

INCIDENCE OF MUSCULOSKELETAL DISORDERS IN TRAIN COMMUTERS

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ABSTRACT

Background: A Musculoskeletal disorders (MSD's) arises not directly from an acute or instantaneous event but arising gradually and chronically. Indian railway is the world's largest railway system; in Mumbai the daily ridership is about 7.585 million. As Mumbai is India's commercial and financial centre therefore, the network is severely crowded during peak hours. Hence, it is the busiest railway system and has some of the worst severe crowding in the world. Repetitive movements and awkward posture are the levels of primary risk factors that have been associated with the MSD's.

Aim: To find the incidence of musculoskeletal disorders in train commuters.

Objective: To find out which common joints are involved using Standard Nordic Questionnaire.



Materials and Methodology: An observational study was conducted for the duration of 1 year in metropolitan city with the sample size of 500 healthy adult male and female with age group of 20-40 years who are train commuters travelling during peak hours daily and are included according to the selection criteria. Sampling is convenient. The data was analysed and collected accordingly.

Results: The above data was analysed and it showed Ankles/Feet (17%) was most commonly affected followed by Knees (16%) and least was the Elbows (7%).

Conclusion: This study concluded that the high incidence were seen in the Ankles/Feet followed by Knees and least in Elbows of the train commuters.

KEY WORDS: Musculoskeletal Disorders, Posture.

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BACKGROUND

A musculoskeletal disorders (MSDs) is a "A disorders of muscle, tendon, joint, intervertebral disc, peripheral nerves and vascular systems not directly resulting from an acute or instantaneous event but arising gradually and chronically" [1].

Indian railway is the world's largest railway system; in Mumbai suburban railway the daily ridership is about 7.585 million. Therefore, it is the busiest commuter rail system and has some of

the worst severe overcrowding in the world [2].

As Mumbai is India's commercial and financial center and one of the most densely populated cities in the world. The cities relies heavily on public transport with about 80% of all motorized trips being undertaken by the public rail . More than half of these trips is undertaken by the rail system which is the lifeline of the city. Every day some 8 million commuters use the city's suburban rail system , travelling on more

than 2,800 trains a day. The network is severely overcrowded during peak hours when the numbers of passengers exceeds the networks carrying capacity by more than four times.

Hence, Mumbai rail network will continue to be the primary mode of transportation in the cities for the year to come [3].

Repetitive movements and awkward posture, and high force levels are the primary risk factors that have been associated with MSD's [4]. Therefore, the problems faced by the commuters are their productive hours are decreased and results in the loss of business and personal human health.

Other problems faced by the commuters in local train are stress, discomfort during journey, accidents and potential for physical injuries. [5]

Need of study: To our knowledge there is very less study on incidence of musculoskeletal disorders in train commuters

During rush hours, many of the train commuters have to travel for their work places, Due to which there will be potential for physical injuries leading to disorders.

Some of the train commuters due to overcrowding have to complete their journey by standing throughout their route.

Whereas, commuters have to compromise in their health to reach their work places, which may lead to physical stress.

Therefore, there is a need to estimate the incidence of musculoskeletal disorders in train commuters.

MATERIALS AND METHODS

An observational study was conducted for the duration of 1year in the metropolitan city with the sample size of 500 Healthy Adult Male and Female 20-40 years of age who are train commuters. They were selected according to the selection criteria that includes commuters travelling at least for 1hour of single route per day and travelling during rush hours from 7am-10am & 6pm-9pm for 6 months; and excludes Commuters travelling in afternoon and night, work related to prolonged sitting and standing for more than 6hrs, handicapped population, recent surgery for less than 6 months, congenital condi-

-tions, cardiovascular and neurological conditions.

Procedure: The whole study was explained to the subjects. They were screened as per the inclusion criteria. Subjects not fulfilling the inclusion criteria were excluded from the study. Subjects who were willing to participate in the survey were only considered and a written consent form was taken from them. Demographic data was recorded. A self-reporting Standardized Nordic Questionnaire based on musculoskeletal disorders that includes various parameters related to musculoskeletal disorders were given and explained on how to fill in the details in the language best understood by them. The data was collected and analyzed accordingly.

Outcome Measure:

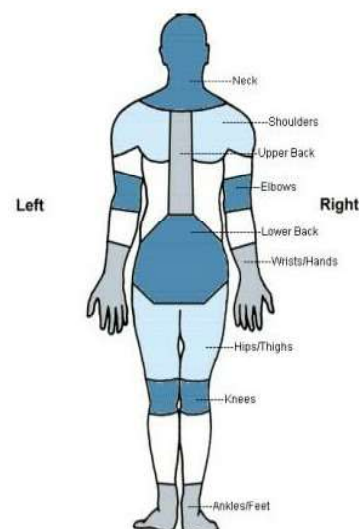
Standard Nordic Questionnaire: It is a self-administered questionnaire. This is used for the analysis of musculoskeletal symptoms. The reliability of the questionnaire is shown to be acceptable.

Musculoskeletal Discomfort Form (based on the Nordic questionnaire (kourinka of al. 1987)

Job/position: _____
Gender: M _____ F _____
Age : _____ Height _____ ft _____ In .
Weight _____
How long you have been doing this job? _____ years _____ months. How many hours you work each week? _____

How to answer the questionnaire:

Picture: In this picture you can see the approximate position of the parts of the body referred to in the table. Limits are not sharply defined, and certain parts overlap. You should decide for yourself in which part you have or have had your trouble (if any).



Please answer by putting "X" in the appropriate box-one "X" for each position. You may be in doubt as to how to answer, but please do your Best any way. Note that column 1 of the questionnaire is to be answered even if you have never had trouble in any part of your body; column 2 and 3 are to be answered if you answered yes in column 1.

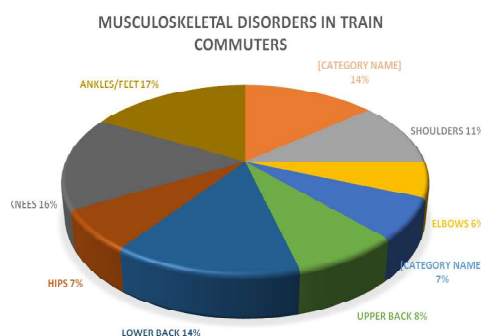
To be answered by everyone	To be answered by those who have had trouble	
Have you at any time during the last 12 months had trouble (ache, pain, discomfort, numbness) in:	Have you at any time during the last 12 months been prevented from doing your normal work(at home or away from home) because of the trouble?	Have you had trouble at any time during the last 7 days?
Neck <input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Shoulders <input type="checkbox"/> No <input type="checkbox"/> Yes right shoulder <input type="checkbox"/> Yes left Shoulder <input type="checkbox"/> Yes both shoulders	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Elbows <input type="checkbox"/> No <input type="checkbox"/> Yes right elbow <input type="checkbox"/> Yes left elbow <input type="checkbox"/> Yes both elbows	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Wrists/hands <input type="checkbox"/> No <input type="checkbox"/> Yes right wrist/hand <input type="checkbox"/> Yes left wrist/hand <input type="checkbox"/> Yes both Wrist/hand	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Upper back <input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
Lower back (small of back) <input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
One or both Hips/Thighs <input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
One or both knees <input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
One or both Ankles/feet <input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes

RESULT

JOINTS	JOINT PAIN (%)
NECK	14
SHOULDERS	11
ELBOWS	6
WRIST/HANDS	7
UPPER BACK	8
LOWER BACK	14
HIPS	7
KNEES	16
ANKLES/FEET	17

Table 1: Showing the body regions and joint pain (%).

Pie diagram of most incidence of musculoskeletal disorders in train commuters



Inference: The above data was analysed and it shows Ankles/Feet (17%) was most commonly affected followed by Knees (16%), Lower back (14%), Neck (14%), Shoulders (11%), Upper back (8%), Hips (7%), Wrist/ Hands (7%) and Elbows (6%).

DISCUSSION

Out of 500 train commuters majority were affected in Ankles/Feet (17%), followed by Knees (16%), Lower Back (14%) and Neck (14%).

Katherine Craine et al. in their study found that commuting to and from the work everyday can have a profound effect on the body biomechanics. Combination of poor posture combined with inability to stretch it out during the commute makes for quite a bit discomfort for most of the people.

The factors contributing for it are:

1. Awkward posture
2. Everyday wear and tear of Ankles/Feet
3. Overuse of feet
4. Repetitive translatory movements
5. Ligaments causing microscopic tears
6. Prolonged standing in awkward posture

Debarati Sen in their study found that foot pain is common in train commuters who travel for long hours, due to this it causes abnormal walk that affects the spine and you develop back and neck pain, therefore recommended to avoid weight bear on one leg at a time.

The factors attributing for Low Back pain are:

1. Slouched sitting posture
2. Sitting on less surface area with awkward posture
3. Sudden jerky posture
4. Twisting

Amenda Macmillan in their study found train commuters faces pain in neck, shoulders, upper back, hips, elbows and hands.

The factors attributing to it are:

1. Sitting slumped for hours
2. Overuse of shoulders
3. Holding rails and continuously gripping

CONCLUSION

This study concluded that the high incidences were seen in the Ankles/Feet followed by Knees and least in Elbows of the train commuters.

ABBREVIATION

MSD's - Musculoskeletal disorders

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Conflicts of interest: None

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