.

Materials and Methods

This study is a cross-sectional study, conducted in Chengalpattu district among IT employees. The study was carried out over a period of 1 month during November 2021. Taking the prevalence of musculoskeletal disorders in India as 20% [9] and 6% margin of error, using the formula $4pq/l^2$, the minimum sample size required was calculated to be 178. Simple random sampling technique was used. IT employees who were in work from home for the preceding 12 months were included in the study. The exclusion criteria for the study were people who were physically challenged. Standardized Nordic Musculoskeletal Questionnaire, which was adapted to fit the current study, was used. The questionnaire was used as a self-administered online questionnaire (google forms). The questionnaire consisted of 5 parts as follows, I - Personal details, II - Questions on musculoskeletal pain in last 12 months, III Questions on musculoskeletal pain that prevented from doing normal work in the last 12 months, IV - Questions on musculoskeletal issues in the last 7 days, V - Questions on changes in pain/discomfort and perceived stress levels during the lockdown.

An IT company located at Chengalpattu district was selected and a list of their employees working for the company along with their contact numbers was obtained. The participants for the study were selected using a random number generator table until the required sample size was achieved. The recruited participants were then contacted over phone and the purpose and confidentiality of the study was explained. After obtaining consent from the participants, the questionnaire (google forms) was sent to them for filling. The collected google form data were entered in Microsoft Excel, coded and analyzed using IBM-SPSS software version 21.0. Chi square test was used to find the significant predictors for musculoskeletal disorders among work from home population.

Results

The total study population was 180. Table 1 shows the various characteristics of the study population. It was observed that 81.8% of the study population belonged to the age group 25-45 years, 15.6% of the study population were >45 years and 3.3% of the population were in the age group 18-24 years. The study population had 78.9% males and 21.1% females. BMI was calculated using the WHO classification of BMI (2021). 45% of the study population were in the normal weight category (BMI 18.5-24.9) while 37.8% of the participants were in the overweight category (BMI 25-29.9) and 17.2% of the participants were obese (BMI > 30). It was observed that 44.4% of the study population worked at home for less than 8 hours per day while 55.6% participant worked for more than 8 hours per day.

Figure 1, shows the distribution of musculoskeletal disorders among the study population. 84% of the study population reported as having musculoskeletal disorders and 16% of the participants reported, as they did not experience any musculoskeletal disorders during the work from home period.

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Table 1.General Characteristics of the Study Population

Characteristics	n	%
Age (years)		
18-24	6	3.3
25-45	146	81.8
>45	28	15.6
Gender		
Male	142	78.9
Female	38	21.1
BMI		
Underweight	0	0
Normal	81	45
Overweight	68	37.8
Obese	31	17.2
Hours of work per day		
<8 hours	80	44.4
>8 hours	100	55.6

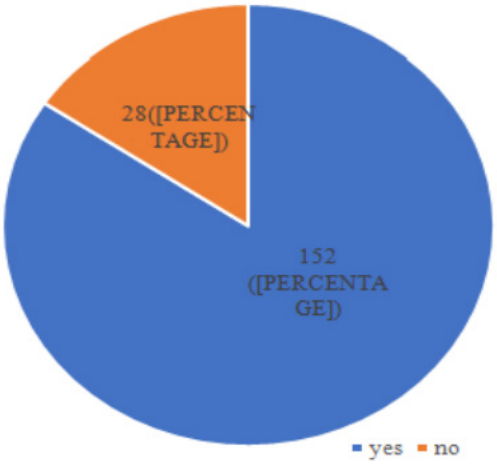

Figure 1.Distribution of Musculoskeletal Disorders among the Study Population

It was also observed that 100% of the study participants in the age group of 18-24 years had musculoskeletal disorders and 85.7% of the participants in the age group above 45 years had musculoskeletal disorders while 83.6% participants of the 25-45 years age had some form of musculoskeletal disorder (Figure 2).

Table 2 shows the distribution of musculoskeletal disorders in various parts of the body among the study participants. It was observed that majority of the study participants, that is 61.7% participants experienced lower back pain at least once in the last 12 months, 40% participants had experienced lower back pain in the last 7 days and 36.7% reported that the pain caused some kind of disability or disturbance in their normal work. Neck pain was reported by 59.4% participants and 38.9% participants reported that they experienced shoulder pain and 31.1% participants reported pain in the wrists during the last 12 months. 27.2% study participants also reported saying that they experienced upper back pain during the last 12 months.

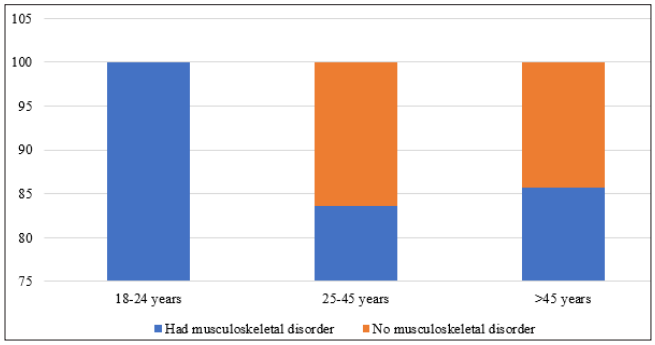

Figure 2.Distribution of Musculoskeletal Disorders among the Participants

Table 2.Distribution of Musculoskeletal Disorders in Various Parts of the Body

Parts of the human body	Had pain in the given regions during last 12 months (n=180)		Had pain in given regions during last 7 days		Pain causing disability/ disturbance in normal work	
	n	(%)	n	(%)	n	(%)
Neck	107	(59.4)	69	(38.3)	50	(27.8)
Shoulders	70	(38.9)	36	(20.0)	32	(17.8)
Elbows	16	(08.8)	06	(03.3)	08	(04.4)
Wrist	56	(31.1)	30	(16.7)	25	(13.9)
Upper back	49	(27.2)	30	(16.7)	17	(09.4)
Lower back	111	(61.7)	72	(40.0)	66	(36.7)
Hips/ thighs	42	(23.3)	18	(10.0)	17	(09.4)
knees	39	(21.7)	26	(14.4)	17	(09.4)
Ankles/ feet	48	(26.7)	33	(18.3)	26	(14.4)

Table 3, shows the distribution of characteristics of musculoskeletal pain. It was observed from the study that though 53.9% of the study participants had musculoskeletal pain or discomfort even before the lockdown, 30.6% of the study participants developed any form of musculoskeletal pain only after the work from home period started. 64.4%

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of the study participants reported that office is the better work place in terms of ergonomics. When questioned about the change in pain during lockdown, 30.6% of the study participants reported that the pain started only after the lockdown. 25.6 % participants reported no change in pain during the lockdown while 18.9% of the participants reported that the pain increased during the lockdown.

Table 4, shows the predictors of musculoskeletal disorders among the study participants in the last 12 months. In the gender category it is observed that 100% of the female participants in the study population had musculoskeletal disorders. Female gender was found to be a significant predictor for musculoskeletal disorders among the study participants (p value-0.003). Also working for more than 8 hours per day was found to be a significant predictor of musculoskeletal disorders (p value - 0.012).

Table 3.Distribution of Characteristics of Musculoskeletal Pain (n=152)

Start of the pain/ discomfort	**n**	**%**
Before lockdown	97	53.9
After lockdown	55	30.6
Better work place		
Office	116	64.4
Work from home	36	20
Change in pain during lockdown		
Increased	34	18.9
Decreased	17	9.4
No Change	46	25.6
Started only after lockdown	55	30.6

Table 4.Predictors of Musculoskeletal Disorders among Study Participants in last 12 months

Predictors	**Categories**	**With MSD**		**Without MSD**		**Total (n=180)**	**P value**
		n	**(%)**	**n**	**(%)**		
Gender	Male	114	(80.3)	28	(19.7)	142	0.003*
	Female	38	(100)	0	(0)	38	
BMI	Normal	67	(82.7)	14	(17.3)	81	0.601
	Overweight	57	(83.8)	11	(16.1)	68	
	obese	28	(90.3)	03	(9.7)	31	
Hours of work	≤8 hours	61	(76.3)	19	(23.7)	80	0.012*
	>8 hours	90	(90.0)	10	(10.0)	100	

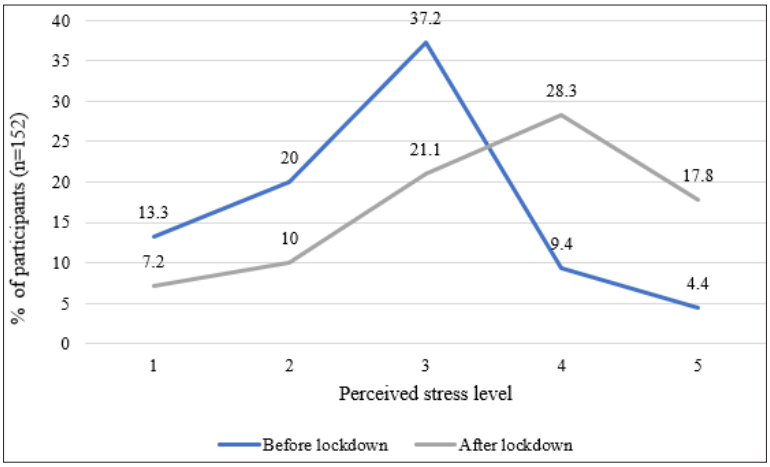

Figure 3.Graph Showing the Perceived Stress Levels during and before the Lockdown

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Figure 3 shows the perceived stress levels among the study participants before the lockdown and during the lockdown, when the work from home period started. The participants were asked to grade their stress levels before and after the lockdown on a scale of 1-5 (1- lowest stress level and 5- highest stress levels) and the findings are represented in the graph. Before the lockdown, majority (37.2%) of the participants reported a perceived stress level of 3 while after the lockdown started majority (28.3%) of the participants reported a perceived stress level of 4. It is also observed from the graph that before the lockdown only 4.4% of the study participants reported as having the highest stress levels of 5, while after the lockdown and the work from home period started around 17.8% of the participants reported as having the highest stress levels of 5.

Discussion

In the current study, the overall prevalence of musculoskeletal disorders among work from home population in the last 12 months is found to be 84% and increased hours of work is found as a significant predictor of musculoskeletal pain among them. A similar study done in Pune showed that the prevalence of musculoskeletal aches and pains during the lockdown was around 66.8% compared to 35.7% before the lockdown and change in pain status may be attributed to the increased work duration (>10 hours) during the lockdown.[10] The current study also revealed that 61.7% participants experienced a low back pain during the work from home period and 36.7% experienced disturbance in normal work due to the low back pain. A similar study done in Italy [11] stated that Low back pain was reported by 41.2% of the home working population and 38.1% reported an increase in the severity of pain. In the present study 17.8% of the participants reported a perceived stress level of 5 during the work from home period compared to 4.4% before the lockdown. Research conducted by the International Labor Organization and Eurofound[12] stated that about 41% of home workers declared that they felt stressed compared with 25% of their colleagues who work in the office. Hence, work from home can also be attributed to affect the mental health in addition to musculoskeletal health.

Conclusion

Prevalence of musculoskeletal disorders among work from home population is found to be 84%, with low backache being the most common musculoskeletal pain. Around 50% of the participants either had an increase in pain (18.9%) or reported that the pain started only during the lockdown (30.6%). Majority of the participants (55.6%) had >8 hours of work per day which may be attributed to the increase in musculoskeletal pain. Gender is also found to be positively associated with prevalence of musculoskeletal pain. Perceived stress levels were found to be increased during the work from home period.

Recommendations

As musculoskeletal pain is a leading cause of disability worldwide it is important to advocate appropriate interventions specially in this time of a global pandemic when prevalence of musculoskeletal disorders is on the rise due to work from home scenario. The absence of ergonomic office furniture may lead to increased faulty posture increasing the musculoskeletal pain, hence awareness on factors like right posture, using the right furniture should be ensured among home working population. Online training programs to create the right ergonomic environment at home along with muscle relaxing/ stretching exercises (with the help of physiotherapists/ doctors) can be provided to the employees before entering the work from home period. Further studies are required on the productiveness of work from home population, their stress levels and job satisfaction to improve their mental health as well.

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Conflicts of Interest: None

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