

## Musculoskeletal Disorders Among The Seed Sower Workers - A Review

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### ARTICLE INFO

### ABSTRACT

Agriculture builds the foundation food supply chain of the nation. Postural stress related with agriculture is very common in the eastern part of the world including India, where it is said to be the primary earning choice for the major population. Sowing of seed is the process where seeds are planted in the prepared field in a continuous manner. The manual method of sowing seeds include drooping posture of an individual where machine bound sowing with seed drill enforces continuous exposure to the vibration as well as extensive muscular activities of fore arm and hand. The review is mainly focused upon the way manually seeds are placed and the faced challenges resolved with ergonomic innovations. Many studies evidenced that the major discomfort is observed in the lower back, hip regions and in upper arms. The gender based reviews also showed that female sowers suffer more work related musculoskeletal disorders (WMSDs) than male. Various methods of posture analysis like rapid entire body assessment (REBA), rapid upper limb assessment (RULA), Ovako working posture assessment (OWAS) along with ART (assessment of repetitive task) tool have projected the moderated to severe risk related to the posture this kind. Lowering working hours, changing the posture at specific intervals, engagement of automation or sowers in a relay pattern and dietary management are the most beneficial ways to lower WMSDs among future farmer generations.

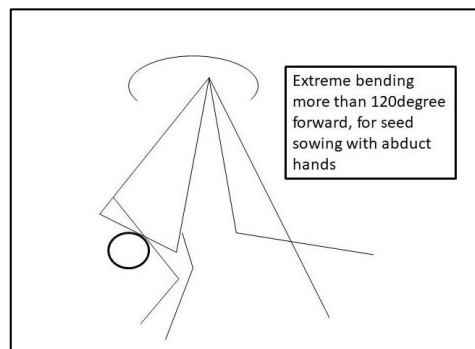
**Keywords:** Work related musculo-skeletal disorder (WMSD), Posture analysis, ART tool, Ergonomics, Posture stress

### Introduction

Farming is a compulsory domain for developing a nation in various ways. It builds the foundation food supply chain of the nation, so as the economy and can be said as the very primary fundamentals for any developing countries. There are various work cultures construct on the basis of agriculture namely on-sight and off-sight work stages, which show a kind of interdependent relationship between person, environment and work. It's around 50 to 65 percent people of the nation have chosen agriculture as their profession and have too some extent progressed them in various ways to reach success on the other hand many difficulties restricted them to reach out their goals (Satapathy, 2022).

Out of which physiological restrictions are very prior to be resolved.

Planned work imposing upon the various unorganized sector can be beneficial in this releasing the physiological stresses and stressors in long run (Pal, 2018). Now ergonomics deals with various works and its



**Fig 1: Ergonomical trio.**

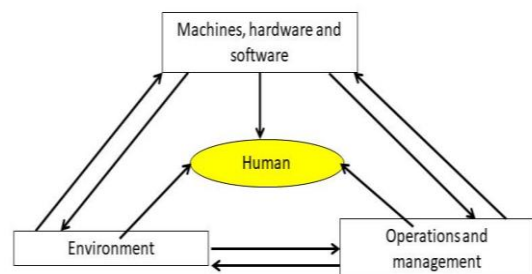
specific culture. It justifies the associated risk factors with the work and also determines its safety measures. The primary objective of the study is to identify the gaps agriculture facing in India in terms of productivity. Specifically the posture related issues in the woman population who are contributing almost half of the population engaged in agriculture in this country.

### Current scenario of agriculture in India

Agriculture is considered as an unorganized sector in India, as it does not possess any fixed income, job security, medical facilities etc., but a person can be educated in this field by professionals. Though the ratio between the skilled and unskilled personals is very poor so, the risk factors can't be screened and lowered at least in this part of the world (Gangopadhyay, 2009). Here the man, machine and environment trio comply mostly untrained individuals who are not so much aware about their physiological aspects. On the contrary they often face numerous health issues which used to develop within them due to various mal practices at the time of crop production. It has been found statistically that the women of India in the crop production are comparatively higher in numbers than that of men and produce almost 75 percent of the total food that comes to the active food chain, who have been also claimed to be the torch bearers of the social, economic and environmental mobilizations (Varghese, 2022). The rate of literacy in the agriculture within the women community are questioned several times and has been pointed out as a key predictors for any of the agronomical hazards (Meena, 2018). Many researches have translated many work stress relieving methodologies & implementation of those may reduce work related stress for the female cultivators, but those methods still have not been implemented (Dupare, *et.al*, 2010). Another issue that has been observed and can said as the one of the major problems in agriculture that is the work-rest schedule. The women cultivators of India need to perform their household duties too along with the fieldwork. So they could not get sufficient time and scope for rest. So their restlessness lead to impose additional stress and as a result it hampers productivity and this story remains same for major parts of India (Dhara, *et.al*, 2018). On the other hand instead of systemic empowerment the semi urban and rural part of the India still face clinical hazards related with musculoskeletal, reproductive, psychological & environmental. Whereas, this study is mainly focused upon the reasons relating postural barriers amongst seed sowers which lead to extreme musculoskeletal disorders.

### Musculoskeletal disorder: A challenge

There are various risks factors have been found in terms of physiological, psychological, occupational and economical, which creates restrictions in the growth of agriculture. Here the physiological challenges are extremely dominant for putting resistance in various ways; farming postures are one of them. Farming includes many steps like: soil preparations, sowing, manuring, irrigation, weeding, harvesting & storage (Kumar, 2020). All the steps involve both static and dynamic activities & are amalgamation of risk-full postures as well as comfortable postures. Now the risk-full postures for prolong period of time leads to postural deformities. Static postures are comparatively more harmful than that of dynamic postures (Dhara, 2007). Most of the musculo-skeletal issues have been raised due to the static postures of seed sowers.



**Fig 2: Seed sowing (Posture in stick diagram).**

### Posture analysis responsible in WRMSDs

In a cross-sectional study the researchers Hafidha and *et.al* in the year 2021, have observed that assessment of rapid upper limb assessment (RULA) and rapid entire body assessment (REBA) show marvellous postural deformities amongst the maize seed sowers. In which the average RULA score is 7 and average REBA score is 11 both are at high risk that correlates severe pain and deformities in the neck, trunk, shoulder and wrist. The conclusion of the experiment prevails that only light motorized maize seeder may face less musculoskeletal deformities or may be retrieved from the current scenario (Azmon, 2021). Another study of Sarita and *et.al* in the year of 2022 represented that most of the males are bound to static standing posture whereas the female of the sowers are more bound to squat position, which is also a static position. Both the postures for prolong period of time leads to dominant musculo-skeletal disorder (Mahalakshmi, 2021). In a research of Rajesh and *et. al* it has been observed that risk based designs on making ergonomical prototype machine for seed sowing may reduce the density of risk from high to moderate and so as lower the tendency for postural hazards (Ramadass, 2021). In another study based upon gender dependent participation it was observed that more than 75% of women are mostly engaged with high risk postures of agriculture relating stooping, squatting, sitting and bending, sometimes erect bending for prolonged period of time leads to postural discomfort and

hazards. Implementation of ergonomic paradigm based on occupational activities need to be informed and aware to the sets of population before engaging them to the activities like, seed sowing, winnowing, cleaning threshing and etc.(Singh, 2013). A study in West Bengal upon both man and woman rice farmers showed significant work related musculoskeletal disorders by elevated postural risks. The study also revealed that environmental hazards are also very powerful in generating stress for e.g. thermal stress. About 82.7% farmers face massive health issues relating muscular pain and abnormalities while sowing seeds (Das, 2015). Another study on farmers had showed that manual workings like crop cutting, seed sowing, harvesting etc. increase substantial risk amongst the farmers of India especially in the body parts like fingers, wrists, shoulders, body parts and lower back. The research concludes with the note that more ergonomic interventions are required to lower musculoskeletal risk (Maryam, 2021). The study of Gangopadhyay *et al* focused upon the duration of work and repetition of the same kind of posture as well as work for prolong period of time which lead to raise the risk factor relating postural deformities and also the un even load distribution leads to generate extreme difficulties amongst the farmers for creating musculoskeletal disorders (Gangopadhyay 2015). The study based upon the potato cultivation also showed a quite similar kind of response that postural abnormalities lead to musculo-skeletal disorders at every part of the world and the countries like India which are mostly based upon the agriculture are not rare of it. So ergonomical interventions are highly important in developing healthy methodologies for agriculture, especially in the unorganised sectors of India (Sengupta, 2015). In a review it was proposed that ergonomical interventions are rarely found among the agriculture workers. A pre harvesting operations are extremely required before going to any of the farming process even the workers must be informed about the postural remedies with the kind of machineries they are using along with the proper duration. (Vargese, 2022).

### Conclusion

Agriculture is the backbone of the economy especially in eastern part of the world so needs to be conducted with highest priority by ensuring the best productivity. Whereas the productivity relies upon the healthy habits and best practices for harvesting at every stages which will lowers the risk of health hazards, rather hassle free productivity. Implementation of ergonomical interventions are said to be one of the key remedial approach in this generation as the researcher had already evidenced the musculoskeletal hazards to the highest risk generators for the agriculture workers at least in this eastern part of the globe.

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