

Research Article

Health Problems among Child Labour in the Brick Industries of Nepal

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Background: Child labour remains a major economic and social phenomenon in Nepal. Children involved in these forms of child labour start working between the ages of 10 and 14.

Methods: A descriptive cross sectional study was carried out to assess the work-related injuries and musculoskeletal disorders among 225 child workers of age above five and up to seventeen years in brick kiln factories of Tanahu district, Nepal.

Results: Among the respondents, majorities (62.2%) were males and 37.8% were females and 35% children were at age between nine to eleven years. They faced health problems during the last month as fatigue or exhaustion, minor cut or bruises, body pain. Half of them suffered from breathing difficulty and more than half suffered musculoskeletal disorders from Grade III BPD with severe pain where elbows, hands, wrists, knees, ankles and feet. 60% of them suffered from insomnia, about 6.7% involved in smoking and 21.8% consuming alcohol. Study showed that younger children among the sampled respondents were found more prone to the health problems due to work.

Conclusion: It is estimated that presence of high workloads, extremely long working hours, poor working environments and unsafely working hours has contributed to musculoskeletal disorders, injuries and other health problems exposing the working children to risks and hazards from the brick factory. The concept of safety, ergonomics and industrial hygiene was missing among the sampled brick kiln factories.

Keywords: Brick industry; Child workers; Ergonomics; Musculoskeletal disorders; Nepal

Introduction

The welfare of the entire community, its growth and development depends on the health, strength and well-being of its children. The prosperity and development of any country would certainly depend upon 'human development' or the well-being of its people in general and children in particular, than the development of their military or economic strength or the splendor of their capital cities and public buildings. Child is the person under the age of eighteen and the term "child labour" is often defined as work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development.

The word "Child labour" means any person under the age of 17 years who works in any place outside his home for financial benefits. Hazardous Child Labour is the worst form of child labour which comprises of: (a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of, debt bondage and serfdom and forced or compulsory labour, including forced or compulsory recruitment of children for use in armed conflict; (b) The use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances; (c) The use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties;

(d) Work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children [1].

Child work and child labour are different concepts. Child work refers to activities performed by child that are not harmful rather they may contribute to the healthy development of the child. But child labour consist all type of works performed by child that deprives him from childhood potential, dignity and that is harmful to physical and mental development. It refers to work that is physically, mentally, socially or morally dangerous and harmful to children. So all types of works done by person below 15 years which are socially, morally, physically dangerous and harmful to him/her are under the domain of child labour [2].

Problem of Statement

According to ILO Convention 182, the worst forms of child labour comprise (a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labour, including forced or compulsory recruitment of children for use in armed conflict; (b) the use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances; (c) the use, procuring or offering of a child for illicit activities, in

particular for the production and trafficking of drugs as defined in the relevant international treaties; (d) work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children [3].

Child labour remains a major economic and social phenomenon in Nepal. Children involved in these forms of child labour start working between the ages of 10 and 14. More than 80 per cent of children trapped in the worst forms of child labour had migrated for work. Lately, due to various interventions, it is believed that an increasing number of urban domestic child laborers are participating in schools. There is, however, a lack of information on whether children in other sectors such as in the brick factory are having access to schooling [4].

Brick manufacturing is a labor intensive informal industry of Nepal employing children as major workforce. Brick making is a painstaking labor job often performed by families accompanied by children living in temporary settlements called Jhyauli. The brick making mostly involves repetitive works including soil excavation and kneading, molding and staking, drying and transport of green and dry bricks [5]. Children who engage in child labour are likely to come from families affected by poverty, with inadequate sanitation and nutritious food and they have to fight against poverty [6].

Report of International Labor Organization (2013) indicates that 168 million children worldwide are in child labour, accounting for almost 11 per cent of the child population as a whole. Children in hazardous work that directly endangers their health, safety and moral development make up more than half of all child laborers, numbering 85 million in absolute terms. The largest absolute number of child laborers is found in the Asia and the Pacific region but Sub-Saharan Africa continues to be the region with the highest incidence of child labour with more than one in five children in child labour. Global number of children in child labour has declined by one third since 2000, from 246 million to 168 million children. More than half of them, 85 million, are in hazardous work (down from 171 million in 2000). Asia and the Pacific still has the largest numbers (almost 78 million or 9.3% of child population), but Sub-Saharan Africa continues to be the region with the highest incidence of child labour (59 million, over 21%). There are 13 million (8.8%) of children in child labour in Latin America and the Caribbean and in the Middle East and North Africa there are 9.2 million (8.4%). Child labour among girls fell by 40% since 2000, compared to 25% for boys [7].

It was estimated that at least one million children in Nepal were working in difficult circumstances, often as slaves in carpet factories, brick factories, domestic service, agriculture, on plantations. There are 2.6 million economically active children in Nepal. This is 42 per cent of the total child population aged 5-14 years [4]. According to the recent Nepal Labor Force Survey (NLFS 2008), a total of 2,097,000 children aged 5 to 14 are currently employed. Among them the highest numbers of children (88.7 percent) were working in the agriculture. In the manufacturing sector, which includes brick factories, 29,358 child laborers are reported to be working. Given there are 750 brick factories in Nepal, this would mean that the majority of child laborers in manufacturing are in the brick factory as this study has estimated that more than 28,000 child laborers are engaged in work at brick factories [8].

Table 1: Socio demographic characteristics of respondent (continued).

Characteristics	Frequency	Percentage
Age		
6 - 8 years	56	24.9
9 -11 years	80	35.6
12 - 14 years	49	21.8
15 - 17 years	40	17.7
Sex		
Male	140	62.2
Female	85	37.8
Regular schooling		
Yes	28	12.4
No	197	87.6
Educational level		
Primary level	11	39.3
Lower secondary level	17	60.7
Did you come here to work leaving your study in school?		
Yes	70	31.1
No	155	68.9
Birth order		
First	76	33.8
Second	77	34.2
Third	58	25.8
Fourth	11	4.9
Fifth	3	1.3
Ethnicity		
Dalit	38	16.9
Disadvantage janajati	118	52.4
Disadvantage non-dalit terai	47	20.9
Relatively minorities janajati	16	7.1
Upper caste	6	2.7
Cultivated land		
Yes	190	84.4
No	35	15.6
Income source		
Farming	82	43.2
Service	20	10.5
Household business	45	23.7
Wage	43	22.6
Marital status		
Married	8	3.6
Unmarried	219	96.4
Home address		
Outside working area	225	100
Own home		
Yes	196	87.1

No	29	12.9
Family type		
Nuclear	33	14.7
Joint	137	60.9
Extended	55	24.4
Source of suggestion/initiation or motivation		
Friend's advice	59	26.2
Own opinion	20	8.9
Parents advice	80	35.6
Domestic conflict	66	29.3
Came to factory with		
Parents	77	34.2
Relatives	68	30.2
Friends	44	19.6
Own	36	16
Age started at work		
6-8 years	56	24.9
9-11 years	95	42.2
12-14 years	60	26.7
15-17 years	14	6.2

Studies are deficient to highlight the gravity of situation in the regard particularly to provide the baseline information about child labor and extent of health problems. The present study was expected to reveal the prevalence and health status of the child labour working in brick kiln factories of Tanahu district, Nepal so that result would be a framework to guide and help improve prevention programs and increase consciousness among parents, factories and community regarding child labour. The study also expected to stimulate and arouse the interest of health professional to conduct further research in this area.

Methodology

An analytical cross-sectional descriptive study was carried out in brick industries of Tanahu district, Nepal. The study was based on quantitative methods. In this study three brick kiln factory were randomly selected from the cluster of six brick kiln factories of Tanahu district, Nepal. 225 sample sizes were selected by using simple random and purposive sampling method based on the study of health problems and work related injuries experienced by the child labours [9]. Multiple tools of research were used as a semi-structured questionnaire for an interview and focus group discussion.

Age of respondents, gender, Duration of work, workload, occupation, income, education level were considered as independent variables whereas workplace health problems and perceived illness among sampled child labors as a dependent variable.

Ethical approval was taken from an ethical review board of Inje University, sampled brick industries and Tanahu district of Nepal. Verbal consent was taken from each respondent and the confidentiality of the received information was maintained. The questionnaire was pretested and modifications were done if needed.

Table 2: Triggering factors for joining child labour.

Characteristics	Frequency	Percentage
Any reason to come here		
Yes	55	24.4
No	170	75.6
If yes, reason		
Marriage	8	14.5
Death of family member	12	21.8
Parents separation	19	34.5
Parents remarrying	16	29.1

Table 3: Activities in the brick factories.

Characteristics	Frequency	Percentage
Activities		
Prepare raw material	23	10.3
Making raw brick	192	85.3
Transporting raw brick	10	4.4

The questionnaire was back-translated English to the Nepali language. Face to face interview was used as a technique for data collection and analysis were done by SPSS 17 version. Chi-square test was applied to find out the association between the dependent and independent variables.

Results

Socio-Demographic Information

Of the total respondents, more than two third (35.6%) were of 9-11 years, followed by 24.9% of 6-8 years, 21.8% of 12-14 years and only 17.8% were of 15-17 years. Majority (62.2%) were male. Among the respondents, only 12.4% children had attended school. About one third (31.1%) children reported that they discontinue school for work. All the child labors were from outside the working area. Except 12.9% of the respondents, all others had their own house. More than half of the respondents (60.9%) were from joint family, whereas 24.2% and 14.7% were from extended and nuclear family respectively.

More than one third (35.6%) of respondents reported that they were engaged in brick factory work by suggestion of their parents, followed by due to domestic conflict (29.3%), friend's advice (26.2%) and own opinion (8.9%). Among them 34.2% said they came to factory with parents, followed by with relatives (30.2%) and friend (19.6%). Majority (42.2%) of child labours reported that they started working in the factories when they were in the age group 9-11 years.

Factors for joining child labour

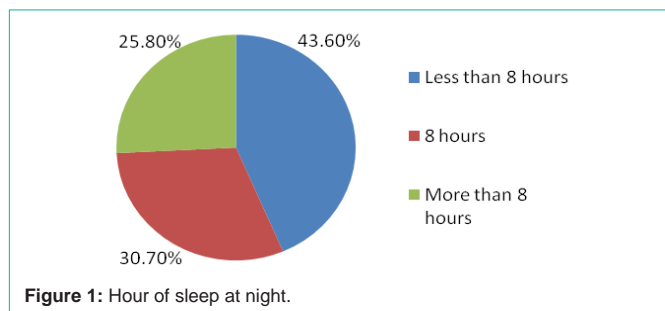
About one fourth (24.4%) of respondents reported that they were forced to join brick factories due to some specific events that had happened within their families. The most common driving force for their involvement in child labor was parent's separation (34.5%), followed by parents remarrying (29.1%) and death of family member (21.8%).

Works related information

Majority (85.3%) of the child laborers were involved in making raw brick, followed by preparing raw material and transporting raw

Table 4: Duration of work.

Characteristics	Frequency	Percentage
Working hours		
Less than 10 hours	35	15.6
10-12 hours	101	44.9
More than 12 hours	89	39.5
Working duration		
Six months	225	100



brick were 10.2% and 4.4% respectively.

Duration of work

Half (44.9 %) of the respondents were working 10 to 12 hours per day and 39.6% said they work for more than 12 hours per day. Children responded that they usually start their work early in the morning, sometimes even at 4 am and work till late in the night up to 10pm. All children said that they will be involved in factory work till 6 months.

Health problems related information

Majority of respondents (72.8%) experienced minor cuts or bruises and 69.8% experienced fatigue in the last one month.

Serious health problems

Half of the respondents suffered from cold, fever and body pain in the last three months. More than one third (43.2%) of respondents suffered from breathing difficulty and headache and only 11% suffered from skin diseases. A total of 36% of child workers suffered from insomnia in the last three months.

Body Part Discomfort Scaling (BPD) Scale

It is evident that more than 50% of the respondents who had severe pain in parts like neck, shoulder, upper back, lower back, hip, thighs and knees had Grade-III BPD, whereas of respondents who suffered from moderate pain had Grade-II BPD.

Perceived Illness due to Job

It is evident from the above Figure that majority (61.8 %) of respondents perceived that their job is main cause for their illness.

Table 5: Recent health events (last 1 month).

Recent health events (last 1 month)	Child Labours			
	Often	Sometime	Never	Unanswered
Experienced fatigue	42 (18.7)	115 (51.1)	49 (21.8)	19 (8.4)
Experienced minor cut or bruises	73 (32.4)	91 (40.4)	47 (20.9)	14 (6.2)
Felt pain in body	37 (16.4)	80 (35.6)	71 (31.6)	37 (16.4)

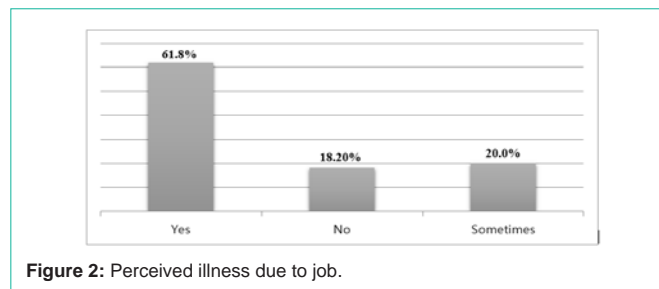


Table 6: Serious health problems.

Health problems (last three month)	Frequency(n=225)	Percentage
Breathing difficulty	66	34.2
Skin rashes/ diseases	23	11.9
Stomach ache	25	13
Cold and fever	100	51.8
Cough	29	15
Headache	64	33.2
Insomnia	81	36.0

Association between Perceived Illnesses due to Job with different Socio- demographic variables

Only age of the respondent was statistically significant with perceived illness due to job but rest of the factors had no significant association with perceived illness due to job.

Discussion

This is a cross-sectional study with an aim to assess the work related injuries and musculoskeletal disorders among child labors in the brick kiln factories of Tanahu district, Nepal.

The study showed that majorities of child labors were male (62.2%) and only 37.8% were female. More than two third (35.6%) of respondents were of 9-11 years and only 17.8% were within 15-17 years. Half of the respondents (52.4%) were from disadvantage janajati, followed by disadvantage non-dalit terai (20.9%), dalit (16.9%) and only 2.7% belonged to upper caste. This finding was quite similar to the study conducted in different brick kiln factories in Nepal by World Education and Plan Nepal in 2012 [4].

Poverty is the key factor in the contribution of child labor. Economically downtrodden families that are poor and below the poverty line usually forced their children into work to supplement their household's income. Child labor deprive children from their basic right; their childhood is stolen and they lack in their basic need such as education, health and recreational activities [10]. This study showed that about one fourth (24.4%) of respondents were forced to join brick factories due to some specific events that had happened within their families. The most common driving factors for their

Table 7: Body Part Discomfort Scaling (BPD) Scale.

Body Part	Body Part Discomfort Scaling (BPD)			
	Grade-0 (No pain)	Grade-I (Slight pain)	Grade-II (Moderate pain)	Grade-III (Severe pain)
Head	24 (10.4)	91 (40.4)	77 (34.2)	33 (14.7)
Neck	17 (7.6)	24(10.7)	46 (20.4)	138 (61.3)
Shoulder	21 (9.3)	29 (12.9)	52 (23.1)	123 (54.7)
Elbows	4 (1.8)	46 (20.4)	154 (68.4)	21 (9.3)
Hands		60 (26.7)	106 (47.1)	59 (26.2)
Wrists	4 (1.8)	73 (32.4)	107 (47.6)	41 (18.2)
Upper back	5(2.2)	11 (4.9)	72 (32)	137 (60.9)
Lower back	3 (1.3)	35 (15.6)	79 (35.1)	108 (48)
Hip		13 (5.8)	61 (27.1)	151 (67.1)
Thighs		23 (10.2)	91 (40.4)	111 (49.3)
Knees		15 (6.7)	79 (35.1)	131 (58.2)
Ankles	17 (7.6)	95 (42.2)	81 (36.6)	32 (14.2)
Feet	3 (1.3)	61 (27.1)	114 (50.7)	47 (20.9)

Table 8: Association between perceived illnesses due to job with different socio-demographic variables.

Characteristics	Perceived illness due to job			χ^2 -value	p-value
	Yes	No	Sometimes		
Year of the respondents				5.784	0.03*
6 to 11 years	77	25	34		
12 to 17 years	62	16	11		
Gender of the respondents				0.616	0.735
Male	87	27	26		
Female	52	14	19		
Sleeping hours				5.047	0.282
<8 hours	66	14	18		
8 hours	36	15	18		
>8 hours	37	12	9		

*= statistically significant **= highly statistically significant

involvement in factory work were parent's separation, parents' remarriage and death of significant family member. No specific difference was seen in the triggering factors to join work among different age groups. This finding was similar to that of the study conducted by World Education and Plan Nepal in different brick kiln factories in Nepal [4].

Working long hour of child labor often deprives of a basic school education, normal social interaction, personal development and emotional support from their family. Among working children growth deficiency is mostly prevalent and physical injuries and health hazards are caused by machineries in factories [10]. This study showed that only about 15.6% children worked for less than 10 hours a day, 44.9% worked from 10 to 12 hours and 39.6% of child laborers work for more than 12 hours per day.

It was evident that a significant proportion of children worked for more than 12 hours per day is considered excessive hour of working. All children reported that their involvement in factory work is only

for 6 months as most of the work in the brick factories was seasonal. In other months, nearly half of the respondents, preferred to work on daily wages, others work in their own farm and only few of them reported that they went to school at their place. The study conducted by Bharti in 2013 [11] and another study by Sumaiya in 2002 [12] also discussed about the worst condition of child labor working for long hour without rest which breed their feeling of frustration and inadequacy. Child labours working at construction and welding sector suffer from both physical and psychological effects on their health.

Working conditions that are safe and healthy for adults may not be safe and healthy for children because of their physical differences. Risks may be higher for children than that for adults at working condition and may have short and long term health effects [13]. Most of the child laborers were engaged in making raw brick than in preparing raw material and transporting raw brick in present study. Raw material preparation includes mud digging and clay preparation.

Majorities (42.2 %) of the child between 9-11 years and the minimum (6.2%) child from the age of 15-17 years began to work in factories in this study. Child labours are typically paid lesser than adults in all varieties of jobs even though they perform the same work and even have to work beyond normal working hours [11]. This study found that majorities (61.8%) of the respondents were earning Rs.10,000- 15,000 per month. The study conducted by Gyawali and associates in 2012 [4] found that 28% child labours earned 5 to 10 thousand per month and 17% earned 1500-2500 per month.

Child labors were involved in brick making and transporting activities; they got their payment on the basis of piece of brick count. A few reported that they got their remuneration on monthly basis. Majorities (84%) were unhappy, two third (67.2%) of whom attributed the reason of unhappiness as long working hours with their current job and 45.8% were not satisfied with their wages. The study conducted by World Education and Plan Nepal in 2012 [4] found that 98% got their payment on a piece count basis which was similar to the present study.

Health status

Various studies conducted in different brick kiln factories showed that musculoskeletal injuries and health problems exist as a major risk in child labour [14,15]. This study found that child laborers experienced fatigue or exhaustion (69.8%), minor cut (72.8%) and also felt pain in their body (52%) during last one month. Findings of this study are supported by the study in West Bengal [9] in 2015 which reported that 77% child labourers experienced fatigue or exhaustion, 54% have experienced minor cuts or bruises and 62.8% felt pain in the body.

It also investigated some specific problems, namely breathing difficulty or persistent cough, ear problems, skin problems, and stomach problems or diarrhea among child laborers. 51.8% of the respondents suffered from cold, 11.9% suffered from stomach ache and 36% were suffering from insomnia. The study conducted in West Bengal [9] in 2015 also found that 53% suffered from cold, 9% from stomach ache and 33.7% were suffering from insomnia.

The postures adopted by the workers depends largely upon nature of work, the design and environment of the work place, personal characteristics of individual worker, the tools used for work and also on the duration and frequency of the work cycle. The posture required for brick making job varies according to the job, letting aside the mechanized process, the manual conditions for soil excavation, kneading and molding process requires constant movement and transfer of heavy loads.

The molding job which is considered to be the most difficult job requires remaining in squatted position for longer duration with constant upper limb movement under natural environment exposure. The vulnerability of children with exposure to unsafe working conditions and missing ergonomics practices pose considerable risk to their physical well-being. This study showed that children responded to multiple pain and injuries owing to working conditions. It concluded that children are more prone to musculoskeletal disorders and varieties of work related problems including injuries and illness. The associated risk involved for children were identified as joint and bone deformities, musculoskeletal problems from repetitive motion, blistered hands, bruised feet from dropped bricks, lacerations, breathing difficulties, and injuries as the major health impacts from the brick industry [14] which also supported this research findings.

The study found that majorities (61.8%) of the respondents perceived that their job is main cause for their illness which was similar to the study conducted in Purba Medinipur in West Bengal [9] in 2015 and the study also found that 57% respondents perceived that their job is main cause for their illness.

The physical factors and external ambient environment for the brick making job were found with full of risks. Brick workers, especially molders, were exposed to the heat and natural condition for longer duration as well as to high particulate. The incidence of Work-Related Musculoskeletal Disorders (WMSDs) were quite common in the brick industries. The common jobs in brick kilns often comprised of pushing, pulling, bending, reaching, stretching, lifting, lowering, sitting, standing, walking, and carrying, mining, rimming of clay, preparation of clay, drying of bricks and burning of bricks. The prolonged stresses and strains caused during various

activities with different load conditions in the brick industries could be the major cause for work related musculoskeletal disorders.

Conclusion

Study estimated that presence of poor working conditions and practices has contributed to musculoskeletal injuries and problems exposing working children to risks and hazards from the brick factory. Study showed that only age of the respondents were statistically significant with the health problems due to work whereas others factors had no any association with the workplace health problems.

The study concluded that poverty and lack of employment in the origin place force them to migrate seasonally in the other place to work in brick kiln factories where all family members were employed continuously for almost six months. Those children who are exposed to unsafe working condition were found more vulnerable to injuries. The musculoskeletal disorders and injuries related to brick manufacturing are prevalent in the sampled brick factories. The concept of safety and good ergonomics practices was missing among sampled brick kiln factories.

References

1. Das R. Physical and Psychological Hazards Faced by Child Labour in the Brick Kilns of Khejuri Blocks of Purba Medinipur District in West Bengal- An Assessment. *International Journal of Humanities and Social Science Invention*. 2015; 4: 32-47.
2. Ojha K. Status of child labour; Child labour at hotel and restaurant: A case study of Dipayal Silgadi Municipality, Doti. Kirtipur, Kathmandu: Tribhuvan University. 2014.
3. International Labour Organization (ILO). Declaration on Fundamental Principles and Rights at Work; Worst Forms of Child Labour Convention. Geneva. 1999; 182.
4. Gyawali K, Sharma S, Sharma RK. A Rapid Assessment of Children in the Brick Industry. 2012.
5. Joshi SK, Dahal P, Poudel A, Sherpa H. Work related injuries and musculoskeletal disorders among child workers in the brick kilns of Nepal. *International Journal of Occupational Safety and Health*. 2013; 3: 2-7.
6. Woolf A. Health Hazards for Children at Work. *Journal of Toxicology and Clinical Toxicology*. 2002; 40: 477-482.
7. International Labour Organization (ILO), International Program on the Elimination of Child Labour (IPEC). A health approach to child labour: Synthesis report of four country studies on child labour in the brick industry. Geneva: International Labor Organization. 2013.
8. Central Bureau of Statistics NPC, Government of Nepal, Nepal Labour Force Survey. Kathmandu: Central Bureau of Statistics, National Planning Commission, Government of Nepal. 2011.
9. Das R. Work related Injuries and Musculoskeletal Disorders among Child Workers in the Brick Kilns of Khejuri of Purba Medinipur in West Bengal. *International Journal of Advanced Research*. 2015; 3: 1065-1076.
10. ECLT. Addressing the challenges of child labour in tobacco growing. 2015.
11. Bharti S, Agarwal S. Physical & Psychological Hazards Faced by Child Labour – A Review Article. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*. 2013; 13: 29-33.
12. Sumaiya K. Child Labour in Bangladesh: A Forward Looking Policy Study Lingard H. The effect of first aid training on Australian construction workers occupational health and safety motivation and risk control behavior. *Journal of safety research*. 2002; 33: 209-230.
13. Bennett R, Hodne C, Sherer J. Child Labor Public Education Project. Iowa University of Iowa Center for Human Rights. 2011.

14. Joshi SK, Dudan I. Environmental health effects of brick kilns in Kathmandu valley. Kathmandu University Medical Journal. 2008; 6: 3-11.
15. ILO. Children in hazardous work- What we know- What we need to do, International Programme on the Elimination of Child Labor (IPEC). Geneva, Switzerland. 2011.