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Screening of Musculoskeletal Disorders Using Standard Nordic Questionnaire in Petrol Pump Workers in the Age Group of 25-50 Years

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ABSTRACT

Background: Musculoskeletal pain is reported as one of the most common health problems in the working population causing physical disability, poor quality of life, loss of productivity. Petrol pump workers have to perform repetitive work and stand for long hours, increasing the demand on the musculoskeletal system.
Aim: The main aim of the study was to Screen for Musculoskeletal pain using Standard Nordic Questionnaire in Petrol Pump Workers in the age group of 25-50 years.
Material and Methodology: A cross-sectional survey was administered to 280 male petrol pump workers in the age group of 25-50 years who are working in Mumbai. The study used the self-administered Standard Nordic Questionnaire aimed at screening the petrol pump workers for musculoskeletal pain in 9 anatomic regions of the body.
Result: out of the total study population, 69% of the petrol pump workers had pain. The commonest sites were the low back (50.3%), knee (26.7%) and foot (18.5%)
Conclusion: The study concludes that a significant number of petrol pump workers had musculoskeletal problems. Majority of the subjects reported Low back pain (50.3%), followed by knee pain (26.7%) and foot pain (18.5%)

Key words: Musculoskeletal Disorders, Petrol Pump Workers, Filling Station attendant, fuel service stations, Prevalence

INTRODUCTION

Musculoskeletal disorders are characterized by the presence of discomfort, disability or persistent pain in the joints, muscles, tendons and other soft parts, caused or aggravated by repeated movements and prolonged awkward or forced body postures. [1] They are the most common cause of severe long-term pain and physical disability, and they affect hundreds of millions of people around the world. This fact has been recognized by the United Nations and WHO, by endorsing the Bone and Joint Decade 2000-2010. [2] Musculoskeletal pain have been reported as one of the most common and important health problems in working populations like dentists, [3] teachers [4] and hair-dressers, [5] generating social and economic implications. Musculoskeletal pain represents a burden on society in both direct costs to the healthcare system and indirect costs through loss of work and productivity. [6] In subsistence communities and low- and middle-income economies, impaired musculoskeletal health has profound

consequences on an individual's ability to participate in social roles and in the prosperity of communities. [7]

Fast urbanization trends have resulted in an increase in the number of vehicles on the road. Increasing the number petrol pumps in the city. Hence, imposing a burden on petrol pump workers, increasing the possibility of musculoskeletal pain in petrol pump workers. [8]

Hence, the purpose of this study is to screen for musculoskeletal disorders in Petrol Pump Workers in the age group of 25-50 years.

Petrol Pump workers have to repeatedly open fuel tank caps, lift and insert fuel nozzle into fuel tank, regulate flow of fuel through the nozzle, replace the fuel nozzle, lock the fuel tank caps and, in some cases, wipe the windscreens of vehicles. Apart from this they have to stand for long hours, there is repetitive bending, twisting, and standing in awkward postures, performing these tasks for several vehicles they service throughout the day. This repetitive activity increases the demand on the muscles, ligaments, soft tissues of musculoskeletal system. [8]

The Standardized Nordic Questionnaire was used to Screen Musculoskeletal pain in Petrol Pump Workers. The NMQ consist of a human body map, viewed from the back, consisting of 9 anatomical body parts in which musculoskeletal problems are commonly seen It is a self-administered questionnaire, the participants have to respond with a 'yes' in the presence of a musculoskeletal problem and 'no' in the absence of a musculoskeletal problem. Participants were asked to indicate whether they had any trouble (ache, pain, discomfort, or numbness) in any of the body parts mentioned in the questionnaire (neck, shoulder, elbow, wrist and hand, upper back, lower back, hip/thigh, knee, ankle, and foot) in the past 12 months; for those who reported in the affirmative were further questioned, if at any time, during the past 12 months, he/she had been prevented from doing normal work, and if he/she had trouble at any time during the last 7 days. [9]

Several studies have been conducted related to musculoskeletal problems in Lagos, Ghana, Brazilon petrol pump workers. [8,10] A study was conducted on the prevalence of shoulder pain in petrol pump workers in Mumbai [11] but a study aimed at screening musculoskeletal disorders in petrol pump workers has not yet been conducted in Mumbai hence, despite the numerous petrol stations in Mumbai, India. There is paucity of information on the proportion of Petrol Pump Workers having musculoskeletal pain. This community is neglected by Health care professionals. Hence, a need is felt to conduct a study that aims at screening the musculoskeletal pain using Standard Nordic Questionnaire in petrol pump workers in the age group of 25-50 years, as a preliminary measure to initiate prevention strategies and create awareness of the problems prevalent in this community.

MATERIALS AND METHOD

MATERIALS:

Pen
Standard Nordic Questionnaire
Subject Evaluation form
Consent form

STUDY DESCRIPTION:

Study Design: A Cross- sectional Observational study
Sample Design: Convenience sampling
Duration of study: 4 months
Location of study: Petrol Pumps in South and suburbs of Mumbai
Outcome Measure: Standard Nordic Questionnaire
Sample size (n): 280
Sample size is calculated using the following Formula:
$Z^2pqN / (N-1)\ e^2 + Z^2\ pq$ (based on previous studies)
Z =1.96 (standard deviation)
P = 50, q = 100-p=50
e=10% of p
N=1000 (total no. of Petrol Pump Workers in South of Mumbai)
n=280

Sampling Method:

1. Based on inclusion and exclusion criteria
2.Area of Petrol pumps to be covered: South and Suburbs of Mumbai
3.total No. Of Petrol Pumps to be included in the study; atleast 15
4.Total No. Of workers at each Petrol pump: approximately 20 workers to be tested as per their availability

Inclusion Criteria:

- Male petrol pump workers
- Age: 25-50 years
- BMI: less than 30 Kg/m²
- Work experience of 3 years and above [6,7]
- Working for at least 7 hours/day
- Workers who are willing to participate
- Workers who can read and understand Hindi or Marathi or English

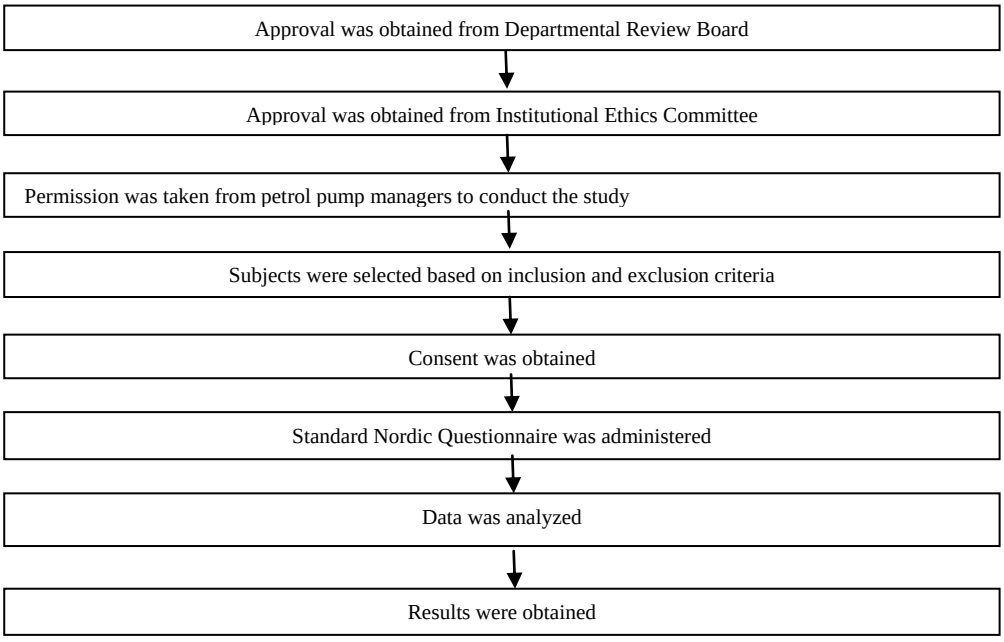
Exclusion Criteria:

- Anyone not willing to participate
- Anyone with history of trauma, neurological involvement, spinal fracture, spinal surgery.
- Anyone suffering from degenerative, inflammatory musculoskeletal conditions like osteoarthritis ankylosing spondylitis, rheumatoid arthritis or any other rheumatic condition.
- BMI above 30 kg/m²
- Anyone with vision problems

METHODOLOGY

An Observational Cross-Sectional study was conducted on 280 Male Petrol Pump workers in the Suburbs and South of Mumbai after taking permission from the managers of the respective pumps. The study was approved by the Institutional Review Board. The study was conducted after obtaining approval from the Institutional Ethics Committee. The Standard Nordic Questionnaire designed by Kuorinka I, Johnson B, Kilobom A, et al. (1987) was used to screen for musculoskeletal pain in this study. [12] Which had questions related to the objective of the study. Petrol Pump workers were selected on the basis of inclusion and exclusion criteria. The workers who fulfilled the criteria were explained the need of the study with confirming confidentiality of their information that it will never be used for purposes other than scientific research before filling the consent form in the language they best understood. A written consent was taken from the subjects and they filled the questionnaire during their working hours. Subject evaluation form was used to obtain baseline information about the age, weight, working hours, medical history etc. Data collected was analyzed and results and conclusions were formed

Ethical Consideration:



Statistical Analysis:

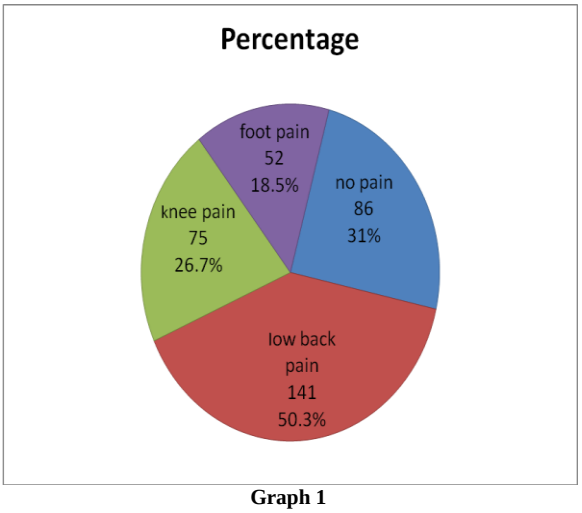
Data was analyzed using Microsoft Excel 2016 edition. Graphical representation too, was done using MS Excel 2016

RESULTS

The study population of 280 male petrol pump workers were screened for musculoskeletal pain in the age group of 25-50 years in Mumbai. Out of the 280 Petrol pump workers, results showed(Graph 1)31% of the petrol pump workers were having no pain (N=86) and 69% were having pain(N=194). Out of which Low Back pain was the commonest site of pain (50.3%), followed by knee pain (26.7%) and foot pain(18.5%) (Table 1).

Table 1

Body Part	No. of affected Subjects	Percentage
Neck	0	0
Shoulder	0	0
Elbow	0	0
Hand/Wrist	0	0
Upper Back	0	0
Lower Back	141	50.3
Hip/Thigh	0	0
Knee	75	26.7
Foot/Ankle	52	18.5



Graph 1

Observations:

31% of the subjects were having no pain

50.3% of the study subject was having low back pain

26.7% of the study subjects were having knee pain

18.5% of the study subjects were having foot pain

DISCUSSION

A study was conducted on 280 Petrol Pump Workers in the age group of 25-50 years at various petrol stations in suburb and South of Mumbai. This study was done to screen the Petrol Pump workers in Mumbai for Musculoskeletal problems. Subjects were selected based on inclusion and exclusion criteria. Procedure was explained and a written consent was taken. Screening for Musculoskeletal disorder was done using Stand Nordic Questionnaire.

In our study we found that, Workers with a work experience of 3-6 years were maximum (45%).the minimum work experience was 3 years and maximum was 30 years. In the same job position the workers worked for 8-9 hours a day, with a 30-minute lunch/snack break, for 6 days a week.

Out of the 280 subjects, 31% of the subjects were having no pain in any body part. They were in the age group of 25-28 years with a work experience of 3-6 years only and reported to be physically more active and fit comparatively and belonged to petrol pumps having less vehicle load.

69% of the subjects had musculoskeletal pain. The findings of this study are similar to the findings of 'health and safety in high risk work environments: a study of fuel service stations in Ghana by Isaac Money et al. on 145 pump attendants in Ghana which reported that 97 % of the respondents had Musculoskeletal pain. Which was one of the most common health problems reported, along with low back pain (43%). According to the study, the highly repetitive work and long hours of standing predispose them to musculoskeletal problems. [8] It also agrees with the study of Pradeep Dohare et al who conducted a study on 111 petrol filling attendants in Bhopal and reported that common illnesses among filling attendants are work-related like musculoskeletal disorders (90%) and low back pain (47%). [13]

Several factors have been associated with Work-related Musculoskeletal Disorders such as repetitive motion,

excessive force, awkward and/or sustained postures, prolonged sitting and standing. [14] Pump attendants at Fuels Service Stations perform diverse and highly repetitive physical tasks which have been shown to be a crucial risk factor for work-related musculoskeletal disorders among employees whose work include repetitive physical activities. [8]

This study shows that majority of the subjects reported low back pain(50.3%), which is in agreement with the study conducted by Akoduak et al. on 300 filling station attendants both male and female between the age of 25-64 years. who observed a 85% prevalence of low back pain in filling station attendants in Nigeria. Majority of the subjects in the study reported prolonged standing causing low back pain. [15]

The major working posture for Petrol pump Workers is Standing. During standing the COG is usually in the hip and waist area, this means that when standing hip carries most of the body weight, prolong standing may cause fatigue of the muscles around the hip from the efforts required to maintain an upright posture, causing back pain. [16]

In the above study, it was also observed that 26.7% of the subjects had knee pain and 18.5% of the subjects had foot pain which is seen in graph 1. This result holds true owing to the type of work petrol pump workers have to do.

When workers perform jobs in prolonged standing, static contraction occurred particularly in their back and legs, thus resulted in diminished function of calf muscle. This condition leads to discomfort and muscle fatigue to the workers. Prolonged standing transfers the load of upper body to the lower parts thus resulted to lower back pain. The American Podiatric Association reported that 83% of industrial workers in the United States experienced foot or lower leg pain and discomfort associated with prolonged standing. [17]

The biomechanical risk factors identified for the development of knee WMSD were heavy physical work, prolonged kneeling or squatting, prolonged standing. Since petrol workers have to stand for long hours they develop knee pain. [14]

CONCLUSION

It can be concluded from this study that majority of the subjects were having low back pain(50.3%), followed by knee pain (26.7%) and foot pain (18.5%)
31% of the subjects reported having no musculoskeletal problems

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