

Association Between Years of Work Experience and Severity of Upper Extremity Functional Disability Among Banana Farmers

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Abstract: Banana farming is a physically demanding occupation involving repetitive upper limb movements, forceful gripping, lifting and prolonged or awkward postures. The present observational correlation study aimed to assess the association between years of work experience and the severity of upper extremity functional disability among banana farmers. Seventy five banana farmers from and around Jalgaon were selected by convenient sampling. Participants were assessed using the Disabilities of the Arm, Shoulder, and Hand questionnaire. Descriptive statistics were used for demographic and DASH scores, and Spearman rank correlation was used to assess the association between work experience and DASH score. The mean work experience was 6.87 plus or minus 2.62 years and the mean DASH score was 45.09 plus or minus 8.95. Moderate disability was reported in 52.00 percent of participants, severe disability in 41.33 percent and mild disability in 6.67 percent. A strong positive correlation was observed between years of work experience and DASH score, with Spearman rho of 0.89 and p less than 0.001. The findings indicate an association between greater work experience and higher upper extremity functional disability among the studied banana farmers.

Keywords: Banana Farmers; Work Experience; Upper Extremity; Functional Disability; DASH; Physiotherapy.

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I. INTRODUCTION

India is predominantly an agricultural country, and farming is a physically demanding occupation. Agricultural workers are exposed to lifting and carrying heavy loads, frequent bending, repetitive movements, prolonged static postures, mechanical tasks and other physical demands. These activities can place considerable stress on the upper extremities, which are frequently involved in gripping, lifting, reaching, carrying and handling agricultural tools and materials.

Banana farming involves labour intensive activities including planting, de-suckering, pruning, tying, pesticide application, cutting, harvesting and carrying banana bunches. Many of these activities require repetitive upper limb movements, forceful gripping, lifting and prolonged elevation of the arms and shoulders. Such occupational demands may contribute to pain and physical limitations in the upper extremities and may affect functional ability.

Functional disability refers to difficulty or limitation in performing physical, occupational and daily activities as a result of pain, weakness, reduced mobility or impaired musculoskeletal function. In farmers, repetitive and physically demanding agricultural activities may interfere with lifting, carrying, reaching overhead, gripping tools and repetitive hand movements.

The development of functional limitations may be influenced by repetitive tasks, manual lifting, awkward or prolonged postures, labour intensive activities, duration of occupational exposure, age and gender. Despite the considerable physical demands associated with banana farming, evidence specifically addressing upper extremity functional disability among banana farmers is limited. Therefore, the present study assessed the association between work experience in years and upper extremity functional disability using the DASH questionnaire.

➤ Need of the Study

Banana farming is a physically demanding occupation involving repetitive upper limb movements. Although musculoskeletal problems have been reported among agricultural workers, there is limited evidence specifically addressing upper extremity functional disability among banana farmers and its relationship with occupational work experience. Assessing work experience provides an indication of the duration of occupational exposure to repetitive and physically demanding activities. Examining work experience together with DASH scores may provide information useful for early identification, ergonomic education, preventive physiotherapy and occupational interventions among banana farmers.

➤ Aim and Objectives

• Aim:

To assess the association between work experience in years and severity of upper extremity functional disability among banana farmers.

• Objectives:

- ✓ To assess the severity of upper extremity functional disability among banana farmers using the DASH questionnaire.
- ✓ To determine the association between years of work experience and the severity of upper extremity functional disability among banana farmers.

II. METHODOLOGY

- Study design: Observational correlation study.
- Study setting: Jalgaon, Maharashtra, India.
- Study population: Banana farmers.
- Study duration: Six months.
- Sampling method: Convenient sampling.
- Sample size: 75 participants.
- Inclusion criteria: Male and female banana farmers aged 20 to 40 years with a minimum of one year of continuous farming experience.
- Exclusion criteria: History of upper limb trauma or fracture within the previous six months; neurological or musculoskeletal disorders such as myasthenia gravis or motor neuron disease; and congenital musculoskeletal disorders such as congenital limb or hand deformity.
- Materials: Pen, paper, assessment sheet, consent form and DASH questionnaire.

- Ethical considerations: Ethical clearance was obtained from the research and ethics committee of Dr. Ulhas Patil College of Physiotherapy. The study purpose was explained to participants and written informed consent was obtained.

➤ Outcome Measure

Disabilities of the Arm, Shoulder, and Hand questionnaire: The DASH questionnaire was used to assess upper extremity functional disability. It uses a five point response scale and provides a score from 0 to 100. The report describes excellent internal consistency with Cronbach alpha values of 0.90 to 0.97 and high test retest reliability with intraclass correlation coefficient values of 0.85 to 0.96.

➤ Procedure

- Banana farmers from and around Jalgaon were selected using convenient sampling.
- Participants were screened according to the inclusion and exclusion criteria.
- The purpose and procedure of the study were explained and written informed consent was obtained.
- Demographic details were recorded.
- The DASH questionnaire was administered to assess upper extremity disability.
- DASH scores were recorded and classified according to severity.
- The collected data were statistically analysed.

➤ Statistical Analysis

Data were entered and analysed using GraphPad software. Descriptive statistics were used to summarize age, gender and DASH scores. Results were presented using frequency, percentage, mean and standard deviation. Spearman rank correlation was used to assess the association between years of work experience and DASH score. Statistical significance was considered at p less than 0.05.

III. RESULTS

A total of 75 banana farmers participated in the study. The mean age was 35.36 plus or minus 4.69 years, with an age range of 22 to 40 years. Most participants were 31 to 40 years old (61, 81.33 percent), while 14 (18.67 percent) were 20 to 30 years old. There were 58 male participants (77.33 percent) and 17 female participants (22.67 percent).

Table 1 Age Distribution

Age group	Frequency (n)	Percentage
20–30 years	14	18.67%
31–40 years	61	81.33%
Total	75	100%

Table 2 Gender Distribution

Gender	Frequency (n)	Percentage
Male	58	77.33%
Female	17	22.67%
Total	75	100%

Table 3 DASH Severity Distribution

Severity	Frequency (n)	Percentage
Mild	5	6.67%
Moderate	39	52.00%
Severe	31	41.33%
Total	75	100%

Table 4 Descriptive and Correlation Results

Measure	Value
Sample size	75
Work experience mean $\pm$ SD (years)	6.87 $\pm$ 2.62
Work experience range (years)	3–10
DASH score mean $\pm$ SD	45.09 $\pm$ 8.95
DASH score range	19–59
Spearman correlation (rho)	0.89
p-value	<0.001

The mean DASH score was 45.09 plus or minus 8.95. Moderate severity was most frequently observed (52.00 percent), followed by severe severity (41.33 percent), while 6.67 percent were classified as mild. Overall, 93.33 percent of participants were classified as having moderate to severe functional limitation.

Spearman rank correlation demonstrated a strong positive association between years of work experience and DASH score ($\rho = 0.89$, $p < 0.001$). Thus, participants with greater years of work experience tended to have higher DASH scores, representing greater upper extremity functional disability.

IV. DISCUSSION

The present cross-sectional study assessed upper extremity functional disability among 75 banana farmers using the DASH questionnaire. The mean DASH score was 45.09 plus or minus 8.95. Moderate disability was observed in 52.00 percent and severe disability in 41.33 percent, while 6.67 percent were classified as mild. Thus, 93.33 percent demonstrated moderate to severe functional limitation in the studied sample.

The findings may be related to the repetitive and physically demanding nature of banana farming. Activities such as pruning, tying, pesticide application, harvesting and carrying banana bunches require repetitive arm and hand movements, forceful gripping, lifting and sustained or awkward upper limb postures. Repeated exposure to these demands may contribute to fatigue, pain and difficulty in occupational and daily activities. However, occupational exposures were not statistically analysed in the present study, so these factors should be considered possible contributors rather than established causes.

The present findings are consistent with the literature cited in the project report regarding musculoskeletal problems among agricultural and fruit tree workers. Kim et al. reported upper extremity musculoskeletal conditions and disability among fruit tree farmers using clinical assessment and DASH. Studies among banana and other agricultural workers have also reported substantial musculoskeletal symptoms associated with physically demanding and repetitive occupational activities.

The strong positive correlation between work experience and DASH score indicates that greater work experience was associated with higher reported upper extremity disability in this sample. The cumulative effect of prolonged repetitive upper limb activity may be one possible explanation. Nevertheless, because the present study was observational and cross-sectional, the correlation should not be interpreted as proof that work experience causes disability.

V. CONCLUSION

The present study demonstrated a considerable burden of upper extremity functional disability among the studied banana farmers. A strong positive association was observed between years of work experience and DASH score. The findings highlight the importance of early identification, ergonomic education and preventive physiotherapy interventions among banana farmers.

VI. LIMITATIONS

- The study was conducted among banana farmers in and around Jalgaon, limiting applicability to other geographical regions.
- Assessment was primarily based on the DASH questionnaire, which evaluates disability and functional

impact rather than establishing a specific clinical diagnosis of an individual musculoskeletal disorder.

FUTURE SCOPE

- Conduct studies with larger and more representative samples from different agricultural regions.
- Combine DASH with clinical examination and specific upper extremity assessment tools.
- Conduct longitudinal and intervention studies to evaluate the effectiveness of ergonomic education and physiotherapy interventions.

CLINICAL IMPLICATION

The observed association between increasing years of experience and greater severity of upper extremity functional disability indicates that cumulative occupational exposure may be considered during physiotherapy assessment and preventive rehabilitation planning among banana farmers. Physiotherapists can provide ergonomic education, correct working and lifting techniques, posture modification, appropriate rest periods and exercise based conditioning to help farmers maintain upper extremity function. Farmers with significant functional limitations can be identified for further clinical assessment and appropriate management.

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