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WORK RELATED INJURIES IN SMALL SCALE METAL PRESS INDUSTRIES OF SHAHDRAH TOWN, LAHORE, PAKISTAN

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The work place injuries have to pay both direct and indirect cost of the accidents. With a population of 169 million, Pakistan has no reported estimate of the national impact of workplace injuries. This study presented a profile of workplace injuries associated with small medium enterprises of metal press cottage industries in Shahdra Town, Lahore (Pakistan) and determined the impact on the country's economy besides to recommend strategies for delineating these important problems. The in-house accident investigation technique was used to collect the data from randomly selected small scale metal press cottage industries of study area for all types of injuries principally from minor to major ones. It was observed that role of human error in occupational injuries is momentous and keeping in view the necessity of proper safety training of the metal workers, there is a dire need to institute an information system to evaluate the true impact of injuries and develop national safety standards.

Key words: accidents, Pakistan, workplace injuries, metal pressing, accident investigation, strategy.

Ozljede na radu u malim pogonima za prešanja metala u Shahdrah Townu, Lahore, Pakistan. Povrede na radnom mjestu predstavljaju direktne i indirektne troškove akcidenata. Pakistan, zemlja koja broji 169 milijuna stanovnika, nije dao procjenu nacionalne štete povreda na radnom mjestu. Ova studija donosi profil nesreća na radnom mjestu u malim i srednjim pogonima za prešanje metala u Shandra Townu u Lahoreu i određuje njihov učinak na nacionalnu ekonomiju te preporučuje strategije za suočavanje s tim važnim problemima. Tehnika ispitivanja nesreća na licu mjesta korištena je za prikupljanje podataka iz slučajno odabranih metalurških pogona u istraživanom području o svim vrstama povreda, od manjih do većih. Zapaženo je da je uloga ljudske pogreške pri profesionalnim ozljedama značajna i da ona upućuje na nužnost obrazovanja metalskih radnika za sigurnost na radu te na strahovitu potrebu uspostavljanja neformalnog sustava vrednovanja pravog učinka ozljeda i razvijanja nacionalnih standarda sigurnosti.

Ključne riječi: nesreće, Pakistan, ozljede na radnom mjestu, prešanje metala, istraživanje nesreća, strategija.

INTRODUCTION

Innovations in the workplace, with low-cost and locally relevant solutions, have been initiated in several developing countri-

es [1]. However, occupational health remains neglected [2] in most developing countries under the pressure of overwhel-

ming social, economic, and political challenges. The traditional workplace-oriented occupational health has proven to be insufficient in the developing world [3] and tangible progress in occupational health can be achieved only by linking occupational health to the broader context of social justice and national development [4,5]. The current labor force stands at 2.7 billion in the world while in Pakistan it is about 42 million. [6]. The industrial sector contributes 60,00000 people to this force [7]. Injury during work is one of the most important but preventable and modifiable occupational safety and health issues [8]. Injuries due to accidents have been known as one of the most common causes of disability and death in communities [9] of both developed and developing countries affecting people at all ages [10]. Injuries due to accidents often destroy families and devastate communities as the injured suffer life long disability, physical disfiguration and financial ruin[11].

World Health Organization (WHO) reported that accidents are responsible for about 3.5 million deaths throughout the world in each year [12]. Furthermore, a remarkable proportion of resources allocated to health care services are being paid to compensate the consequences of accidents [13]. During the year 1982 and 1991 there was a 13% increase in the number of registered factories, but a 49% decline in the total number of industrial accidents per 1000 workers. At the same time a 50% rise in the rate of fatal industrial accidents per 1000 workers was reported. The cost of job-related accidental injuries is much more than the costs of other known diseases such as cancers, cardiovascular diseases, Alzheimer and AIDS [14]. According to International Labor Organization (ILO), about 50 million job-related injuries happen throughout the world in each year and this is equal to about 16000 injuries in each day. There are clusters

of small industries In Shahdarah Town Lahore. These are Metal Press or Brake Press Works and all these small Metal Press industrial units are established at home. A day time industry serves as a bed room at night for the residents. Most of the machines are manually operated which involves all family members including children and women. There is a long list of Occupational accidents related injuries and among them small industries are seldom discussed. These accidents and incidents associated with metal press are not yet investigated and studied and certainly need attention.

This research work is primarily carried out in order to identify the major and minor work related injuries in small scale metal press industries of the Shashtra town and evaluating the cause of the injuries. There is no reported effort on the behalf of policy-makers or academics in Pakistan to address the problem of metal press work related injuries. In this paper we will analyze the available data and investigate these small medium enterprises randomly to make a case that metal press work related injuries are an important public health problem in the country. The objectives of this study are to present the profile of occupational injuries associated with metal press works in Pakistan and recommend strategies to further delineate this issue. This paper will evaluate workplace injuries with special emphasis on the metal press works related accidents. The intension of the injury, the risk factors, extent and the nature, cause and type of injury will also be evaluated as the data allows. It is hoped that this will provide a background for launching policy initiatives in Pakistan to manage the small medium enterprises issues. To our knowledge no such review has been reported in literature concerning occupational accident incident related injury investigation.

MATERIALS AND METHODS

A methodological review of published and unpublished literature was undertaken and occupational accident, incident investigation was carried out in randomly selected small scale metal press cottage industries of shadarah town Lahore. Published and unpublished documents including governmental reports, peer review journals and other literature such as occupational health and safety journals have been included as sources of information for this paper. A systematic walk through survey based on simple questionnaire checklist was conducted in the months of June to August, 2013. Unpublished documents were also obtained from the small medium enterprises's top management.

The analysis was helped by discussions with experts in government,

public health sector and non-profit organizations. Data were compiled and analyzed on spreadsheet using Microsoft Excel (Version 7.0).

The information and the data related to the work related injuries were collected from different working areas of metal press cottage industries of shahdarh town Lahore where the work related to occupational injuries were identified, verified and evaluated by using Hazard analysis technique, and accident / incident investigation technique and also interviewing with the workers of small medium in-house industries. For this purpose of study a total of 100 workers were interviewed for studying the personnel & occupational characteristics.

RESULTS

An exhaustive search revealed only a handful of articles with mention of Pakistan and any type of injuries. The data for work related injuries are tabulated by number of events and number of workers involved. Therefore the actual workers affected in these categories can be summarized. We

have used the most conservative ratio of one death or injury per event for the data presented below in Table 1, 2 and Figure 1. This may underestimate the deaths and injuries caused but provide a satisfactory assumption to state the impact of injuries at the minimal level in Pakistan.

Contact with rotating parts related injuries

The primary hazards of lathes are contact with rotating parts and contact at the point of operation. Operators' hands, clothing, or jewelry may be caught on the rotating parts and pulled into the machine.

The rotating chuck or drilling bit is not guarded to provide protection from flying particles. The rotating Point of operations injuries is very common in metal press workers.

Point of operations related injuries

Although most press brake operations do not require the operators to place their hands or any part of their body into the point of operation, exposure to point

of operation injuries still exists. Operating controls, especially foot pedals, introduce the possibility of accidental cycling. Press brakes can be guarded using presence

sensing devices, two-hand control devices, pull back devices or restraint devices. Injuries may occur if the operator is inexperienced, improperly trained or if the blade is not properly guarded. Avoid loose-fitting clothes and long hair that might become entangled in a power tool and remove rings, watches, neck chains and other jewelry. The major occupational

accidents observed during field study are the Crushed or amputated fingers in point of operation while feeding / holding / removing stock cleaning removing scrap, making adjustments / lubricating, accidentally stepping on foot pedal, bypassing safety guards or devices, having only one set of controls for multiple operators.

Table 1. Different types of injuries in small scale metal press industrial units

Tablica 1. Različiti tipovi nesreća u malim pogonima metalnih preša

Type of Occupational injuries.	Dicutting	Bending	Dicutting & Bending	Spring Works	Strip Cutting	Frequency of Occupational injuries.
Full Hand Chopped	1	1	3	0	2	7
Two or more fingers chopped	5	2	3	2	5	17
Thumb Chopped or 1-finger Chopped	6	5	5	3	4	23
Tip of the Finger Chopped	8	3	4	6	6	27
Accidents due to Flickering Metal Pieces	0	0	3	6	0	9

Table 2. Status of preventive measures being taken in the in-house industries

Tablica 2. Stanje preventivnih mjera ustanovljenih u kućnim pogonima

Preventive Measure	Frequency	Percentage
Better Machines	6	17.14%
Better Resources	10	28.57%
Better Care	8	22.86%
Better Attention	9	25.71%
Adopting Safety	2	5.71%

Maintenance or setup related injuries

During the process of metal pressing, maintenance or setup Individuals are injured while repairing/adjusting with power on, inserting/removing dies, tooling, operating

equipment without authorization, slipping and falling in the area around a press brake because of most of the workers do not wear the PPE (Personnel protective equipments).

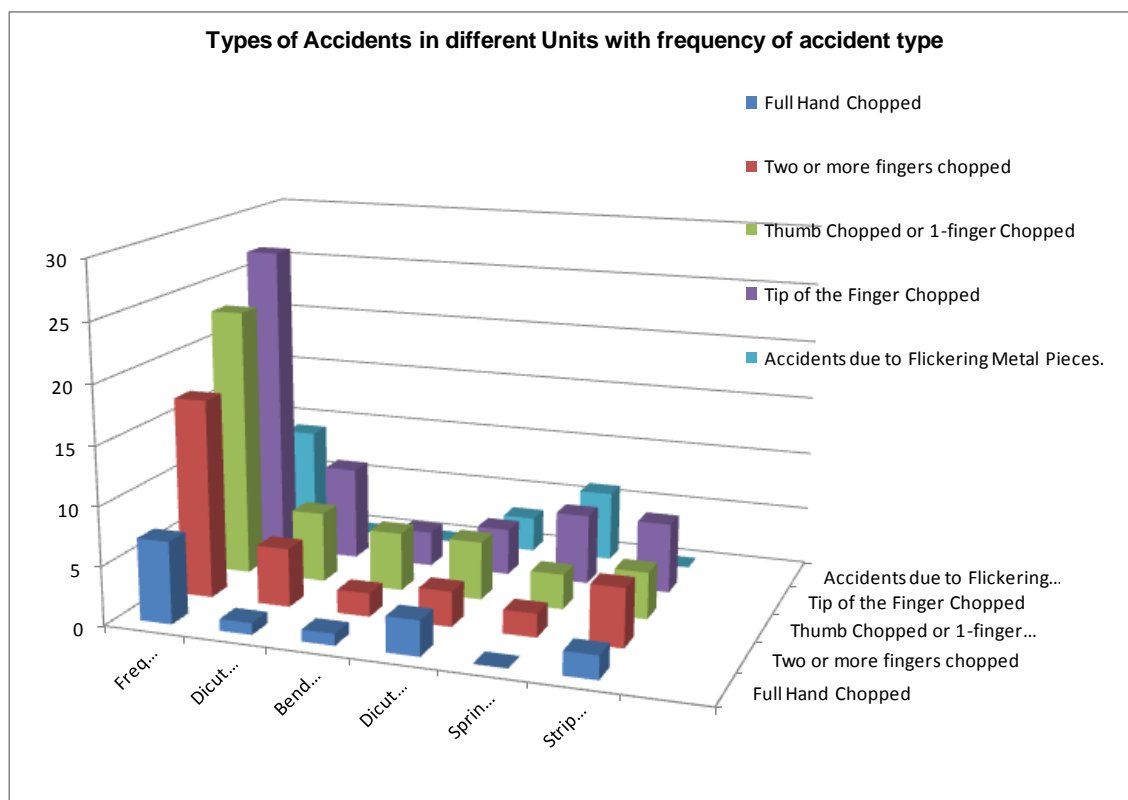


Figure 1. Graph showing frequency of injuries occurred in overall sections of the metal press industries of Shahdrah Town, Lahore

Slika 1. Učestalost nesreća u svim sekcijama industrije metalnih preša u Shahdra Townu, Lahore

Power transmission apparatus related injuries

The Power transmission apparatus hazards include all the components of the mechanical system which transmits energy to components. Types of energy transmission include flywheels, pulleys, belts, connecting rods, couplings, cams, spindles, chains, cranks, and gears are also cause of the occupational injuries. The hazards

created during the working conditions of machines include reciprocating, rotating, and transverse moving parts, as well as feed mechanisms and auxiliary parts of the machine are also the cause of major injury.

The piece of iron / steel. The contact injuries are mostly by grinders where workers have to hold the piece of metal

while the cutting edge of machine is revolving at its highest speed. The electric shocks are from any machine having electrical motor installed with its body.

Injuries caused by ejection of material are mostly from lathe Machines where piece of metal is treated for final shape. The small or large pieces are ejected by machine pierce the body of workers. All sorts of machines cause minor injuries while

workers are fatigued and are less attentive to work.

Major causes of the occupational injuries in overall metal press industries includes lack of knowledge, careless attitudes, Horseplay, working without authority, lack of ability to work properly, poor tools and equipment and mismanagement and poor maintenance, taking short cuts.

DISCUSSION

The cost of the injury can be measured in both financial and human terms [15]. An injury that is apparently minor and insignificant have a severe impact on both the company and the social life structure of the worker because the major source of earning for them is to work manually., when all related factors and implications are considered [16]. The after effects of the occupational injuries include the social & health problems which include mental strain, suffering, loss of earnings, extra expenditure, possibility of a continuing disability, possible loss of life, incapacity for some kinds of work , loss of leisure activities & effect on family, friends and colleagues. Injuries also affects the financial conditions of the injured worker & the industry as it cause loss of skilled and experienced workers, loss of production, loss of profit from injured workers, expense of re-training injured worker or a replacement, time lost by the effect on other workers and increased insurance premiums [17].

The major injury according to frequency of occurrence in different sections of metal press industries is the tip of finger chopped which has the highest frequency of occurrence. Secondly the thumb or finger chopped is the second highest injuries that occur in the metal press industries and the preventive measures to avoid these occupational injuries shown in the table 2 that only

2 workers (5.71%) have the knowledge to adapt safety measures. Remaining (94.29%) are still not in the favor of safety measures in spite of the fact that they have suffered from occupational injury due to unsafe working conditions. So there is dire need of safety guard measure for the machinery and training of the workers such that they should adopt safety measures and personnel protective equipments.

The number of industrial units has been steadily increasing in Pakistan [18] and this has not been accompanied by an enforcement of safety procedures. It is reasonable to assume that such situation would increase the risk of work related injuries. The available data, however, are controversial with a reported decline in total industrial accident rates but an increase in fatalities. This indicates that event reporting of all types of accidents needs to be improved and there is an urgent need for life saving safety standards in places of work. Increasing awareness and training of health providers to manage accidental emergencies and implementation of occupational health standards need to be considered [11].

The site workers are following the traditional methods of working on these machines which are of old make. They are not getting any formal training before starting the job. The workers do not use safety measures at work. It is surprising that

in spite of feeling the requirement for safety, almost all of them are reluctant to sue safety measure at work. No factory has provided any sort of safety appliances for the workers with the sole exception of gloves to 3 workers out of 100 of this cross section. They are exposed to occupational accidents due to non-availability and non-practice of safety measures. Most of the workers have suffered from injury while at work.

It is also concluded from the study that in spite of occupational injury the workers are still reluctant to use the safety measures. This means that there is some link missing for practice of safety among these workers. Even the few educated workers are not practicing the safety measures. Consequently they are exposed to risk at work. Occupational injuries are causing

CONCLUSION

It can be concluded from the study that most of the workers start their jobs in early age due to poverty which is the most important cause of involvement of family women in machine operations and production. Workers have low education and belong to poor socioeconomic class. They work long hours a day and have maximum exposure at the working place. They hardly enjoy any holiday for recreational activities. We recommend to create awareness of safety measures among workers of Metal Press Cottage Industry, Shahdara Lahore for eradication of occupational injuries Social Welfare Officer may be appointed in this area to educate the workers about the importance of adopting safety measures at work places or NGOs may be encourage educating workers to adopt safety measures.

thousands of death in Pakistan [19] although the exact number is difficult to gauge. These are often children, females and male workers of aged 13-60, causing widespread social and economic effects. Productivity losses when measured for the nation will be significant for the magnitude but more importantly because this is a preventable loss.

The interesting situation in Pakistan with respect to standards regarding occupational health and safety at work is that majority of the small medium enterprises are working without Health and Safety at work Act (HASAWA). It must be drafted, get approved and be implemented in its original spirit to eradicate the possibility of health hazards at working places. Good house keeping is necessary to prevent slip trip or falling accidents. [20].

Print, electronic media and advertising agencies may be used effectively to raise awareness level about the use of protective equipment among the workers.

Training and teaching courses for supervisors and employers may be started and should be made mandatory to all workers to educate and give incentives to workers regarding continuous practice who adopt safety measures.

They feel requirement of safety at work. Most of them have the knowledge of safety measures but their knowledge is poor. This poor knowledge is due to their low level of education. The workers learn by their experience and through self-awareness about safety. Print media and Govt. departments have not played any role in imparting knowledge to them about safety.

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