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Work related musculoskeletal pain/discomfort perceived by potato growers while performing potato cultivation activities

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Abstract

Work-related musculoskeletal disorders (MSDs) which are produced by postural discomforts are impairments of the bodily structures, such as muscles, joints, tendons, ligaments, nerves or the localized blood circulation system, which are caused or aggravated primarily by the performance of work and by the effects of the immediate environment in which work is carried out. Most WMSDs are cumulative disorders, resulting from repeated exposure to high- or low-intensity loads over a long period of time. Present study entitled "Work Related Musculoskeletal Pain/Discomfort Perceived by Potato Growers while Performing Potato Cultivation Activities". Multistage purposive random sampling technique was followed to select the state, district, blocks and finally respondents. District Kannauj is purposively selected as this is one of the largest potato producer districts while two blocks namely Kannauj and Jalabad were randomly selected. Two villages from each selected block i.e. Basirapur and Mahmoadpur path from Kannauj and, Badlepurwa and Kheda from Jalalabad, selected randomly. Forty farmers from each selected village, Total sample size 160 respondents were randomly selected for final data collection,

Keywords: Work-related MSD, Nordic musculoskeletal questionnaire, potato cultivation activities

Introduction

Agricultural work requires manual labour and, perhaps more than any other occupational group, agricultural workers are exposed to tremendous postural stresses that are potentially harmful to their health and well-being (Sabharwal and Kaushik, 2011) ^[10]. They face many job-related health problems during work. Occupational problems of female cultivators and stated that the female agricultural workers have job related problems other than musculoskeletal disorders. Among them fatigue, digestive disorders and headaches were prevalent. They also reported indigestion and pain in the abdomen. Different types of eye related problems such as pain and burning sensation in the eyes, watering and blurred vision were evident among the women workers engaged in agricultural tasks. In addition to cereal production (rice, wheat, etc.), agricultural labourers also performed different vegetable cultivation. Potato cultivation is one of the more important vegetable cultivations in India. There are different tasks in potato cultivation, which are performed in different phases. The potato cultivation tasks, viz., planting of seeds, tunneling and harvesting potatoes are repetitive in nature and are carried out through manual efforts. Most of the tasks of potato cultivation performed by the cultivators are monotonous, strenuous, physiologically demanding as well as time-consuming (Gangopadhyay *et al.*, 2005; Das and Gangopadhyay, 2012) ^[4, 2]. Due to adopting different inappropriate postures whilst performing different potato cultivation tasks, workers are exposed to postural stress and may suffer from pain in different parts of the body. In different phases of potato cultivation tasks different patterns of work are performed. Some of the activities are dominated by static muscular contractions and some other tasks involve tasks repeated dynamic activities. Prolonged static muscle loads have appeared as a major risk factor in the development of load-related illnesses. A constant repetition of movements imposes a cumulative work-load which can cause pain and weakness and impaired function of the muscles and other soft tissues (Gangopadhyay *et al.*, 2007; Girish *et al.*, 2012) ^[5, 6]. The predominant posture of different potato cultivation jobs are the stooping and squat postures. Workers sometimes adopt stooping and twisting postures during tunneling jobs and squatting postures while harvesting of potatoes for long durations. All these postures may produce discomfort in different body parts of the body. In potato cultivation jobs, continuous movement of upper limbs also occurs during tunneling jobs. In many parts of the agricultural sector, upper extremity injuries are prevalent and are related to several common risk factors,

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viz., awkward posture and repetitive movement (Meyers *et al.*, 2000; Struttmann and Reed, 2002; Gomez *et al.*, 2003; Goswami *et al.*, 2012)^[3, 7]. High repetitions, excessive forces and awkward postures are major causes of musculoskeletal disorders and complaints in industries. Competition and increased work demands have also increased farmers' exposure to risk factors through increased work pace and duration. Potato cultivation is a physically arduous occupation that places potato growers in potential risk of musculoskeletal disorders, which impose a greater impact on their health. To assess musculoskeletal discomfort among potato growers, NORDIC (1987) standardized questionnaire designed for the analysis of musculoskeletal discomfort of complete body parts with special reference to low back, shoulders and neck.

Research Methodology

The study was conducted in Kannauj district of Uttar Pradesh during the year 2015. The pre-coded interview schedule was constructed in order to elicit information needed to obtain the objectives of the study. Multistage purposive random

sampling technique was followed to select the state, district, blocks and finally respondents. District Kannauj is purposively selected as this is one of the largest potato producer districts while two blocks namely Kannauj and Jalabad were randomly selected. Two villages from each selected block i.e. Basirapur and Mahmoadpur paith from Kannauj and, Badlepurwa and Kheda from Jalalabad, selected randomly. Forty farmers from each selected village, Total sample size 160 respondents were randomly selected for final data collection.

Musculoskeletal disorders

The musculoskeletal disorders of the workers were evaluated by the modified Nordic Questionnaire technique (Kuorinka *et al.*, 1987)^[9]. The questionnaire emphasized individual details, type of work and the occurrence or frequency of pain felt in different parts of the body.

Result and Discussion

Table 1: Distribution of Respondents on the Basis of Severity of Musculoskeletal Pain/ Discomfort while Performing Potato Cultivation Activities, N=160

S. No.	Body parts	Very mild	Mild	Neutral	Severe	Very severe	Mean	Rank
1	Neck	40.00 (25.00)	10.00 (06.25)	05.00 (03.12)	75.00 (46.87)	30.00 (18.75)	02.71	VII
2	Shoulders	-	60.00 (37.50)	-	15.00 (09.37)	85.00 (53.12)	03.10	VI
3	Upper back	-	10.00 (06.00)	-	30.00 (18.75)	120 (75.00)	04.62	II
4	Elbow	06.00 (03.75)	32.00 20.00)	-	40.00 (25.00)	82.00 (51.25)	04.00	V
5	Low back	10.00 (06.25)	17.00 (10.62)	05.00 (03.12)	32.00 (20.00)	128.00 (80.00)	05.16	I
6	Wrists/Hands	07.00 (04.37)	05.00 (03.12)	-	39.00 (24.37)	109.00, (68.12)	04.48	III
7	Hips/Thighs	15.00 (09.37)	06.00 (03.75)	02.00 (01.25)	75.00 (46.87)	62.00 (38.75)	04.01	IV
8	Knees	63.00 (39.38)	15.00 (09.38)	40.00 (25.00)	32.00 (20.00)	10.00 (06.25)	02.44	VIII

Data presented in Table 1 clearly depicts that, more than forty five per cent respondents reported 'Severe' pain in neck followed by 25.00 per cent respondents, had 'Very mild' pain in neck, whereas about nineteen per cent respondents complaint 'Very severe' pain in neck (Mean Score 92.71, Rank VII). Maximum (53.127) respondents reported 'Very severe' pain in shoulder but in contrast 37.50 per cent respondents complaint 'Mild' pain in shoulders, only about nine per cent respondents felt 'Severe' pain in shoulder (Mean Score 3.10, Rank VI). Seventy five per cent respondents reported 'Very severe' pain in upper back followed by 18.75 per cent respondents complaint 'Severe' pain in upper back while minimum (6.25%) respondents suffered 'Mild' pain in upper back with Mean Score 4.62, Rank II. Further table 4.4.1 also depicts that more than fifty per cent respondents' complaint 'Very severe' pain in elbow while performing potato cultivation activities followed by one quarter respondents, reported 'Severe' pain. Twenty per cent respondents reported 'Mild' pain in their elbow. Majority (80.00%) of respondents complaint 'Very severe' pain in low back while twenty per cent reported 'Severe' whereas about eleven and six per cent respondents reported 'Mild' and 'Very mild' pain in low back respectively thus identified as Rank I with Mean Score 5.16. Maximum 68.12 per cent respondents complaint 'Very severe' pain in wrist/hand while performing potato cultivation activities. About twenty four per cent respondents felt 'Severe' pain in wrist/hand (Mean score 4.48, Rank III). More than forty five per cent respondents reported 'Severe' pain in hips/ thighs followed by 38.75 per cent respondents reported 'Very severe' pain in hips/thighs. A little less than ten per cent respondents complaint 'Very mild' pain in hips/thighs while performing potato cultivation

activities, whereas about four per cent respondents suffered 'Mild' pain in hips/thighs and 1.25 per cent respondents had 'Neutral' feeling. Majority (39.38%) respondents reported 'Very mild' pain in knee while performing selected potato cultivation activities while one quarter respondents had 'Neutral' feeling about the pain in knee. Twenty per cent respondents complaint 'Severe' pain in knee while performed potato cultivation activities but less than ten per cent reported 'Mild' pain. Only 6.25 per cent respondents felt 'Very severe' pain in knee while performed Potato cultivation activities (Mean Score 2.44, Rank VIII). Finding of the study were supported by the finding of Anon (2001) that majority of the respondents were having severe pain in the shoulder joint (73%), low back (31%) and upper leg (28%) in younger age groups while performing harvesting activity. The older age group respondents complained severe to very severe pain in the shoulder joint (46%), upper arm (42%), calf muscles (22%) and ankles (23%) in harvesting activity.

The musculoskeletal discomfort associated in potato cultivation affected badly the lower and upper back and hence identified as in maximum risk, therefore, Ranked I and II. Wrist and thighs were also in heavy risk since all activities were performed by handles in sitting posture. In all potato cultivation activities repetitive movement of different body parts were common which affected musculoskeletal system and causes musculoskeletal discomfort along with this awkward posture for longer duration, extended static hold, carrying heavy loads and direct pressure on soft-tissues of the body were certain risk factors identified leading the musculoskeletal pain/ discomfort and if continued lead to permanent disability.

Fig indicated that most important body parts in terms of having musculoskeletal pain were lower back, upper back,

wrists/hands and hips/thighs whereas, level affected body parts found were knee and neck.

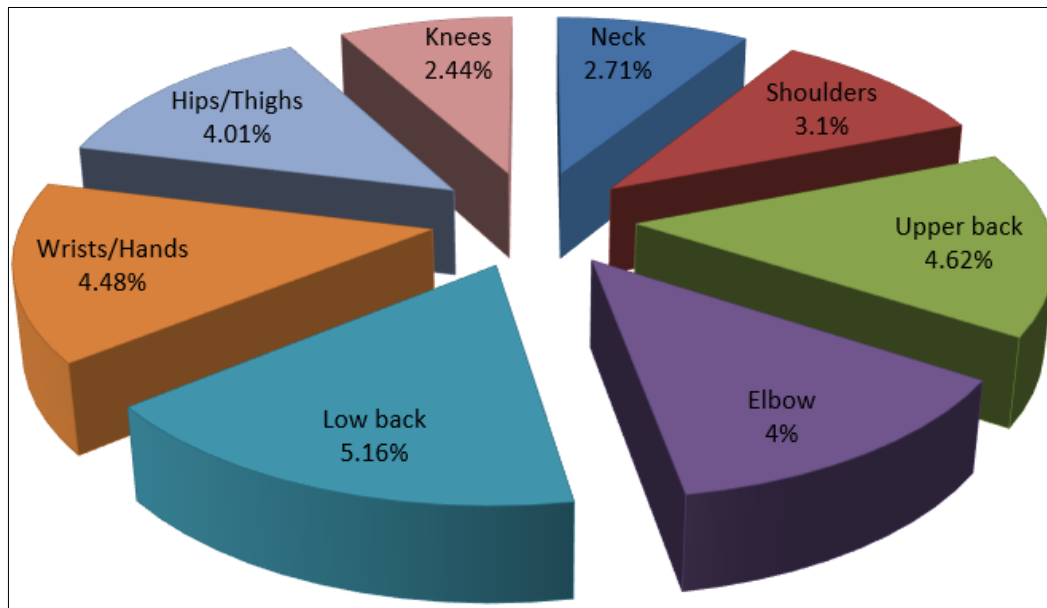


Fig 1: Musculoskeletal Pain/Discomfort in Different Body Parts

Conclusion

The potato cultivation tasks are repetitive in nature and those are carried out mainly by manual efforts.

The musculoskeletal discomfort associated in potato cultivation affected badly the lower and upper back and hence identified as in maximum risk, in potato cultivation, upper extremities were found at higher risk of work related musculoskeletal discomfort than lower extremities.

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