

## Occupational health in small scale and household industries in Nepal: A situation analysis

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### Abstract

**Introduction:** Making working conditions safe and healthy is the interest of workers, employers and the Government. Although it seems simple and obvious, this idea has not yet gained meaningful recognition in Nepal.

**Materials and methods:** The study was conducted in ten small scale industries of Kathmandu valley. Altogether 545 questionnaires on socioeconomic and occupational history were filled up. Similarly, Workplace Occupational Health Assessment was done in all ten industries. A thorough medical examination of 135 child workers was done using a structured questionnaire to find out the health effects due to occupational hazards.

**Results:** Out of the total 545 workers present in the industries under study, 135 (24.8%) were child workers. Higher proportion of child workers (97%) was illiterate compared to 3% of children with primary level education. Among the child workers, 23 (17%) were girls. The majority of the child labourers were suffering from conditions like otitis externa, otitis media, scabies, anaemia, upper respiratory diseases, nasal problems, abdominal pain etc.

**Conclusion:** The occupational health and safety practices in small scale industries in Kathmandu have been found to be unsatisfactory. Child labour is a serious problem. Out of ten industries, six have employed child workers and the working conditions range from bad to terrible. Health and welfare of the child workers was also not satisfactory.

**Key words:** Situation Analysis, Occupational Hazards, Occupational Health and Safety, Small Scale and Household Industries, Child Labour, Kathmandu, Nepal

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The industrial revolution paved a new highway for charting newer territories and defining development in a newer perspective. The mechanization of work and human inputs requirements enabled human to explore newer horizons and newer dimensions. Although, human cherished desire has been fruitful to an extent the back log of industrialization, altered work behaviour and changing trends have resulted in newer phenomena of occupation related hazards. The sustainability and continued development of industrialization requires increased production and enhanced productivity, which also requires safe work and working conditions. Though these factors should have been a prerequisite, they are often neglected in our contemporary society. Its pertinent effects make human work force susceptible to various work related adversities. The situation is worse in the small scale and household industries.

Small scale and household industries (SSHI) employ on average nearly 40% of the workforce in the industrialized countries and up to 60% of the workforce in developing and newly industrialized countries.<sup>1</sup> SSHI are gaining importance in national economies. They are employment-intensive, flexible in adapting

to rapidly changing market situations, and provide job opportunities for many who would otherwise be unemployed. Their capital requirements are often low and they can produce goods and services near the consumer or client.

The workforce of SSHI is characterized by its diversity. SSHI provide entry to the world of work for young people and meaningful activities to elderly and redundant workers who have been separated from larger enterprises. As a result, they often expose such vulnerable groups as children, pregnant women and the elderly to occupational health risks. Further, since many SSHI are carried out in or near the home, they often expose family members and neighbours to the physical and chemical hazards of their workplaces. Like all other aspects of SSHI, their working conditions vary widely depending on the general nature of the enterprise, the type of production, the ownership and location.

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In general, the occupational hazards are much the same as those encountered in larger enterprises, but as noted above, the exposures to them are often substantially higher than in large enterprises.

Although very few studies have been reported, it is not surprising that surveys of the health of workers in SSHI in such industrialized countries as Finland<sup>2</sup> and Germany<sup>3</sup> have disclosed a relatively high incidence of health problems, many of which were associated with lowered capacity for work and/or were work-related in origin. In the SSHI in developing countries an even higher prevalence of occupational diseases and work-related health problems has been reported.<sup>4</sup>

Thousands of toxic chemicals used in SSHI pose serious health threats potentially causing cancer, respiratory and skin diseases as well as adverse effects on reproductive function.<sup>4,5</sup> Workers are exposed to hazardous chemical agents such as solvents, pesticides and metal as well as vegetable and mineral dusts.<sup>6,7</sup> The risk of cancer from workplace exposure is of particular concern. The most common occupational cancers include lung, bladder, skin and bone cancer, leukaemia and sarcomas. Though it is very difficult to achieve information about details concerning carcinogens in the industries in Nepal, there seems to be a large number of workers who are exposed to different carcinogens in a large number of industries and the incidence of cancer is thought to be increasing every year.<sup>8</sup> In a case control study done in Nepal, a high risk (OR 4.2 CI: 1.4, 12) for lung cancer was found among the workers, who have worked in the exposed occupations like agriculture, construction of buildings, construction of roads and bridges, manufacturing, and transport.<sup>9</sup>

This study is a pioneering event in analysis of Occupational Health and Safety (OHS) in the industries in Nepal. The concept of OHS is new even to the oldest industries of Nepal. Though there have been some studies in relation to different industrial aspects specific studies on working conditions, occupational health and safety have not been conducted, except in the jute industry of Nepal. Thus many industries, which are prone to health hazard or many problems of OHS is yet to be studied. The lack of Procedural Guidelines to analyse occupational health risks in the industries is another setback in the field of occupational health risks management in Nepal.

The objectives of the study were to assess occupational health risks focusing more towards children in the selected SSHI in Kathmandu valley and identification of procedural guidelines to analyse occupational health risks in SSHI.

## Materials and methods

This study was conducted in ten SSHI of Kathmandu valley; the industries were randomly selected from the list of the industries prepared by the researchers during the preliminary survey. The preliminary list contained the name of the registered SSHI located inside as well as outside the industrial estates. All industries were assigned numbers and ten numbers were randomly picked up by a person not related to the study.

The respondents (545) were given a brief orientation on the nature and purpose of study; the information seeking procedures were initiated by receiving prior consent from the respondents and assuring them that their personal details would be concealed. However, they consented to publish their photographs in the article. The procedures and methods used for study were limited to personal interviews, health examination of the child workers and occupational health risk assessment using an assessment form developed by Harrington JM et al.<sup>10</sup>

The health check up for 135 children less than 16 years of age was performed by a qualified physician to diagnose the ailments of child workers. The questionnaire used for health check up was a modification of the questionnaire by Shukla and Trivedi<sup>11</sup> which was used by them to determine the exposure assessment to environmental pollutants in Delhi. During health check up, general vital indicators, skin, eyes, ENT organs, chest, abdomen and extremities were examined thoroughly. Similarly, information was gathered on subjective complaints of the child workers associated with different psychological and physical effects possibly induced by the work processes.

The information collected was recorded and analysed using SPSS 10.0 version. The procedural guidelines developed to analyse occupational health risks were based on the trends established around the globe in assessing OHS. Intense discussion was carried out with the managers of those industries and other resource persons on OHS to design the guidelines that fit the local conditions. The study has been conducted from December 2004 to December 2005.

## Results

The result of this study was based on the findings from 545 respondents including 135 child workers from 10 different small scale/household industries. The industries selected for study were as follows:

1. Metal industry
2. Paint (Coating) Industry
3. Tent industry
4. Drinking water bottling plant

5. Brick kiln
6. Stone crusher plant
7. Construction industry
8. Embroidery industry
9. Instant noodle industry
10. Carpet industry

Results on occupational health risk assessments of the studied SSHI are not presented here in detail.

#### **Results on socioeconomic survey**

Important baseline characteristics such as gender, education level, monthly income, alcohol drinking and smoking habit of the overall workers in all ten industries have been compared.

Table no. 1 shows the distribution of male and female workers along with the number of child workers within them and their working period in different industries.

A high proportion of the child workers (97%) was illiterate and only 3% of the children had a primary level education. Among the child workers, 23 (17%) were girls. The monthly income of the workers was less than five thousand rupees in the majority of the industries under study, except in the metal, paint, drinking water bottling plant and carpet industries. The majority of the workers in brick kiln, stone crushing, construction, embroidery and carpet industries were illiterate with higher number of workers with secondary level education in the drinking water bottling plant and instant noodle industries.

Alcohol drinking habits were habitual among a large proportion of workers. The majority of the workers were daily drinkers.

#### **Results on health check up of the child workers**

The figure 7 shows the prevalence of different health outcomes / diseases among the child workers. Except for lower respiratory tract infection (LRI), the prevalence of all selected diseases was found to be high. The highest prevalence (53.3%) was found for ear problems, whereas 49.6% were suffering from other diseases (e.g. scabies, anaemia, and pin worm infestation) and 38.5% from upper respiratory tract infection (URI) respectively. Also 37% of the respondents had nose problems.

The Table no. 2 shows the prevalence of different health outcomes/diseases among the child workers from different SSHI. Subjective complaints of the child workers related to different psychological and physical effects induced by the work processes are shown in the Fig 8. The major health effects induced by the physical work were observed as fatigue, general body ache, headache, irritation, weakness, sleep disturbance and depression.

#### **Results on the preparation of procedural guidelines to analyse occupational health risks**

The procedural guidelines developed mainly focuses on situational analysis, and identification of hazards. The guidelines identified include followings sequential analysis as walk through survey, identification of hazards, sampling, health assessment, occupational history recording, biological effect monitoring and review of medical records. (Table 3)

**Table 1:** Distribution of workers in the industries under study and their working period

List of Industries	Number of adult workers		Number of child workers	Exposure period (in hours)
	Male	Female		
Metal Industry	28	2	10	8 – 12
Paint industry	25	0	0	8
Tent industry	32	28	0	8
Drinking water bottling Plant	36	12	0	8
Brick Kilns	45	33	35	10
Stone Crushing Plant	35	32	25	10
Construction Industry	42	5	15	8
Embroidery Industry	32	0	18	8 – 18
Instant Noodle Industry	40	32	0	8
Carpet Factories	30	56	32	10



**Fig 1:** Metal casting work without protection.



**Fig 2:** Grinding and polishing of metal.



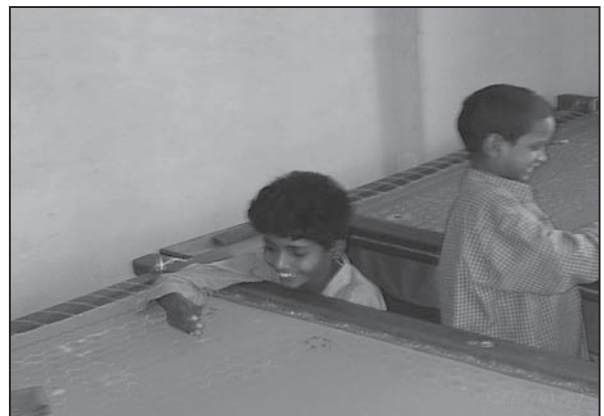
**Fig 3:** Chemical burn



**Fig 4:** Stone crusher plant.



**Fig 5:** A child worker carrying bricks.



**Fig 6:** Child workers doing embroidery work

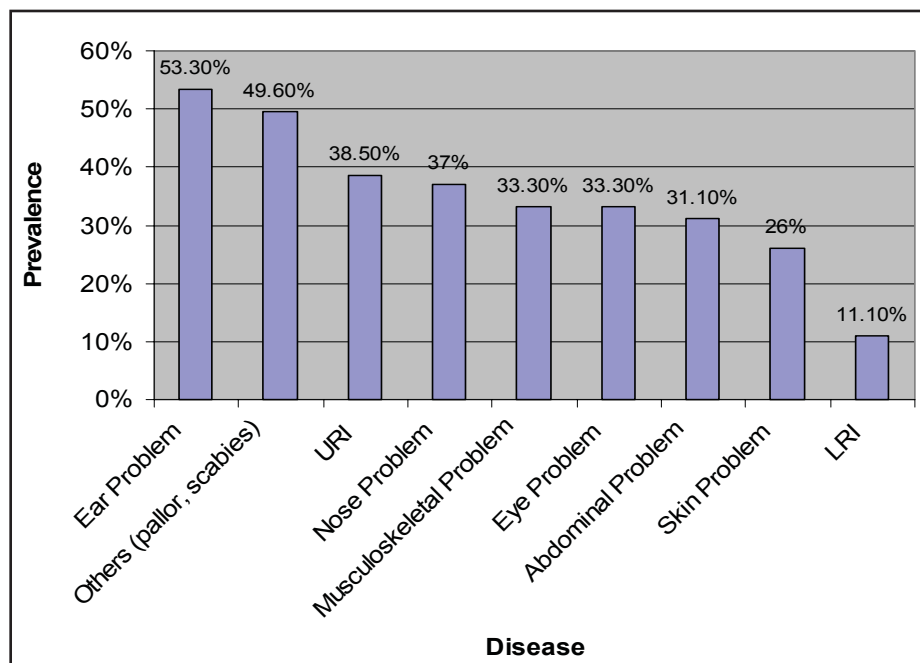


Fig 7: Overall prevalence of health problems among child workers in all industries

Table 2: Cumulative Frequency Distribution of Health Outcomes/Diseases among child workers in different industries

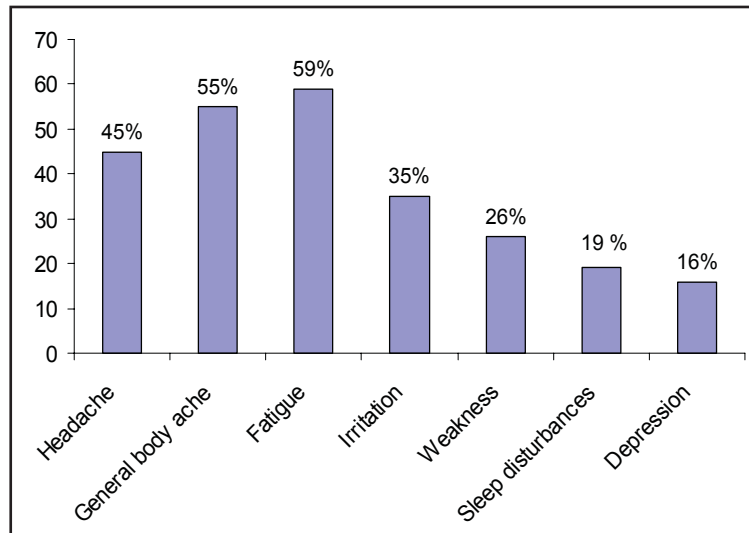
S.N.	Diseases	Frequency (%) in different industries						
		Metal (10)	Brick Kiln (35)	Stone Crusher (25)	Construction (15)	Embroidery (18)	Carpet (32)	Total (135)
1	Eye Problem	3 (30%)	16 (45.7%)	12 (48%)	0	7 (39%)	7 (22%)	45
2	Ear Problem	5 (50%)	20 (57.1%)	10 (40%)	10 (66%)	9 (50%)	18 (56%)	72
3	Nose Problem	5 (50%)	22 (62.8%)	12 (48%)	7 (58%)	0	4 (12.5%)	50
4	URI	2 (20%)	17 (48.6%)	15 (60%)	3 (20%)	0	15 (47%)	52
5	LRI	0	4 (11.4%)	6 (24%)	0	0	5 (16%)	15
6	Skin Problem	7 (70%)	18 (51.4%)	6 (24%)	4 (26%)	0	0	35
7	Abdominal Problem	1 (10%)	7 (20%)	9 (36%)	0	15 (83%)	10 (31%)	42
8	Musculoskeletal Problem	2 (20%)	10 (28.6%)	12 (48%)	5 (33%)	0	16 (50%)	45
9	Other problems *( pallor, scabies)	1P (10%)	10 P (28.6%)	12 P (48%)	0	12 P (67%)	7 P 25 S =32 (100%)	67

\*P: Pallor (anaemia) S: Scabies

**Table 3:** Summary of Procedural guidelines for assessment of occupational health risk in small scale and household industries

Assessment Tools	Variables
1. Walk-through surveys	Go to the workplace and see yourself what people do and how they do that. It is common to use a walk through checklist*
2. Identification of Hazards	Reviewer's senses (sight, smell, sound, taste, touch), review work process in detail, consult hazardous material data sheet
3. Sampling (Exposure assessment)	<ul style="list-style-type: none"> <li>• Why sample?</li> <li>• What to measure?</li> <li>• How to sample?</li> <li>• Whose exposure should be measured?</li> <li>• Where to collect the sample?</li> <li>• When to measure?</li> <li>• How long to sample for?</li> <li>• How often to sample?</li> <li>• What to do with the data?</li> <li>• What to record?</li> </ul>
4. Health Assessment	Symptoms review, clinical examination, differential diagnosis and laboratory or physiological tests
5. The Occupational History	<ul style="list-style-type: none"> <li>• Job title</li> <li>• Description of task / duties within the job title</li> <li>• Employer and nature of the industry</li> <li>• Duration of employment in each job</li> <li>• Hours of work, including over time and shift work</li> <li>• Exposure to occupation hazards</li> <li>• Provision and use of personal protective equipment</li> <li>• Sickness absence, especially for work related diseases or injury</li> </ul>
6. Post sickness absence review	Ensure that the person has no residual effects from the cause of the sickness absence
7. Medical surveillance for group at risk	Periodic medical/ physiological assessment of exposed workers, with a view to protect and prevent occupationally related diseases.
8. Biological monitoring and biological effect monitoring (BEM)	Analysis of biological samples for the presence of a chemical or its metabolite
9. Review of medical records	Pre-employment questionnaire, Occupational history information, Visits to the occupational health department / clinics or hospital and the reason and outcome of the visits, Results of physiological tests, Results of other laboratory investigations, Immunisation records including vaccination for specific protection against occupational infections, Communications and reports from family physicians or hospital doctors, nurses providing treatment to the workers.

\* Checklist for the walk through survey should be developed independently for each industry depending upon the nature of work processes and available occupational hazards



**Fig 8:** Subjective complaints of the child workers

### Discussion

The study revealed that the OHS situation in the selected industries of Kathmandu valley was quite bad. Most of the industries were found to be profit oriented and they had low expenses and provision for OHS. Although reported events of accidents were common in the industries, very few have been taking any preventive measures. The use of personal protective equipments was almost negligible. Only two among ten industries have exposed their workers to OHS through training and awareness programs.

The children working as a labour force in these industries are the result of various intervening factors as social injustice, economic exploitation, deprivation and illiteracy. The constant poverty, unemployment and lack of basic needs in the rural areas force the parents to send their children to work in the cities for additional income for family subsistence. The recent political instability, Maoist insurgency has also triggered the incidence of child labour in Nepal. Children are favoured among the employer as they are a cheap source of labour, weak, fragile and uncomplaining.

The socio-economic analysis of the workers presented age structure, sex ratio, income level, educational level among major indicators. It was found that male workers largely dominated the industries and a majority of the workers had completed their primary education. Illiteracy coupled with lesser access to organised labour posed serious threat to workers with increasing susceptibility to occupational health hazards. The income range of the workers dominated in the range of NRS. 5000/- per month

The prevalence of eye problem was very high among the child workers from stone crushing (48%) and brick kiln (45.7%) industries. Availability of excessive amount of dust in those industries might support the evidence. Surprisingly, there was no case of eye problem in the construction industry. Suffering from ear problems was very significant in almost all types of industries, being highest in the construction industry (66%). Lack of personal hygiene might be a cause for wax in the ear and otitis externa.

The prevalence of skin problems like eczema and dermatitis was highest among the child workers in the metal industry (70%) followed by brick kiln industry (51.4%), which could be explained by extensive contact with irritant chemical substances and brick dust respectively in those industries. There were no skin problems in the embroidery and carpet industries.

The prevalence of LRI is relatively low compared to other diseases, stone crushing industry being at the top (24%). Similarly, URI, abdominal problem and musculoskeletal problem were highest among the children working in stone crushing (60%), embroidery (83%) and carpet (50%) industries respectively. The prevalence of pallor was also very high among the children working in the embroidery industry (67%). This finding was highly suggestive of intestinal worm infestation, which could also be the main reason for the abdominal problem. Out of 32 child workers from the studied carpet industry, 25 children were suffering from scabies, which would reflect their very poor personal hygiene and environmental sanitation.

The child workers involved in the study have considered different occupational hazards as the cause of various health problems. Though they were not aware about the types of occupational hazards, they considered “hard work” as the root cause for various conditions like fatigue, general body ache, headache, irritation, weakness, sleep disturbance and depression. Similar health effects and self reported health problems were also found in other similar studies.<sup>12,13</sup>

OHS in SSHI has not yet received attention in terms of research or support for preventive initiatives even in the developed countries. Such industries are facing serious problems due to limited access to human, economic and technological resources.<sup>14</sup> A study done in China reported that approximately 83% of the surveyed small scale industries had at least one occupational hazard.<sup>15</sup>

OHS has never been a major issue of government, production houses or the industries nor have it been a concern at the general public level. Although the practice of OHS has been enforced by various legislations and international deceleration, Nepal has not been able to follow up to that. The precarious labour conditions, absence of safety measures and nonexistent use of protective equipments could result in accidents. The importance of personal protective equipments in the prevention of accidents in the small scale industries has been shown in a retrospective study conducted in Norway.<sup>16</sup>

Absence of effective legal system, lack of monitoring mechanisms and least priority for the working conditions often limits management to consider safety measures. There is an immediate need of legal mechanisms and following of international declarations to provide opportunities of growth and safety at work. The management should also be obliged to provide a minimum working system, culture and environment so as to increase the effectiveness of working condition and the health of the workers.

This study was able to come up with the identification of risk of combined exposures to different occupational hazards. Apart from the mentioned factors, social conditions at work also raise serious concerns about the importance of procedural guidelines for assessment of occupational health risks in small scale and household industries. The guidelines developed will aid in assessing and diagnostically treating various variables that have a role to play in occupational health risk analysis. The government should look forward to use the developed format as model guidelines in the assessment of occupational health risks in SSHI in Nepal.

There are many SSHI operating in Nepal, which are not yet registered. They often use old machinery, unsafe buildings and workers with limited occupational hazard knowledge. Personal protective equipment is seldom available and they solely depend on child workers. It is very difficult to achieve information about details concerning hazardous chemicals including carcinogens in the industries in Nepal, but there seems to be a large number of workers who are exposed to different hazards in a large number of industries. It would be highly recommended to keep detailed information about the occupational hazards in the work settings. Child workers should not be allowed to work under extremely hazardous conditions.

Results of this study strongly indicate that there are many occupations and industries in Nepal where a huge number of child workers are employed with possible exposure to hazards. The children are found to be working in hazardous condition and their lesser immunity often poses them serious immediate and long term threat to occupational diseases. This could have been the reason for the high prevalence of different health related problems among the child workers, although the actual relationship could not be associated as the level of exposure was not measured and information about other sources of exposures could not be obtained.. In this study, only ten SSHI that were located within the Kathmandu Valley were included which might not actually represent the real scenario of such industries in our country. Due to the nature of this study, statistical significance of the association between exposure and disease outcome could not be calculated. Although the findings of this study cannot be generalized to all industries of Nepal, it will still help to analyse trends and shifting patterns amongst the industrial work forces.

This study demonstrates the need for further research on occupational health in Nepal with inclusion of more number of industries and sampling for different occupational hazards. As this study is one of the first studies on occupational health with more focus towards children in Nepal, it will provide a baseline for the further researches on occupational health.

### **Conclusion**

The OHS practices in small scale and house hold industries in Kathmandu are found to be unsatisfactory. Out of the ten industries only few industries have been practicing some OHS practices. Health status of the child workers was also unsatisfactory. The majority of them were suffering from possible work related health problems.



There is an urgent need in Nepal to introduce a legally binding mechanism for OHS with the creation of an appropriate authority to supervise its implementation and enforcement. This will help to ensure a uniform standard of occupational health care at all levels ensuring workers efficiency and well being. There should be a strong provision of occupational health services, carrying out activities in the workplace with the aim of protecting and promoting workers' safety, health and well-being, as well as improving their working conditions and environment.

The incidence of child labour cannot be overlooked; it requires a holistic effort from all level in eradicating child labour problem and keeping work place free from child labour. As Nepal has already enacted legal tools for child labour abolishment, it still requires effective legal monitoring mechanism and social wave of change.

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