

**PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG VEGETABLE  
CULTIVATORS-A REVIEW****Jagannath Ghosh<sup>1</sup>, Pratiti Ghosh<sup>2</sup> and Shruti Agrawal<sup>3\*</sup>**<sup>1</sup>Research Scholar, West Bengal State University, Barasat.<sup>2</sup>Professor, Department of Physiology, WBSU, Barasat.<sup>3</sup>Assistant Professor, Department of Food and Nutrition, Budge Budge College, Kolkata.**\*Corresponding Author: Shruti Agrawal**

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**ABSTRACT**

India holds the second largest agricultural land in the world with 53.2% workers employed in agricultural sector. Farming is a physically hazardous occupation that places farm workers at potential risk of musculoskeletal disorder and has imposed a greater impact on their health. Each activity in agriculture brings about certain stress and strain on bones and muscles leading to work-related musculoskeletal disorders which can lead to several permanent diseases and disabilities. The review aims at the most common work related health hazards which is prevalent among the vegetable cultivators and an attempt to suggest some corrective measures in order to minimize medical expenses and loss of the labor force.

**KEYWORDS:** Musculoskeletal, Occupation, Hazards, Potential Risk**INTRODUCTION**

India with 157.35 million hectares, holds the second largest agricultural land in the world. India has made impressive strides on the agricultural front during the last three decades. Total food grain production in India reached an all time high of 252.68 million tons in the last financial year 2015 (Ministry of Agriculture, 2016). Much of the credit for this success should go to the several million small farming families that form the backbone of Indian agriculture and economy. The percentage of workers employed in agricultural sector is 53.2% (2009-10) (Nagaraj, 2008). Census 2011 has shown that every fourth person of the labour force is an agricultural worker in India (Puri et al, 2013). India produces 14 % (146.55 million tonnes) of world's vegetables on 15 % (8.5 million hectares) of world area under vegetables. India is the second largest producer of fruits and vegetables in the world. Potato (28.9%), tomato (11.3%), onion (10.3%) and brinjal (8.1%) are the four major vegetables contributing to 58.6% of total vegetable production in our country. Other important vegetables are cabbage (5.4%), cauliflower (4.6%), okra (3.9%) and peas (2.4%). India ranks first in the production of okra in the world (73% of world production) (Vanitha et al, 2013).

The major vegetable growing states in India are West Bengal, Uttar Pradesh, Bihar, Andhra Pradesh, Gujarat, Karnataka and Tamil Nadu. West Bengal state ranks first in cultivating vegetables. Here 18.2% of India's total vegetable are cultivated (Vanitha et al, 2013).

Farming is a physically hazardous occupation that places farm workers' at potential risk of musculoskeletal disorder and has imposed a greater impact on their health. Each activity in agriculture brings about certain stress and strain on bones and muscles leading to work-related musculoskeletal disorders which can lead to several permanent diseases and disabilities (Vyas, 2012). The review aims at the most common work related health hazards which is prevalent among the vegetable cultivators.

The prevalence of musculoskeletal disorders (MSDs) was very high among the vegetable cultivators and the most affected area were back, knees, shoulder, neck, hand, wrist, thighs, legs and foot. (Chandra et al, 2016).

Low back pain was more frequent in those with over 30 years of farming experience. Musculoskeletal disorder has a significant association among pain, history of prior injury and workload. The frequency of low back (63.8%), leg/foot (43.3%), shoulder (42.9%), wrist/hand/finger (26.6%), arm/elbow (25.3%), and neck (21.8%). (David et al, 2016). In the previous study the MSD in farmers were located in the lower back (50% and 43% respectively) and the shoulders (47% and 43% respectively). MSD were also frequently reported in the neck (33%) among farmers, and in the hands/wrist (41%) among farm workers. MSD in the elbows (23%) and feet (21%) were significantly more frequently reported by farmers than farm workers (5%). Female farmers and farm workers both reported significantly higher

frequencies of MSD in the neck (48% and 56% respectively) and hands/wrists (44% and 61% respectively) than their male colleagues (24% and 5%; 10% and 21%, respectively). In addition, female farm workers had significantly higher reported frequencies of MSD in the upper and lower back (39% and 61%, respectively) than their male counterparts (5% and 26% respectively). (McMillan et al, 2015; Lunner et al, 2012).

The women had significantly more problems than the men with respect to the upper extremities. Symptoms in the wrists and hands such as numbness, reduced muscle strength, aching fingers and wrists, and tendency to drop things were significantly more common among the women than the men (Stal et al, 2005).

Female workers had significantly more reported discomfort from repetitive and monotonous work than their male counterparts (Christina, 2012). Farmers perceived that routine tasks performed repetitively caused more musculoskeletal discomfort than heavier tasks performed on a non-routine or seasonal basis. Males were more likely to perform heavier manual handling duties and tasks involving the use of machinery, whereas females performed more routine administration work. Both men and women were exposed to similar physical demands from the performance of a number of commonly reported and strenuous tasks (Innes et al, 2010).

In another study by (Osborne et al, 2010), MSDs was common in back pain (37%) and neck/shoulder pain (25%). Other MSDs experienced include knee pain (9%), hand-wrist-elbow pain (9%), ankle/foot pain (9%) and hip pain (8%).

A study by McMillan et al, (2015) showed that MSD prevalence did not vary with sex, commodity type, or by total hours of farm work completed rather the prevalence was significantly related to time spent performing biomechanically demanding tasks such as heavy lifting and working with arms overhead. Latest study by Jain et al, (2017) has confirmed that factors such as age, gender, daily working hours, hand dominance, perceived fatigue, and work experience were found to be associated with MSDs in one or more upper body regions. The outcome of multinomial regression showed that gender is the most influencing factor for MSDs in all upper body regions except the shoulders. The outcomes of study indicate high occurrence of MSDs among manual-working farmers and highlight the significance of individual and work-related factors.

Musculoskeletal Disorders (MSDs) can affect the body's muscles, joints, tendons, ligaments and nerves. Most work-related MSDs develop over time and are caused either by the work itself or by the employees' working environment (Sarker et al, 2016).

Prevalence of MSDs was relatively high in the farmers. Moreover, the level of risk that was obtained according to the OWAS (Ovako Working Posture Analysis System) indicated that the working conditions and environment in this industry are harmful. (Beheshti et al, 2016).

Overall, MSDs were more common in farmers working longer hours (> 8). Back pain was more prevalent in full-time farmers, while prevalence of hip pain was greater in farmers who were older, full time, farming for longer and working for longer hours.

Farmers are at particular risk of developing agricultural work-related musculoskeletal (MSK) pain, because farming work consists of strenuous physical activities and high levels of manual labor, which has been considered a high-risk occupation for MSK disorders (Park et al, 2010; Rosecrance et al, 2006). Agricultural work-related MSK pain may lead to further negative consequences such as reduced work ability, lower farm income, poorer quality of life, and the onset of other health problems such as stress or depression. (Lee et al, 2010; Oh et al, 2001). Farmers with MSD had altered plasma levels of protein biomarkers compared to the referents, indicating that farmers with MSD may be subject to a more systemic inflammation. It is possible that the identified differences of proteins may give clues to the biochemical changes occurring during the development and progression of MSD in farmers, and that one or several of these protein biomarkers might eventually be used to identify and prevent work-related MSD. (Ghafouri et al, 2016).

Musculoskeletal pain was more common among the farmers when they worked in squatting position (52%) and specially during weeding of plants (31%). Most of the farmers complained dull aching pain (40.6%), only 2.3% noticed severe acute pain, but about 86% farmers' temporary stop their work for pain and 80% get relief after discontinuing their work.

Likewise, Walker-Bone and Palmer (Walker et al, 2002) suggested that several physical risk factors for MSK pain (such as lifting and carrying heavy loads, work with the trunk flexed, and exposure to whole-body vibration) were present more frequently among farmers, and farmers more often have knee osteoarthritis and low back pain, as compared to the workers in occupations with fewer physical demands. (Lee et al, 2010; Oh et al, 2001). The lower back was most frequently affected (57.7%), followed by shoulders (44.0%), and neck (39.6%) and serious pain have prevented 27.9% farmers from performing regular work activities.

Farming has been considered a high-risk occupation for musculoskeletal disorders. However, documentation of the increased risk is weak except for hip osteoarthritis. The farmers reported significantly more symptoms affecting the hands and forearms, low back and hips than did the non-farmers and a non-significant trend in the

same direction was found for symptoms from the neck, shoulders and knees. However, the farmers did not seek medical advice more often than the referents, and they reported significantly less sick leave for these problems. Thus, farmers appear to have more musculoskeletal symptoms than do non-farmers (Holmberg et al, 2002).

Thus, it was found that the rates of musculoskeletal complaints are more prevalent among those individuals who worked relatively bad ergonomic condition, such as body position probably play an important role (Basher et al, 2015). Equipment repair and maintenance and low back pain; milking animals and neck/shoulder pain; and manual material handling and elbow/wrist/hand pain, among others factors associated with MSD (Fethke et al, 2015). Severe flexion and lifting of heavy loads was common across farms, may have a continued or increased role in the development of musculoskeletal disorders (Kotowski et al, 2014). The development of musculoskeletal conditions can increase older farmers' risk for additional injuries because many older farmers continue to work past typical retirement age (Tonelli et al, 2014). Occupational health nurses with agricultural expertise can assist farmers by evaluating their health and safety needs. Possible interventions include ergonomic improvements in farm equipment, safety improvements in the farm environment and referrals to programs that assist older farmers in modifying their farms to improve safety (Tonelli et al, 2014).

Observations made during the present study suggest that poor postures and lack of ergonomic awareness in the farming community are the two principal causative factors contributing to the development of MSDs (Garima et al, 2013). Ergonomic interventions including improved and adapted work techniques and tools should be considered to reduce the prevalence of pain in our study population (Naidoo et al, 2009). Since medical expenses and loss of the labor force are enormous, developed countries have started to pay attention to these problem.

Farm workers should avoid bad work postures, should take rest period in between the working hours and avoid long working hours as far as possible during their work for reducing job related health. So preventive strategies such as coping and reducing injury or work load are suggested.

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