

Occupational Health Status of Saw Mill Workers in Central Kashmir

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Abstract: First of its kind study conducted in Kashmir showed that the workers remain continuously exposed to the risk of accidents and diseases especially respiratory illnesses and physical injuries. Majority of the workers acquired their skills and expertise from their practical experience during the job period. Further the personal protection devices such as earmuffs or plugs, hand gloves were either unavailable or if available used inadequately and often considered as irrelevant and disturbing. The study also revealed that no standard functional first aid boxes and fire extinguishers were available at the workplace, thus further increasing the chances of any health risk. Therefore the introduction and enforcement of safety health measures through training and regular inspection by the relevant agencies can help to further promote the adoption of safety among sawmill workers in order to safe-guard and maintain good health and wellbeing among them.

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Introduction

Human activities, especially their occupations are associated with several forms of hazards that can cause injuries and/or diseases in a dangerous manner, known as occupational hazards, the true extent of which is not clearly known as many occupational symptoms, injuries and diseases are neither notified nor registered (Balmes, 2003). The hazardous working condition which are responsible for diverse occupational hazards include working for long hours, working for long sitting sessions, extensive traveling, night duty and absence from home for several days or weeks. Occupational exposure occurs during the performance of duties and places a worker at risk of infection, disease, injury or accident. Occupational injuries alone account for more than 10 million disabilities or healthy years of life lost whether to disability or premature death and 8% of unintentional injuries worldwide (Goldstein et al., 2001). The exposure in a working environment comprise of mixture of potentially hazardous materials for instance, exposure to wood dust can at the same time result in an exposure to harmful biological pathogens like moulds and fungi and chemicals like formaldehyde used in preserving the wood (Ndejjo, 2015). Sawmilling, the process of breaking down of timber into further different sizes of boards after passing through various machines in the sawmill plant (Smith, 2004) involves a number of workers and these workers are grouped into machine operators, saw technicians, dust packers, overseers, wood loaders, machine off loaders and administrative staff with different duration of exposure to wood dust at the workplace (Egan et al. 2007). The operations of

wood processing industries are generally associated with high level of occupational hazards with consequent health risk among workers (Annan, 2015). Hazards in various occupations in wood processing industries include dust, noise, electric shock, chemicals and vibration hazards which may be encountered in work with pneumatic tools such as drills and hammers. The occupational hazards in wood processing industries could be managed through the process of planning, organizing and coordinating wood processing activities (Ajayi and Ayodele, 2002) and everybody working in the industries has a duty to protect himself and others from hazards arising from various operations being performed (Oguntola, 1992).

Therefore, assessing knowledge of hazards among sawmill workers would be cardinal in providing promotive, preventive, curative and rehabilitative occupational health services to sawmill workers and it was in this backdrop that this study which was first of its kind in Kashmir is expected to contribute or help to improve the knowledge of the sawmill workers on various hazards associated with the wood dust and ways to reduce their exposure to these hazards by the use of occupational safety equipment. The baseline data generated from this study will help policy makers to develop guidelines to regulate operation of sawmill industries in Kashmir valley.

Methodology

Background information on study Area

Given the enormous forest wealth, which as per the interpretation of satellite data of 2006-07, is 22686

Km², constituting 10.21% of the states geographical area. Due to huge population pressure and an increasing demand of construction wood, an extensive network of saw mill industries (Table 1) have been installed in the Jammu and Kashmir state, thus making it convenient for a large number of people to work in these industries as laborer, operators and machine drivers etc.

Instrument for Data Collection

A structured questionnaire framed by modifying questionnaires from various sources (Weel and Fortuin, 1998; Muthuviknesh and Kumar, 2014; Susitaival et al., 2003) consisting of 69 items was administered to 100 respondents of different saw mill workers of Srinagar and Budgam districts. The questionnaire comprised of six sections (A to E) on Socio Demographic data, Posture and Movement, Safety and Hygienic practices, Factors at workplace, and Safety and Management services.

Study Population.

The study population comprising all males within different age groups ranging from 15 to 60 years and above, who are at risk of occupational exposure to various hazards, especially those directly involve in wood milling processes were subjected to survey.

Data Analysis

Data generated was collected and analyzed using statistical packages for social sciences (SPSS version 20.0) and results calculated in percentages.

Results

The demographic data (including the age, educational status, job duration and training received) of the workers (Table 2) indicates that the majority (38%) of the respondents were above the age of 44 years followed by (31%) workers in the age group of 35-44 years, (20%) in the age group of 24-34 years and (11%) of them in the age group of 15-24 years with all of them as males. As per the work status of the workers, 48% of them were operators, followed by 38% helpers and 14% masters. Based on the duration in their respective jobs it was also observed that about half of the workers (53%) were in their respective jobs for a period of 1-10 years, followed by 30% of those who were in the job for 11-20 years, 9% who were in the job for 21-30 years, 4% each in the jobs for more than 30 years or less than 1 year. As a prerequisite for the occupational safety of the workers it is basically imperative to receive a proper training course before taking up any job as an occupation and based on the same it was observed that 59% of the workers in the current study had received the required training while 41% of the workers had taken the job without receiving any proper training course, thus making a huge chunk of these workers more and more susceptible to the respiratory disorders and other types of damages and injuries.

Though a number of ailments including general respiratory problems, neck pain, muscular pain, fatigue and injuries occur to different body parts in the workers, the health problems experienced by the sawmill workers in the current study (table 3) revealed that a major proportion of them (63%) suffered general respiratory problems like coughing, wheezing, sneezing etc. while as a least percentage (37%) didn't experience any respiratory problems. Evaluation of the respiratory risk rate evaluated with respect to age, job duration, and smoking habits of the workers showed that the workers above 45 years of age had high risk rates (76.31%) followed by the workers in the age group of 35-44 years with a risk rate of 67.74%. Workers in the age group of 25-34 years were with a respiratory risk of 40% and those in the age group of 15-24 years were seen to possess a risk rate of 27.27%. Respiratory risk rate by job duration (Table 4) showed that workers with a job duration range of 21-30 years are at a higher risk (88.88%) of respiratory problems followed by those with job duration of 11-20 years with a risk rate of 76.66%. Workers with job duration of less than a year had lowest risk rate of 40%, while as workers above 30 years of job duration had 75% of respiratory risk rates.

As smoking is normally a precursor of many mild to serious respiratory ailments, here in the study we tried to observe a combined (synergistic) effect of the smoking habit of the workers along with the dust, they are exposed to during their regular course of jobs. Respiratory problems on the basis of smoking habits were prevalent in a higher proportion of workers compared to the non-smoking workers (Table 5). 75% of the smoking workers where the sufferers of different kinds of respiratory problems, while as in case of non-smoking workers the percentage of respiratory sufferers was only 52%, inferring that the smoke and sawmill dust has a prominent effect for the generation of respiratory problems.

Personal Protective Equipments (PPE's) like masks, helmets, goggles, gloves and others etc. are an essential part vis-à-vis the maintenance of occupational safety in general in any type of industry and in particular in a sawmill. But the use or non use of these PPE 's by the sawmill workers depends upon various factors like the availability or non availability of these equipments in the unit, awareness of the workers and even the availability of any strict norms for the use of these equipments by the workers in the industry.

A detailed account of the use of PPE's, frequency of the use, type of PPE used (Table 6) and reasons for using or non-using of these PPE's etc. shows that the majority of workers (86%) were not using any PPE while as a least percentage (14%) of workers were having the knowledge of the PPE and hence using

them. In the workers the frequency of use was either rare (35%) or frequent (64%) with none of the workers using it always. 92.8% of the workers were seen to use masks as the only PPE's thus making it the most frequently used PPE while only a single worker used eye goggles. The most frequently stated reasons for non-use of PPE by the workers were inconvenience (70%), followed by non-affordability (24%) and non-necessary nature of the equipments (6%). Among the safety and hygienic practices, it was observed that in 95% cases the workers don't sprinkle water to settle down the dust generated by different operations in the unit, thus rendering themselves to a greater risk of respiratory infections. Another dimension of occupational safety and standard in the units displayed by the availability of the fire extinguishers and first aid boxes revealed that all the 100% workers denied the presence of any such equipments or first aid facilities in their respective units thus rendering them susceptible to a greater risk of being hit by any of the emergency at any point in time during their working tenures.

Body injuries to the workers operating different machines in a sawmill is almost an integral part of their occupations. But this usually happens due to the mishandling of the machines and machine related work. The present work carried vis-à-vis the observance of different types of body injuries to the sawmill workers (Table 7) showed a total of 31 injury cases among the surveyed workers. Of these most of the workers 26 (83.8%) were having injuries in their fingers and hands, followed by 4 (12.9%) workers with arm injuries and 1 (3.22%) worker with back injury. The most common cause responsible for the injuries was found to be the milling of circular saw, as it was responsible for all the hand and finger injuries followed by the log movement responsible for 12.9% injuries and log movement to mills responsible for a least of 3.22% injuries. The prevalence of injury during log movement and feeding into the machine were found out to be as a result of the manual work done by a group of workers.

Discussion

The study that was focused on the occupational health status, occupational hazards, the effects, safety and hygienic practices of sawmill workers in Srinagar and Budgam districts of Kashmir valley studied different socio-demographic parameters like age, educational status, work status, job duration and received training of the respondents. The timber workers (all male) within the age group of 15-70 years with a majority to be above 44 years which is not unusual in case of the wood work in a sawmill, as the work requires a high degree of manual labour more effectively carried out by younger adults; and the same

was observed in a study in Ghana and some Nigerian studies. The results were in a simple consonance with the study of Osuchukwu et al. (2015) who observed the timber workers to be predominantly male with majority of above 40 years of age. These findings tend to prove that, work in the sawmill industry demands a lot of physical strength for its execution and for that matter, males are more preferred and are therefore more likely to be employed to do such jobs, as compared to their female counterparts. The educational qualification of more than half of the respondents in the studied population that was either primary or secondary level of school education was similar to the findings of Awoyemi (1997), who found the secondary school level as the major educational qualification among sawmill workers. The rest half (49%) had no formal education at all and may be for the fact that the labour force working in sawmills need not to be educated as they don't need to carry out any specialized, mechanical work. These findings may not be surprising as about (41%) of workers were unskilled (helpers) who only required apprenticeship to carry out their job and almost about more than half of the workers (59%) have received training through apprenticeship to carry out the work in a more professional manner confirmed by the findings of Sabitu et al. (2009) who found that all the workers of their study received training through apprenticeship.

Coming to the main motive of the study i.e. to study the problems associated with the workers, the majority of workers (63%) in this study complained of respiratory problems with symptoms like running nose, cough, sneezing, wheezing, breathing while some complained of skin irritation like rashes, and continuous itching as it is a proven fact that most frequent pulmonary symptoms among sawmill workers are running nose, and sneezing due to exposure to sawdust (Ige and Onadeko, 2000). Occupational respiratory risk rate by year of experience per 100 among sawmill workers is likened to prolonged and repeated exposure to sawdust which leads to symptoms like fever, headache, weakness after working hours. Respiratory risk rate with respect to age of workers showed that workers above 45 years of age are at a higher risk (76.31%) compared to the rest of the worker age groups which may be as a result of developing tissues and immune system in children and aging of tissues in older people, which may make their immune systems compromise as they get older, thus cannot protect them from the occupational hazards associated with sawmill industries (Akinyeye et al., 2013). Risk rate of respiratory irritation with respect to smoking, among sawmill workers displaying the smokers to be at a higher respiratory risk rate than non smokers is consistent with the study of Zock et al. (2001) who observed that the Occupational exposure

to wood dust leads to increased risk of chronic bronchitis (cough and phlegm production) being more pronounced in smokers. Chronic bronchitis is more prevalent among smokers than non-smokers (Li et al. 1990; Liou et al. 1996).

The lower use of PPE by the sawmill workers and if used, their confinement to masks only on a major scale, based on a few factors like their inconvenience during the course of work, their unaffordable nature due to higher costs and their non-importance due to the reasons like over confidence and lack of vision may be attributed to the reasons cited above. As a similar study conducted by Osagbemi et al. (2010) on awareness of occupational hazards, health problems and safety measures among sawmill workers in Nigeria also identified that the use of PPE was very low with 56.9% of the respondents never using any PPE at all, while only 15% always use protective devices during the working. Similarly some reasons given for not using the devices were the non-availability of the devices by the employers, non necessary nature of the devices, inconvenient use of the devices or forgetfulness to use. There was a simple and straight concurrence between our observation and the observation of Osagbemi et al (2010) with respect to these PPE's. Similarly Ochire-Boadu et al. (2014) reported the inadequate supply and discomfort during work as the main reasons for the low or no use of PPE's. Ali et al. (2012) however reported the unwillingness to wear face shields probably due to discomfort and willingness to wear hand gloves and coat overalls probably influenced by their awareness.

Exemplifying a very poor safety level in the sawmills by the total absence of fire extinguishers, lack and non-use of first aid boxes, and the use of hospitals in the event of any eventuality, the lack of safety levels further compounds the consequences of the low prevalence of correct and consistent use of PPE's amongst the workers which is in consistence with their low prevalence especially in developing countries reported in various studies (Ochire et al. 2014). The unhygienic practices like eating inside the workshops and other such practices further deepens the risk of diseases and accidents in the work place as occupational illnesses normally develops over a period of time because of the poor hygiene and sanitary conditions of the work environment.

Fingers, hands, upper/lower back were the usual injury affected organs found in the workers and the same may be attributed to the proximity of these body organs to the specific tasks in the mill site. Frequent injuries to the fingers and hands, may be attributed to the movement of circular saws, while as injuries to the upper/lower back may be attributed to the awkward bending to lift the heavy logs, reaching for far objects and working on low log tables leading to skewed

postures, thus developing lower back disorders as witnessed by Bello and Mijinyawa (2010).

The study also revealed the workers response to the health concept and safety rules for operating sawmills thus showing that no preference is given to basic training in work safety during operations as none of the workers had attended any safety training during their job periods. The knowledge acquired was based on the apprenticeship training and experience gathered in the job. In some cases, many entered the industry as traders but not as a trained wood industry worker with requisite professional knowledge which result in the exposure of the workers to some untold level of hazards. During log loading, a number of workers often induce themselves to conveyor pushing, rolling heavy green logs into the saw table which often leads to accumulated stress thus causing lower back injuries and other health hazards. On-site observations showed that little attention was paid to the use of individual protection devices such as wearing of earmuff or plug, wearing of hand gloves during movement and stacking of logs or sawn lumbers or operating of machines. The results of the current study are in agreement with a study conducted by Bello and Mijinyawa (2010).

Conclusions

From the study it can be concluded that the Majority of the workers in sawmill industries acquired their skills and expertise from their practical experience during the job period as the professional knowledge regarding safety approach of their work are lacking. Inadequate attention is given to safe work environment and organization as there is non-availability of appropriate tools to carry out effective routine maintenance. Exposure to sawdust has deleterious effects on work related respiratory symptoms and lung function impairment which could further be enhanced by the age of worker, smoking and years of working at the saw mill. There is an enhanced need for proper education of the relevant hazards, their associated PPE, hygienic practices and consistent use of the different protective devices. Further the introduction and enforcement of safety health measures through training and regular inspection by the relevant agencies can help to further promote the adoption of safety and hygienic practices among sawmill workers in order to safe-guard and maintain good health and wellbeing among them.

Ethical Approval:

Although no medical procedures were done on the human participants, the survey was done in accordance with the ethical standards of Institutional Ethics Committee (IEC) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Verbal consent was taken from the participants prior to the interviews and use of

questionnaires. Participants were informed of the data collected will be used in the compilation of dissertation and later publication.

Table 1. Statistical data of saw mills in Jammu and Kashmir State

S.No.	Number of Band Saw/ Saw mills	Kashmir	Jammu	Total
1	Licensed Saw mills/Band saw mills	2103	517	2620
2	No. of Saw mills/Band saw mills falling outside 8kms of demarcated forests	144	16	160
3	No. of Saw mills/Band saw mills falling within 8 kms of demarcated forests	1959	501	2461
4	No. of Saw mills/Band saw mills made nonfunctional, which were running unauthorized	748	109	857

Note: Further registration of saw mills has been stopped w.e.f. 15.02.1997 vide Forest Department endorsement No: FST/lease/60/96 dated 15.02.1997.

Table 2. Socio Demographic Characteristics of the Worker population

Variable	Age (yrs) and Educational Categories	No. of Workers	Percentage
Age	15-24	11 (11)	11%
	24-34	20 (20)	20%
	35-44	31 (31)	31%
	>44	38 (38)	38%
Educational Status	None	49	49%
	Primary	9	9%
	Middle	11	11%
	Secondary	23	23%
	Above	8	8%
Duration on the Job	<1	4	4%
	1 – 10	53	53%
	11- 20	30	30%
	21- 30	9	9%
	>30	4	4%

Table 3. General Respiratory Problems seen in the Workers

Variable	Category	Frequency	Percentage
General respiratory problems (cough, wheezing, breathing etc.)	YES	63	63%
	NO	37	37%

Table 4. Job Duration related Respiratory Risk Rates

Job Duration	Workers Studied	Reported Cases	Percentage
<1	5	2	40%
1-10	52	27	51.92%
11-20	30	23	76.66%
21-30	9	8	88.88%
>30	4	3	75%

Table 5. Age Group and Smoking Habit related Respiratory Risk Rates

Age Group/ Smoking habit	Workers Studied	Reported Cases	Percentage
15-24	11	3	27.27%
25-34	20	8	40%
35-44	31	21	67.74%
≥45	38	29	76.31%
Smokers	62	47	75%
Non-smokers	38	20	52%

Table 6. Personal Protective Equipment (PPE) used by the Workers

Variable	Category	No. of Workers	Percentage
PPE used	Yes	14	14%
	No	86	86%
Frequency of PPE used	Always	0	0
	Frequently	9	64%
	Rarely	5	35.7%
Type of PPE used	Mask	13	92.8%
	Helmet	0	0
	Eye goggles	1	7.2%
	Ear plug	0	0
	Others	0	0
Reasons for not use of PPE	Forget to use it	0	0
	Can't afford it	24	24%
	Inconvenient	70	70%
	Not a necessity	6	6%
Sprinkle water before sawing wood	Yes	5	5%
	No	95	95%
Availability of first aid box	Yes	0	0
	No	100	100%
Availability of fire extinguisher	Yes	0	0
	No	100	100%

*percentage & no. Of all column & rows is out of a total of 14 workers using the PPE 's

Table 7. Body Injuries Due to Sawmill Tasks/Operations

Body area affected	Log transport	Moving logs to mill	Milling circular saws	Total injuries among 31 workers (%)
Back and low back	0	1	0	1(3.22%)
Arm	4	0	0	4(12.90%)
Hand and fingers	0	0	26	26 (83.87%)
TOTAL	4	1	26	31(31%)
Injury among 31 workers/%	12.90%	3.22%	83.87%	

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Conflict of Interest

We declare that we do not have any conflict of interest

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