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Occupational Health Hazards of Farmwomen in Agricultural Operations: A Narrative Review

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ABSTRACT

Agriculture is the primary occupation of majority of the population in rural India. Agriculture in India serves as a critical component of the national economy. In rural area the agricultural operations are carried out by involving the family labour. However, women play a significant role in agriculture and allied sectors. In agricultural operations such as sowing, transplanting, weeding, harvesting, post-harvesting process the participation of women is significant. Despite their tireless contribution, the issues of the women remain unaddressed and they face a range of occupational health hazards. These include physical, chemical, biological, mechanical, psychological and ergonomic health hazards which not only affect their personal and family life but also affect the production process. Identifying and addressing these issues will not only improve the health but also livelihoods of women in agriculture at the same time ensuring sustainable agricultural productivity in India.

Keywords: Agricultural operations, Farmwomen, Occupation, Occupational health hazards

INTRODUCTION

Women in agriculture play a significant role in Indian economy. Rural women act as a primary source of workforce but due to their limited education and skill, they are exposed to various occupational health risks. Agriculture is the informal sector which represents the face of Indian rural women. The informal sector is that sector of the economy which does not have a formal organization or registration or support of any government or private body for its recognition (Munda and Udgata, 2024; Meenakshi and Panneer, 2020). According to report of National Institute of Occupational Health, ICMR (Indian Council of Medical Research), there are various occupational health hazards in agriculture, which are harmful. Women workers in India located in the informal sector of the economy face extremely exploitative conditions of work (Kalyani *et al*., 2008). Women in the informal sector are exposed to occupational related issues such as several sicknesses, postural discomfort, interaction/ exposed to dangerous chemicals, constant work, absence of rest, a shortage of protection mechanisms and strongly unfavourable workplace (Khode *et al*., 2024).

METHODOLOGY

The data on occupational health hazards of farmwomen in performing agricultural activities are collected and compiled by reviewing the recent research studies in print and electronic media. The most related literatures were chosen to be incorporated in the present review to find out the various activities which the women perceived light, moderate and difficult. This indicated the drudgery of postural discomfort in performing the activities. This study will generate a database for further interventional research to improve the occupational health status of the farmwomen.

Occupational health hazards:

The occupational health hazards are harmful conditions or agents in the workplace that can cause

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injury, illness, or adverse health effects. According to WHO, agricultural workers face numerous health risks including physical hazards (such as injuries from machinery and exposure to harsh weather conditions), chemical hazards (directly exposure from pesticides and other chemicals), biological hazards (from infected plants and animals, pathogens) and ergonomic hazards (from heavy lifting, repetitive motions and awkward postures). Besides this, the National Institute for Occupational Safety and Health mentions that "agricultural workers are at very high risk for fatal and nonfatal injuries, work related lung diseases, noise- induced hearing loss, skin diseases and certain types of cancers associated with use of chemical products and prolonged sun exposure". Occupational health hazards are classified into Physical hazards, Chemical hazards, Mechanical hazards, Biological hazards, Ergonomic hazards and Psychological Hazards.

Physical hazards:

Physical hazards at the workplace include noise, vibration, poor illumination, ionizing and non-ionizing radiation and microclimatic conditions. One of the most occupational health consequences in both developing and developed nations is noise-induced hearing loss. Women's health can be negatively impacted and even death by coming into contact with poisonous animals, insects, spiders, scorpions, snakes and some wild creatures. Due to difference in the physiology of women, men, children and other genders all are affected in different ways. Majority of the tribal farmwomen from Betul district of Madhya Pradesh complained about occurrence of swollen and sore hands and feet during irrigation (25.83%); digging, weeding and harvesting (52.20%) operations. Highly prevalent health hazards in agriculture were bite of insects and poisonous animals while performing weeding, irrigation and harvesting (50%) (Badodiya *et al*., 2013). 97.5% reported physical hazards were the most common types of occupational hazards among the agricultural works. 29% of them had dog bites and 24% were affected by bee stings (Bhavana *et al.*, 2024). Devi *et al*. (2022) reveals that majority of the respondents had "often" sun burn during sowing operations. 82.8% had backpain, 78% had laceration, 59.5% of them had insect sting, 12% had snake bite, 6.3% had injuries from falling from trees and 5% had injuries from falling branches (Amodu *et al*., 2017). Moharana *et al*. (2020) reported that in turmeric cultivation, farmwomen experiences strain in eyes (mean score 2.33), insect bite (1.94), trips (1.7) and slips (1.28). Tribal farmwomen in paddy cultivation faced problems like irritation in eyes, nose and throat (74%), headache (68%) (Behera *et al*., 2025). Farmwomen in tobacco cultivation suffered from shoulder pain, body ache while performing watering activity. Suffered from low back pain, pain in joints of arms and body ache while weeding. They suffered from low back pain while manuring due to continuous bending posture. While mulching and demulching, suffered from backpain by bending constantly for hours in bent posture. Back pain and body ache were persistent while transplanting for long hours of working under scorching sun (Kalyani, 2008).

Chemical Hazards:

Agrochemicals are widely used to improve and protect crops and livestock. To obtain good crop yield, fertilizers and pesticides are used for protecting crops from insects and diseases. Farm animals are protected from parasites and disease by veterinary treatment such as vaccination, oral dosing or immersion dipping (chemical hazards in the agricultural sector by ILO). Bhavana *et al*. (2024) investigated that 86.4% of the agricultural workers complaint about chemical hazards while performing some agricultural activities. By using pesticides, 83.9% reported burning of eyes and 80.6% had headache. Pesticide exposure is linked to adverse health effects like dizziness, muscular pain, sneezing, itching, skin burns, blisters, difficulty in breathing, nausea and sore eyes. Chronic exposure to pesticides are also linked to non- communicable diseases such as reproduction impairment, diabetes, hypertension and cancer (Mrema, 2017). Due to pesticide exposure, reproductive problems takes place such as pain in abdomen (2.80- mean score) being the most prevalent followed by low body weight of the mother (2.75), low body weight of the baby (2.10) bleeding (1.80), poor lactation (1.80), and still birth (1.58) (Sachan *et al.,* 2018). Approximately 55% of female farm labourers complaint about exposure to pesticides and fertilizers without precautions or any protective gear which leads to respiratory diseases, skin allergies and adverse reproductive health effects like irregular menstrual cycles and miscarriages (Yadav, 2025). Preparation and application of fertilizers and pesticides without any protective measures and preparation of soil mixtures leads to hazards (Moharan *et al.*, 2025).

Mechanical Hazards:

Women have less physical strength and more diminutive stature. Beside this, women's vital capacity is 11% less. Haemoglobin is approximately 20% less among women and their skin area is more significant than circulating volume more extensive body fat content. They also have lower heat tolerance and greater cold tolerance. Therefore, they are more prone to mechanical hazards. Mechanical risks include unshielded machinery, unsafe structures in the workplace and dangerous tools. 50% of the agricultural workers reported mechanical hazards. Injuries due to machine use by 42.5% (Bhavana *et al.,* 2025). Mechanical hazards due to injuries in hands, palms, fingers and nails as most of the tasks executed in bare hands (Moharana *et al*., 2025)

Biological Hazards:

Women may also be exposed to infections, bacteria, virus, fungi, insects, parasites at fields. Farmwomen are often involved in agricultural activities such as sowing, weeding, harvesting, threshing, cleaning grain, livestock care and post-harvest processing which expose them to biological hazards differently than men. They are at more risk due to longer exposure hours, lack of protective equipment and limited health awareness to health care. 19.7% reported biological hazards (Bhavana *et al*., 2025).

Ergonomic hazards:

Agricultural activities performed by farmwomen frequently characterized by repetitive and constraint postures, which affects lower back, neck and elbows. Suthar and Kaushik (2013) reported that farmwomen remain fully occupied and overburdened with three fold responsibility of farm, home and livestock management. 51.67% were having pain in upper arm, 76.67% were having pain in elbow and 66.67% were having pain in wrist. Bindu *et al.* (2024) reported that during brinjal harvesting 100% of the respondents always had pain in legs. 23% of them had cramps in fingers and 33% had pain in feet. Badodiya *et al*. (2013) reported that in performing agricultural activities like digging, sowing and weeding, 51.7% had bodyache. After performing harvesting and post-harvesting, 52.50% had bodyache. Similarly, after cleaning shed and making dung cake, 59.17% had body ache. Bhavana *et al.* (2025) found that musculoskeletal pain was the most common manifestation of physical hazards and 53.3% complaint for acute pain in the shoulder area, 37.3% complained pain in lower back and 72% reported headache of being exposed to sun.

Most studies showed that during land preparation, female workers had shoulder pain, joint pain and pain in hands. During sowing operation, female workers had joint pain and almost every women engaged in farming activities had back ache, headache and fatigue. Moharana *et al*. (2025) found out discomfort in lower back got maximum mean score of 3.86 (rank 1) followed by the score of discomfort in lower arm was 3.73. discomfort in right hand (3.47), upper back (3.45), wrist and upper arm (3.37), shoulder (3.29) and left hand (3.18). Sombatsawat (2019) resulted that the highest prevalence of MSDs among rice farmers were found to be pain in lower back (86.5%), neck (85.9%), and shoulders (80.7%). Occupational health problems faced by women in agricultural activity. Most of them had backache followed by body pain, pain in elbow, upper leg, pain in joints of arms and spondylitis (Sachan *et al.*, 2018). Farmwomen involved in vegetable transplanting. The activity of transplanting includes/ results to musculoskeletal problems and are very pronounced because the activity is time taking and performed continuously for prolonged hours. The sitting posture results in heavy workload and high rate perceived exertion (Ojha *et al*., 2022). Female agricultural labourers experience a various range of occupational health problems because of long working hours, inadequate protective measure and environmental conditions. About 70% of the female farm labourer had musculoskeletal disorders due to repetitive bending and lifting heavy objects. Chronic pain in the back, shoulders and knees was common among older workers (Yadav, 2025).

Psychological Hazards:

Farmers always experience high level of anxiety, stress and depression due to unpredictable weather conditions, physically demanding tasks, financial pressure. Many agricultural workers live in remote areas which also leads to social isolation. The feelings of loneliness and lack of social support impacts mental health, psychological problems such as too much workload (mean score 2.88), dual role stress (2.51), irritation (2.26), job insecurity (2.00) and lack of enthusiasm (1.92) (Moharana *et al*., 2025). Sachan (2018) state that tension (2.87), fear of crop loss (2.85), dullness (2.57), boredom (2.25), low cost of benefits (2.75). Yadav (2025) found that Low wages, job insecurity, gender based

discrimination contributed to high stress levels among 60% of respondents. Symptoms of depression and anxiety were prevalent among them and they lack access to mental health support. Getting lesser wage than men, dominated or controlled by the senior staffs, lack of training opportunities for emplyoees on proper work practices, lack of basic facilities for women workers in all orchards, no sick leave, no wage for absence at work, gender differences (Moharana *et al*., 2025).

Conclusion:

It is concluded from the review that, women face a wide range of health hazards in agricultural operations starting from sowing to post harvest operations. To address the occupational health hazards of the women in agricultural sector it is very important to assess the participation and identification of the hazards faced by the women. The impact of climate change and geographical parameters are to be considered while formulating a strategy to enhance the occupational health hazards of the women. Keeping in view the dual responsibility of the farmwomen in both the family and occupational front, the interventions are to be planned for better life and livelihood.

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