Prevalence of Shoulder Pain Among Street Sweepers in Kolhapur City

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Abstract*—Introduction: Sweepers play an important role in maintaining the health and hygiene in the cities. They work in hospital, under corporation, institutions and local bodies. Their work requires continuous use of arms and hands which involves repetitive shoulder activities thus increasing the demand on the muscles, ligaments and soft tissues around the shoulder joint. [1] Improper posture and repetitive activity while working produce major stress over joint and scapular muscles which is main reason behind shoulder pain. [1] It can lead impaired range of motion associated with muscle spasm. In sweepers shoulder joint pain or dysfunction is high in number as compared to other occupational workers due to the occupational demand. Musculoskeletal pain is a major worldwide occupational health problem. It can affect different body parts like upper and lower extremities, lower back, neck and shoulders. [2] Sweepers are exposed to musculoskeletal pain directly or indirectly as they use upper limb frequently for sweeping for prolonged duration sweeping with improper posture [3]. They are suffering from different occupational health problems due to illiteracy, lack of knowledge on occupational health problems and ergonomics. [1] Shoulder pain is common among them, with their routine work like sweeping, mopping which requires repetitive movements of shoulder. Most sweepers need to maintain awkward or static postures while cleaning large areas, which commonly results in musculoskeletal dysfunction. Method: The study aimed to investigate the prevalence of shoulder pain in street sweepers. Subjects were selected from Kolhapur municipal corporation and assessed using goniometer, SPADI and NPRS scale. Inclusion and exclusion criteria were considered, and subjects willing to participate were included after receiving an explanation of the study's nature. Result: In this study of 116 participants, pain complaints varied across age groups, with 92 participants reporting pain. The SPADI score and Numeric Pain Rating Scale (NPRS) revealed that 24 participants had no pain, while 92 participants reported varying degrees of pain severity. Conclusion: The goal of our study was to investigate the prevalence rate of shoulder pain among street sweepers in Kolhapur city. The present study concluded that, 79% of street sweepers (92 out of 116 street sweepers) reported having shoulder pain and mostly seen in age group of 23-57 years.

***Index Terms*—Shoulder pain, street sweepers, prevalence.**

I. INTRODUCTION

The shoulder complex, composed of the clavicle, scapula, and humerus, is an intricately designed combination of three joints that links the upper extremity to the thorax. The articular structures of the shoulder complex are designed primarily for mobility, allowing us to move and position the hand through a wide range of space. The glenohumeral (GH) joint, which links the humerus and scapula, has greater mobility than any other joint in the body. Although the components of the shoulder complex constitute half the mass of the entire upper limb, they are connected to the axial skeleton by a single joint, the sternoclavicular (SC) joint. As a result, muscle forces serve as a primary mechanism for securing the shoulder girdle to the thorax and providing a stable base of support for upper extremity movements. The contradictory requirements on the shoulder complex for both mobility and stability are met through active forces, or dynamic stabilization, a concept for which the shoulder complex is considered a classic example. In essence, dynamic stability exists when a moving

segment or set of segments is not limited very much by passive forces such as articular surface configuration, capsule, or ligaments, but instead relies heavily on active forces or dynamic muscular control. Dynamic stabilization results in a wide range of mobility for the shoulder complex and provides adequate stability when the complex is functioning normally. However, the competing mobility and stability demands on the shoulder girdle and the intricate structural and functional design mediating the compromise between structure and function make the shoulder complex highly susceptible to dysfunction and instability.

Shoulder pain is the third most common musculoskeletal disorder after low back pain and neck pain. [1] Improper posture and repetitive activity while working produce major stress over joint and scapular muscles which is main reason behind shoulder pain. [1] It can lead impaired range of motion associated with muscle spasm. In sweepers shoulder joint pain or dysfunction is high in number as compared to other occupational workers due to the occupational demand. Musculoskeletal pain is a major worldwide occupational health problem. It can affect different body parts like upper and lower extremities, lower back, neck and shoulders. [2] Sweepers are exposed to musculoskeletal pain directly or indirectly as they use upper limb frequently for sweeping for prolonged duration sweeping with improper posture. [3] They are suffering from different occupational health problems due to illiteracy, lack of knowledge on occupational health problems and ergonomics. [1] Shoulder pain is common among them, with their routine work like sweeping, mopping which requires repetitive movements of shoulder. Most sweepers need to maintain awkward or static postures while cleaning large areas, which commonly results in musculoskeletal dysfunction. Sweepers play an important role in maintaining the health and hygiene in the cities. They work in hospital, under corporation, institutions and local bodies. Their work requires continuous use of arms and hands which involves repetitive shoulder activities thus increasing the demand on the muscles, ligaments and soft tissues around the shoulder joint. [1] Kolhapur is a city in the western state of Maharashtra, India. Sweepers have been dedicating their lives for cleaning. They have been employed in this city as ‘sanitation workers’ since sanitation and maintaining hygiene become priority. There are around 1300 males and females employed with the sanitation department between the age group of 18-57 years in Kolhapur city.

II. METHODOLOGY

Data collection sheet, consent form, shoulder Pain and Disability Index, numerical Pain Rating Scale, goniometer Methods of Research: Prospective Type of study: Observational. Study design: cross-sectional study, duration of 6 months Study place: Kolhapur city Sample design: Simple random sampling. Patient fulfilling inclusion and exclusion criteria are taken in this study Inclusion criteria**,** willing to participate, male and female street sweepers between 23-57 years, working experience of more than 5year, Exclusion criteria, History of any disease or condition related to spine and shoulder, neurological deficit, history of trauma to the shoulder joint, multiple joint pain (> 2 joints), history of neck or shoulder surgery.

III. RESULTS

Total number of 116 street sweepers aged between 23-57 was included in the study.

Age: The age of the participants in this study ranged from 23- 57 years, with an average of 40.12. The minimum age of the subject was 23 years and the maximum age was 57 years. From total sample size of 116, In 92 participants shoulder pain was noted. Inference: The percentage of shoulder pain is also high in 23-57 years of age group.

Gender: The prevalence of shoulder pain in females is 84.44 % and in males is 76.06 % by SPADI score and NPRS scores on activity. Prevalence of shoulder pain according to NPRS on rest is 64.44 in females and 45.07 in males. Inference: Females have higher prevalence of shoulder pain than males.

Years of working:

In our study we included the participant working as a sweeper for more than 5 years. The minimum number of years working as sweepers in our study is 5 years and maximum is 38 years. Mean of number of years working (work experience) is 16.78 and SD is 7.30. Severity of shoulder pain was recorded higher in sweepers who had more work experience compared to who had lower work experience. Inference: Shoulder pain is likely to be more in more experienced sweepers.

SPADI					
Shoulder Pain	Male	Percentage	Female	Percentage	Total
No	17	23.94%	7	15.56%	24
Yes	54	76.06%	38	84.44%	92
Total	71	100.00%	45	100.00%	116

Table 2: Prevalence of shoulder pain according to SPADI score in male and female street sweepers.

Numeric pain rating scale score: NPRS was taken on rest and on activity, collected data shows that 53 % of participants was having shoulder pain which was mild on rest and on activity 79 % participants reported shoulder pain which was varying in between mild to severe out of 116 participants. Inference: Shoulder pain is likely to be more on activity among sweepers.

NPRS (On Rest)		
Shoulder Pain	No of Participants	Percentage
No	55	47%
Yes	61	53%
Total	116	100.00%

Table 3: Prevalence of shoulder pain according to NPRS (on rest) score among street sweepers.

Shoulder pain and disability index the outcome measure used was shoulder pain and disability index (SPADI) the minimum total score of SPADI was 0% and maximum total score was 43.84%.

Table 2: Prevalence of shoulder pain according to SPADI score in male and female street sweepers.

NPRS (On Rest)					
Shoulder Pain	Male	Percentage	Female	Percentage	Total
No	39	54.93%	16	35.56%	55
Yes	32	45.07%	29	64.44%	61
Total	71	100.00%	45	100.00%	116

The SPADI score recorded, those 92 participants were having shoulder pain, from 92 participants 54 were female and 38 were male. Most of the previous articles have used SPADI for their prevalence of shoulder pain. Inference: The SPADI score were recorded was ranges from 0% to 43.84% which indicates that pain severity varies in between mild, moderate and severe.

IV. DISCUSSION

The prevalence of shoulder pain among street sweepers in Kolhapur City is a concerning issue that highlights the occupational hazards faced by workers in this sector. The nature of the work, involving repetitive motion, prolonged physical exertion, and poor ergonomic conditions, can significantly contribute to musculoskeletal disorders, particularly shoulder pain. In our study evaluated the frequency of shoulder pain in 116 street sweepers from Kolhapur city. Shoulder pain is a common issue that can affect individuals in various professions, especially those involving repetitive movements, heavy lifting, or sustained postures. The musculoskeletal discomfort in body region among street sweepers related to work condition such as used upper limb frequently sweeping and prolonged duration of sweeping. The purpose of this study was to find out prevalence of shoulder pain. In this study of 116 participants, pain complaints varied across age groups, with 92 participants reporting pain. According to SPADI score and Numeric Pain Rating Scale (NPRS) revealed that 24 participants had no pain, while 92 participants reported varying degrees of pain severity. Using inclusion and exclusion criteria, we looked into the incidence of shoulder pain among street sweepers, a finding consistent with similar studies in other cities of Maharashtra and professions building sweepers, construction workers, and agricultural laborers. Study

of Hemani Malhotra [2] in Mumbai city have also reported a high prevalence of musculoskeletal disorders, including building sweepers. The physical demands of these jobs, which often involve repeated lifting and stretching motions, contribute to the high occurrence of shoulder pain.

Also, comparatively, a study conducted in Mumbai reported that street sweepers and waste management workers had a higher incidence of musculoskeletal disorders than workers in other sectors. This trend seems to be similar across urban areas in India, suggesting that street sweepers are particularly vulnerable to shoulder pain due to the nature of their work and environmental factors, such as heat, dust, and pollution.

The study revealed that the participants, aged between 23 and 57 years with an average age of 40.12, showed a higher prevalence of shoulder pain among older sweepers, likely due to cumulative wear on the musculoskeletal system. Although male sweepers outnumbered females, the latter reported higher instances of shoulder pain, possibly due to differences in muscle strength and endurance. Factors contributing to shoulder pain included repetitive motions, awkward postures, heavy lifting, prolonged activity, poor physical fitness, and environmental factors. Participants had a minimum of 5 years and a maximum of 38 years of experience, with most starting at age 18. The numeric pain rating scale (NPRS) indicated that 79% of participants experienced shoulder pain, with scores ranging from 0 to 7. The shoulder pain and disability index (SPADI) scores ranged from 0% to 43.84%, reflecting varying pain severity levels. Key working factors contributing to shoulder pain included sweeping distance, broom length, broom weight, and working hours, which often extended to 6-8 hours daily. Repetitive movements and strenuous activities, like sweeping and lifting waste, placed significant strain on the shoulder muscles, leading to musculoskeletal pain and decreased efficiency.

V. CONCLUSION

The goal of our study was to investigate the prevalence rate of shoulder pain among street sweepers in Kolhapur city. The present study concluded that, 79% of street sweepers (92 out of 116 street sweepers) reported having shoulder pain and mostly seen in age group of 23-57 years.

REFERENCES

[1] Dr. Ruchi Gupta. Reliability and Validity of shoulder pain and disability index (SPADI) in sweepers of Surat city. International Journal of Yogic, Human Movement and Sports Sciences 2019; 4(1): 1231-1236.

[2] Hemani Malhotra, Manjit Kaur Chauhan. Prevalence of musculoskeletal disorders among building sweepers. International Journal of Health and Research Vol. 10 Issue3 March 2020.

[3] Kanjanar Pintakham, Wattasit Siriwong. Prevalence and risk factors associated with musculoskeletal discomfort among street sweepers in chiang rai province, Thailand. J Health Res.Vol 30 no.3 2016.

[4] Benjamin Haldorsen, Ida Svege, Yngve Roe and Astrid Bergland[3]. Reliability and validity of the Norwegian version of the Disabilities of the Arm, Shoulder and Hand questionnaire in patients with shoulder impingement syndrome Haldorsen et al. BMC Musculoskeletal Disorders 2014, 15:78.

[5] Ferraz MB, Quaresma MR, Aquino LR, Atra E, Tugwell P, Goldsmith CH. Reliability of pain scales in the assessment of literate and illiterate patients with rheumatoid arthritis. J Rheumatol 1990;17:1022–4.

[6] Thiago Paulo Frascareli Bento, Caio Vitor dos Santos Genera, Guilherme Porfirio Cornellio, et al. Prevalence and factors associated with shoulder pain in general population. 2019Fisioter Pesqui. 2019;26(4):401-406

[7] Shivneri C Raut, Ruchika Kuba, Sushmitha Baskar. Musculoskeletal disorders among group D staff in government aided hospitals in Aurangabad City, Maharashtra. International Journal of Preventive, Curative & Community Medicine Vol.7, Issue 4- Pg.no.1-7.2021.

[8] Asrain Hasibuan. Complaints of musculoskeletal disorders in cleaning officers at hospital. IAMSPH, Vol. l, Nol Halaman ishwri 51-62. 2020.

[9] Fariba Khosravi. Zahra Amir et al. Shoulder pain prevalence and risk factors in middle- aged women. Journal of bodywork & movement therapies.2019.

[10] Jasim Uddin, A. S. M. Giasuddin et al. Prevalence and Associated Factors of Musculoskeletal Disorders Among Municipal Solid Waste Disposal Male Workers in a Selected Area of Dhaka City. International Journal of Clinical and Experimental Medicine Research 6(1),31-39.2022.

[11] Mei Ching Lim", Khamiah Awang Lukman et al. Prevalence of upper limb musculoskeletal disorders and its associated risk factors among janitorial workers: A cross-sectional study. Annals of Medicine and Surgery 73. 2022.

[12] M. Gayathri Devi, Aditi Vats. Prevalence of work-related musculoskeletal disorders among women tea factory workers of Nilgiri: An ergonomic study. Journal of Applied and Natural Science 10 (3): 990 - 994 (2018) ISSN: 0974-9411.

[13] Vedanti Nilesh Walchale, Dr. Amruta Khilwani, Dr. Albin Jerome. Prevalence of Musculoskeletal Pain Amongst Sweepers of Pune Region. International Journal of Health Sciences and Research Volume 14; Issue: 4; April 2024 ISSN: 2249-9571