



PREVALENCE OF LOW BACK PAIN AMONG PEASANT FARMERS IN A RURAL COMMUNITY OF NEAR JALGAON CITY DURING THE GARLIC AND ONION TRANSPLANTING PROCESS – AN OBSERVATIONAL STUDY.

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ABSTRACT

Background: Low back pain (LBP) is a common musculoskeletal disorder and a major cause of disability worldwide, particularly among individuals engaged in physically demanding occupations such as farming. Garlic and onion transplanting involve repetitive bending, prolonged stooping, and manual labour, increasing the risk of LBP among farmers. **Aim:** To determine the prevalence of low back pain among peasant farmers in a rural community near Jalgaon city during the garlic and onion transplanting process. **Methodology:** An observational study was conducted on 85 farmers aged 30–59 years using convenient sampling. Data were collected over a period of 6 months from villages near Jalgaon. The Oswestry Low Back Pain Disability Questionnaire (ODI) was used to assess the severity of disability due to LBP. Descriptive statistical analysis was performed using mean, standard deviation, frequencies, and percentages. **Results:** All participants reported low back pain. Among them, 61.17% had moderate disability and 38.82% had severe disability according to ODI scores. The findings also indicated functional limitations in activities such as lifting, sitting, standing, and walking. Both male and female farmers were significantly affected, highlighting the occupational nature of the condition. **Conclusion:** The study demonstrates a high prevalence of low back pain among farmers involved in garlic and onion transplanting. Repetitive movements, prolonged awkward postures, and lack of ergonomic awareness are major contributing factors. Preventive strategies, ergonomic education, and early physiotherapy interventions are essential to reduce disability and improve quality of life among farmers.

Keywords: Low back pain, farmers, prevalence, musculoskeletal disorders, garlic transplanting, onion transplanting, Oswestry Disability Index.

INTRODUCTION : India is an agricultural country where farming forms the backbone of the national economy. A large part of the population, especially in rural areas, depends on farming as their primary occupation. Agriculture provides not only food but also employment and income for millions of people. Among various agricultural activities, the cultivation of garlic and onion plays a major role because these crops are used daily in households and are also exported to many countries, contributing significantly to India's economy.⁽¹⁾ Farming, particularly garlic and onion farming, is an important occupation in India. Garlic and onion are the most important products for consumption and export. Nowadays, agricultural production of garlic and onion is

easier in developed countries than in the past due to technological progress. However, in developing countries, use of agricultural technology is limited. For this reason, farmers in developing countries, such as in some areas of India, Myanmar, Laos, and Thailand, use traditional methods involving manual work. Garlic and onion farming consists of many manually performed tasks, including transplanting and sowing. Consequently, it is not surprising that there is a high prevalence of work-related musculoskeletal disease among garlic and onion farmers. LBP can arise due to many factors, which can be divided into three main categories. The first category is personal factors including age, body mass index (BMI), exercise, alcohol consumption, and smoking. The second category is psychosocial factors including anxiety, depression, somatization of symptoms, stress, job dissatisfaction, negative body image, and poor self-esteem. The third category is physical occupational factors including repetitive motion, heavy lifting, non-neutral postures, and vibration. ⁽²⁾

Despite its economic importance, agriculture remains one of the most physically demanding and high-risk occupations. The work requires long hours of manual labour in different climatic conditions. Farmers often perform repetitive movements such as bending, squatting, lifting, carrying heavy loads, and maintaining awkward postures. These actions lead to increased physical strain on the body, especially on the muscles and joints of the lower back ⁽³⁾.

The problem of low back pain is common among farmers because of the nature of their work. Low back pain is defined as pain or discomfort in the region between the lower ribs and the gluteal folds, with or without pain radiating to the legs. It may result from injuries, repeated strain, or poor postures maintained over time. This pain can be acute, subacute, or chronic, depending on how long it lasts. In severe cases, it can lead to long-term disability and affect the ability to perform daily and work-related activities ⁽⁴⁾.

Globally, low back pain is recognized as one of the leading causes of disability. It affects people of all ages and professions, but it is particularly common among those engaged in manual work. Studies have shown that almost 80% of adults experience low back pain at least once in their lifetime ⁽⁵⁾. Farmers are among the groups most affected because they perform repetitive physical tasks and often have limited access to medical care or preventive strategies. ⁽⁶⁾ In developed countries, mechanization and modern equipment have reduced the amount of manual labour in agriculture. However, in developing countries like India, farmers still rely heavily on traditional farming techniques, especially during transplanting, sowing, and harvesting. The limited use of technology and machinery increases physical effort, which in turn raises the risk of developing musculoskeletal disorders such as low back pain. ⁽⁷⁾

Garlic and onion farming are considered high-labor crops. The transplanting process involves repetitive bending and stooping for several hours a day. Farmers plant seedlings manually in the soil, often while working in wet or waterlogged fields. These actions put a continuous load on the spine and the muscles supporting the lower back. The posture adopted during this process requires frequent spinal flexion and rotation, which can lead to pain and injury over time ⁽⁸⁾.

The repetitive physical work required in garlic and onion transplanting leads to microtrauma of the muscles, ligaments, and discs in the lower back. These small injuries, when not given time to heal, accumulate and result in chronic pain. The situation becomes worse when farmers do not take rest breaks or use proper lifting techniques. Continuous work under such conditions contributes to the development of musculoskeletal disorders. ⁽⁹⁾

The prevalence of low back pain among farmers is influenced by various factors. These include personal factors such as age, gender, body mass index, and general fitness level. Older farmers are more prone to pain due to reduced flexibility and muscle strength. Overweight individuals experience greater strain on the spine, which increases the risk of developing back pain. A sedentary lifestyle and lack of exercise can further weaken the back muscles, making them more vulnerable to injury ⁽¹⁰⁾.

NEED OF STUDY : Farming particularly garlic and onion cultivation is an important occupation in various states of India, especially in many regions of Maharashtra. Peasant farmers are at a high risk of developing musculoskeletal problems due to physically demanding and repetitive tasks, which often lead to conditions such as low back pain (LBP). Research indicates that the 1-year prevalence of LBP among farmers ranges from 26.9% to 63.9%, influenced by factors such as manual labour, age, years of farming experience, and psychosocial stress. These issues mainly arise from onion and garlic transplantation like heavy lifting, repetitive movements, prolonged bending, and awkward postures, making LBP a major concern within the agricultural community. In rural areas, farmers frequently work long hours without sufficient rest, ergonomic support, or awareness about proper posture. Limited knowledge of safe work practices further increases their risk of developing chronic back problems. Despite the significance of this issue, there is still a lack of comprehensive studies in India examining the prevalence, contributing factors, and allied treatment methods related to low back pain among farmers.

OBJECTIVE : To understand the Prevalence of low back pain among peasant farmers in a rural community of near Jalgaon city during the garlic and onion transplanting process.

METHODOLOGY : This observational study was conducted among peasant farmers involved in garlic and onion transplanting in villages near Jalgaon. A convenient sampling method was used, and a total of 85 participants were included based on the calculated sample size using the formula $n = Z^2pq/d^2$ at a 95% confidence level. The study duration was six months. Farmers aged 30–59 years with mechanical low back pain were included, while those with neurological, surgical, or other musculoskeletal conditions were excluded. Ethical clearance and informed consent were obtained prior to data collection. Demographic details were recorded, and low back pain-related disability was assessed using the Oswestry Low Back Pain Disability Questionnaire. Data were analyzed using descriptive statistics and presented as mean, percentage, and frequency. The inclusion criteria included both male and female farmers aged between 30–59 years who were experiencing mechanical low back pain. Farmers were excluded if they had any other musculoskeletal disorders, neurological conditions, previous surgical history, or significant past medical history.

Materials used in the study included pen, paper, patient evaluation sheet, consent form, and the Oswestry Low Back Pain Disability Questionnaire. Data were collected after obtaining informed consent and were analyzed using appropriate statistical methods.

OUTCOME MEASURES

Oswestry Low Back Pain Disability Questionnaire:

The Oswestry Disability Index (ODI) is a questionnaire that measures the level of disability and functional impairment caused by low back pain. It's a self-administered tool that's commonly used by clinicians and researchers to evaluate a patient's quality of life and permanent functional disability. The ODI is a 10-section questionnaire that assesses pain, daily activities, and personal care. Each section is scored on a scale of 0–5, with 5 representing the greatest disability. The total score is then calculated as a percentage, with higher scores indicating worse outcomes.

□ The ODI score indicates the severity of pain and disability, with the following ranges:

- 0–20%: Minimal disability
- 21–40%: Moderate disability
- 41–60%: Severe disability
- 61–80%: Crippled
- 81–100%: Bed-bound or exaggerating symptoms

PROCEDURE: Ethical clearance was taken from the ethical committee of Dr Ulhas Patil college of Physiotherapy, Jalgaon prior to the commencement of study. An observational study was undertaken among the Peasant farmers involved in garlic and onion transplanting. Participants were selected on the basis of inclusion and exclusion criteria as defined earlier in the study protocol. A brief demographic data of all participants was obtained and a written consent were taken from all the participants.

Firstly, farmers were provided with a brief introduction to the topic and objectives, focusing on the relationship between their transporting activities and the prevalence of low back pain. Then they were asked about their regular work-related physical strain, posture and any musculoskeletal issues. Then he /she was provided with the questionnaire and asked to fill the desired information according to their professional work. Data will be collected, managed and statically analyzed.

STATISTICAL ANALYSIS: The entire data of the study was entered and cleaned in MS Excel before it was statistically analyzed. All the results are shown in tabular as well as graphical format to visualize the statistically significant difference more clearly. The data on quantitative characteristics was presented as Mean Standard Deviation (SD) across study group and categorical data was presented using numbers and percentages. The selection of each statistical test was based on the level of measurement of the variables and the distribution characteristics of the dataset.

OBSERVATION AND TABLES

Table 1) Distribution by Gender

Sr. No.	Variable	Groups	Frequency	Percentage
1	Gender	Male	32	37.65
		Female	53	62.35

This table shows the gender-wise distribution of all 85 participants, comprising 53 males (62.35 %) and 32 females (37.65 %).

Graph 1: Distribution by Gender

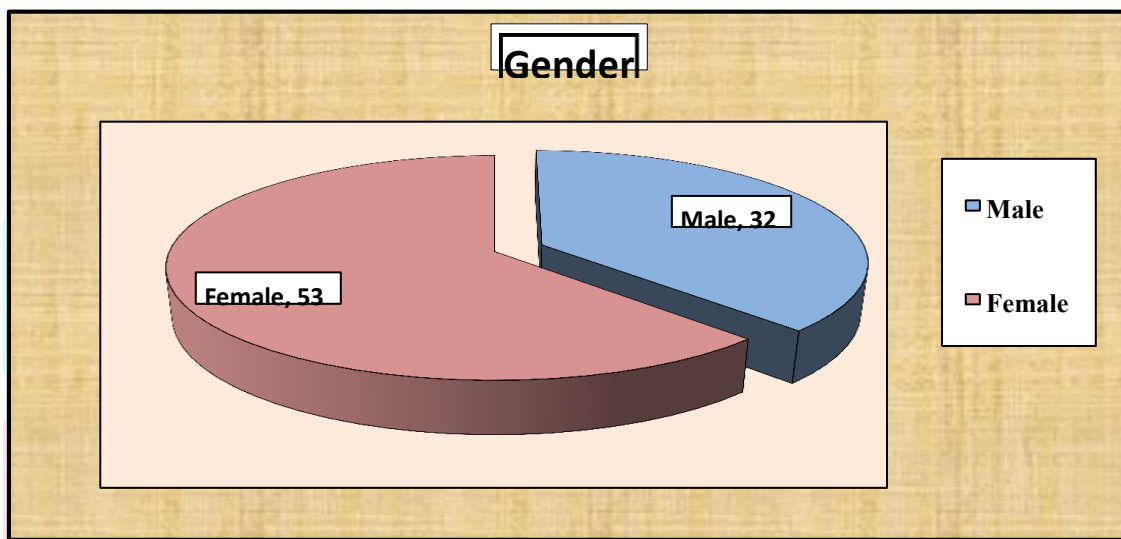


Table 2) Distribution by Dominance

Sr. No.	Variable	Groups	Frequency	Percentage
2	Dominance	Right	71	83.53
		Left	14	16.47

This table presents the distribution of hand dominance among the 85 farmers, where 71 (83.5 %) were right-hand dominant and 14 (16.5 %) were left-hand dominant.

Graph 2: Distribution by Dominance

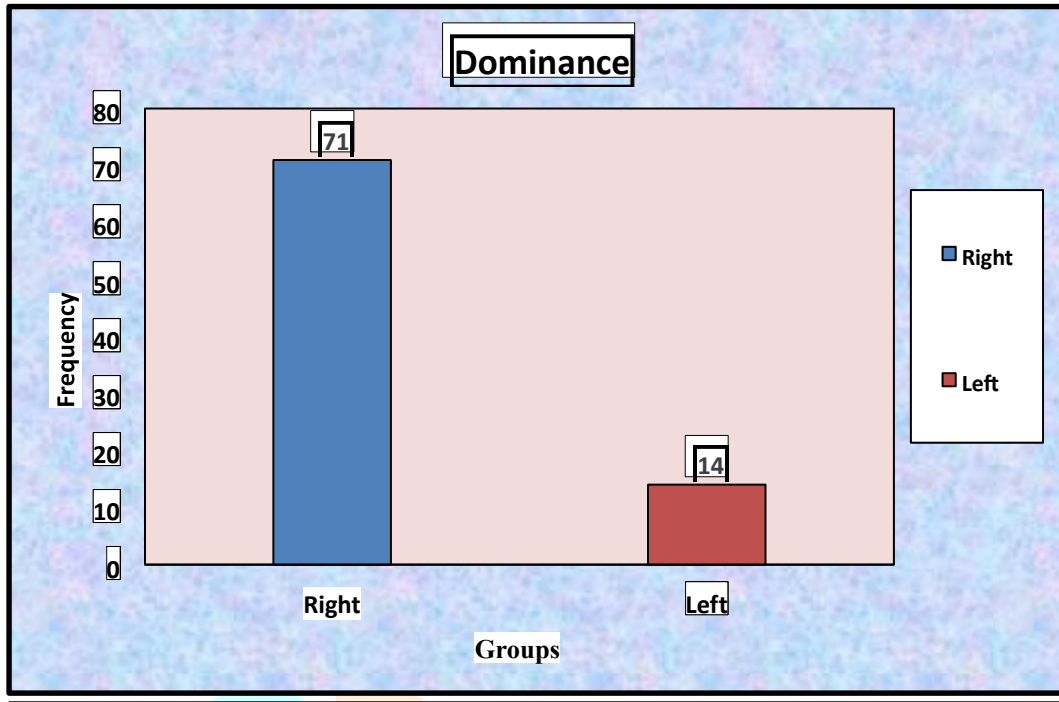


Table 3) Section wise Averages

This table displays the mean ODI scores across ten functional sections (S1–S10) for all 85 participants, illustrating which daily-activity areas were most affected by low back pain during onion and garlic transplanting.

Sr. No.	Variable	Section	Average Score
3	Section-wise Averages	S1	3.21
		S2	2.91
		S3	2.69
		S4	2.92
		S5	3.16
		S6	2.94
		S7	3.18
		S8	3.14
		S9	2.94
		S10	2.82

Graph 3: Section-wise Averages

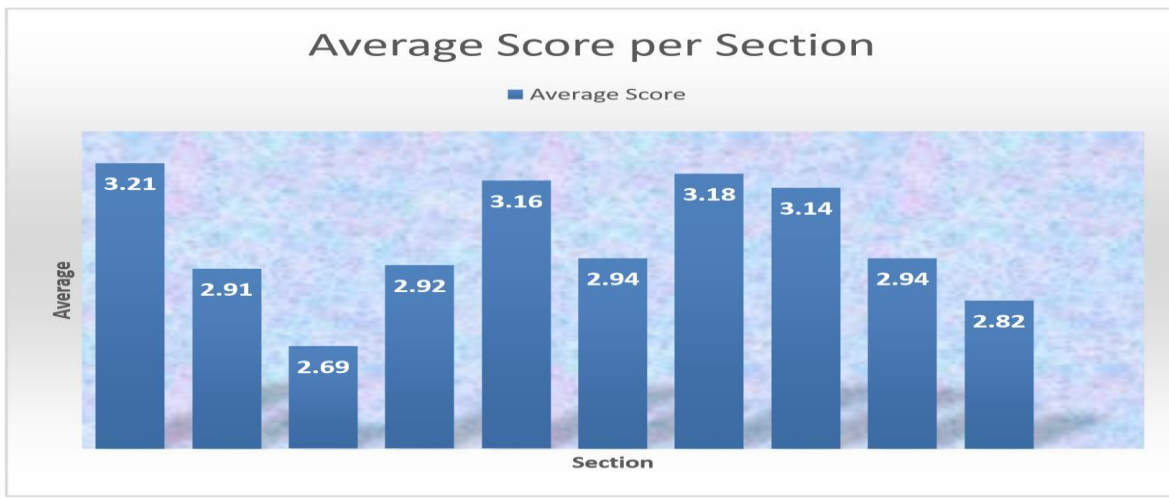
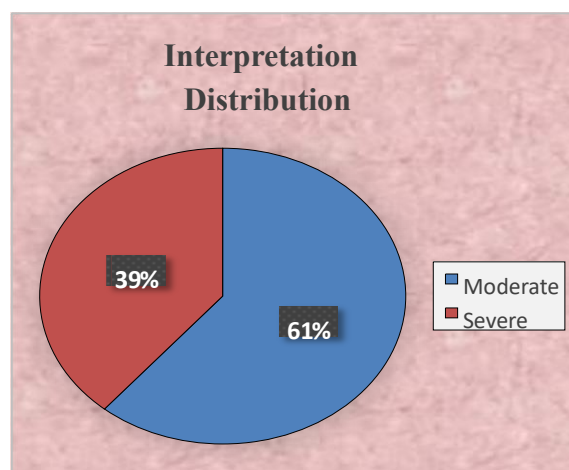


Table 4) Interpretation distribution

Sr. No.	Variable (Interpretation)	Frequency	Percentage (%)
4	Moderate	52	61.17%
	Severe	33	38.82%

This table summarizes the overall ODI classification for 85 farmers, revealing that 52 (61.17 %) experienced moderate disability and 33 (38.82 %) had severe disability due to low back pain.

Graph 4: Interpretation distribution



RESULTS : The study was conducted on 85 Indian farmers (53 males and 32 females) engaged in the garlic and onion transplanting process in the Jalgaon district. Among them, 71 participants (83.5%) were right-hand dominant, while 14 (16.5%) were left-hand dominant. According to the Oswestry Low Back Pain Disability Index (ODI) analysis, all participants reported some degree of low back discomfort. Out of 85 farmers, 52 (61.17%) had moderate disability, and 33 (38.82%) had severe disability related to low back pain. The section-wise average ODI scores ranged from 2.69 to 3.21, indicating that most farmers experienced difficulty in activities such as lifting, walking, sitting, and standing due to pain. The mean ODI percentage score showed that a majority of participants were functionally limited in their daily work activities. Overall, the study results confirm a high prevalence of low back pain among Indian farmers during the garlic and onion transplanting process, with most cases showing moderate to severe functional disability.

DISCUSSION : This study aimed to find out how common and serious low back pain is among Indian farmers working specifically in garlic and onion transplanting. This kind of farming needs a lot of heavy physical work like bending, lifting, and staying in uncomfortable positions for a long time. The purpose was to understand how much low back pain these farmers have, how it affects their daily life and work, and what work-related and mental factors cause or worsen their pain. Millions of farmers in India depend on onion and garlic farming for their income, and these crops are important food ingredients and products exported around the world. So, the health problems caused by farming affect not only people's lives but also the economy.

The research included 85 farmers between 30 and 59 years old from a particular farming area. Data was collected during the transplanting season using tool like the Oswestry Disability Index, which measures how much pain limits daily activities. The results showed that more than 60% of these farmers had moderate disability due to low back pain, and nearly 39% had severe disability. This means many had trouble sitting, standing, lifting, or taking part in social activities, which lowers their quality of life and ability to work. The data also showed that the pain level was similar for men and women, young and older farmers, and whether they were left- or righthanded, showing that the hard physical work and postures farmers use are the main causes of the pain, not their personal differences.

In Previous study done by Petcharat Keawduangdee, Rungthip Puntumetakul, Manida Swangnetr involves research of high prevalence of LBP among farmers is most likely the result of injury to the spinal structures, which may arise from working postures and movements of the lower back during the work process. In study analyzed farming postures and showed that the farmers were working with forward lumbar bending and twisting and were carrying weights of 10 kg or less and that these postures seemed to generate their LBP.

The postures in the onion and garlic transplanting process are awkward, constrained, asymmetric, repeated, and prolonged. These postures can generate load on the lumbar region, which can overload tissues and exceed their thresholds of tolerable stress, causing injury due to overexertion or imbalance. For example, the maintenance of static postures for prolonged periods of time compresses the veins and capillaries inside the muscles, causing micro lesions due to the absence of tissue oxygenation and nutrition. Farmers in rural areas often continue working despite pain due to economic necessity, limited healthcare access, and lack of awareness regarding preventive measures. This results in unmanaged symptoms and progression of musculoskeletal issues, further increasing disability risk. (2)

CONCLUSION : The present study concludes that low back pain (LBP) is a highly prevalent and serious occupational health problem among Indian farmers involved in onion and garlic transplanting activities. The results clearly demonstrate that the repetitive, physically demanding, and ergonomically poor working postures required during this agricultural task lead to significant musculoskeletal strain and disability. Among the 85 farmers examined, every participant reported some degree of low back discomfort, with 61.17% experiencing moderate disability and 38.82% suffering from severe disability as measured by the Oswestry Low Back Pain Disability Index. The study population was predominantly male (62.35%), and most farmers were right-hand dominant (83.5%). Despite gender differences in workload distribution, both male and female farmers experienced high rates of pain and disability, indicating that the risk is universal across the farming population.

FUTURE SCOPE OF STUDY : Further information can be researched on Preventive strategies for low back pain and types of exercises that can help to farmers .

Proper instruction and knowledge should be given to them about the proper ergonomics and awareness about work related musculoskeletal disorders.

LIMITATIONS

1. Limited Sample Size: The study was conducted on only 85 farmers, which may not represent the entire farming population involved in onion and garlic cultivation across India.
2. Restricted Study Area: The data were collected from a single geographic region; hence, the results may vary in farmers from other states with different climatic and working conditions.
3. Self-Reported Responses: Pain and disability scores were based on the Oswestry Disability Index (ODI) questionnaire, which depends on the accuracy and honesty of participants' responses.

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