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Original Research Article

Prevalence of Work Related Musculoskeletal Disorders in Farmers of Gujarat

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ABSTRACT

Introduction: Musculoskeletal Disorders (MSDs) are a global problem and have a comprehensive impact on health and economy of a country. Work-related musculoskeletal disorders (WMSDs) are accumulative disorders that are most frequently found in agricultural farmers. Farming is a physically arduous occupation. Presence of musculoskeletal disorders among these farmers will result in reduction in their work capacity which may reflect in reduction in economic contribution from farming sector. The present study was conducted to find out the prevalence of musculoskeletal disorders among farmers.
Methodology: All adult farmers between the ages of 18 to 70 years were included. 947 workers were selected randomly and the prevalence of musculoskeletal disorders was determined by self developed questionnaire. Result The most common MSDs were found to be in the Lower back (61%) followed by Knee (33%), Shoulder (31%), Neck(29%), Upper back (28%), Elbow (15%) , Hip (13%), Wrist and hand (12%), and Ankle and Foot (11%).
Conclusion: The prevalence of MSDs in farmers is high in farmers of Gujarat with highest prevalence in Lower Back.

Key words: Work-related musculoskeletal disorders, Farmers, Gujarat

INTRODUCTION

Musculoskeletal Disorders (MSDs) are a global problem and have a comprehensive impact on health and economy of a country. [1] Musculoskeletal disorders are defined as a "Group of disorders that affect the musculoskeletal system including the nerves, muscles, tendons and joints and supporting structures such as inter-vertebral discs etc." [4] Work-related musculoskeletal disorders (WMSDs) are accumulative disorders that are most frequently found in agricultural farmers. [2] Farming is a physically arduous occupation and this places farm workers at potential risk of musculoskeletal disorders such as osteoarthritis (OA) of the hip and knee, low back pain (LBP), neck and upper limb complaints, and hand–arm vibration syndrome (HAVS). [3] It may result in pain, damage to musculoskeletal structures, poor health as well as poor quality of life and reduced productivity. [5] They are the most common cause of severe persisting pain and disability, and are currently reported to be affecting hundreds of millions of people across the globe. [6-8] It often occurs in an individual, when the work load exceeds the capacity that his / her locomotor apparatus can bear. WMSDs may occur as a result of acute injuries from one-time trauma or multiple traumas such as repetitive motion,

excessive force, sustained abnormal postures, prolonged squatting and standing in the course of work. [15] The disorder takes on a more serious dimension when it becomes chronic; nearly 25 percent of the affected adults are identified as having chronic Musculoskeletal (MS) impairment, which is equally prevalent in both developed as well as developing countries. [10,11]

Ergonomics is the scientific discipline concerned with the understanding of the interactions among humans and other elements of a system and the profession that applies theory, principles, data, and methods to design in order to optimize human well - being and overall system performance. In the design of work and everyday life situations, the focus of ergonomics is a man. Unsafe, unhealthy, uncomfortable or inefficient situations at work or in everyday life are avoided by taking account of the physical and psychological capabilities and limitations of a human. [9]

The major work related risk factors associated with LBP have been identified as poor/awkward work postures, bending, lifting and physically strenuous work. [12-14] Based on the International Labour Organization, globally 74% of the agricultural workers live in Asia and Pacific regions. [16] In India, as 68% of the populations live in rural areas, agriculture based activities play a major role in improving the rural economy of the country. [17,18] Agriculture and its related activities have provided nearly 60% of the employment opportunities in India. [19] WMSDs are found to be associated with absenteeism, loss of productivity and economic loss to the worker, industry and the nation at large. [20] There are several studies globally showing that the agriculture workers have a higher risk of developing MSDs than any other group of people.

However, there are scarcities of studies that focus on the country's farming community, which constitutes more than 58 percent of the Indian work force. [21] Presence of musculoskeletal disorders among these farmers will result in reduction in their work capacity which may reflect in reduction in economic contribution from farming sector. After a thorough literature search, it had been found that the prevalence of musculoskeletal disorders in various regions of body among farming community in this part of the country is not well documented. Hence, the present study was conducted to find out the prevalence of musculoskeletal disorders among farmers.

MATERIALS AND METHODS

Ethical approval was obtained from Institutional Ethics Committee. A community based cross-sectional study was conducted from December 2017 to September 2019.

All adult farmers between the ages of 18 to 70 years were included. Part-time farmers (i.e. people who were also doing some other jobs besides farming e.g. rickshaw pullers, carpenters, other labour workers); subjects with diagnosed congenital skeletal deformities or deformities due to fractures; subjects with any diagnosed psychiatric illness; who were known to have spinal fracture resulting from tumours, infections or any major trauma to the spine or having diagnosed neurological problems were excluded. Unwilling subjects were also excluded. Informed written consent was taken from all included farmers.

947 workers were selected randomly and the prevalence of musculoskeletal disorders was determined by self developed questionnaire. In this questionnaire the musculoskeletal system is divided to 9 regions such as neck, shoulders, hip, upper back, knees, wrists/hands, ankles/foots, low back and knee. The researcher completed the questionnaires by interview with workers. In very explicit and simple terms respondents were asked if they had experienced any musculoskeletal discomfort in any of the joints in their body which prevented them from performing the normal activity during the past 12 months or for a short and temporary period of 7 days.

Compilation of the responses was aided by an illustrative body map to indicate the major nine symptom sites - neck, shoulder, upper back, elbow, low back, wrist/hands, hip/thighs, knees, and ankles/ feet.

RESULT

The descriptive statistical analysis of data (N=947, Farmers), showed that the mean age was 47.83 ± 13.55 years. Figure 1 shows the musculoskeletal disorders in all 9 body regions mentioned in Self Developed Questionnaire and Figure 2 shows overall prevalence of WMSDs in farmers of Gujarat.

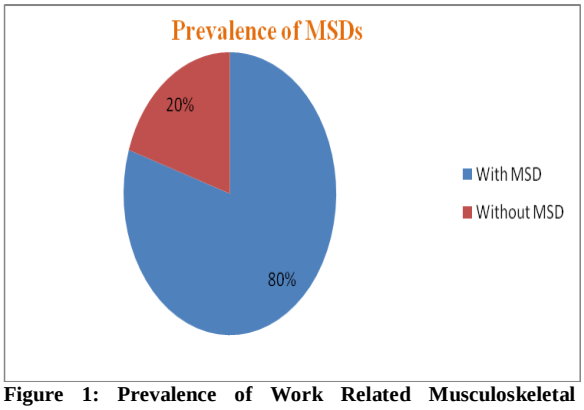

Figure 1: Prevalence of Work Related Musculoskeletal Disorders in farmers

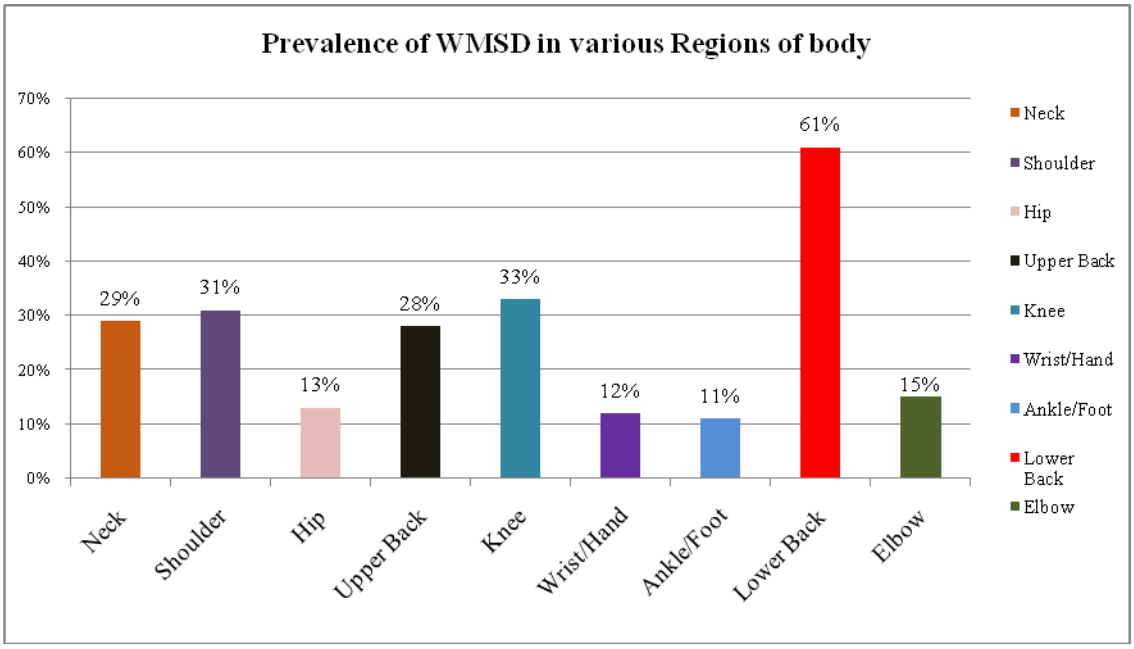

Figure 2: Prevalence of Work Related Musculoskeletal Disorders in various regions of body in farmers

Out of the 947 study subjects, 80% have musculoskeletal disorders (MSDs) during a 12 month period as shown in Figure 1.

Figure 2 shows the distribution of musculoskeletal disorders in different parts of the body in male and female subjects according to Self developed questionnaire. The most common MSDs were found to be in the Lower back (61%) followed by Knee (33%), Shoulder (31%), Neck(29%), Upper back (28%), Elbow (15%) , Hip (13%), Wrist and hand (12%), and Ankle and Foot (11%).

DISCUSSION

Musculoskeletal disorders and the accompanying pain in farmers are multifactorial phenomena. Any part of the body is prone to develop such pain due to the work setup they are in and the nature of the work. Farmers in Gujarat work in various fields do a lot of manual labor. They also don't have knowledge of ergonomics which makes them susceptible to work related MSDs.

There are many types of research which document the prevalence of various musculoskeletal discomfort in an occupation like mine workers, stone cutters, sanitary

workers, military personnel, aircrew workers, shoe factory workers, goldsmiths, etc. [13]

In the present study, farmers presented with pain in all the nine areas of the body identified in the Self Developed Questionnaire. But Low Back pain was the most common MSD that has been seen among the participants of the present study. Knee pain was the next common problem identified and these had been corroborated by multiple other studies carried out elsewhere i.e. Osborne et al, Murthty SR et al, Omran A et al. [15,27,28] The Neck and Shoulder pain were the other important MSDs affecting the farmers. The ankle was the region that was least affected among the workers in the study. However, these five areas were identified as most common musculoskeletal disorders areas- Lower Back(61%) followed by Knee (33%), Shoulder (31%), Neck(29%) and Upper back (28%).

Forward bending, twisting, exposure to vibrations while driving tractors coupled with heavy load carrying predispose them to continued physical stresses that affect the spinal disc making them prone to injury. Modern machinery like tractors, power tillers though may overtly seem to ease the work but actually put the workers to the additional risk of whole body vibrations. Walker-Bone and Palmer in their study on MSDs in agricultural workers concluded that tractor drivers or riders are particularly at risk of low backache for the concerned risk factors. [29, 30]

The present study also revealed substantial proportion of workers with knee involvement. The cultivators need to assume prolonged squatting positions in the fields that put excessive pressure on knee joints. Activities like squatting involve eccentric contraction of quadriceps muscle group. A study on agriculture health in University of Wisconsin USA reported that eccentric contraction leads to non-uniform lengthening of sarcomere or other ultra-structural abnormalities. [30, 31] These could possibly explain the development of knee pain in these workers.

Some ergonomic problems of farmers are twisting, bending, manual material handling, awkward postures, and lifting, carrying heavy loads, hand tools, work-rest schedule and also lack of training of workers. [22-24] Such risk factors are associated with various musculoskeletal disorders. The risk of slipping, tripping, and fall on uneven fields is also associated with farming and these could also lead to the development of musculoskeletal discomfort in farmers. [25,26]

Long duration of involvement in farming activities was associated with higher prevalence of MSDs that had been collaborated by studies done by Osborne et al, Omran A et al., Xi. [4,28] Once pain in a particular body part developed, it was bound to remain over a long time and becomes chronic. These could have happened because of negligence or unavailability of proper health care facilities as well as lack of ergonomic education among farmers.

CONCLUSION

The prevalence of MSDs in farmers is very high. Low back pain is the most common type of MSD followed by Knee, Shoulder, Neck, Upper back, Elbow, Hip, Wrist and hand, and Ankle and Foot.

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