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Bending Posture, Repetitive Hoeing, Working Duration, and Low Back Pain Among Farmers in Cisampih

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ABSTRACT

This cross-sectional investigation assessed bending posture, hoeing frequency, and daily working hours in relation to reported low back pain among farmers in Cisampih Village, Sumedang, West Java. Total sampling yielded 55 respondents; exclusion of three farmers with specified comorbidities left 52 for analysis. A closed questionnaire and observations provided demographic, symptom, and occupational data. Descriptive statistics summarised the sample, and the supplied analysis used chi-square tests with $p < 0.05$ as the significance threshold. Low back pain affected 44 participants (84.6%). Reported associations involved bending angle ($p = 0.002$), hoeing frequency ($p < 0.001$), and daily work duration ($p = 0.038$). All 14 farmers working more than nine hours per day reported pain. Conflicting hoeing-frequency labels prevent interpretation of the direction of that association. Differences between general and task-specific pain responses also require checking. The posture and duration findings support further assessment of occupational demands in this community. Ergonomic education, tools matched to worker dimensions, task variation, and opportunities for rest deserve consideration, although this study did not evaluate their effectiveness. Its cross-sectional design precludes causal conclusions. The authors need to confirm coding and statistical results against the original dataset before submission

INTRODUCTION

Farmers often work with the trunk bent, repeat manual tasks, and sustain physical effort over extended periods. These exposures make low back pain a relevant concern in agricultural workplaces. Two reviews document its clinical and economic burden across countries with different income levels (Fatoye, Gebrye, Ryan, et al., 2023; Fatoye, Gebrye, Mbada, & Useh, 2023). Examining farming conditions within a particular community can help describe how occupational demands and reported symptoms occur together.

The demands of planting, hoeing, lifting, and carrying vary across tasks, although each can repeatedly load the lower back. Lee et al. (2021) investigated occupational factors associated with low back pain among farmers in Jeju. Research in Indonesia has examined working posture, time spent farming, and work activities in relation to similar complaints (Sutami et al., 2021; Nurcahyani et al., 2024). These studies inform the selection of exposures examined in Cisampih Village.

This investigation focused on bending angle, hoeing frequency, and daily working hours among farmers in Cisampih Village, Sumedang, West Java. It sought to describe the participants and their occupational exposures, then examine the association of each exposure with reported low back pain. Its contribution lies in documenting these relationships within the same local farming population.

LITERATURE REVIEW

Low Back Pain and Occupational Exposure

The outcome in this study concerns pain reported in the lower back. It does not represent a spinal disorder confirmed through clinical examination. Occupational assessment considers the position of the body during work together with the duration of exposure. Age, other individual characteristics, and farming experience may also shape the relationship between workload and symptoms (Lee et al., 2021; Nurcahyani et al., 2024).

Bending Posture

Trunk flexion alters the effort required to maintain a working position. Sustained or repeated bending can place additional demands on muscles and supporting tissues. Samara et al. (2005) examined bending and twisting during work in relation to low back pain. To assess posture in the present population, the analysis compared the two bending-angle categories recorded in the study report.

H1: Reported low back pain is associated with the bending angle adopted during farm work.

Repetitive Hoeing

Hoeing requires workers to repeat tool-handling and trunk movements. Repetition may contribute to fatigue, particularly when workers have limited time to recover between tasks. This study classified exposure by the recorded number of hoeing movements. Interpreting that count also requires attention to posture, tool characteristics, and opportunities for recovery (Lee et al., 2021).

H2: Reported low back pain is associated with the frequency of hoeing movements.

Daily Working Duration

Hours worked per day provide a measure of how long farmers remain exposed to the demands of their tasks. Extended work may prolong time in demanding positions and leave fewer opportunities for recovery. Sutami et al. (2021) investigated work duration and posture among farmers reporting low back pain. The current analysis compared four duration groups; it did not model hours worked as a continuous variable.

H3: Reported low back pain is associated with the daily duration of farm work.

Conceptual Framework

Table 1. Conceptual Framework

Independent variables	Relationship assessed	Dependent variable
Bending angle during farming	Association	Reported low back pain
Repetitive hoeing frequency	Association	Reported low back pain
Daily working duration	Association	Reported low back pain

The framework examines each occupational exposure separately in relation to reported pain. These bivariate comparisons provide neither evidence of a causal pathway nor estimates adjusted for other variables.

METHODOLOGY

Design and Setting

An analytical observational study with a cross-sectional design examined farmers in Cisampih Village, Sumedang Regency, West Java. The underlying methods record gives the collection period as 2–8 September 2024, while its title refers to July 2024. The authors need to verify this discrepancy before submission. Although the underlying report uses the term prospective, the described procedures contain no longitudinal follow-up; the design is therefore described here as cross-sectional.

Participants and Sampling

The sampling approach sought to include village residents who worked as farmers, had at least one year of farming experience, and agreed to participate. The exclusion criteria specified physical disability, mental disorders, and comorbid conditions such as osteoporosis, kyphosis, lordosis, and rheumatic disease. Three of the 55 respondents met the comorbidity exclusion criteria. The final analysis consequently included 52 farmers. A response rate cannot be established from the supplied report because it does not state the number of farmers in the sampling frame.

Measures and Data Collection

Researchers obtained primary information through a closed questionnaire covering demographic characteristics, work exposures, and pain. The operational definitions additionally describe observation of bending and repetitive movements. Bending exposure comprised angles of 30–60 degrees and angles above 60 degrees. Hoeing exposure comprised counts below and above 100 movements within the stated 10-minute observation period. The available documentation does not identify the angle-measurement equipment, describe observer training, or explain how a count of exactly 100 movements was classified.

Participants reported daily work duration within four groups: 1–3, >3–6, >6–9, and >9 hours. A yes/no item recorded low back pain. Other questions addressed pain during farming, pain on bending, sudden brief pain, fatigue after work, and symptom improvement with rest. Each item captures a distinct response and should retain its own interpretation. The supplied materials provide no instrument-validity or reliability results.

Data Processing and Analysis

Data preparation involved editing, coding, entry, and cleaning in SPSS. Frequencies and percentages described the sample. The underlying report applied chi-square tests to examine each of the three exposure–pain relationships, using $p < 0.05$ to indicate statistical significance. The counts and p values presented here remain those reported in the supplied analysis; no adjusted estimates or new calculations have been introduced. Several cells contain few observations, so the authors should check test assumptions and confirm whether exact testing is required.

Ethical Reporting

Agreement to participate formed part of the eligibility criteria. However, the supplied documentation identifies neither an ethics committee nor an approval number and does not describe a formal informed-consent process. The authors should supply these details. Missing information in the report alone cannot establish whether ethical approval or consent occurred.

RESULTS

Participant Characteristics and Occupational Exposures

Among the 52 farmers analysed, participants aged 45–54 years formed the largest age group. Men outnumbered women, and most respondents had more than six years of farming experience. Every participant reported repetitive hoeing and standing for longer than two hours.

Table 2. Participant Characteristics and Occupational Exposures

Characteristic	n	%
Age 25–34 years	3	5.8
Age 35–44 years	14	26.9
Age 45–54 years	18	34.6
Age 55–64 years	17	32.7
Men	32	61.5
Women	20	38.5
Farming experience 3–6 years	9	17.3
Farming experience >6 years	43	82.7
Daily work 1–3 hours	7	13.5
Daily work >3–6 hours	12	23.1
Daily work >6–9 hours	19	36.5
Daily work >9 hours	14	26.9
Standing >2 hours	52	100.0
Heavy lifting reported	28	53.8
Bending reported	39	75.0
Repetitive hoeing reported	52	100.0
Hoeing >100 movements reported	36	69.2

All percentages use 52 participants as the denominator. The exposure labels follow the supplied descriptive tables.

Reported Pain Characteristics

Table 3. Positive Responses to Pain and Fatigue Items

Questionnaire item	n	%
Low back pain	44	84.6
Low back pain while farming	49	94.2
Sudden pain of short duration	23	44.2
Low back pain when bending	47	90.4
Aching and fatigue after farming	31	59.6
Pain improves with rest	36	69.2

Percentages use a denominator of 52. Positive responses to questions about pain during specific tasks exceed those for the general low back pain item. The authors should verify outcome coding and any questionnaire skip rules.

Bivariate Associations

Table 3. Bending Angle and Low Back Pain

Bending angle	Pain yes, n	Pain no, n	Reported p
>60 degrees	37	2	0.002
30–60 degrees	7	6	
Total	44	8	

The reported p value remains unchanged. The bending-angle comparison represents a different measure from the questionnaire item asking whether participants bend during work.

The reported test indicated an association between bending-angle category and low back pain. More participants reported pain in the group bending beyond 60 degrees. Because the analysis does not adjust for other characteristics, it cannot distinguish the contribution of posture from concurrent occupational or individual factors.

Table 4. Hoeing Frequency and Low Back Pain as Labeled in the Source

Hoeing frequency	Pain yes, n	Pain no, n	Reported p
<100 movements	35	1	<0.001
>100 movements	9	7	
Total	44	8	

Exposure labels differ between the supplied tables: the descriptive results place 36 farmers above 100 movements, but this bivariate comparison places 36 below 100 movements. The underlying discussion assigns the 35 pain cases to the higher-frequency group. The original labels remain visible pending verification against the dataset.

The reported statistical result links hoeing-frequency category with low back pain, but the conflicting labels leave the direction of that association unresolved. A conclusion identifying either frequency group as having more pain requires reconciliation of the descriptive table, bivariate table, and original coding.

Table 5. Daily Working Duration and Low Back Pain

Duration	Pain yes, n	Pain no, n	Reported p
1–3 hours	4	3	0.038
>3–6 hours	9	3	
>6–9 hours	17	2	
>9 hours	14	0	
Total	44	8	

The p value follows the supplied analysis. Low cell counts make verification of the statistical test necessary.

Daily work duration showed an association with pain in the reported analysis. All 14 participants who worked more than nine hours per day answered yes to the low back pain item. This pattern merits further study, although the small sample and lack of adjustment restrict what it can establish.

DISCUSSION

Low back pain was common among the farmers who participated, with 44 of 52 respondents reporting symptoms. The questionnaire identifies perceived pain; it cannot identify a spinal diagnosis or explain its underlying pathology. Responses also differed across the general and task-specific questions. Before publication, the researchers need to confirm how those items relate to one another and define which item serves as the primary outcome.

The bending-angle comparison directs attention to posture during agricultural tasks. Working close to the ground or handling tools can require farmers to maintain trunk flexion. Research by Samara et al. (2005) addresses bending and twisting during work, while Sutami et al. (2021) examines work posture among farmers. These studies provide context for assessing posture in Cisampih. However, the present unadjusted comparison cannot show that bending caused the reported complaints or contributed independently of other exposures.

Hoeing frequency requires a more cautious interpretation. Repeated movements may coincide with demanding posture and limited recovery, making this exposure relevant to occupational assessment. Lee et al. (2021) investigated associated factors in a farming population. In the present report, however, the contradictory frequency labels prevent identification of the group with more symptoms. Statistical significance does not resolve that inconsistency. Interpretation must await a check of the underlying records.

The finding for daily working hours supports examining exposure duration together with the tasks performed. Indonesian studies by Sutami et al. (2021) and Nurcahyani et al. (2024) address working time and other occupational factors. Farmers who work longer may also undertake different tasks or experience heavier workloads. Since the current analysis does not account for those differences, it cannot separate a duration effect from the effects of other conditions.

For local occupational health planning, the results support closer assessment of farm tasks and discussion of practical ergonomic options. These could include matching tools to worker dimensions, limiting sustained flexion where feasible, alternating tasks, and allowing rest opportunities. The study did not test these measures, so their effectiveness cannot be inferred from its findings. Subsequent evaluation should examine symptom change, work function, and participation after implementation.

CONCLUSIONS AND RECOMMENDATIONS

Of the 52 eligible farmers included in the analysis, 44 reported low back pain. The supplied results show statistically significant bivariate associations with bending angle, hoeing frequency, and daily working duration. The posture and duration patterns justify further occupational assessment. For hoeing, contradictory category labels prevent a reliable conclusion about the direction of the relationship. The cross-sectional comparisons do not establish causation. Local health services and agricultural stakeholders can consider ergonomic assessment and education tailored to farm tasks, including tool dimensions, task variation, and planned breaks. Before submitting the manuscript, the authors should verify the exposure labels, clarify the pain outcome, resolve the study dates, and check the statistical procedures against the original records.

FURTHER STUDY

This research still has limitations, so further studies on the topic of Bending Posture, Repetitive Hoeing, Working Duration, and Low Back Pain Among Farmers in Cisampih are needed to improve this study and add insight for both readers and writers.

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