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Prevalence of Musculoskeletal Pain in Class IV Workers of Hospitals in Pune Region

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ABSTRACT

Aim: To find the prevalence of musculoskeletal pain in class IV workers of hospitals in pune region.
Objectives: A) To assess the prevalence of musculoskeletal pain among class IV workers of hospitals in Pune region using Nordic Musculoskeletal Questionnaire. B) To assess the intensity of musculoskeletal pain among class IV workers of hospitals in Pune region using NPRS.
Methodology: 386 subjects were selected according to the inclusion and exclusion criteria. A written informed consent was taken from the subjects. The subjects were explained about the procedure. All the participants were evaluated using Nordic Musculoskeletal questionnaire, and Numerical rating pain scale (NPRS). This questionnaire has been used to evaluate musculoskeletal problems in Class IV workers. The data was collected and statistically analyzed.
Statistics & Results: The percentage of pain observed in Neck was 15.80%, Shoulder (Both) pain was 29.10%, Elbow/Hand (Both) pain was 24.30%, Wrist (Both) pain was 20.10%, Upper back pain was 28.20%, was Lower back pain was 30.10%, Hip/Thighs (Both) pain was 18.30%, Knee (Both) Pain was 30.50%, and last Ankle (Both) pain was 24.10%. Major intensity of pain on NPRS was observed at wrist joint (5.62), least was found at ankle joint (4.88).
Conclusions: In conclusion, this study highlights the prevalence of musculoskeletal pain among the class IV was 97.67%
Clinical Implications: This study recommends that improper positions while working affects the joint and lead to pain, therefore proper Ergonomics should be explained to the workers. Proper working posture must be informed, also the working activities that creates least pressure at the joint must be explained.

Keywords: NPRS, Class IV workers, musculoskeletal pain, pain Intensity, Housekeeping staff

INTRODUCTION

Body Biomechanics is the study of the structure, function and motion of the mechanical aspects of biological system. Body coordinates with muscles and nerves balance the posture and body alignment while lifting object, bending forward, to perform activities of daily living. The use of proper body mechanics reduces the risk of injuries and allow physical mobility without

straining major muscles and also reducing excessive use of muscular energy. Gravity plays an important role in body mechanics. There is a constant pull exerted by earth on every object towards its center part, which helps to maintain the good posture and balance of whole body. The proper functioning of the body relates to the posture also and correct use must be implicated during shifting the bedridden or immobilized patients. Walking, moving, lifting and are some essential components needed in transferring the patients in the hospital.[1]

Hospitals are classified as general, specialty, or government depending on the sources of income received. Hospitals are currently staffed by professional physicians, surgeons, nurses, allied health practitioners and also Class IV workers.[2] The government of India classifies public officials into class 1, class 2, class 3, class 4. Class 4 employees include manual workers such as skilled, semi-skilled and unskilled. [3] Population involved in Housekeeping staff are also called as Class IV workers or manual workers [ward boys, sweepers, laundry workers, security guards, laboratory attendants, peons, etc.].[4] The activities performed by these worker are different for different class IV workers. Job duties of these workers include: Scrubbing the wards, OPDs, and other departments of the hospital, carrying patients to different wards, operation theatre, consultation rooms, procedures, to carry mattresses and waste materials from different areas of the hospital to the biomedical waste plant, to help nurses to make beds, giving baths, bringing and receiving medicines and changing linen and also prepare patients for surgery.[3] Considering the work environment Ward boys are involved in shifting, transferring of patients from bed to chair or bed to a stretcher, ambulation of individual, lifting of heavy objects. Sweepers plays an important role in maintaining health and hygiene in the hospital their job exposes to variety of risk factors include dust bio aerosols, volatile organic matter and mechanical stress. [5] Peons are the lowest ranking worker, has the most interaction and direct contact with patients, involving continuous walking, stand for long hours and repetitive movements. [6] Problems Heavy load transfer with forward bending and standing positions put excessive pressure at the back. Poor physical condition in association to job demands increases the risk of developing back pain. [7] Housekeeping is a physical demanding job it involves forceful movements and working in awkward body position while lifting mattress, cleaning tile, in every shift which in turns contribute to musculoskeletal disorder. [8] Study of among health care providers have mainly focused on Back, neck, shoulder, and knee problems are the most common complaints among security guard, porter, patient care attendant, sweeper etc.[3] The health issues of this group of employees are neglected by the administrative authorities worldwide. Body mechanic is very much essential for health care professionals, especially to class IV workers. [1] Thus this study is intended to find the prevalence of musculoskeletal pain in Class IV workers of Hospitals in Pune region.

NEED OF STUDY

Class IV workers also called as manual workers works for longer period with minimum or no break in between also with extended number of working hours causes musculoskeletal pain followed by musculoskeletal disorders. Large number of manual workers works under the umbrella of class IV workers are as follows, Ward boys, patient care attendant, Sweepers, Security guards, porters etc. Precipitated or exacerbated by sudden exertion or prolonged exposure to physical factors such as high force, repetition, awkward body posture or vibration are the major factor for musculoskeletal pain. There are limited studies on health assessment of class IV workers in India. We therefore intent to conduct this study with objective of assessing in prevalence of musculoskeletal

pain of class IV workers of hospitals in pune region.

AIM AND OBJECTIVES

AIM: To find the prevalence of musculoskeletal pain in class IV workers of hospitals in pune region.

OBJECTIVES: A) To assess the prevalence of musculoskeletal pain among class IV workers of hospitals in Pune region using Nordic Musculoskeletal Questionnaire. B) To assess the intensity of musculoskeletal pain among class IV workers of hospitals in Pune region using NPRS.

MATERIALS & METHODS

The study was Observational study in Class IV workers of tertiary care hospital among pune region. The age group being 25-55 was included in the study. There was total of 6 hospitals and a formal letter was provided to the authority of the respective hospitals. Ethical clearance was obtained from the Institutional Ethics committee. Which involves convenient sampling with 386 sample size with paper, pen and a consent form. Samples were collected with among pune region with the duration of 6 months

SAMPLE SIZE CALCULATION USING COCHRAN'S FIORMULA.

With reference to the study done by D'Souza P, Frank RW, Mathias AA. Knowledge and usage of body mechanics among Class IV workers. Int J Physiother. 2020; 7(6):264-8. [10]

The minimum sample size required for execution of the research study was computed using Microsoft Excel 2013 version sample size template with the formula given by Cochran.

$$n = \frac{Z^2pq}{e^2}$$

The above formula has the following parameters and the required inputs for sample size calculation were provided based on the mother article prevalence rate and the error rate

Or the precision level as recorded by the authors. Where n represents Sample Size, Z^2 is the Expected confidential level, p denotes projected proportion of population [prevalence level], q value is 1- p, and e is the preferred level of precision. Sample size calculation for study based on the mother article inputs. Two tailed analysis where Z^2 value is 1.96^2 (5 % significance level) and rest p, q, is 50% and e is 5%

$$n = \frac{(1.96^2)*(50)*(50)}{(5)^2}$$

$$n = 386$$

There will be 384 respondents based on propulsive convenient sampling method for the study. The researcher would consider 5% dropout ratio units for the present study and shall consider approximately 404 respondents for the research study to reach the desired sample size of 385 units based on the non-probability sample method. Informed and written consent was taken from all the participants in a vernacular language before including them in the study. All the heads of Class 4 workers for different areas of the hospital were explained about study purposes. Every participant has explained the need and purpose of the study. The inclusion criteria were housekeeping staff who had put in a minimum of 5 years in this field will be included in the study, ages between 25 and 55 years, who are working in OPD, IPD, OT, and management departments. The exclusion criteria were any underlying musculoskeletal problems before joining the work, any congenital deformities, workers who were not willing to participate, workers who had injuries other than work place. All the questionnaires were explained into vernacular language and the participants were assessed by one-to-one interview method. All the participants were evaluated using Nordic Musculoskeletal questionnaire, and Numerical rating pain scale (NPRS). The first section of the questionnaire focuses on collecting demographic data, along with address, occupation, duration of work, hours of working per day, type of

work, The second section gathered data on the prevalence of Musculoskeletal pain in different body regions. The Nordic Musculoskeletal questionnaire determined the prevalence of WMSDs for nine different body regions, that is, shoulders, elbows, neck, upper back, wrist/hand, lower back, feet/ ankles, knees, and thighs/hips. This questionnaire has been used to evaluate musculoskeletal problems in Class IV workers. The response options of the questions were polar (Yes/No) except for age. In the questionnaire, there is a body map after the 11 questions for indicating the following 9 body regions: shoulders, elbows, neck, upper back, wrist/hand, lower back, feet/ankles, knees, and thighs/hips. The questions were asked related to musculoskeletal problems at work which have hampered their normal activities were as follows: (a) duration of pain, (b) change of job or duties due to pain, in the past 12 months, last month and the present day. The second sale used was of NPRS to calculate the intensity of pain among the workers. Numerical pain rating scale which consists of number between 1-10 where the reading is maximum pain 9, minimum of 2 and moderate or bearable pain is 5. The subjects here have to rate their intensity of pain using the scale. The joint wise distribution of pain among the Class IV workers was evaluated Statistical Analysis Statistical Analysis is obtained by using SPSS Advanced Microsoft Excel. Percentage of the prevalence of pain among workers was derived and graphical representations of the same were generated for the purpose of analysis.

RESULT

Data were summarized using the descriptive statistics of mean, standard deviation, and percentages for the Nordic questionnaire also NPRS. Demographic data of the participants were taken to know their age and gender. The mean age of the Class IV workers was 41.17 (±8.60) years and the number of Male and Female participants were 239 (61.9%) and 147 (38.1%) respectively. The mean working hours per week of the Class IV workers was 53.8 (±12.17) (±6.3) hours.

Table 1 – Pain on NPRS of Class IV workers among hospitals in Pune region

Pain on NPRS	Mean	SD
NPRS (on Activity)	5.26	1.82
NPRS (at Rest)	1.28	1.39

Interpretation – The mean NPRS of Class IV workers was 5.26 (±1.82) on activity and 1.28 (±1.39)

Table 2: Joint wise Distribution of Pain intensity on NPRS in Class IV workers of Hospitals in Pune region.

Joints	Pain on NPRS (Activity)
Neck	5.42
Shoulder	5.26
Elbow/ hand	5.48
Wrist	5.62
Upper back	5.20
Lower back	5.58
Hips/ thighs	5.28
Knees	5.24
Ankle	4.88

Interpretation: Major intensity of pain on NPRS was observed at wrist joint (5.62), followed by lower back (5.58), pain intensity at elbow joint and neck was (5.48) and (5.42), minor pain was prominent in hips/thigh, shoulder, knees, upper back with intensity (5.28), (5.26), (5.24), (5.20) respectively and the least was found at ankle joint (4.88).

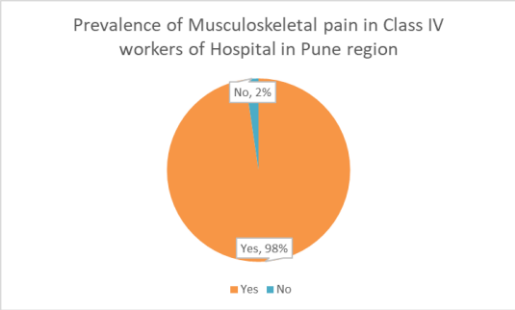
Table 3 – Distribution of Pain in Class IV workers among hospitals

Region	No of Participants	Percentage
Neck Pain		
- Yes	61	15.8%
- No	325	84.2%
Shoulder Pain		
- Both	49	12.7%
- Left	13	3.4%
- Right	50	13%
- No	274	71%
Elbow/ Hand Pain		
- Both	36	9.3%

- Left	16	4.1%
- Right	42	10.9%
- No	292	75.6%
Wrist Pain		
- Both	33	8.5%
- Left	12	3.1%
- Right	33	8.5%
- No	308	79.8%
Upper Back Pain		
- Yes	109	28.2%
- No	277	71.8%
Lower Back Pain		
- Yes	116	30.1%
- No	270	69.9%
Hip/ Thighs Pain		
- Both	46	11.9%
- Left	11	2.8%
- Right	14	3.6%
- No	315	81.6%
Knees Pain		
- Both	88	22.3%
- Left	11	2.8%
- Right	21	5.4%
- No	268	69.4%
Ankles Pain		
- Both	73	18.9%
- Left	7	1.8%
- Right	13	3.4%
- No	293	75.9%

Interpretation – The percentage of pain observed in Neck was 15.80%, Shoulder (Both) pain was 29.10%, Elbow/Hand (Both) pain was 24.30%, Wrist (Both) pain was 20.10%, Upper back pain was 28.20%, was Lower back pain was 30.10%, Hip/Thighs (Both) pain was 18.30%, Knee (Both) Pain was 30.50%, and last Ankle (Both) pain was 24.10%.

Graph 1: Prevalence of musculoskeletal pain in class IV workers



Interpretation: Among 386 number of participants, 377 number of class IV workers had Musculoskeletal pain. Prevalence of musculoskeletal pain in class IV workers was 97.67%.

DISCUSSION

NPRS numerical rating pain scale has been used in this study to calculate the intensity of pain among the Class IV workers due to their long working hours. NPRS was evaluated on activity and at rest where the mean pain NPRS was 5.26 (±1.82) and 1.28(±1.39) respectively. NPRS numerical rating pain scale has been used in this study to calculate the intensity of pain among the Class IV workers due to their long working hours. NPRS was evaluated on activity and at rest where the mean pain NPRS was 5.26 (±1.82) and 1.28(±1.39) respectively. Nordic Musculoskeletal questionnaire was used to find distribution of Pain in Class IV workers among hospitals. Around 30.50 % of the participants had Low back pain among class IV workers. This might be due to inappropriate lifting techniques used by the workers. [11] Poor ergonomics followed during their working hours might lead to excessive stress on lumbar region. Heavy load transfer with forward bending and standing positions put excessive pressure at the back. Poor physical condition in association to job demands increases the risk of developing back pain. Improper lifting can cause muscle injury as well as change in position while lifting it may place a lot of strain on the lower back muscles. [11, 12] According to the study conducted by

sintayehu Daba Wami titled by Work related risk factors and the prevalence of Low back pain among low wage workers, Defines back pain as Chronic or acute pain, aches or trouble in the lumbar or buttocks area sometimes called lumbago or in the upper leg region which has major work related disorder in almost all physical demanding jobs. [13] Housekeeping is a physical demanding job it involves forceful movements and working in awkward body position while lifting mattress, cleaning tiles, in every shift which in turns contribute to musculoskeletal disorder. In many studies wide range of factors associate with low back pain has been identified.[15] Among all these Lifting and carrying heavy objects, Awkward posture, psychosocial job demands, repetitive movement, static work load, Bed making were reported as the major risk factor for low back pain. Their job also include shifting, lifting and transferring of patient and heavy objects. All these activities involve repetitive movement such as lifting the patients bending, transferring, working with awkward body position.[14,15] Workers involved in multiple physical activities of repetitive motion, static postures, and forceful exertions leading to work related stress, injury, unusual body movements, cause wounds or dysfunctions of nerves, tendons, muscles, cartilage, bone, spinal discs and joints. [15] These disorders comprise soreness of the muscles, connective tissue damage, pain in back, problems at shoulder joint and degeneration of knee joint. Continuous physical activities such as manual sweeping in the standing posture for long durations, bending while collecting the swept waste, pushing and pulling of the wheelbarrow, and manual lifting of baskets to deposit waste. [15] Workers involved in multiple physical activities of repetitive motion, static postures, and forceful exertions frequent movement because of broom, sweeping and bending back for removing garbage on walking areas. Repetitive movement conditions, using upper limb frequently might lead to shoulder pain among sweepers [3,16]. This is in agreement with a study done by Pradeep salve et al 'Assessing the exposure of street sweeping and potential risk factors for developing musculoskeletal disorders and related disabilities: a cross-sectional study' who stated that on observation, the shoulder pain might be because of continuous sweeping with long-handle brooms and carrying collected waste in the wheelbarrows to the hospitals dustbins manually in an unvarying posture also repetitive movement such as lifting the patients bending, transferring, working with awkward body position under high risk of strain, sprain to the muscles and ligaments certain forceful and jerky movements during activity and unnatural postures of the body, affecting natural structure of the body leads to injury. [16] According to the study conducted by Verma chayya titled by musculoskeletal morbidities in class 4 women employs of tertiary care hospitals. [3] This study determines detailed description of manual and physical activities, detailed activities physically performed by the workers, includes, long standing hours, lifting heavy loads, repetitive bending awkward postures, positions in beds, equipment's handling and cleaning etc. Climbing stairs with heavy buckets causes direct pressure at the back can lead to disc buldge, disc herniation, moving around the wards, Repetitive motion of the abduction of the arm increases the mechanical load at the supraspinatus tendon (intrinsic mechanism) and can cause an extrinsic mechanical conflict between the supraspinatus tendon and adjacent anatomical structures when the arm is above the horizontal position leading to pain at shoulder joint. [3] The lowest ranking worker, has the most interaction and direct contact with patients, involving continuous walking, stand for long hours and repetitive movements.[13] Article given by Shweta Mahesh Kumar Parikh tilted by Prevalence of musculoskeletal disorders and its risk factors among Class 4 workers of rural tertiary health-care hospitals in Western

India, says that according to the World Health Organization, musculoskeletal conditions are the second largest contributor to disability worldwide being a single leading cause of disability globally. Every one in three and one in five people suffer from a painful and self-limiting musculoskeletal problem [17]. These conditions significantly limit mobility, leading to early retirement from work, reduced accumulated wealth, and reduced ability to participate in social roles. These conditions account for the highest proportion of consistent pain and are regularly encountered by individuals in day-to-day life which cause sickness absenteeism. [18] Prevalence of musculoskeletal pain among the IV workers was 97.67%.

CONCLUSION

In conclusion, this study highlights the prevalence of Musculoskeletal pain among the class IV was 97.67% where the workers are supposed to work for long hours using their maximum physical strength, improper positions affecting their postures and under low wages. Lots of physical activity over the period of time causes stress at particular joint leading to musculoskeletal pain.

Declaration by Authors

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