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A study to find work related musculoskeletal disorders and associated risk factor among dairy workers

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Abstract
Background: The work of dairy often involves lifting heavy object, moving and carrying equipment, and awkward working posture, all are risk factor of low back injuries and other musculoskeletal problems. The purpose of the study was to identify the prevalence of work-related musculoskeletal disorders among dairy workers in Surat.
Objectives: To identify the prevalence and risk factors of work-related musculoskeletal disorders in dairy worker.
Methodology: This is an observational study including 50 subjects, both male and female of dairy workers from production and packing department and age between 20-45 years with work experience more than one year in the milk dairy. The subject with previous history of trauma, musculoskeletal problem before joining the dairy, and not willing to participate in study were excluded from study. The study setting was production and packing department of Sumul dairy Surat. Standardized Nordic questionnaire was used to find the prevalence of work-related musculoskeletal disorders among dairy workers.
Statistical Analysis: Descriptive analysis of prevalence of work-related musculoskeletal disorders was done by using Microsoft excel 2013.
Result: The most common work-related musculoskeletal problem was lower back pain (32%), followed by knee pain (18%), upper back pain (18%), ankle pain (8%), neck pain (4%), wrist pain (4%), shoulder pain (2%). Highest prevalence of low back pain was in age group around 28-35 years.
Conclusion: Low back pain is commonest condition affecting dairy workers followed by knee pain, upper back pain, ankle and neck pain respectively, affecting most of the dairy workers in Surat.

Keywords: work related musculoskeletal disorders (WMSDs), prevalence, low back pain, dairy worker, Standardized Nordic questionnaire

Introduction

Work-related musculoskeletal disorders (WMSD) are not diseases of modern times they are associated with activities involving repetitive movements sinE. However, after the industrial revolution there was a significant increase in the number of clinical cases reported and there were several epidemics [1]. This high risk is due to the multiple activities involved in agricultural work, which may involve accidents with mechanical equipment, respiratory hazards, hazardous noise levels and electrical hazards [2]. Musculoskeletal Disorders are defined as a group of disorders that affect the musculoskeletal system including the nerves, tendons, muscles, and joints and supporting structures such as inter-vertebral discs etc [3]. WMSDs describe disorders and diseases of the musculoskeletal system that are a result of acute injuries from a onetime trauma or are associated with cumulative traumas such as repetitive motion, excessive force, awkward or sustained postures associated with WMSDs [4, 5]. Musculoskeletal Disorders could result in pain, injury, illness, poor quality of life and reduced productivity [6].

These diseases are usually initiated with fatigue and pain that can develop into restricted movements and impaired muscle strength [7, 8]. The cause of sever long term pain and disability, and are currently reported to be affecting hundreds of millions of people around the world [9, 10, 11]. Work tasks such as udder drying, pre-milking and attaching the tea cups are reported to be the most physically demanding tasks for the hands/wrists during milking in parlour systems, especially among females [12]. Physically demanding work, such as an intensified work load, monotonous and repetitivepain include poor wrist postures, repetitive gripping, and farm workers pick fruit, prune grapes, or perform other tasks above work tasks, combined with psychosocial factors, such as time pressure, overtime, low control, and low job satisfaction have been found as possibly Predisposing for upper extremity disorders among workers in different occupations [13, 15].

Agriculture is one of the three most hazardous sectors in the working world and farmers and farm workers are exposed to a variety of work-related factors, which can affect their safety and health [16, 24]. Dairy farming is one of the most important agricultural sectors where workers are forced to adopt and apply awkward and poor postures to complete tasks [25, 26]. Farming is a physically demanding occupation with work tasks that cause MSDs and work disability, such as lifting heavy objects, moving and carrying equipment and awkward working postures [27].

It is well-known that working with dairy farming, milking in particular, is physically demanding, associated with

difficult working postures and movements, caused by slips, trips and falls on slippery floors or barn fittings, which constitutes a risk factor for development of MSD [28, 31]. WMSDs have been described as one of the main work-related diseases among agriculture sector workers [32, 33]. Dairy farm workers reported high frequencies of MSDs in the 'back' and in the 'upper extremities', and had high work demands, they also had high level of control and support and were satisfied with their work [34]. The dairy workers are also exposed to other ergonomic risk factors and resulting injuries [35].

Musculoskeletal pain develops from repeated exposures to a stressor among farm workers [36, 37] Kneeling, bending, heavy lifting and carrying, vibrations from tractor driving and work in uncomfortable postures were found to be associated with hip pain antheir [38]. Stooping is a major factor for low back pain [39].

Documented risk factors for work related low back pain (LBP) are heavy physical work, lifting and/or carrying heavy weights, forceful movements, awkward working postures (frequent bending and twisting) and whole-body vibrations (Bernard 1997; NRC Corporation 2001) [40]. The neck, shoulders and upper arms operate as a functional unit, which makes it difficult to estimate specific exposure factors for the neck/shoulder region beyond that of job or job tasks (NRC Corporation 2001) [41]. Considering this above, need of this research is to identify the risk factors related to Work-related Musculoskeletal Disorders (WMSD) among Sumul dairy Surat.

Methodology

Source of Data: Data collection to find out prevalence of WRMD was carried out from production department of Sumal dairy Surat. Study Design: An Observational study Sample size: 50 workers. Participants: Worker from production and packing department of Sumul dairy. Sampling Method: Convenient sampling. Inclusion criteria included- Age group between 25 to 45 years, Workers have the experience more than one year, Both male and female worker, Worker from packing and production department. Exclusion criteria were -Subjects are not willing to participate in study, Previous history of trauma, Musculoskeletal problem before joining the dairy. Outcome measures: Standardized Nordic questioner Performa,

Procedure: Ethical approval from Institutional ethical committee was taken to carry out this observational study. After ethical approval, HR department was contacted and only after permission obtained from the HR department, production and packaging department were selected to carry out the study on diary workers. Based on inclusion and exclusion criteria of the study dairy worker are selected in the study. Workers are oriented to study procedure and based on their willingness for participation in the study, they are recruited in the study after obtaining consent from the workers. Total 50 subjects were selected for the study to answer the research questions on prevalence of musculoskeletal discomfort in Sumul diary workers of Surat, The Nordic musculoskeletal questionnaire was selected. Since Guajarati language used in Surat Guajarati version of the scale was used in the presence study. Patients were then given clear-cut instruction for responding to the Nordic musculoskeletal questionnaire; there was no any further assistance or prompting to the respondents. All the participants were allowing to replaying in close ended form in their mother tongue. Data was recorded.

Data Analysis

Descriptive analysis of prevalence of work-related musculoskeletal disorders was done by using Microsoft excel 2013. Body region wise analysis of weekly (shortterm) and yearly prevalence of musculoskeletal discomfort.

Result

The descriptive statistical analysis of data (N=50, workers), showed that the mean age was 28.02 ± 6.83. Descriptive analysis of data reveals that a total of 4% of the workers experienced neck pain 2% of shoulder pain, 4% of wrist pain, 32% of low back pain, 8% of upperback pain, 18% of knee pain, and 8% of neck pain reported (Table 1).

PREVALANCE OF WMSD	RESPONSE	FREQUENCY	%
SNQ RESPONSE NECK	YES	2	4
	NO	48	96
SNQ RESPONSE SHOULDER	YES	1	2
	NO	49	98
SNQ RESPONSE WRIST	YES	2	4
	NO	48	96
SNQ RESPONSE UPPER BACK	YES	4	8
	NO	46	92
SNQ RESPONSE LOWER BACK	YES	16	32
	NO	34	68
SNQ RESPONSE KNEE	YES	9	18
	NO	41	82
SNQ RESPONSE ANKLE	YES	4	8
	NO	46	92

Table 1

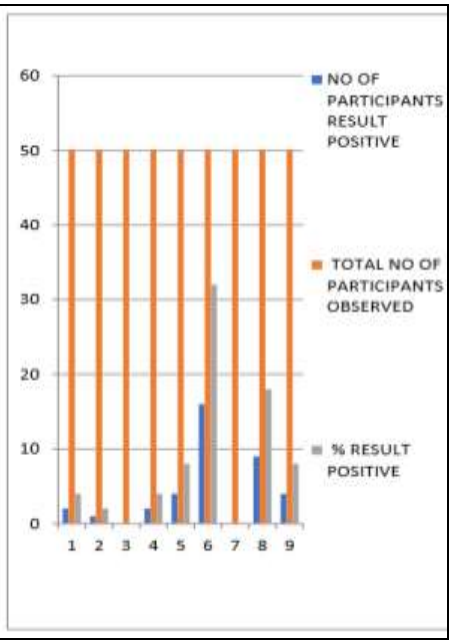

Fig 1

Discussion

Pain due to musculoskeletal discomfort is a multi-factorial phenomenon. It can affect almost all parts of body depending upon the physical movement characteristics and work setup. Present study has successfully identified four of the most common musculoskeletal disorders affecting the dairy worker of the study area - neck pain (4%), shoulder pain (2%), wrist pain (4%), upper back pain (8%), lower back pain (32%), knee pain (18%) and ankle joint (8%). There are many researches which document the prevalence of various musculoskeletal discomfort in occupation like mine workers, stone cutters, sanitary workers, military personnel, aircrew workers, shoe factory workers, goldsmiths, etc [42, 43]. But much less has been documented about musculoskeletal discomfort in farmers of India. Among the agricultural practices, several studies show the higher prevalence of MSD among farmers compared to other occupation workersc [44]. A systematic review done by Osborne *et al*. showed that the prevalence of MSD was more in farmers compared to non-farmers and lower back pain was the most common region followed by the upper and lower extremities [45]. In this study though the overall prevalence WMRD was high, in the past 12 months and 7 days prevalence of pain was highest in the lower back followed by knee pain. Observation of the data also gave an insight to the health trend in workers that once the pain is developed in any body region, it tends to persist for a year or more.

Although in the present study blinding of investigation was not done and the data collection was not done using random sampling method, findings of the present study provide important information regarding the presence of MSDs in worker of Sumul dairy Surat, India. These results provide a backdrop for future researches both nationally or internationally. Observations made during the present study suggest that poor postures and lack of ergonomic awareness in the farmers are the causative factors contributing to the development of MSDs. It is suggested that future studies should examine the effect of educational level and other socio psychological factors on MSDs. Future studies should especially focus on the effect of health education and adherence to ergonomic measures and postures on prevalence of MSDs.

Conclusion

The results showed that high prevalence of MSD and perceived discomfort from ergonomic work factors are still not uncommon among workers of dairy. MSD were mainly reported to be located in the lower back, knee, upper back, ankle, neck, wrists and shoulders affecting most of the dairy workers in daily work practice.

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