



PREVALENCE OF WORK RELATED MUSCULOSKELETAL DISORDERS AMONG MEDICAL REPRESENTATIVES IN BELAGAVI CITY: A CROSS SECTIONAL STUDY

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ABSTRACT

Objective: To study the prevalence of work related musculoskeletal disorders among medical representatives in belagavi city.

Method: Subjects between the age group of 25-40 years with a work experience of more than 2 years and those travelling on a two-wheeler for transportation were included in the study. Nordic musculoskeletal questionnaire was provided to the subjects to assess musculoskeletal symptoms and Numeric pain rating scale was given to quantify the pain experienced. Finally a Body diagram was provided to locate the area of the body affected by pain. Data analysis was carried out after the final tabulation of all scores.

Results: Prevalence of neck pain at 1 year was 40.29% of one or both hips/thighs were 7.28%, at 6 months prevalence of one or both hips/thighs was 26.70% and at 7 days the prevalence for neck was 13.11% and for one or both hips/thigh was 55.83%.

Conclusion: Comparison of gender with prevalence of musculoskeletal disorders at 1 year was significant for neck, one or both hips/thighs and ankle, at 6 months only for one or both hips/thighs and at 7 days for neck and one or both hips/thighs.

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INTRODUCTION

The human body is composed of three types of muscles; cardiac, smooth and skeletal, where the skeletal muscle type is responsible for the structure of the human skeleton via tendons. It strengthens and protects the human skeleton by distribution of loads and through shock absorption. Being the largest organ in the human body skeletal muscle is responsible for major cause of morbidity.¹

Musculoskeletal disorders (MSD) are inflammatory and degenerative conditions which affect the muscles, tendons, ligaments, joints, peripheral nerves and blood vessels. Some of the biomechanical risk factors for MSD are repetitive work, abnormal postures and lifting of heavy weights. According to one of the articles, data on prevalence of MSD are limited in India.²

The interaction of the physical factors with ergonomic, psychological, social and occupational factors causes MSDs. Work related MSDs (WMSDs) are the disorders of the musculoskeletal system including nerves, blood vessels which are primarily aggravated by work itself. Areas in the human body affected predominantly are back, neck, upper extremities and lower extremities in a smaller percentage.

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WMSDs cause significant pain and discomfort associated with disability and hospitalization in severe cases. According to studies worldwide, WMSDs are responsible for 42-58% of all work related illnesses and 40% of all work related health costs.³

WMSDs represent the second largest cause for absenteeism from the work and inability to do work after the common cold. WMSDs are responsible for morbidity in many of the working population due to working in the same position for long hours.⁴ A study was done to identify the MSDs among commercial minibuses drivers in Ghana, where the drivers reported pain in the low back and upper back region, neck, wrist and elbow.³

Medical representatives are a group of people who have to travel from one place to another on a daily basis because their jobs demand so. Two wheeler as a mode of transportation in urban areas is equally convenient and accessible.⁵

According to a study there is an association between prolonged driving, sedentary work and self-reported MSDs in sales personnel. The authors say that the pharmaceutical sales representatives (PSRs) are highly susceptible to MSDs due to the nature of their work. According to a few surveys on PSRs, 53% reported low back pain. Another survey done on Turkish PSRs reported pain in the lower back (55%), followed by the shoulders (41%) and neck (35%).⁶

A study was done to find out the prevalence of pain in medical representatives exposed to two wheeler riding compared with those using other modes of transport. The authors concluded that medical representatives using two wheeler for transportation suffer from more cumulative trauma compared to others. Since India is a developing country with crowded streets and ever-increasing fuel prices, two wheeler is considered as the most preferred modes of commute and thus subjecting the medical representatives to MSDs.⁵

Various studies report the burden of MSDs on the general health and well-being of the population. Further studies explored the association between the MSDs and the quality of life and mental health of patients and concluded that MSDs are associated with a poor quality of life and mental distress. According to a review of psychological risk factors, people with MSDs suffer from depression, anxiety, distress with relation to spinal pain and disability. Mental morbidity were found to be related to sick leave among the rural population.⁷ The outcome measures used in various studies were the Visual analogue scale for pain, Body diagram to locate the site of pain, SF-36 (short form 36) to measure the quality of life, Nordic musculoskeletal questionnaire (NMQ) to assess the prevalence of MSDs, Copenhagen Psychosocial Questionnaire.⁸

Visual analogue scale with a reliability of 0.97 (95% CI=0.96 to 0.98) is used to measure the intensity of pain in patients.⁹ Nordic musculoskeletal questionnaire with a sensitivity (82.3-100%), specificity (82.4%), repeatability (95% CI 0.74-0.80) consists of a generalised and a specific questionnaire which focusses on low back region, neck and shoulder. It is used to screen the musculoskeletal disorders among individuals. One of the advantages of this questionnaire is that it assesses both the musculoskeletal and psychosocial components.⁶ SF-36 is a reliable and valid questionnaire to measure the quality of life. It consists of 36 items related to one of eight health concepts: 1)Physical functioning 2)Role limitation 3)Bodily pain 4)Vitality 5)Social functioning 6)Role limitations due to emotional problems 7)Mental health 8)General health.¹⁰

This study attempts to use the Visual analogue scale to measure the intensity of the pain, a Body diagram to locate the site of the pain and The Nordic musculoskeletal Questionnaire to assess the prevalence of MSDs among medical representatives in Belagavi city.

The prevalence of pain in medical representatives using two wheeler for transportation when assessed concluded that those using other modes of transport are suffering from less cumulative trauma compared to those who are using a two wheeler. The limitation of this study is that only prevalence of pain was studied and not all the musculoskeletal disorders among medical representatives. Most of the studies that have been conducted evaluate the prevalence of MSDs among medical representatives in western countries. Since there is a dearth in literature about the prevalence of MSDs among medical representatives in Belagavi city, there is a need for this study.

METHODOLOGY

Study Design and Ethical Considerations

The present study was an observational study. Ethical clearance was obtained from Institutional Research and Ethics

Committee of KAHER Institute of Physiotherapy, JNMC, Nehru Nagar Belagavi, Karnataka, India (Research and Ethics Committee, KIPT/168/16-10-17) prior to the study. A written informed consent was obtained and acknowledged from all the participants and was ensured that their identity was not revealed. The study was carried out in tertiary care hospitals of Belagavi city, India. Full time working medical representatives both males and females with an age group of 25-40 years and with a work experience of more than 2 years were included in the study. Subjects already diagnosed with cervical and lumbar spondylosis or recent fractures in last 6 months were excluded from the study. A total of 206 participants were screened to find out the prevalence of work related musculoskeletal disorders among medical representatives in Belagavi city. All subjects were then evaluated using a Body diagram to locate the areas of pain, Numeric Pain Rating Scale to intensify the pain and Nordic Musculoskeletal Questionnaire to find out the prevalence. The collected data was then given for data analysis.

Outcome Measures

Body Diagram

It consists of a front and a back view of the human body. The subject marks an "X" at the site where the subject experiences pain.

Numeric Pain Rating Scale: The NPRS is a segmental numeric version of the visual analogue scale (VAS) in which a respondent selects a whole number (0-10 integers) that best reflects the intensity of his/her pain. The common format is a horizontal bar/line. The 11 point numeric scale ranges from 0 representing one pain extreme (eg.no pain) to 10 representing the other pain extreme (eg. Worst imaginable pain). Scores ranges from 0-10 points, with higher scores indicating greater pain intensity.

Nordic Musculoskeletal Questionnaire: It was developed to test low back, neck, shoulder and general complaints for use in epidemiological studies. It has got 2 sections.

Section 1: A general questionnaire of 40 items comprising neck, shoulders, upper back, elbows, low back, wrists, hips, knees etc. Subjects are asked if they have had any musculoskeletal trouble in the last 12 months and last 7 days which has prevented normal activity.

Section 2: Additional questions relating to the neck, shoulders and low back. 25 items eliciting any accidents affecting each area, functional impact at home and work, duration of the problem, assessment by a health professional and musculoskeletal problems in the last 7 days.

Statistical Analysis

Data was analysed using SPSS software version 21.0.

RESULTS

Out of 206 participants screened 93.69% were males and 6.31% were females, 34.47% subjects were in the age group of 25-29 years, 32.04% in 30-34 years group and 33.50% were in the age group of more than 35 years. Whereas 49.51% were non-obese and 50.49% were obese. (Table 1) Prevalence of neck pain at 1 year was 40.29% and of one or both hips was 7.28% (Table 2), at 6 months prevalence of one or both hips/thighs was 26.70% (Table 3) and at 7 days the prevalence

of neck was 13.11% and of one or both hips/thighs was 55.83%. (Table 4) When comparison was made between the age groups with prevalence of musculoskeletal disorder at 1 year, 6 months and 7 days p value was not found to be significant for any of the areas in the body. (Table 5, 6,7) Finally when comparison was made between gender with prevalence of musculoskeletal disorders at 1 year for neck pain, it was found to be significant with a p=0.0280, for one or both hips/thighs p=0.0001 and for one or both ankles/feet p=0.0500 which was highly significant. (Table 8) At 6 months the comparison between the gender and prevalence of MSDs proved to be significant for one or both hips/thighs (p=0.0020). (Table 9) At last neck (p=0.0260) and one or both hips/thighs (0.0020) at 7 days was proved to be significant. (Table 10)

Table 1 Distribution of patients by gender, age groups and obesity

	No of patients	% of patients
Gender		
Male	193	93.69
Female	13	6.31
Age groups		
25-29yrs	71	34.47
30-34yrs	66	32.04
>=35yrs	69	33.50
Mean age	32.28	
SD age	4.80	
Obesity		
Non-obese	102	49.51
Obese	104	50.49
Total	206	100.00
Mean BMI	26.02	
SD BMI	3.92	

Table 2 Prevalence of various musculoskeletal disorders in the study at 1 year

Disorders	No of patients	% of patients
Neck		
Absent	123	59.71
Present	83	40.29
Shoulder		
Absent	72	34.95
Present	134	65.05
Elbows		
Absent	187	90.78
Present	19	9.22
Wrists/hands		
Absent	188	91.26
Present	18	8.74
Upper back		
Absent	144	69.90
Present	62	30.10
Lower back		
Absent	89	43.20
Present	117	56.80
One or both hips/thighs		
Absent	191	92.72
Present	15	7.28
One or both knees		
Absent	150	72.82
Present	56	27.18
Total	206	100.00

Table 3 Prevalence of various musculoskeletal disorders in the study at 6 months

Disorders	No of patients	% of patients
Neck		
Absent	153	74.27
Present	53	25.73
Shoulder		
Absent	184	89.32

Present	22	10.68
Elbows		
Absent	150	72.82
Present	56	27.18
Wrists/hands		
Absent	99	48.06
Present	107	51.94
Upper back		
Absent	195	94.66
Present	11	5.34
Lower back		
Absent	188	91.26
Present	18	8.74
One or both hips/thighs		
Absent	151	73.30
Present	55	26.70
One or both knees		
Absent	97	47.09
Present	109	52.91
Total		

Table 4 Prevalence of various musculoskeletal disorders in the study at 7 days

Disorders	No of patients	% of patients
Neck		
Absent	179	86.89
Present	27	13.11
Shoulder		
Absent	133	64.56
Present	73	35.44
Elbows		
Absent	82	39.81
Present	124	60.19
Wrists/hands		
Absent	191	92.72
Present	15	7.28
Upper back		
Absent	181	87.86
Present	25	12.14
Lower back		
Absent	142	68.93
Present	64	31.07
One or both hips/thighs		
Absent	91	44.17
Present	115	55.83
One or both knees		
Absent	196	95.15
Present	10	4.85
Total	206	100.00

DISCUSSION

This study was done to estimate the prevalence of work related musculoskeletal disorders among medical representatives in belagavi city. The findings of the present study concluded that prevalence of neck pain at 1 year was 40.29% of one or both hips/thighs were 7.28%, at 6 months prevalence of one or both hips/thighs was 26.70% and at 7 days the prevalence for neck was 13.11% and for one or both hips/thigh was 55.83%. A study conducted by Katherine Sang *et al* in UK to assess the prevalence of musculoskeletal symptoms in Pharmaceutical Sales Representatives concluded that 57% reported low back symptoms.⁶ Another study to find out the work-related musculoskeletal problems among PSRs in Turkey presented with similar results like pain in low back (55.4%), in shoulder (41.1%) and in neck (34.8%).¹¹ This suggests that all the pharmaceutical sales representatives experience musculoskeletal symptoms in one or more parts of their body despite of different culture worldwide.⁶

A review of literature done by G. Harris, G. Mayho *et al* provides us with a strong evidence saying there is a link

between fixed postures and prolonged seating with occupational low back pain.¹² Pope *et al* concludes in his study that disc degeneration leading to disc herniation occurs due to accumulation of metabolites due to long hours of sitting and ultimately causing inactivity. They also found out that riders/drivers' postures could lead to pain in the neck, back and upper extremity due to postural stress.¹³

One or both knees	50	25.91	3	23.08	53	0.0510	0.8210
One or both ankles/feet	20	10.36	2	15.38	22	0.3220	0.5700

Table 5 Comparison of age groups with prevalence of musculoskeletal disorder at 1 year (numbers are only prevalence)

Disorders	25-29yrs	%	30-34yrs	%	>=35yrs	%	Total	%	Chi-square	p-value
Neck	28	39.44	30	45.45	25	36.23	83	40.29	1.2260	0.5420
Shoulder	45	63.38	41	62.12	48	69.57	134	65.05	0.9550	0.6200
Elbows	9	12.68	3	4.55	7	10.14	19	9.22	2.8060	0.2460
Wrists/hands	4	5.63	8	12.12	6	8.70	18	8.74	1.8050	0.4050
Upper back	22	30.99	20	30.30	20	28.99	62	30.10	0.0690	0.9660
Lower back	38	53.52	39	59.09	40	57.97	117	56.80	0.4910	0.7820
One or both hips/thighs	5	7.04	5	7.58	5	7.25	15	7.28	0.0150	0.9930
One or both knees	18	25.35	23	34.85	15	21.74	56	27.18	3.1120	0.2110
One or both ankles/feet	7	9.86	11	16.67	9	13.04	27	13.11	1.3920	0.4990

Table 6 Comparison of age groups with prevalence of musculoskeletal disorder at 6 months

Disorders	25-29yrs	%	30-34yrs	%	>=35 yrs	%	Total	%	Chi-square	p-value
Neck	23	32.39	30	45.45	20	28.99	73	35.44	4.4370	0.1090
Shoulder	45	63.38	36	54.55	43	62.32	124	60.19	1.3100	0.5200
Elbows	8	11.27	1	1.52	6	8.70	15	7.28	5.1260	0.0770
Wrists/hands	6	8.45	10	15.15	9	13.04	25	12.14	1.5200	0.4680
Upper back	22	30.99	21	31.82	21	30.43	64	31.07	0.0300	0.9850
Lower back	38	53.52	37	56.06	40	57.97	115	55.83	0.2830	0.8680
One or both hips/thighs	4	5.63	3	4.55	3	4.35	10	4.85	0.1450	0.9300
One or both knees	16	22.54	23	34.85	14	20.29	53	25.73	4.3200	0.1150
One or both ankles/feet	6	8.45	9	13.64	7	10.14	22	10.68	0.9950	0.6080

Table 7 Comparison of age groups with prevalence of musculoskeletal disorder at 7 days

Disorders	25-29yrs	%	30-34yrs	%	>=35 yrs	%	Total	%	Chi-square	p-value
Neck	20	28.17	21	31.82	15	21.74	56	27.18	1.7840	0.4100
Shoulder	37	52.11	30	45.45	40	57.97	107	51.94	2.1180	0.3470
Elbows	7	9.86	1	1.52	3	4.35	11	5.34	4.9130	0.0860
Wrists/hands	5	7.04	8	12.12	5	7.25	18	8.74	1.3960	0.4980
Upper back	20	28.17	17	25.76	18	26.09	55	26.70	0.1210	0.9410
Lower back	35	49.30	36	54.55	38	55.07	109	52.91	0.5730	0.7510
One or both hips/thighs	3	4.23	4	6.06	3	4.35	10	4.85	0.3070	0.8580
One or both knees	15	21.13	19	28.79	13	18.84	47	22.82	2.0710	0.3550
One or both ankles/feet	5	7.04	10	15.15	9	13.04	24	11.65	2.3810	0.3040

Table 8 Comparison of gender with prevalence of musculoskeletal disorder at 1 year

Disorders	Male	%	Female	%	Total	Chi-square	p-value
Neck	74	38.34	9	69.23	83	4.8300	0.0280*
Shoulder	125	64.77	9	69.23	134	0.1070	0.7440
Elbows	17	8.81	2	15.38	19	0.6290	0.4280
Wrists/hands	17	8.81	1	7.69	18	0.0190	0.8900
Upper back	58	30.05	4	30.77	62	0.0030	0.9560
Lower back	112	58.03	5	38.46	117	1.9010	0.1680
One or both hips/thighs	10	5.18	5	38.46	15	19.9810	0.0001*
One or both knees	51	26.42	5	38.46	56	0.8910	0.3450
One or both ankles/feet	23	11.92	4	30.77	27	3.8010	0.0500*

Table 9 Comparison of gender with prevalence of musculoskeletal disorder at 6 months

Disorders	Male	%	Female	%	Total	Chi-square	p-value
Neck	66	34.20	7	53.85	73	2.0550	0.1520
Shoulder	116	60.10	8	61.54	124	0.0100	0.9190
Elbows	14	7.25	1	7.69	15	0.0030	0.9530
Wrists/hands	22	11.40	3	23.08	25	1.5580	0.2120
Upper back	59	30.57	5	38.46	64	0.3540	0.5520
Lower back	110	56.99	5	38.46	115	1.6960	0.1930
One or both hips/thighs	7	3.63	3	23.08	10	9.9760	0.0020*

Table 10 Comparison of gender with prevalence of musculoskeletal disorder at 7 days

Disorders	Male	%	Female	%	Total	Chi-square	p-value
Neck	49	25.39	7	53.85	56	4.9830	0.0260*
Shoulder	100	51.81	7	53.85	107	0.0200	0.8870
Elbows	10	5.18	1	7.69	11	0.1520	0.6970
Wrists/hands	15	7.77	3	23.08	18	3.5780	0.0590
Upper back	51	26.42	4	30.77	55	0.1170	0.7320
Lower back	104	53.89	5	38.46	109	1.1630	0.2810
One or both hips/thighs	7	3.63	3	23.08	10	9.9760	0.0020*
One or both knees	44	22.80	3	23.08	47	0.0010	0.9810
One or both ankles/feet	21	10.88	3	23.08	24	1.7600	0.1850

It has been proved that there is a higher prevalence of pain in subjects who use two-wheeler for daily commute rather than a bus, train or other measure of transport. This is further explained by authors that riding a bike lead to continuous recruitment of muscles to maintain the balance and maintain the weight of the bike, there is a lack of back support, inability to change the posture while riding, and even some of the environmental factors like exposure to cold or heat.⁵

Skov *et al* on the other hand revealed that not only physical but also psychosocial factors were associated with musculoskeletal symptoms. Multivariate analyses found out that high job demands increased the tendency of neck and shoulder pain in subjects where as feeling of overworking or lack of social support from colleagues lead to increased back pain amongst subjects. One important personality characteristic, the feeling of overworking lead to increase in the percentage of musculoskeletal symptoms.¹⁴

According to a study done by Maria D Antonopoulou *et al* there is an association between musculoskeletal disorders and disability which is assessed by health related quality of life (HRQL). Surveys done in various industries revealed high prevalence of MSD and its negative effect on the HRQL. The results in this study showed that people with MSDs had worse HRQL than those without MSDs. Another finding of this study was that people with MSDs scored higher in General Health Questionnaire (GHQ). A review of psychological risk factors says that depression, anxiety and distress are related to spinal pain and disability. The authors believe that patients with MSD symptoms should be compulsorily screened for psychological symptoms.⁷

In our distribution the pain was more around the neck, hips/thighs and ankle at one year. At 6 months hips/thighs were affected more by pain whereas at 7 days again neck and

hips/thighs were affected by pain. Neck pain is said to be associated with improper or heavy head gear, heavy weight of the bag as well as the subject's posture.⁵

Education and training of both the employee and the manager on the ergonomic risks must be made prominent. Adequate measures must be taken by the PSRs to avoid the musculoskeletal disorders. The best way to do this is by providing a risk assessment package for both the physical and psychosocial difficulties that the PSRs may go through. There should be a regular communication on a daily basis between the PSRs and the manager. Accessibility to occupational health service for advice followed by reference to physiotherapy and ergonomic assessment will solve their problems at early stages thus reducing the chances of major problems.¹²

CONCLUSION

Comparison of gender with prevalence of musculoskeletal disorders at 1 year was significant for neck, one or both hips/thighs and ankle, at 6 months only for one or both hips/thighs and at 7 days for neck and one or both hips/thighs.

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