



ISSN: 2456-0057

IJPNPE 2023; 8(2): 275-279

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www.journalofsports.com

Received: 10-07-2023

Accepted: 12-08-2023

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An analysis of the physiological posture and health injuries with the issue related to work-place accident among manual material handlers in the Bankul-bazaar of South-Tripura

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DOI: <https://doi.org/10.22271/journalofsport.2023.v8.i2d.2811>

Abstract

The Bankul bazaar is one of the most significant major market places in Manu-Bankul area of Sabroom South Tripura District, where material handling, loading, and unloading is a constant operation of daily labour. To perform this type of heavy work general healthy fitness with proper physiological index is also required. Being a physically demanding job, manual material handling (MMH) workers are frequently facing a lot of work place related difficulties which results in accidents, injuries, and even fatalities. In order to determine the risk variables causing accidents, one hundred (n=100) MMH employees from the local area of the core market were chosen. A modified standard Nordic questionnaire was used. Apart from this different approaches are already available to evaluate (like- OWAS approach can be used to analyse working postures) the details of accident cases based on the proper reason. Lifting and carrying goods was when the majority of accidents—including being struck by an object and slipping and falling—took place. Accident reports indicated that not many accident cases reported in the local hospitals, which actually indicating to a general disregard for going to the hospitals of injured labours.

Keywords: Accidents, injuries, even fatalities, manual material handling (MMH).

Introduction

Accidents are unforeseen, unwelcome events that happen suddenly and that have the unintended effect of causing harm to people or property or even death. There are millions of workplace accidents worldwide each year. The transportation and storage of materials at the lowest cost feasible via the use of appropriate techniques and tools is known as manual material handling (MMH), and it can be characterized as lifting, lowering, pushing, pulling, holding, or carrying weights. As a result of the intense stress brought on by MMH operations, a significant percentage of workers suffer injuries and frequently have to abandon their occupations. In small and medium organized and unorganized sectors, manual material handling (MMH) is directly performed by over 60% of India's entire population ^[1]. MMH jobs are quite demanding since, in many situations, the postures used during activity put a lot of strain on the musculoskeletal and cardiovascular systems, which leads to a variety of accidents ^[2]. In the current study, an effort was undertaken to pinpoint and evaluate the likely reasons behind accidents involving manual material handling among MMH employees besides their fat percentage.

Methods

Subject selection

At random, one hundred (100) men workers who handled manual materials in the Bankul Bazaar region were chosen. The subjects included for this study had a minimum of five years of job experience.

Questionnaire study & Hospital records

This study's occupational health questionnaire was based on the Modified Nordic Questionnaire and the collected from the local rural hospital ^[3, 4]. The evaluation of the ergonomic and workplace risk variables related to the MMH job and accidents was done using a checklist created by Keyserling *et al.* ^[5].

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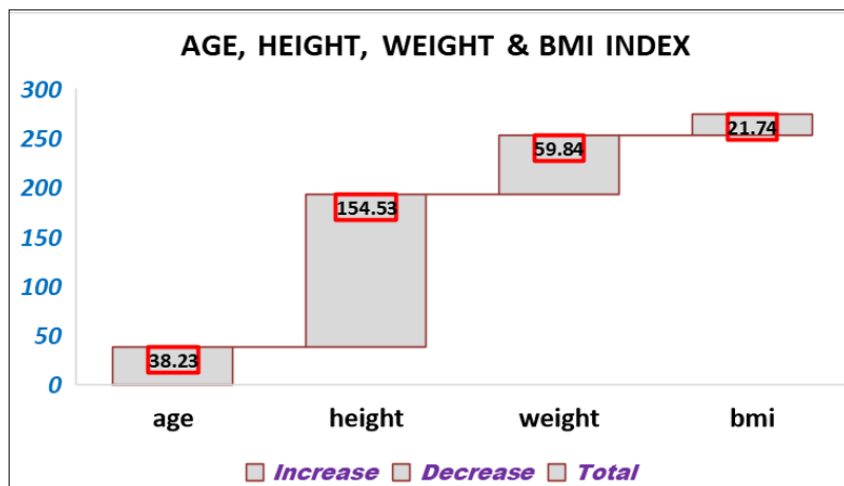
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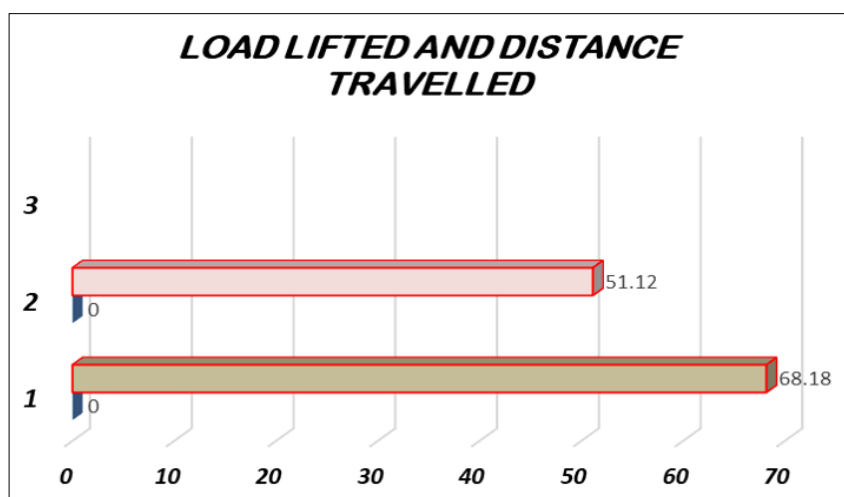
Analysis of accidents based on survey results and medical records: For four months in 2023, a full accident study was conducted using data from the questionnaire and in-person interviews. For the examination of accidents, pertinent information was gathered from these hospital records that were close to the core market area. Event information was documented, particularly the history of injuries or the victims' actions at the time of the event.

The mean and SD values of different physical parameters along with the general information regarding the workers and type of accidents based on the seasonal variation and different parameters related to work place accidents has shown by using data collected by the questionnaire method and from the hospital records, which is mentioned in Table No. 1 to Table No. 6. Besides by using the graphical representation of the collected data different parameters has also shown about the MMH-workers engaged in Bankul market area.

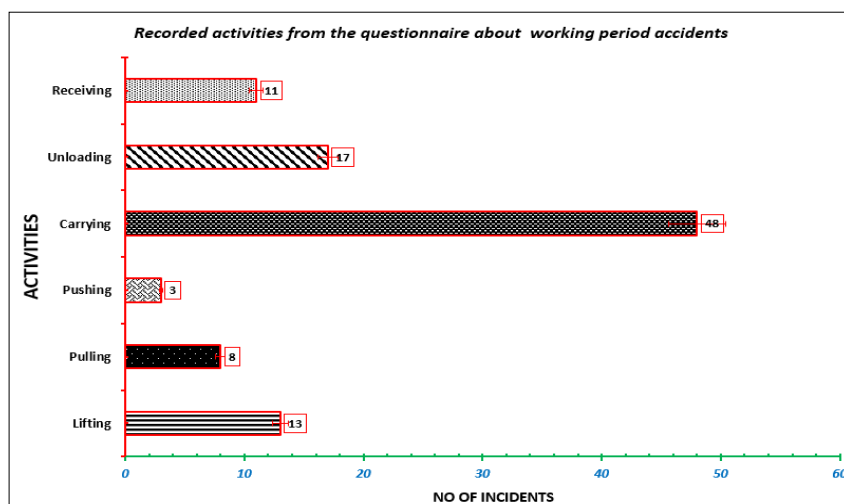
Results



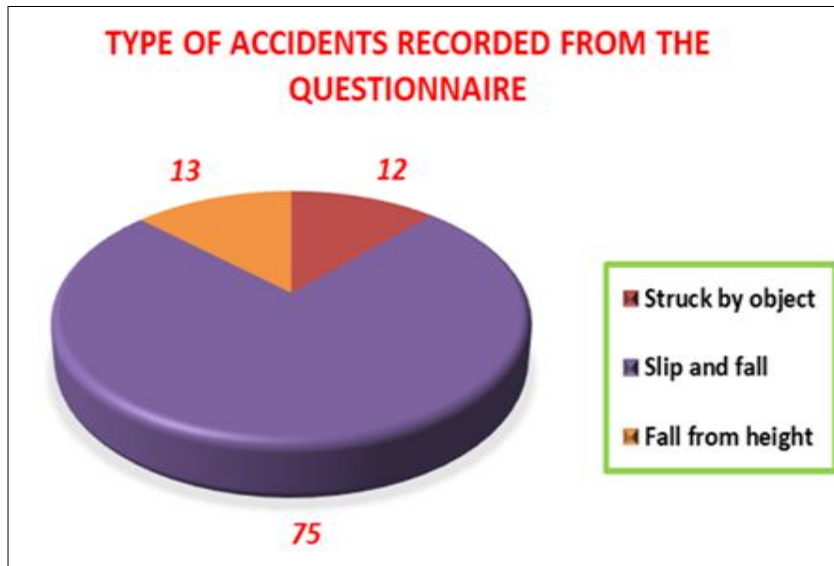
Graph 1: Different Parameters Related to Physical Characteristics of Workers



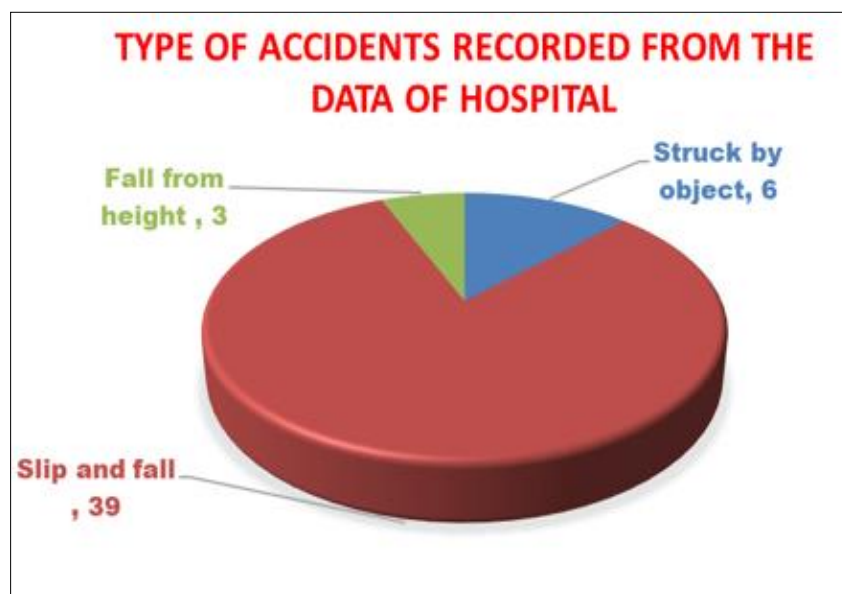
Graph 2: General Information about the Work Schedule of the Workers



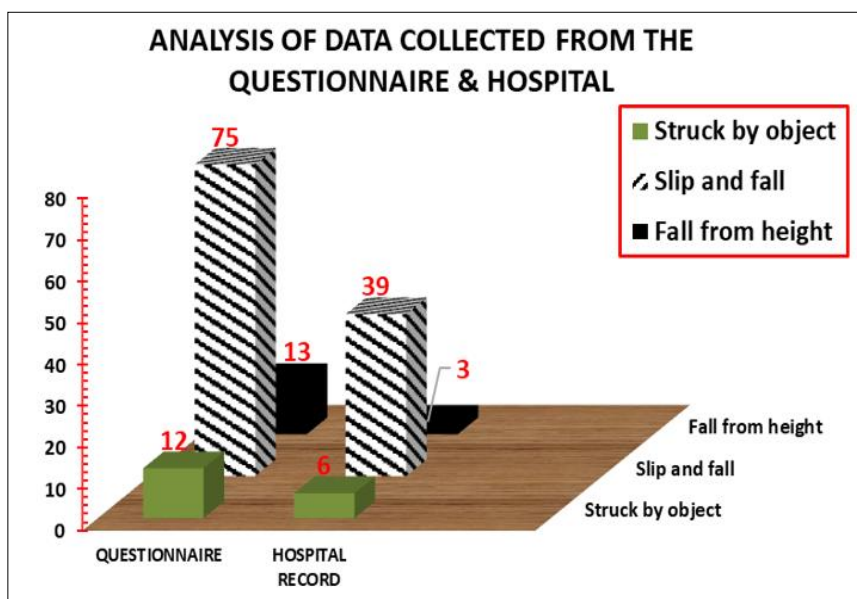
Graph 3: Analysis of Accident during Different Activities through Questionnaire



Graph 4: Type of Accidents Recorded From the Questionnaire



Graph 5: Type of Accidents Recorded From the Hospital



Graph 6: Data Analysis by Using the Data of Table 4 & Table 5

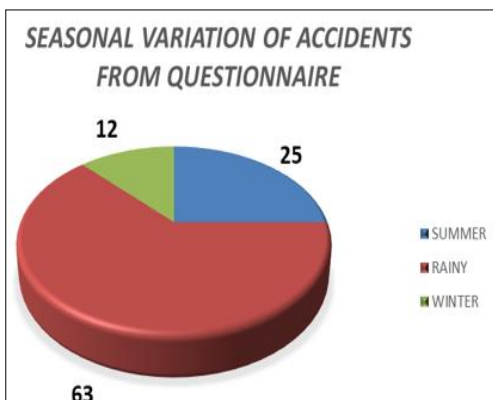
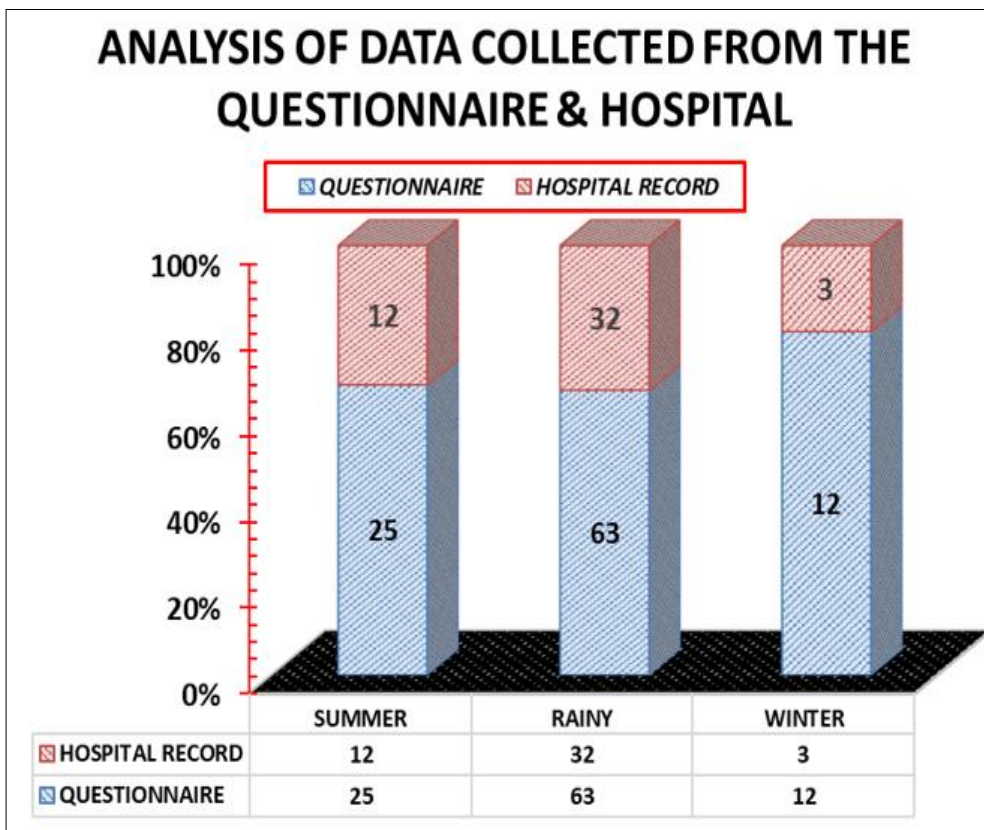


Fig 1: Seasonal Variation of Accidents from Questionnaire and Hospital Record

Table 1: Physical Characteristics of Workers

Parameters	Mean	SD (±)
Age (years)	38.23	8.02
Height (cm.)	154.53	4.48
Weight (kg.)	59.84	5.73
BMI (kg/m ²)	21.74	1.45

Table 2: General Information About the Type of Works

General Information	Mean	SD (±)
Load lifted by the MMH workers (kg)	68.18	3.92
Distance covered with load at a time (m)	51.12	15.16

Table 3: Activities During Accidents Recorded From the Questionnaire

Activities	No of workers
Lifting	13
Pulling	8
Pushing	3
Carrying	48
Unloading	17
Receiving	11

Table 4: Type of Accidents Recorded From the Questionnaire

Type of accidents	No of workers
Struck by object	12
Slip and fall	75
Fall from height	13

Table 5: Type of Accidents Recorded From the Hospital

Type of accidents	No of workers
Struck by object	6
Slip and fall	39
Fall from height	3

Table 6: Data Analysis From Questionnaire & Hospital Record Regarding the Seasonal Variation of Accidents

Sources of data	Summer	Rainy	Winter
Questionnaire	25	63	12
Hospital record	12	32	3

Discussion

The workers, who participated for this particular study, can be seen that they have a normal range of BMI, which actually clearly indicating that the physiological status of these workers have almost similar status. It can be observed that the load lifted and at a time distance covered by the MMH workers are 68.18kg and 51.12 m

Further analysis observed from the data of questionnaire that during different activities like lifting, pulling, pushing, carrying and during unloading, receiving a good number of workers (where n=100) have injured which is 13, 8, 3, 48, 17,11 number of workers respectively.

Besides we analysis the type of accidents which occurred in the work place during various activities and this analysis was performed based on the data collected from the both questionnaire and hospital records. According to the analysis of the data collected from the questionnaire it was found that due to the struck by object total 12 workers were injured; 75 workers were injured due to the slip and fall and 13 workers were injured due to fall from the height during the time of material handling. Similarly, when we analysis the data collected from the hospital records it was found that out of the 12 injured workers due to struck by object only 6 workers visited to the hospital. Besides only 39 injured workers went to the hospital for the treatment among 75 injured workers due to slip and fall and out of these 13 injured workers due to fall from height only 3 workers visited to the hospital for the treatment; which is showing that only very few workers are visiting to the hospital for the treatment of their injuries.

We also analysis the seasonal variation of accidents which occurred in the work place during various activities and this analysis was also performed based on the data collected from the both questionnaire and hospital record. According to the analysis of the data collected from the questionnaire it was found that during Summer 25 workers were injured; 63 workers were injured during Rainy Season and 12 workers were injured in Winter Season during the time of material handling. Similarly, when we analysis the data collected from the hospital records it was found that out of the 25 injured workers of Summer only 12 workers visited to the hospital. Besides only 32 injured workers went to the hospital for the treatment among 63 injured workers of Rainy Season and also out of the 12 injured workers in Winter Season only 3 workers visited to the hospital for the treatment; which is showing that only very few workers are visiting to the hospital for the treatment of their injuries.

So, from this data it is observed that there was a seasonal variation in the occurrence of accidents. From the analysis of this data collected from the questionnaire that most of the accidents occurred in summer and in rainy seasons. Excessive Hot, higher humidity and due to the slippery work place during rainy seasons may be the causes for the most of the accidents.

Conclusion

From the analysis of all these data in can be concluded that all these workers having normal ranges of BMI. Further analysis observed from the data of questionnaire and hospital records that during different activities like lifting, pulling, carrying, unloading, a good number of workers (where n=100) have injured but among of these injured workers very few workers used to visit hospital for the treatment of their injuries. This may also indication of lower socio-economic income of this MMH workers and lack of consciousness among the workers regarding their health-related issues. Spreading awareness regarding health among of the workers is highly necessary.

Seasonal injuries may be due to the excessive temperature during summer and the slippery work place of this market place in rainy season. From the study, it can be concluded that the faulty work practice with the adoption of awkward working postures during heavy load handling may be regarded as one of the primary causes of accidents leading to permanent disablement and consequent loss of earnings. Thus, it is clear that by remaining in such awkward postures during activities, these workers were exposed to hazards which may cause different types of accidents.

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