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A study on the prevalence of musculoskeletal disorders among Male IT professional Telecommuters and Male IT professional Office Goers during COVID-19 pandemic.

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ABSTRACT

Background: Musculoskeletal disorders in developing countries are considered as main cause of occupational disorders and disability and highly associated with socioeconomic burden to individual, organization and society in general view. COVID-19 pandemic has enforced the concept 'Work from Home' (WFH) into an officially mandated, strictly enforced rule. Now, WFH concept is emerging from all sectors, from IT sectors to teaching sectors. WFH concept is new to majority of the employees, as the COVID 19 has forced almost all the employees of all the sectors to work from home for the first time. As the employees are experiencing new environment, the purpose of this study was to determine the prevalence of musculoskeletal disorders among IT professional male telecommuters (people who work from home) and office goers.

Method: This cross-sectional study was carried out among 100 Normal population between the age group of 25-35 years, which has been divided into two groups. Group A (50) includes individuals who work from home - telecommuters and Group B (50) includes individuals who on daily basis travel to office -office goers. Standard Nordic questionnaire has been employed to assess prevalence of MSD's among the two groups.

Results: The results showed that there is significant difference between different category of neck 7 days, shoulder 7 days, elbow 7 days, wrist/hand 12 months, upper back 7 days, lower back 7 days, hip/thigh/buttocks 7 days pain and the groups but there is no significant difference between other joint region pain and groups.

Conclusion: There is a significant difference between different category of neck, shoulder, elbow, wrist/hand, upper-back, lower-back, h/t/b pain and the groups so we can conclude from the results that telecommuters are prone to multiple MSD's due to COVID-19 pandemic situation that has forced them to WFH with no proper ergonomic facilities provided at home environment. Therefore, proper counselling, postural correction, and awareness sessions should be conducted on ergonomics to maintain and prevent the MSD' s among IT professional telecommuters and office goers.

Key words: MSD's, telecommuters, office goers, Nordic scale, QOL, WRMSD.

INTRODUCTION

Musculoskeletal disorder (MSD'S) refers to injuries affecting the soft tissues of the neck, shoulder, elbow, hand wrist and fingers. Musculoskeletal (MSK) pain is very common in both developed & developing countries with estimates of prevalence ranging from 11-60%. Musculoskeletal condition affects more than 1.7 billion people worldwide and have the 4th greatest impact on the overall health of the world population, considering both death and disability. [1,2] COVID-19 pandemic has enforced the concept 'Work from Home' (WFH) into an officially mandated, strictly enforced rule. Now, WFH concept is emerging from all sectors, from IT sectors to teaching sectors. WFH concept is new to majority of the employees, as the COVID 19 has forced almost all the employees of all the sectors to work from home for the first time.[3] The Global Burden of Disease (GBD) study provides evidence of the impact of musculoskeletal conditions, highlighting the significant disability burden associated with these conditions. In the 2017 GBD study, musculoskeletal conditions were the highest contributor to global disability (accounting for 16% of all years lived with disability), and lower back pain remained the single leading cause of disability since it was first measured in 1990. While the prevalence of musculoskeletal conditions varies by age and diagnosis, between 20%–33% of people across the globe live with a painful musculoskeletal condition.[4] Work-related musculoskeletal disorders (WRMSDs) are serious socioeconomic problems in modern society from two point of view. First, WRMSDs are one of the most common work-related diseases in developed countries. Second, WRMSDs are key factors for sick leave, which is common around the world. [5] Most of the researches agree that exposure to a combination of work place risk factors and an interaction between them are the major contributors to WMSD'S. Epidemiologic studies of workers have associated these disorders with many work- place physical and psychosocial factors. [6] Specific physical factors associated with these disorders include intense, repeated or sustained excretions, awkward, sustained, or extreme postures of the body, insufficient recovery time, and high impact forces are the primary risk factors for WRMSD'S. [7] The WRMSD's developed due to exposure of above factors over a longer period of time that need suitable coping strategies which help in controlling it. Workers performing strenuous work for longer duration can cope with musculoskeletal symptoms by modifying their working techniques with the help of ergonomic principles.[8] Hence, this study was undertaken for finding the prevalence of musculoskeletal disorder among telecommuters and office goers using Standard Nordic Musculoskeletal Questionnaire. The findings will help improve their working conditions and prevent work-related disorders. [9]

METHODOLOGY

Study criteria

- Sample design
  The sample design is convenient sampling.
- Sample size
  A sample size of 100 normal population aged 25-35

Criteria for selection

- Inclusion criteria
  Age group: 25-35yrs
  Sex: Male
  Occupation: IT professionals
- Exclusion criteria
  Any diagnosed case of musculoskeletal/neurological/psychological/psychiatric/deficit or disorders that can affect the study.

Procedure

Sample of 100 subjects were taken among the age group of 25-35 yrs which has been divided into two groups.

Group A (50) includes telecommuters (people who work from home and Group) B (50) includes office goers.
Then the purpose and procedure of the test was explained to all the subjects and consent was taken.

Standard Nordic questionnaire has been employed to access prevalence of MSDs among these two groups.

This Sample, general questionnaire, recognized, validated internationally, detects symptoms in neck, back, shoulder and extremities. It presents 28 multiple choice questions, sometimes negative, structured in two well differentiated parts.

The first part, the general one refers to symptoms in 9 parts of the body [Neck, Shoulders, Elbows, Wrist/ Hands, Upper Back, Lower Back, Hip/ Thighs, Knees & Ankles / Feet] during the last 12 months / 7 days.

The second part, the specific one, refers to symptoms in 3 parts of the body [Neck, Shoulders & Lower Back] throughout the subjects working life/ 7days beforehand. In both cases, complementary information of the worker would be helpful, but not obligatory, to ensure a better evaluation.

RESULTS

The 100 individuals participated in this study are divided into two groups Group A (telecommuters)and Group B (office goers). In both the groups all are males.
Nobody had any other medical problems.

Table-1

Group		N	Mean	Std. Deviation
AGE	Group A	50	27.2800	2.76302
	Group B	50	28.3000	3.22775

Table -1: The mean and standard deviation of age is Group A is 27.28±2.763 and that of in group B is 28.3±3.227.

Table-2

Group		MALE
GENDER	Group A	50
	Group B	50

Table-2: The number of males in group A (telecommuters) is 50 and the number of males in group B

Table -3

Group		N	Mean	Std. Deviation
Job duration	Group A	50	10.54	0.676
	Group B	50	8.6	0.670

Table -3: The mean and standard deviation of job duration is 10.54±0.676 in group A and 8.6±0.670 in group B.

DATA ANALYSIS

Crosstabulation of neck12m			Group A	Group B	Total
neck12m	N	COUNT	38	39	77
		% WITHIN GROUP	49.4%	50.6%	100.0%
	Y	COUNT	12	11	23
		% WITHIN GROUP	52.2%	47.8%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -4(a):

Chi square=0.056, p value=0.812

not significant

Crosstabulation of neck7d			Group A	Group B	Total
neck7days	N	COUNT	24	43	67
		% WITHIN GROUP	35.8%	64.2%	100.0%
	Y	COUNT	26	7	33
		% WITHIN GROUP	78.8%	21.2%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -4(b):

Chi square=16.327, p value=0.000 significant

Crosstabulation of neckFI12m			Group A	Group B	Total Total Total
Neck impairment	N	COUNT	46	49	95
		% WITHIN GROUP	48.4%	51.6%	100.0%
	Y	COUNT	4	1	5
		% WITHIN GROUP	80.0%	20.0%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -4(c):

Chi square=1.895, p value=0.169

not significant

Crosstabulation of shoulder12m			Group A	Group B	Total
shoulder12m	N	COUNT	37	41	78
		% WITHIN GROUP	47.4%	52.6%	100.0%
	Y	COUNT	13	9	22
		% WITHIN GROUP	59.1%	40.9%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -5(a):

Chi square=0.932, p value=0.334

not significant

Crosstabulation of shoulder7d			Group A	Group B	Total
shoulder7days	N	COUNT	35	46	81
		% WITHIN GROUP	43.2%	56.8%	100.0%
	Y	COUNT	15	4	19
		% WITHIN GROUP	78.9%	21.1%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -5(b):

Chi square=7.862, p value=0.005 significant

Crosstabulation of shoulderFI12m			Group A	Group B	Total
Shoulder impairment	N	COUNT	45	49	94
		% WITHIN GROUP	47.9%	52.1%	100.0%
	Y	COUNT	5	1	6
		% WITHIN GROUP	83.3%	16.7%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -5(C):

Chi square=2.837, p value=0.092

not significant

Table -6(a):

Chi square=3.053, p value=0.081 not significant

Crosstabulation of elbow12m			Group		Total
			Group A	Group B	
elbow12m	N	COUNT	43	48	91
		% WITHIN GROUP	47.3%	52.7%	100.0%
	Y	COUNT	7	2	9
		% WITHIN GROUP	77.8%	22.2%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -6(b):

Chi square=5.983, p value=0.014 significant

Crosstabulation of elbow7d			Group		Total
			Group A	Group B	
elbow7days	N	COUNT	42	49	91
		% WITHIN GROUP	46.2%	53.8%	100.0%
	Y	COUNT	8	1	9
		% WITHIN GROUP	88.9%	11.1%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -6(c):

Chi square=1.010, p value=0.315 not significant

Table -7(a):

Chi square=4.574, p value=0.032 significant

Crosstabulation of wrist/hand7d			Group		Total
			Group A	Group B	
wrist7days	N	COUNT	42	47	89
		% WITHIN GROUP	47.2%	52.8%	100.0%
	Y	COUNT	8	3	11
		% WITHIN GROUP	72.7%	27.3%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -7(b):

Chi square=2.554, p value=0.110 not significant

Crosstabulation of wrist/handFI12m			Group		Total
			Group A	Group B	
Wrist Impairment	N	COUNT	44	47	91
		% WITHIN GROUP	48.4%	51.6%	100.0%
	Y	COUNT	6	3	9
		% WITHIN GROUP	66.7%	33.3%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -7(c):

Chi square=1.099, p value=0.295 not significant

Crosstabulation of upperback12m			Group A	Group B	Total
Upper-back 12m	N	COUNT	41	40	81
		% WITHIN GROUP	50.6%	49.4%	100.0%
	Y	COUNT	9	10	19
		% WITHIN GROUP	47.4%	52.6%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -8(a):

Chi square=0.065, p value=0.799

not significant

Crosstabulation of upperback7d			Group A	Group B	Total
Upper-back 7days	N	COUNT	35	46	81
		% WITHIN GROUP	43.2%	56.8%	100.0%
	Y	COUNT	15	4	19
		% WITHIN GROUP	78.9%	21.1%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -8(b):

Chi square=7.862, p value=0.005 significant

Crosstabulation of upperbackFI12m			Group A	Group B	Total
Upper-back Impairment	N	COUNT	49	50	99
		% WITHIN GROUP	49.5%	50.5%	100.0%
	Y	COUNT	1	0	1
		% WITHIN GROUP	100.0%	0.0%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -8(c):

Chi square=1.010, p value=0.315 not significant

Crosstabulation of lowerback12m			Group A	Group B	Total
Lower-back 12m	N	COUNT	23	28	51
		% WITHIN GROUP	45.1%	54.9%	100.0%
	Y	COUNT	27	22	49
		% WITHIN GROUP	55.1%	44.9%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table –9(a):

Chi square=1.000, p value=0.317 not significant

Crosstabulation of lowerback7d			Group A	Group B	Total
Lower-back 7days	N	COUNT	16	40	56
		% WITHIN GROUP	28.6%	71.4%	100.0%
	Y	COUNT	34	10	44
		% WITHIN GROUP	77.3%	22.7%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -9(b):

Chi square=23.377, p value=0.000 significant

Crosstabulation of lowerbackFI12m			Group A	Group B	Total
Lower-back Impairment	N	COUNT	36	42	78
		% WITHIN GROUP	46.2%	53.8%	100.0%
	Y	COUNT	14	8	22
		% WITHIN GROUP	63.6%	36.4%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -9(c):

Chi square=2.098, p value=0.148 not significant

Crosstabulation of h/t/b12m			Group		Total
			Group A	Group B	
h/t/b12m	N	COUNT	40	45	85
		% WITHIN GROUP	47.1%	52.9%	100.0%
	Y	COUNT	10	5	15
		% WITHIN GROUP	66.7%	33.3%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -10(a):

Chi square=1.961, p value=0.161 not significant

Crosstabulation of h/t/b7d			Group		Total
			Group A	Group B	
h/t/b7days	N	COUNT	36	47	83
		% WITHIN GROUP	43.4%	56.6%	100.0%
	Y	COUNT	14	3	17
		% WITHIN GROUP	82.4%	17.6%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -10(b):

Chi square=8.575, p value=0.003 significant

Crosstabulation of h/t/bFI12m			Group		Total
			Group A	Group B	
h/t/b impairment	N	COUNT	47	47	94
		% WITHIN GROUP	50.0%	50.0%	100.0%
	Y	COUNT	3	3	6
		% WITHIN GROUP	50.0%	50.0%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table –10(c):

Chi square=0.001, p value=1.000 not significant

Crosstabulation of knee12m			Group		Total
			Group A	Group B	
knee12m	N	COUNT	47	43	90
		% WITHIN GROUP	52.2%	47.8%	100.0%
	Y	COUNT	3	7	10
		% WITHIN GROUP	30.0%	70.0%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -11(a):

Chi square=1.778, p value=0.182 not significant

Crosstabulation of knee7d			Group		Total
			Group A	Group B	
knee7days	N	COUNT	45	47	92
		% WITHIN GROUP	48.9%	51.1%	100.0%
	Y	COUNT	5	3	8
		% WITHIN GROUP	62.5%	37.5%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -11(b):

Chi square=0.543, p value=0.461 not significant

Crosstabulation of kneeFI12m			Group		Total
			Group A	Group B	
Knee Impairment	N	COUNT	49	48	97
		% WITHIN GROUP	50.5%	49.5%	100.0%
	Y	COUNT	1	2	3
		% WITHIN GROUP	33.3%	66.7%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -11(c):

Chi square=0.344, p value=0.558 not significant

Crosstabulation of ankle/feet12m			Group		Total
			Group A	Group B	
ankle12m	N	COUNT	42	41	83
		% WITHIN GROUP	50.6%	49.4%	100.0%
	Y	COUNT	8	9	17
		% WITHIN GROUP	47.1%	52.9%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -12(a):

Chi square=0.071, p value=0.790

not significant

Crosstabulation of ankle/feet7d			Group		Total
			Group A	Group B	
ankle7days	N	COUNT	44	45	89
		% WITHIN GROUP	49.4%	50.6%	100.0%
	Y	COUNT	6	5	11
		% WITHIN GROUP	54.5%	45.5%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -12(b):

Chi square=0.102, p value=0.749

not significant

Crosstabulation of ankle/feetFI12m			Group		Total
			Group A	Group B	
Ankle Impairment	N	COUNT	46	50	96
		% WITHIN GROUP	47.9%	52.1%	100.0%
	Y	COUNT	4	0	4
		% WITHIN GROUP	100.0%	0.0%	100.0%
Total		COUNT	50	50	100
		% WITHIN GROUP	50.0%	50.0%	100.0%

Table -12(c):

Chi square=4.167, p value=0.041

not significant

DISCUSSION

Statistical analysis was done by using chi square test. The chi square test is used to find the association between the attributes. Among the two groups that is group A and group B the chi square is significant if the p value is less than 0.05.

Table -1: The mean and standard deviation of age is Group A is 27.28±2.763 and that of in group B is 28.3±3.227.

Table-2: The number of males in group A (telecommuters) is 50 and the number of males in group B.

Table -3: The mean and standard deviation of job duration is 10.54±0.676 in group A and 8.6±0.670 in group B.

Interpretation: Table 4 (b) At 5% level of significance the calculated chi square value is 16.327 and p-value is 0.000. Since, p-value is lesser than 0.05 there is significant impact of MSD on neck 7 days and the groups.

Table 5 (b) At 5% level of significance the calculated chi square value is 7.862 and p-value is 0.005. Since, p-value is lesser than 0.05 there is significant impact of MSD on shoulder 7 days and the groups.

Table 6 (b) At 5% level of significance the calculated chi square value is 5.983 and p-value is 0.014. Since, p-value is lesser than 0.05 there is significant impact of MSD on elbow 7 days and the groups.

Table 7 (a) At 5% level of significance the calculated chi square value is 4.574and p-value is 0.032. Since, p-value is lesser than 0.05 there is significant impact of MSD on wrist/hand 12 months and the groups.

Table 8 (b) At 5% level of significance the calculated chi square value is 7.862 and p-value is 0.005. Since, p-value is lesser than 0.05 there is significant impact of MSD on upper-back 7 days and the groups.

Table 9 (b) At 5% level of significance the calculated chi square value is 23.377 and p-value is 0.000. Since, p-value is lesser than 0.05 there is significant impact of MSD on lower-back 7 days and the groups.

Table 10 (b) At 5% level of significance the calculated chi square value is 8.577 and p-value is 0.003. Since, p-value is lesser than 0.05 there is significant impact of MSD on hip/thigh/buttocks 7 days and the groups.

From the above interpretations we can say that the respondents were affected by MSD's in one or more body regions. In response to the COVID-19 pandemic, many countries have adopted a broad spectrum of containment measures, from recommendations to stay at home to quarantines of large geographic regions. More than 3.4 billion people in 84 countries have been confined to their homes, as estimated in late March 2020, which potentially translates to many millions of workers temporarily exposed to telecommuting. The sudden shift to teleworking could not have been anticipated by workers or employers, so the safety of the home working environment has not necessarily been ensured. However, for many the uptake of telework will be temporary, so a limited duration of exposure may mitigate risks of injury or pain associated with the home environment, or risks of musculoskeletal disorders associated with unergonomic workstations. [10] Therefore, awareness of proper movement analysis according to ergonomics should be educated and measures to provide an ergonomic workstation to avoid MSD's among telecommuters to indicate opportunities for prevention.[1]

CONCLUSION

There is a significant difference between different category of neck, shoulder, elbow, wrist/hand, upper-back, lower-back, h/t/b pain and the groups so we can conclude from the results that telecommuters are prone to multiple MSD's due to COVID-19 pandemic situation that has forced them to WFH with no proper ergonomic facilities provided at home environment. Therefore, proper counselling, postural correction, and awareness sessions should be conducted on ergonomics to maintain and prevent the MSD' s among IT professional telecommuters and office goers.

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