

Prevalence and Causes of Accident and Injuries among Pakistan Railway Workers of Carriage Factory, Rawalpindi

Ahmed Malik¹, Muddasar Pervez², Aliya Zafar³

ABSTRACT

OBJECTIVES: To assess the prevalence and causes of accidents and injuries among Pakistan Railway Carriage Factory workers.

STUDY DESIGN: A descriptive cross-sectional study.

PLACE AND DURATION: At Pakistan Railway Carriage Factory in a time period of three months i.e. from 1st June 2017 to 31st August 2017.

METHODOLOGY: By convenient sampling technique, 200 participants were recruited for this study. A self-administered questionnaire comprised of questions about the demographic profile of workers, their satisfaction level for the safety measures and implementation level of safety measures in the factory and the possible causes of accidents in Railway carriage factory.

RESULTS: The most frequent cause of accidents as perceived by railway carriage factory workers was not following the protocol of work (66%), followed by negligence in work (65%), over confidence (60%), defective personal protective measures (57.5%), over work (55%), ignorance of workers (44%), untrained/non-qualified staff members (19%), under compensation for workers (6%) and unavoidable causes (2.5%). 50% of the respondent said that safety measures are satisfactory while 44% considered it to be good. 49.5% were satisfied with level of implementation of safety measures and 28% considered it to be good.

CONCLUSION: Accidents and injuries among Railway Carriage Factory workers are an important occupational health problem in this area. Occupational injuries are high, and utilization of safety measures is low among workers.

KEYWORDS: Prevalence, Accidents, Injuries, Factory Workers, Safety Measures, Occupational Hazards.

HOW TO CITE THIS:

Pervaiz M, Malik A, Zafar A. Prevalence and Causes of Accident and Injuries among Pakistan Railway Workers of Carriage Factory, Rawalpindi. Isra Med J. 2018; 10(3): 143-147.

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INTRODUCTION

The Rail transport is a mean to transport passengers and goods from one place to another. Pakistan railway carriage factory was built in 1970s, in Rawalpindi by the assistance of LHB Germany, to meet mainly domestic need for rail carriages.¹

In many countries, occupational accidents have put an adverse effect on the safety and health of various professions. In 1999 France reported 1.41 million accidents among 15 million workers, which was 2 percent increase in the number of accidents reported in 1998. Of these accidents 51 percent caused injuries and these injured people also faced social and

economic problems, disabilities and loss of work time. Due to their injuries their health care expenses also increased and also had other adverse consequences.²

An international survey was carried out in which it was concluded that about twenty million work related accidents occur each year in world. And each year about one million people die in these accidents. The average rate of fatal accidents is about fifteen per hundred thousand workers, in developed countries. This ratio is nearly six but in developing countries like India and Pakistan it is more than twenty. This is because of lack of facilities and simply not following the SOP of work.³

In Pakistan nearly two hundred and fifty workers die in different occupational accidents.⁴ Most of the studies about accidents and injuries of railway workers of last fifty years shows that most of the accidents occur due to mishandling of the machines, but when we look forty years back we see that the number of accidents ratio were more comparatively, because of unsafe machines at that time. Now there is more safety button given in machines, they are more advanced, and more protective.⁵ There are also workers adopting more personal protective equipment's. In last ten years survey we come to know that more than thirty percent accidents were due to machines, whether mishandling of the machine or due to faulty machinery.⁶

The objective of this study is to assess the prevalence and causes of accidents and injuries among Pakistan Railway Carriage Factory workers.

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Received for Publication: 22-12-17

1st Revision of Manuscript: 27-03-18

2nd Revision of Manuscript: 20-04-18

Accepted for Publication: 01-05-18

METHODOLOGY

This was a descriptive cross-sectional study conducted at Pakistan Railway carriage factory employees in a time period of three months i.e. from 1st June 2017 to 31st August 2017. By convenient sampling technique, 200 participants who were willing to participate in the study and who had been working in the factory for at least 6 months were recruited for this study. The history of all fatal and non fatal accidents among workers in Railway Carriage Factory during the period of 2004 to 2014 was taken from the factory record.

A self-administered questionnaire adopted from a similar study conducted by Kazi et al,⁷ was used to collect data. The questionnaire comprised of questions about the demographic profile of workers, their satisfaction level for the safety measures in Railway Carriage Factory, the implementation level of safety measures in the factory and the proportion of possible causes of accidents (which included not following the protocol of work, negligence in work, over confidence, defective personal protective measures, over work, ignorance of workers, untrained/non-qualified staff members, under compensation for workers and unavoidable causes) as perceived by workers of Railway carriage factory.

Data Analysis: The data was analyzed by using SPSS 23 software. The working experience, designation and perception of workers regarding the possible causes of injuries and accidents were presented as frequencies and percentages. The frequency of fatal and non fatal injuries and accidents, workers' level of satisfaction regarding safety measures and level of implementation of safety measures were presented as bar charts.

RESULTS

A total of 200 respondents were included in this study. Table I shows the frequencies of working experience in years and designation of railway carriage factory workers. Nearly half (50.5%) of the workers had experience of ≤ 15 years. Less than half workers (39.5%) had experience of 16-30 years and only few of them (10%) had experience of 31 or more years. Most of the workers (34%) were helpers, followed by 49 (24.5%) as supervisors, 43 (21.5%) as foremen, 31 (15.5%) welders and 9 (4.5%) were lower charge men.

TABLE - I: WORKING EXPERIENCE AND DESIGNATION OF RESPONDENTS IN CARRIAGE FACTORY (N=200)

| Experience and Designation | N |
|------------------------------|-------------|
| Experience (in years) | |
| ≤ 15 | 101 (50.5%) |
| 16-30 | 79 (39.5%) |
| 31 and more | 20 (10%) |
| Designation | |
| Helper | 68 (34%) |
| Welder | 31 (15.5%) |
| Lower Charge Man | 9 (4.5%) |
| Supervisor | 49 (24.5%) |
| Foreman | 43 (21.5%) |

In Figure 1 the year wise data of injuries and deaths in Railway carriage factory are shown, or in other words it shows fatal and non fatal accidents. The numbers of fatal accidents were nearly the same in ten years but the percentage of non fatal accidents increased every year. Most common accidents were head injuries, electrocutions, burns, amputation and paralysis.

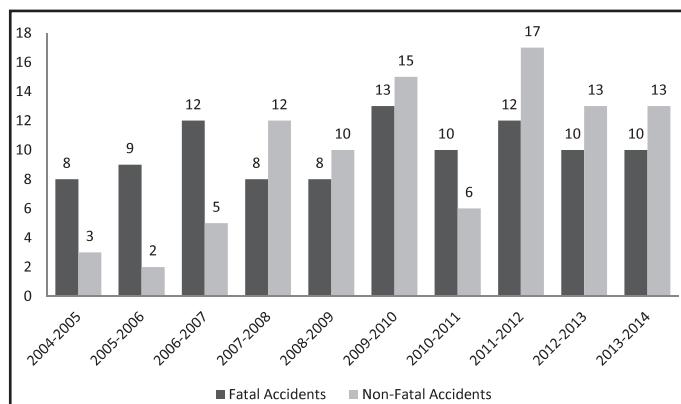


FIGURE-1: FREQUENCY OF INJURIES AND DEATHS OF WORKERS

In Figure 2 the level of satisfaction about Railway carriage factory safety measures availability is shown, the level of satisfaction of only 2 respondents was excellent and that are only 1% of the total respondent, 88 said to be good which are 44 percent of the total, 100 respondents said that it is satisfactory which forms 50% of the total respondents and 10 respondent said that they are not satisfactory at all, and it forms 5% of the total.

The level of implementation in Railway carriage factory is shown in Figure 3. It is seen that only 2 respondents (1%) agreed that the level of implementation is excellent, 56 (28.5%) respondents said that it is good, 99 respondents said that it is satisfactory it mean that nearly 50% said that it is satisfactory, and 42 respondents said that it is not satisfactory.

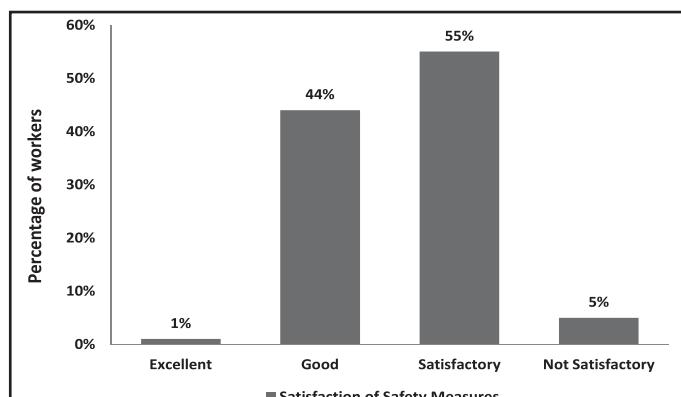


FIGURE - 2: FIGURE OF LEVEL OF SATISFACTION FOR RAILWAY CARRIAGE FACTORY SAFETY MEASURES (N=200)

Table II shows the perception of railway carriage factory workers regarding the causes of accidents in railway factory. The most frequent cause of accidents was not following the protocol of work [132 (66%)], followed by negligence in work [130 (65%)], over confidence [120 (60%)], defective personal protective measures [115 (57.5%)], over work [110 (55%)], ignorance of

workers [88 (44%)], untrained/non-qualified staff members [38 (19%)], under compensation for workers [12 (6%)] and unavoidable causes [5 (2.5%)]. However, no worker perceived the over qualification as a cause of accidents in railway carriage factory.

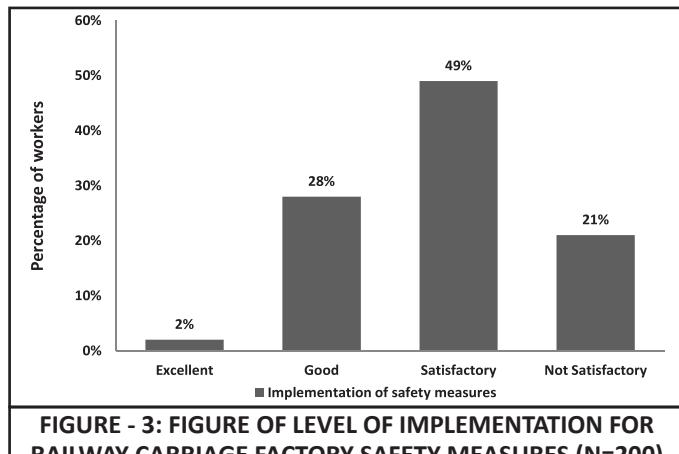


FIGURE - 3: FIGURE OF LEVEL OF IMPLEMENTATION FOR RAILWAY CARRIAGE FACTORY SAFETY MEASURES (N=200)

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TABLE - II: PERCEPTION OF RAILWAY WORKERS REGARDING THE CAUSES OF ACCIDENTS IN RAILWAY FACTORY (N=200)

| Causes of Accident among workers | Yes | No |
|---|-------------|-------------|
| Over Confidence | 120 (60%) | 80 (40%) |
| Defective Personal protective measures | 115 (57.5%) | 85 (42.5%) |
| Untrained / non-qualified Staff Members | 38 (19%) | 162 (81%) |
| Over work | 110 (55%) | 90 (45%) |
| Not following the protocol of work | 132 (66%) | 68 (34%) |
| Under compensation for workers | 12 (6%) | 188 (94%) |
| Ignorance of workers | 88 (44%) | 112 (56%) |
| Negligence in work | 130 (65%) | 70 (35%) |
| Unavoidable causes | 5 (2.5%) | 195 (97.5%) |
| Over qualified staff | 0 (0%) | 200 (100%) |

DISCUSSION

The injuries due to machines account for a significant portion of accidents that lead to death. It has been reported that about 35 percent of the events that lead to death were due to machine injuries in 1995 and 2005.⁸ Pakistan is not exempted from this

trend; about 250 workers die each year in different factories in Pakistan.⁴ For this reason Railway Carriage Factory is studied for finding out the reasons of such accidents and make recommendations for improvement.

By looking at the statistics of yearly fatal and non-fatal accidents, it is observed that, despite of all safety measures adopted, there is slight increase, both in fatal and non-fatal accidents over the past 10 years. It has been found in literature review that 90% accidents are due to the Human element, such as, over confidence, non-authorized work on line, carelessness, lack of proper attention and importance to work "Safety" both by the field officers, supervisors and other staff.⁹ However, according to a study conducted by Kazi et al on IESCO workers in Pakistan, it is also argued that the slight increase in accidents is due to increased negligence and increased work load of workers, with no corresponding increase in workforce, leading to overwork lethargy and hence increased accidents.⁷

The findings of this study and those mentioned in reviews don't differ much, both at national and international level.^{7,10,11} As it is observed, the level of satisfaction of only two respondents is excellent, i.e. 1% of the total respondents. While for a high number of respondents 55%, the level of satisfaction is just satisfactory and for 44% level of satisfaction is good. It shows that majority of worker's level of satisfaction fall in the area of good and satisfactory. One reason of non-reduction or even increase in accidents is that about more than 50% of the respondents do not consider the safety measures as good as to reduce the number of accidents.

As can be seen, only three respondents (1.5%) agreed with the excellent level of implementation for safety measures 49.5% agreed with satisfactory level and 28% with good level of implementation of safety measures. On the other hand, a significant percentage i.e. 21% was not satisfied with the level of implementation of safety measures. This shows that there are very less workers which are agreed with the excellent level of implementation and nearly fifty percent say that it is hardly satisfactory. It points towards a very important clue that though the facilities for safety do exist, these are not fully implemented, which seems to be a shortcoming both on part of workers and supervisors. Again, it can be said that if the level of implementation of safety measures was considered to be good or excellent by majority of the respondents which is not the case in our study findings, the accident would have been controlled. In this study, 60% of the respondents believed that overconfidence on part of workers is cause of accidents. It appears that overconfidence comes as barrier in following protocols of safety resulting in high number of accidents. In a similar study conducted on occupational hazards in Pakistan, 57% of employees considered overconfidence and defective personal protective measures as important causes of occupational accidents while 69% of employees considered that non adherence to SOP is a major cause of work related accidents.⁷

57.5% of respondents thought that defective personal protective measure (PPM) is the cause of accidents, which means that though the safety system does exist, it is defective/incomplete and thus, contributing to the accidents. It is the

opinion of more than 50% respondents that the PPM is either deficient or defective leading to accidents which can be prevented by improving PPMs. 19% agreed that untrained /non qualified staff is the contributory cause of accidents. By this observation, one possible conclusion made could be the common occurrence of work by untrained / unauthorized workers illegally. 55% believed that over work is one of the causes of accidents while 45% do not think that overwork is the cause. It is an in congruence with our initial observation of high workload because of increased number of consumers with no corresponding increase in number of trained workers.

66% of respondents agreed that not following the protocol of work is the contributory cause of accidents. This finding differs significantly from the official version found out in review that 90% of accidents occur due to not following the protocol of work.¹² However this observation is in line with our previous conclusions, as most of times, it is not the lack of equipment (PPM) rather it is the non-implementation and not following of protocol of work which is the issue that leads to accidents.

44% workers considered ignorance to be contributory factor. If we take training and ignorance about work as opposite phenomenon, then, there appears to be discrepancy on our one of previous questions regarding training to which good / satisfactory response was shown while the opinion regarding ignorance is almost split.¹⁰ One of the possible reasons is illegal work by non-qualified workers which is not an uncommon occurrence.

Majority of respondents (65%) were of the opinion that negligence is one of the contributory factors while 35% do not agree with it. It seems to be a logical observation which is in line with most of our previous findings. Under compensation is not considered to be contributory cause to accidents. While comparing results of this study with reviews it is observed that the causes / factors responsible for accidents do not differ much, both at national and international level.^{7,11}

The official version of causes of accidents of 85% due to not following of protocol¹² does not tally with our findings which are about 60%. The reason could be factors other than this, such as lack of supervision, deficient training and unauthorized work.

As per findings of HSE (Health and Safety Executive), the factors / causes mentioned are unsafe working conditions, no training inadequate information, failure to manage work and poor work control in that order.¹³ The findings do not differ from ours except the low incidence and difference in contributions of causal factors.

The USAID study's most important conclusion is non-following of protocols of work as to be major cause of accidents. It supports the fact that non-following protocols gives rise to other errors that lead to accidents.¹⁴ It's others conclusions, such as non-use of personal protective equipment's as contributory cause, are in congruence with our study findings. It is essential that the protocols of procedures be implemented in true spirits to save human lives.

CONCLUSION

Accidents and injuries among Railway Carriage Factory workers

are an important occupational health problem in this area. Occupational injuries are high and utilization of safety measures is low among workers.

ACKNOWLEDGEMENT

The authors are thankful to the respondents of this study and their administration for permitting to conduct this survey.

Contribution of Authors:

Malik A: Statistical analysis, Literature review

Pervez M: Conceived idea, Data collection, Data analysis, Manuscript writing.

Zafar A: Designed research methodology, Data interpretation

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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