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Toil in soil-impact of work at brick kilns on health of children and youth

Report of research in 5 districts of Pakistan

**International
Programme on
the Elimination
of Child Labour
(IPEC)**

November, 2013

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Foreword

This study is an attempt to fill the knowledge gap which exists about the health and safety implications of work on children and youth engaged in clay brick manufacturing sector. A large number of bricks are required for the construction industry throughout the world, which are met by the local brick making industries. There are varying degrees of mechanisation in this sector, but in most developing countries considerable work gets done manually.

In many countries, notably in South Asia, brick making is marred by allegations of bonded labour and trafficking in persons. The health and safety implications of work in this sector are relatively unknown. A large segment of the workforce in this sector in many countries consists of children and youth, many of whom also live in sub-standard temporary shelters at the workplaces. The issue of health and safety hazards faced by these workers sometimes gets overshadowed by the issue of bonded labour.

This study focuses in great detail on the implications of work in clay brick making sector on the health, safety and wellbeing of children and youth engaged in various processes of brick making. This study provides valuable insight into the implications of work in clay brick making in the context of the most important ILO Conventions 138 on “Minimum Age” and Convention 182 on “Worst Forms of Child Labour”. These Conventions are considered the main global standards defining the principles for elimination of child labour and form part of the Fundamental Conventions of the ILO. Most countries of the world have ratified these core Conventions.

The information provided by this study will provide valuable input to the policy makers in the field of labour, education, social protection and health in Pakistan, and encourage them to make greater efforts to protect the health of children and youth and to devise specific programmes and projects addressing unique circumstances of work in this sector.

These findings will help lay the foundation for launching actions by the stakeholders to address hazardous forms of child labour in brick-making. The study will also provide the facts and data for launching awareness campaigns for the communities for recognizing and addressing hazardous forms of child labour in clay brick making.

The study has global implications as well. It was done in parallel with similar studies in other countries notably Nepal, Afghanistan and Bangladesh using very similar methodologies and study instruments. The inter-country comparisons will provide highly useful information for launching global or regional actions for addressing areas of common concern.

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Susan E. Gunn Senior Technical Specialist - Hazardous Child Labour at the International Labour Organization, Geneva, provided close backup support at each phase of the research. She provided highly valuable suggestions during research planning and compilation of the report.

Janessa Graves, Assistant Professor at Washington State University College of Nursing in Spokane Washington-USA helped with data analysis and interpretation.

Mark J.D. Jordans, Senior Research & Technical Advisor at HealthNet TPO, Netherlands, which specializes in research and health care in war disrupted areas, designed the PVAT (Psychosocial Vulnerability Assessment Tool) for an earlier study, which was used to assess the impact of work on the psychosocial well-being of the children.

Sujeewa Fonseka, Chief technical Advisor of ILO-EC project CACL-II (Combating Abusive Child Labour) provided close support by mobilising his project's support for this work and sharing his experience with the researchers. Mian M Benyameen National Project Coordinator of the ILO project on Trafficking in Persons and Bonded Labour provided the support of his project and brought the workers and employers on board during various consultative meetings his project organised.

In addition the individual brick kiln owners who provided access to their workplaces and allowed the teams to interact with workers also were very helpful.

Executive summary

The main objective of the study was to assess and document health and safety hazards and risks as well as psychosocial stresses faced by child, adolescent and youth workers in the brick making sector in three provinces of Pakistan (Punjab, Sindh, and Khyber Pakhtunkhwa (KPK)).

A total of 463 respondents in three age groups, 11- 14 (child), 15 – 17 (adolescent) and 18 – 24 (youth), were selected. The sample was selected from Rawalpindi, Okara and Bawalpur districts in Punjab, Sukhar district in Sindh and Haripur district in KPK. The sample included 374 brick kiln workers. Out of these, 275 were boys and 99 were girls. A control group of 89 non-working children in the same districts (Punjab only) was also included in the study with the aim to compare health and psychosocial indicators.

Some of the most salient findings of the study are:

- Over 60% of the working children had never attended school. Majority of the working children who had never received education were between the ages of 15 – 17 years which suggests that pro-education initiatives might be having an effect on this socio-economic group.
- More than 50% of the workers had started working at brick kilns between the ages of 8 - 10 years. In Rawalpindi, Punjab, more than 50 per cent of the child workers had started working at the brick kilns before they had reached the age of 8.
- Children usually work for long hours, but gender specific differences were observed. A majority (81%) of those individuals who worked for more than 8 hours a day were male and between the ages of 18 – 24.
- Compared to children who worked fulltime in the brick kilns, the controls participated more in the household chores.
- Among the working children, virtually all (95%) had experienced exhaustion, and a large majority had experienced minor injuries (87%), and pain (77%) in the last month.
- In KPK and Sindh, workers in all three age groups (11-14, 15-17, 18-24) were injured more than their counterparts in Punjab. Overall, child and adolescent workers suffered more injuries than the controls. This difference was statistically significant.
- In addition to injuries, the workers in Sindh and KPK experience more health related problems than workers in Punjab: over half had experienced respiratory and stomach problems in the last year and more than 70% had experienced headaches and fever. Similarly, 95% of the workers from KPK and Sindh had experienced some musculo-skeletal pain in the month before data collection, compared with 60% of the workers in Punjab. Workers from KPK and Sindh were more vulnerable to psychosocial

problems when compared to the brick kiln workers in Punjab. Specifically, Underage brick kiln workers in Sindh and KPK experienced more stress and somatic stress compared to brick kiln workers in Punjab.

- At the district level, respondents from Sukhar, Sindh, reported the highest number of injuries and other health problems.
- Musculoskeletal problems, as expected, were high among workers; with more than 50% of the workers from all three provinces suffering from pains in back and neck within the last year.
- Interestingly, a greater percentage of controls were found to be underweight (45%) compared to brick kiln workers (30%). However, more brick kiln workers suffered from Anemia (42%) in comparison to the controls (18%).
- Brick kiln workers were found consistently more vulnerable on psychosocial factors when compared to children who did not work at brick kilns. An intensive study into the short term and long term health outcomes of these pressures is recommended.

1. Introduction

Pakistan is the third largest producer of fired and green clay bricks in the world after China and India. Pakistan's annual production of brick kilns is estimated to be 100 billion. Bricks are extensively used as construction material in the country, which still faces perennial shortfall in housing units. Bricks are also used in large numbers in the projects like lining of irrigation canals and channels, large scale office and residential projects including schools, hospitals, and government offices. Most of these projects are financed by the government.

Despite such large-scale demand, the brick making industry has not adopted mechanisation in a significant manner. Most of the work is still done in traditional manual way, providing employment to a large number of workers. The production methods have not changed to a large extent for the last 4000 years.

The workforce in the brick making industry is unique in many aspects. Unlike other major sectors of economy where individuals are employed, the bulk of the labour force works as family units who are residents at the brick kilns. They also move as family units to other brick kilns. This means that the children and youth have to remain with the families who are usually landless. As brick kilns are located away from the settled communities and in the outskirts of urban centres, due to cheaper land and soil costs, which are major inputs besides the labour costs and fuel costs for the industry, the families engaged in brick making do not enjoy even the basic social services available to rural poor like education, healthcare, etc. This makes them vulnerable to exploitation as well, as most families have no roots in the local communities and have no political voice or clan support. Due to the unique nature of the workforce, the sector is also blamed for using bonded labour. In order to retain families to cater for the rapid increase in demand of bricks, which can only be moulded in the dry season, the brick kiln owners offer large advances, to the heads of these families. Some of the debt is deducted from wages, but still the debt continues to accumulate which is not helped by the illiteracy, lack of accounting skills, poor health and lack of other income earning opportunities available to the workers. This debt becomes generational and in order to change employment, the family has to incur more debt from successive brick kiln owners.

1.1 About the numbers and characteristics of workforce in brick kilns

While no accurate data exist about the size of the workforce in brick kilns the production data as reported by World Bank provides a rough indication. With 100 billion bricks produced annually in Pakistan, and with average labour productivity of 500 bricks per day during the brick making season, this translates into 200 million man hours of clay moulders at brick kilns. If we assume that moulding work stops during inclement weather like monsoon or snow fall in some areas and take into account the festive and religious holidays as well as one day of rest per week observed generally at all brick kilns, we can say that work is carried out for approximately 225 days. If we also take into account the other types of processes at brick kilns as shown later in this chapter, we can safely assume that

approximately 1 million workers are engaged as labour force in brick kilns. The present study also indicated that approximately one third of the workforce consisted of persons below the age of 18 years. Despite differences in productivity of child workers of lower age groups and females, we can assume that approximately 250,000 to 300,000 children below the age of 18 might work at brick kilns.

This study also looks to some extent on the factors which might have a bearing on the health of workers like migration, ethno-religious and linguistic origin. This study was originally intended to encompass all provinces of Pakistan. However, it was done in three Districts in Punjab and one each in Khyber Pkhtunkhwa (KPK) and Sindh provinces, but due to law and order considerations it could not be carried out in Baluchistan province.

1.2 Impact of work at brick kilns on children's health and well being

As very little if any education and other services are available at or near brick kilns, children have nothing to do but to accompany their parents at their workplace. Small children just take care of babies and toddlers but as they grow up these kids become regular workers. In fact many of them get married while they are still legally children thus starting their own families. Due to work at brick kilns, the children face unique health and safety problems while still young. This study is an attempt to look into the physical health, risks faced and psychosocial stresses faced by the children and youth at brick kilns. A major aim of the study is to provide a complete picture of the health and related issues to the policy planners and decision makers within the government and to devise tailored programmes for addressing the needs of children and youth at brick kilns. In fact it may be much easier to cater to the needs of these workers than many other sectors where hazardous child labour is found, because a significant number can be found at each workplace, thus designing cost effective interventions to address health and safety concerns which can be made a point of entry for other interventions like those aimed at addressing bonded labour conditions.

This study also has wider regional and international implications as work in similar circumstances is carried out at brick kilns in most of South Asia. In fact the labour force in brick kilns also migrates among these countries, particularly between Afghanistan and Pakistan and India and Nepal. The processes and stages of mechanisation in most developing countries are very similar.

While the issue of bonded labour has been debated extensively in the context of work at brick kilns, the health problems of the workforce particularly those of children and youth have remained largely ignored. This study tries to fill major gaps in the information and looks into possible health implications and see what constitutes hazardous child labour. While the issue of bonded labour is still marred in controversy, addressing the health issues of workers is something where there is a general consensus amongst workers employers and interested stakeholders.

During this study extensive discussions were held with brick kiln owners and managers as well as parents and communities. In fact recent experience has shown that provision of health services can become a major point of entry for other services like education, poverty alleviation and social dialogue at the brick kilns. Many workers have described expenditure

on health as major cause for pushing the family into debt or escalation of existing debt, which is also confirmed by owners and managers of brick kilns.

Ratification of ILO Convention 182 further requires the state to identify processes and occupations in the list of hazardous work for children below the age of 18 in their respective laws of against child labour. A blanket ban on children's work at brick kilns may not be feasible as there are very few alternatives due to resident nature of workforce and lack of social services. However a detailed study can shed light on what is 'hazardous' and what is not for children of different age groups. For this we have to have evidence that certain groups of children based on gender, age or other factors are more prone to health damage. Also we need information on the specific types of injuries, health damage and stress these children face while at work to adopt a practicable strategy to address hazardous child labour.

1.3 Description of brick making process



Each kiln usually runs in 3-4 cycles every year. In one cycle approximately 1-7 million bricks are prepared. The whole process is based on manual work. These pictures describe the brick making process as is being practiced these days. Whole families are usually engaged in the brick making.

The clay is dug manually (shovel and pick), and transported to the kiln site with tractor driven carts.

The mud is transported on wheel barrows to the site where bricks are made. In one go approx. 40-60 kilograms is transported. Here boys and girls and occasionally adults are engaged.



Water is mixed in and the clay rests overnight. Before sunrise, the brick making families start kneading it. It takes approximately 2 hours for 2-3 persons to prepare the mud sufficient for day's work (approx. 2000 bricks). This process is carried out mainly by males (adults and boys)



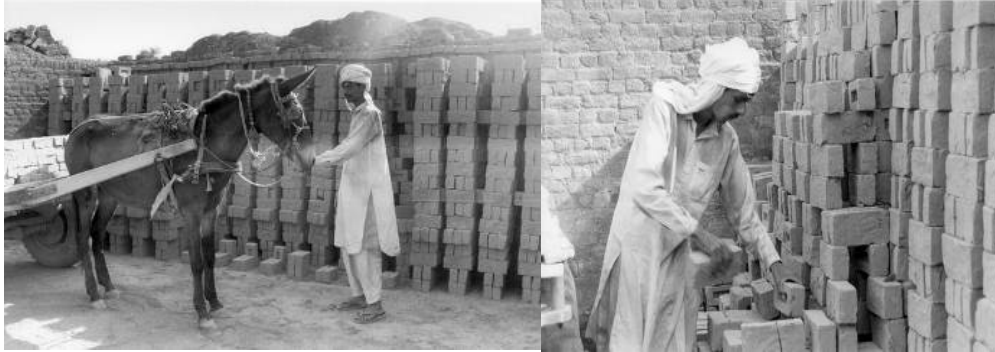
Bricks are made by hand moulding. The moulds are either wooden or iron lines with wood. This is the most labour intensive process. Most family members work on this process. The wet clay bricks are left in the open to dry for a day before they are turned (see background in pic # 2). Sand is also used in the moulds to reduce the stickiness of the clay. Usually one adult person can make 1000-1500 bricks a day (approx. 9 hours). 30-150 persons or 10-50 families are involved in this process at each kiln. On average an adult person can make 500-1000 bricks a day depending on their skill and physical health.



Once the bricks have slightly dried, the rough edges are removed with a wooden plate. All these processes are carried out by crews of family members including children.

Bricks are left in the sun for approximately one week to completely dry them. Then they are transported to the kiln on animal driven carts or donkeys. This work is carried out by men and boys.

The bricks are transported and stacked in the kiln for firing.



The stacked bricks are covered with clay and red bricks and holes are left for pouring fuel (which in this case is coal). This is a specialized work done by skilled workers (males only) known as *jalai walas*.



With the increasing prices of coal a number of cheaper fuels are being used, many of which pose grave environmental threats due to emission of toxic gases and smoke. The alternate fuels used include plastic scrap, shredded rubber tyres, wood shavings, dried fruit pulp, poultry farm droppings and used lubricant oils.



Black smoke bellowing from chimney of a kiln on fire.



The firing continues for approx. 4 days. The end produced is red clay bricks. As firing of a portion is completed the holes are covered with bricks to let them cool for a week.

Fired bricks are removed from the kiln and either transported directly to customers or are stacked outside the kiln for later sale



1.4 Objectives

The main objective of the study was to assess and document hazards and risks faced by workers in brick kiln sector in Pakistan. The study focused on the following aspects:

- Assessment of the physical hazards to underage workers' face in brick kilns.
- Assessment of physical health, injuries, nutritional status of the child workers and comparison with non-working children as well as working children in other sectors of economy.
- Assessment of psychosocial stresses and mental health problems faced by the child workers in brick kilns and comparison with children working in other sectors of economy.
- Assessment of latent health effects of brick kiln work that underage brick kiln workers may face after they reach adulthood.
- An assessment of the social vulnerability of child workers in the brick kiln sector and comparison with non-working children as well as working children in from other sectors of economy.

- Assessment of the variation in level of risk that underage brick kiln workers face in various regions of Pakistan.
- Preparation of guidelines for employers, government, workers and concerned stakeholders based on the finding of the study to reduce and mitigate health and other hazards faced by children in brick kiln industry and promote healthy adult employment in this sector.

2. Study design and methodology

The study was mainly conducted in the province of Punjab, with two comparison groups selected from the provinces of Sindh and KPK. Data from Sindh and KPK were collected to observe the differences in work conditions at the brick kilns and health risks faced by underage kiln workers across three provinces of Pakistan. The study was carried out in the Rawalpindi district, Oraka district, Bhawalpur district in Punjab province, Sukkur district in Sindh province and Haripur district in KPK.

The sample size was 463, including 249 kiln workers between the ages of 11 – 17, 124 kiln workers between the ages of 18 – 24, and 89 controls between the ages of 11 – 17. The sample size is large enough to provide a reasonably accurate assessment of health safety and psychosocial stresses faced by the study population.

2.1 Methodology

Mixed methodology approach was used to make a risk assessment of the health hazards faced by underage brick kiln workers in Pakistan. Corroboration of findings from the quantitative and qualitative analyses allowed researchers to identify the health hazards that underage brick kiln workers face and explore into their long and short term physical and psychological outcomes. The methodologies used in this study include:

- Observation research
- Surveys
- Interviews (guided by open-ended questions in the survey)
- Physical examination of respondents

2.2 Sampling plan

The purpose of this study was to gain a cross-sectional perspective of the manifest and latent health hazards faced by underage brick kiln workers in Pakistan. The type of risks faced by underage kiln workers may vary across the geographical and environmental characteristics of the area in which the kiln is located. Furthermore, the type of labour performed by underage kiln workers may vary in different locations due to social, economic of cultural trends within local communities. A multistage sampling technique was used to select respondents for participation in this study.

2.2.1 *Sampling plan for identifying locations/kilns*

Punjab was selected as the focal province for this study. KPK and Sindh were selected for the conformity study. A random sample of three districts, namely Rawalpindi, Okara and Bawalpur, was selected from Punjab. Similarly, the districts Sukkur and Haripur were randomly selected from Sindh and KPK, respectively.

A list of registered and unregistered brick kilns located in each of the selected districts was prepared. A simple random sample of four registered and one unregistered kiln was selected out of each district. A total sample of twelve registered and three unregistered brick kilns was selected from Punjab. This sample over represents unregistered brick kilns, which approximately represent 7.5% of the total number of brick kilns operating in the Punjab province. However, oversampling unregistered brick kilns will permit comparisons between the type and intensity of health hazards that minors working in registered and unregistered kilns may be exposed to. Next, a simple random sample of four registered and one unregistered brick kiln will be selected from each district. A total of eight registered and two unregistered brick kilns will be selected from both provinces.

A sample of approximately 75 brick workers was selected from each district. In addition, an approximate sample of 30 non-working children was selected from the each district. Table 1 displays the sample selected from each district classified by the age and work status of the respondent.

Table 1: Distribution of samples across districts

Province	Region	District Number	Underage (11 – 17) Brick Kiln Workers	Youth (18 – 25) Brick Kiln Workers	Non-Working Children (11 - 17)	Total
Punjab	Rawalpindi	1	50	30	25	105
	Orara	2	50	28	26	104
	Bhawalpur	3	50	31	25	106
KPK	Sukhkur	4	50	NS	23	73
Sindh	Haripur	5	49	NS	25	74
Total			249	89	124	462

The number of underage and adult workers selected from kilns in each district was proportionate to the estimates generated from a preliminary census of 11 randomly selected brick kilns in Punjab. These calculations were also used to determine the gender breakdown of the sample within each age category.

A control group of children between the ages of 11 – 14 and 15 – 17 years was selected from the three districts in Punjab. The field team visited the communities surrounding the kilns selected in Punjab and identified households that matched the kiln workers' economic status, using local indices of wealth like livestock, location of dwelling etc. The field team interviewed a convenience sample of approximately 5 individuals under the age of 18 from these households surrounding each of the kiln samples from Punjab. None of the controls that were interviewed had ever worked at a brick kiln or in any other hazardous employment sector.

3. Results

3.1 Socio-demographic profile

Table 2 describes the socio-demographic distribution of the sample.

Table 2. Distribution of sample by location, work status, age and sex

Age (Years)											
		11-14 years N (%)		15-17 years N (%)			18-24 years N (%)			Total N (%)	
		Total	M	F	Total	M	F	Total	M	F	
Punjab											
Child Worker		63 (20)	36 (11)	27 (9)	87 (28)	57 (18)	30 (10)	76 (24)	41 (13)	35 (11)	226 (72)
Control		36 (11)	18 (6)	18 (6)	53 (17)	34 (11)	19 (6)	NS	NS	NS	89 (28)
Province: District											
Punjab: Rawalpindi											
Child Worker		23 (22)	14 (13)	9 (9)	27 (26)	17 (16)	10 (10)	25 (24)	13 (12)	12 (11)	75 (71)
Control		12 (11)	6 (6)	6 (6)	18 (17)	12 (11)	6 (6)	NS	NS	NS	30 (29)
Punjab: Okara											
Child Worker		19 (18)	12 (11.5)	7 (7)	31 (30)	20 (19)	11 (11)	26 (25)	15 (14)	11 (11)	76 (73)
Control		12 (12)	6 (6)	6 (6)	16 (15)	10 (10)	6 (6)	NS	NS	NS	28 (27)
Punjab: Bahawalpur											
Child Worker		21 (20)	10 (9)	11 (10)	29 (27)	20 (19)	9 (8)	25 (24)	13 (12)	12 (11)	75 (71)
Control		12 (11)	6 (6)	6 (6)	19 (18)	12 (11)	7 (7)	NS	NS	NS	31 (29)
KPK and Sindh											
Child Worker		35 (24)	33 (22)	3 (2)	65 (44)	63 (43)	2 (1)	48 (32)	45 (30)	3 (2)	148 (100)
Control		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Province: District											
Sindh: Sukhur											
Child Worker		15 (21)	15 (21)	NS	35 (48)	35 (48)	NS	23 (32)	23 (32)	NS	73 (100)
Control		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
KPK – Haripur											
Child Worker		20 (27)	18 (25)	2 (3)	30 (41)	28 (38)	2 (3)	25 (34)	22 (30)	3 (4)	73 (100)
Control		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total	N (%)	134 (29)	87 (19)	47 (10)	205 (44)	154 (33)	51 (11)	124 (27)	86 (19)	38 (8)	462 (100)

Brick kiln workers between the ages of 11 – 14 years represented almost 19 per cent of the sample. 15 per cent of these were males and 4 per cent females. This category will be

referred to as 'child workers' in this report. 33 per cent of the kiln workers interviewed were between the ages of 15 – 17 years, 26 per cent males and 7 per cent females. This category will be referred to as 'adolescent workers in this report'. 27 per cent of the sample was represented by brick workers between ages of 18 – 24, 19 per cent males and 8 per cent females. This category will be referred to as 'youth workers' in this report. Almost 68 per cent of the total sample was collected from Punjab. 'Cases' or brick kiln workers represented 72 per cent of the Punjab sample. For comparison with kiln workers, 28 per cent of the sample collected in Punjab was of children who did not work in brick kilns. These children were chosen from communities surrounding the selected brick kilns. Only, those communities were selected that were in the same socioeconomic strata as the brick kiln workers. This group will be referred as 'controls' in this report. Almost, 42 per cent of the controls were females.

32 per cent of the sample was selected from Sindh and KPK (16 per cent each). No controls were interviewed in Sindh or KPK. Brick kiln workers represented 81 per cent of the overall sample, while the controls represented 19 per cent.

3.2 Migration

Table 3 shows the number of migrants among cases and control by age in Punjab and KPK and Sindh.

Table 3. Migrant workers and controls by age and province

Where were you born?					
		Within District		Outside District	
		Worker N (%)	Control N (%)	Worker N (%)	Control N (%)
Punjab	11- 14 years	30 (48)	33 (92)	33 (52)	3 (8)
	15 - 17 years	42 (48)	48 (91)	45 (52)	5 (9)
	18 -24 years	76 (100)	NS	0 (0)	NS
		148 (65)	81 (91)	78 (35)	8 (9)
KPK and Sindh	11- 14 years	23 (66)	NS	12 (34)	NS
	15 - 17 years	47 (72)	NS	18 (28)	NS
	18 -24 years	48 (100)	NS	0 (0)	NS
		118 (80)		30 (20)	
Total		226 (71)	81 (91)	108 (29)	8 (9)

= Chi Square Sig. <0.01

Data showed that a greater percentage of brick kiln workers were migrants compared to the controls. 29 per cent of the total workers in the sample were migrants or, not born in the districts that they were working in. Only 8 per cent of the controls were migrants. The chi square value of difference between cases and controls was statistically significant. In the sample from Punjab, 35 per cent of the workers were migrants while only 8 per cent of the controls were migrants. Both the child workers and the adolescent workers were almost 44 per cent more likely to be migrants, compared to their respective controls. Findings of the qualitative analysis revealed that migrant families usually found it hard to find employment

for their children and preferred employment at brick kilns because they offered employment for the entire family in one place.

Lastly, none of the workers between the ages of 18 and 24 were migrants.

3.2.1 Migrant status of respondents by province and district

The percentage of migrants in the brick kiln population in Pakistan varied across the location of the kiln. 35 per cent of the workers in Punjab were migrants while only 20 per cent kiln workers in the provinces of Sindh and KPK were migrants.

Figure 1. Migrant workers by provinces

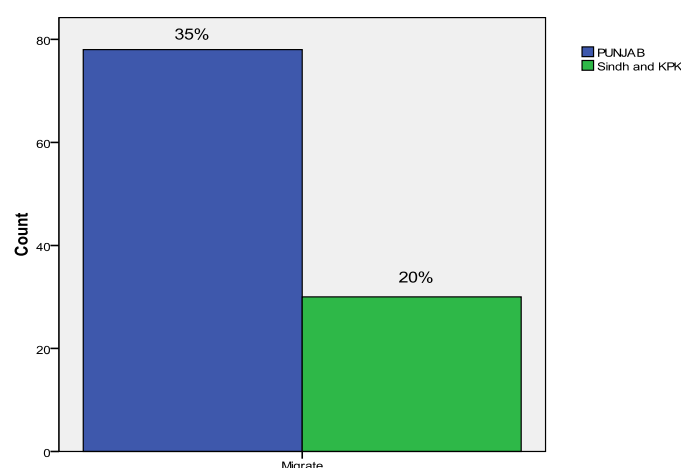
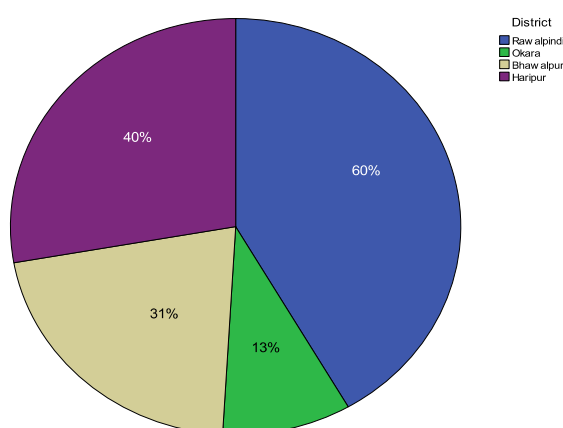


Figure 2, showing the percentage of migrant workers by district, further confirms that percentage of migrant workers in the brick kiln sector varies by location.

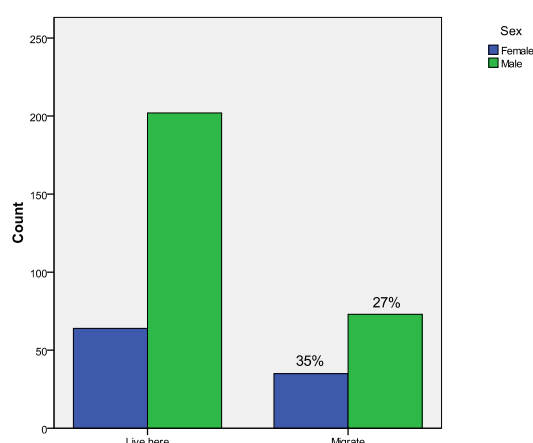
Figure 2. Migrant workers by provinces



3.2.2 Migrant status of workers by gender

Female workers had a slightly higher percentage of migrant workers compared to male brick kiln workers. One third (35%) of the female workers in the sample were migrants, while one fourth (27 %) of the male workers in the sample were migrants.

Figure 3. Migrant status by gender of brick kiln worker



3.3 Seasonal migration

The prevalence of seasonal migration among child and adolescent workers was much higher than the controls. approximately two thirds of the child and adolescent workers (70% and 64%) in the sample moved from time to time and more than half had moved at least twice in the last two years. Only 2 per cent of the controls in the sample migrated seasonally.

Almost all workers that moved from time to time moved seasonally. Therefore, the migration trends of the workers were likely influenced by the seasonal nature of brick kiln work.

Table 4. Seasonal migration by workers and controls by age and province

			Move from time to time		Seasonal Migrants	
			Worker N (%)	Control N (%)	Worker N (%)	Control N (%)
Punjab	11 - 14 years		44 (70)	2 (3)	35 (56)	2 (3)
	15 - 17 years		56 (64)	0 (0)	45 (51)	0 (0)
	18 - 24 years		1 (1)	NS	1 (1)	NS
	Total		101 (45)	2 (2)	81 (36)	2 (2)
Sindh and KPK	11 - 14 years		14 (40)	NS	10 (29)	NS
	15 - 17 years		22 (33)	NS	21 (32)	NS
	18 - 24 years		0 (0)	NS	0 (0)	NS
	Total		36 (24)	NS	31 (31)	NS
Total			137 (37)	2 (2)	112 (30)	NS

3.4 Education status of respondents

Underage brick kiln workers were found to be 31 times (62% ÷ 2%) more likely to have never attended school compared to the controls. This percentage is slightly greater in Sindh and KPK (56%) than in Punjab (50%).

Adolescent workers were found to be least likely to have every received any formal education. Particularly, the percentage of illiteracy among the 15 – 17 years old kiln workers

was found to be extremely high (91%) in Sindh and KPK. Within Punjab the rate of illiteracy was also highest within the adolescent kiln workers (76%).

Table 5. Literacy status and current education status of respondents by age and province

			Never attended school		Not attending school presently	
			Worker N (%)	Control N (%)	Worker N (%)	Control N (%)
Punjab	11 - 14 years		47 (74)	1 (1)	11 (24)	3 (7)
	15 - 17 years		66 (76)	1 (1)	18 (39)	2 (4)
	18 - 24 years		1 (1)	NS	0 (0)	NS
	Total		114 (50)	2 (2)	29 (62)	5 (11)
Sindh and KPK	11 - 14 years		24 (69)	NS	6 (13)	NS
	15 - 17 years		59 (91)	NS	6 (13)	NS
	18 - 24 years		0 (0)	NS	0 (0)	NS
	Total		83 (56)	NS	12 (26)	NS
Total			197 (62)	2 (2)	41 (89)	5 (11)

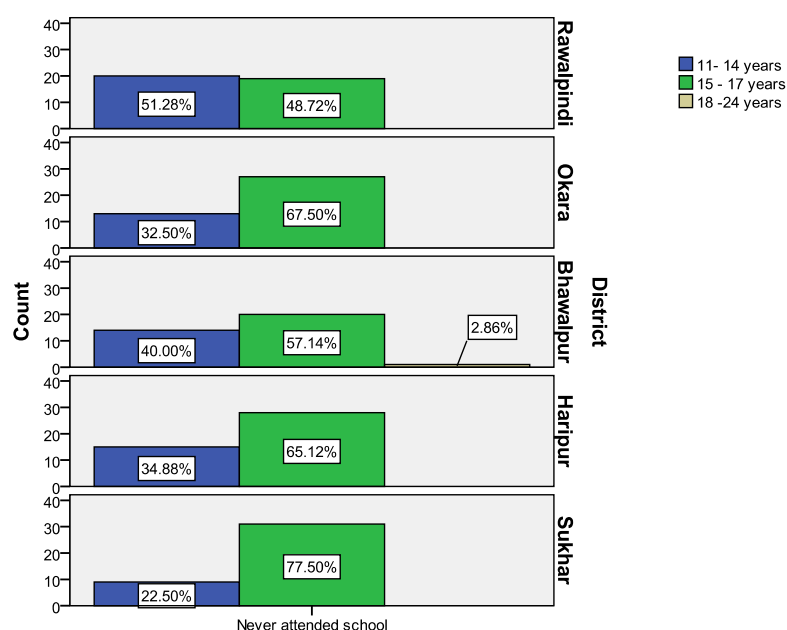
^a Missing cases excluded

Similarly, out of the 46 respondents who were literate but were not attending school presently, 89 per cent were workers and only 11 per cent were controls. Again, adolescent workers were found least likely to attending school in the sample collected from all three provinces.

3.4.1 Illiteracy among workers by district

Figure 4 compares the district-wise percentage of illiterate underage brick kiln workers by age. The rate of illiteracy among adolescent workers remains highest within all districts, with the exception of Rawalpindi. Findings indicate prevalence of high levels of illiteracy among underage brick kiln workers, specifically among adolescent workers, in Pakistan.

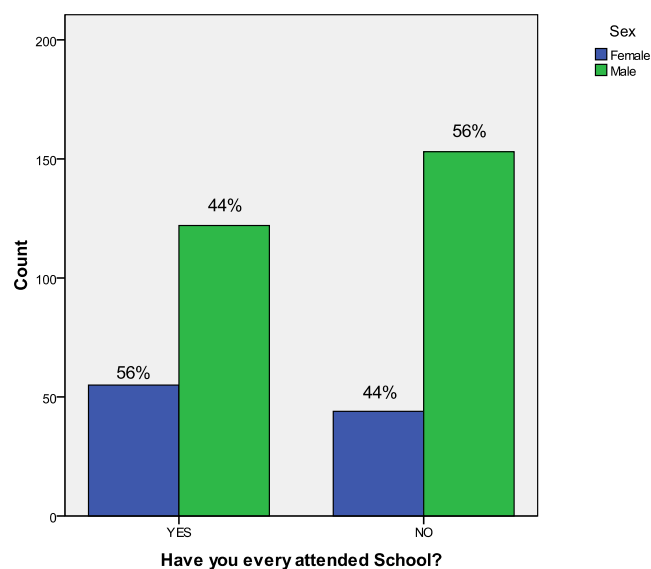
Figure 4. Illiteracy among respondents by age and district



3.4.2 Illiteracy among workers by gender

Compared to males, females were more likely to have received some schooling. The percentages of illiterate males and females kiln workers within the sample were 56 per cent and 44 per cent respectively.

Figure 5. Illiteracy among kiln workers by gender



3.5 Years exposed to brick kiln work

In all three age categories across, Punjab, Sindh and KPK, more than half of the kiln workers in the sample had started working at kilns between the ages of 8 – 10 years. The percentages of workers that had stated work in brick kilns between the ages of 8 – 10 years within Punjab, Sindh and KPK were 51 per cent and 59 per cent, respectively. In Punjab, 51 per cent of the child workers started working at kilns before reaching the age of 8 years. However, a majority of the adolescent worker and youth workers in Punjab started working at kilns between the ages of 8 – 10 years. Thus, child workers in the Punjab sample were more likely to have started working at kiln earlier than their older peers.

A majority of the kiln workers in Punjab (71%) and Sindh and KPK (61%) had been working at kilns for more than 5 years.

Table 6. Age started and total number of years spent doing brick kiln work by worker's age

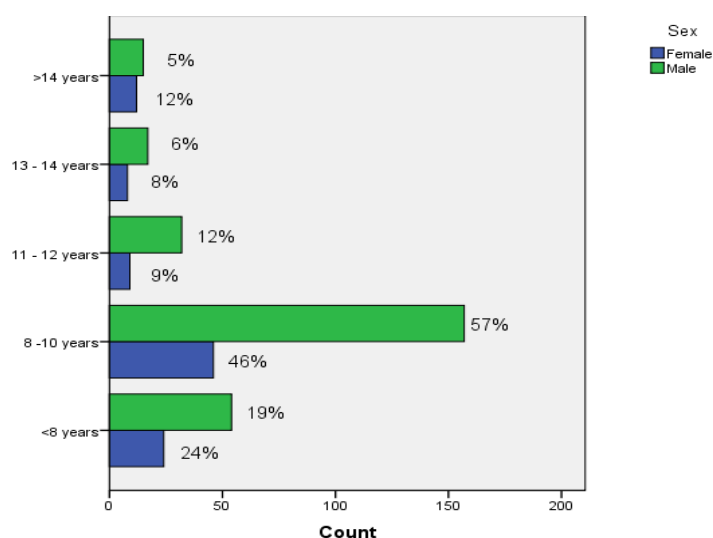
	Age started						Years worked					
	Total	<8	8-10	11-12	13-14	>14	<1	1-2	3	4	5	>5
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Punjab												
11-14 years	63 (100)	32 (51)	29 (46)	2 (3)	0 (0)	0 (0)	0 (0)	6 (10)	9 (14)	11 (17)	16 (25)	21 (33)
15-17 years	87 (100)	19 (22)	57 (65)	4 (5)	5 (6)	2 (2)	0 (0)	5 (6)	2 (3)	2 (3)	7 (8)	71 (82)
18-24 years	76 (100)	11 (15)	30 (39)	15 (20)	8 (10)	12 (16)	0 (0)	2 (3)	1 (1)	2 (3)	2 (3)	69 (90)
Total	226 (100)	62 (36)	116 (51)	21 (9)	13 (6)	14 (6)	0 (0)	13 (6)	12 (5)	15 (7)	25 (11)	161 (71)
Sindh and KPK												
11-14 years	35 (100)	6 (17)	26 (74)	3 (9)	0 (0)	0 (0)	0 (0)	10 (29)	7 (20)	7 (20)	9 (26)	2 (6)
15-17 years	65 (100)	5 (8)	42 (64)	9 (14)	6 (9)	3 (5)	0 (0)	4 (6)	5 (8)	2 (3)	9 (14)	45 (69)
18-24 years	48 (100)	5 (10)	19 (39)	8 (16)	6 (13)	10 (21)	0 (0)	3 (6)	0 (0)	0 (0)	1 (2)	44 (92)
Total	148 (100)	16 (11)	87 (59)	41 (28)	25 (17)	27 (18)	0 (0)	17 (11)	12 (8)	9 (6)	19 (13)	91 (61)

In green= Highest percentage of cases in a row

3.5.1 Years exposed to kiln work by gender

A slightly greater percentage of female worker started working at brick kiln under 8 years of age. 24 per cent of female workers started working at brick kilns at under 8 years of age. This percentage was 19 per cent among the male workers.

Figure 6. Age at which the respondent started working at brick kilns by gender



3.6 Days worked at kiln per week

More than 90 per cent of the brick kiln worker in Punjab (95%), Sindh and KPK (90%) worked between 5 to 6 days at the kiln. Therefore, child and adolescent workers at brick kilns worked for the entire work week.

Table 7. Days worked at brick kiln by province and age

		Number of days worked at kiln ^a			
		3 - 4 Days	5 - 6 Days	7 Days	Total
Punjab	11- 14 years	1 (2)	57 (90)	4 (80)	62 (98)
	15 - 17 years	0 (0)	84 (97)	3 (3)	87 (100)
	18 -24 years	0 (0)	73 (96)	3 (4)	76 (100)
	Total	1 (3)	214 (95)	10 (4)	225 (99)
Sindh and KPK	11- 14 years	2 (6)	30 (46)	3 (9)	35 (100)
	15 - 17 years	0 (0)	62 (95)	3 (5)	65 (100)
	18 -24 years	0 (0)	41 (85)	6 (13)	47 (97)
	Total	2 (1)	133 (90)	12 (8)	147 (99)

^a Missing cases not included

In green= Chi Square value < 0.01

3.7 Hours worked at kiln per day

On a normal workday, a majority of child and adolescent workers in Punjab (84% and 54%) and Sindh and KPK (83% and 63%) worked between 5 to 8 hours. Youth workers were comparatively exposed more to the hazards of brick kiln work because a majority of the workers in this category worked between 9 to 12 hours at the brick kiln. Overall, almost 60 per cent of the total sample of workers worked between 5 – 8 hours per day at the kiln.

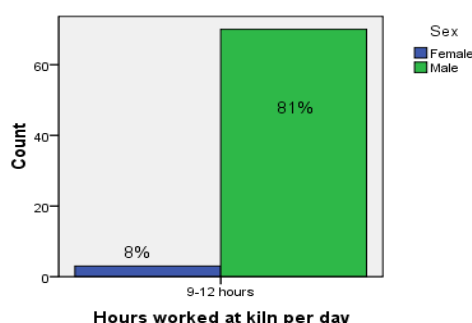
Table 8. Number of hours worked at kiln by province and age of worker

		Number of hours worked per day at brick kiln			Total
		1-4	5-8	9-12	
Punjab	11- 14 years	1 (1.5)	55 (84)	7 (11)	63 (100)
	15 - 17 years	1 (1)	47 (54)	39 (45)	87 (100)
	18 -24 years	1 (1)	35 (46)	40 (53)	76 (100)
	Total	3 (1)	137 (61)	86 (38)	226 (100)
Sindh and KPK	11- 14 years	6 (17)	29 (83)	0 (0)	35 (100)
	15 - 17 years	0 (0)	43 (66)	22 (34)	65 (100)
	18 -24 years	0 (0)	15 (31)	33 (69)	48 (100)
	Total	6 (4)	87 (59)	55 (37)	148 (100)

In green= Chi Square value < 0.01

Interestingly, within the 18 – 24 years category among workers mostly males were more likely to work for 9 – 12 hours per day. Only, 8 per cent of the female youth workers in the sample worked for 9 – 12 hours, while 81% of male youth workers worked for 9 – 12 hours.

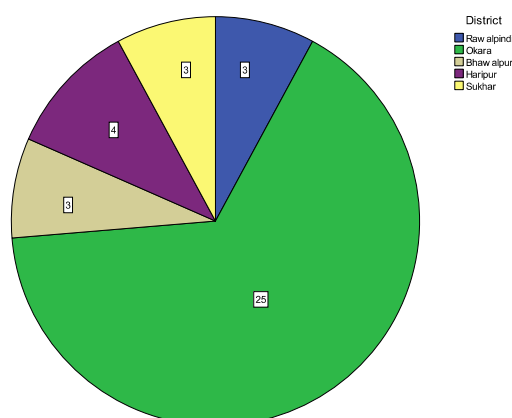
Figure 7. Percentage of youth working between 9 - 12 hours at brick kin by gender



3.8 Workers' employment in other work

Only 10 per cent (38 out of 374 workers) of the cases worked at any other place during brick kiln season. Out of these 25 were from the district of Okara. Most of the individuals in Okara that were employed in other work during brick kiln season were males and worked in the Agriculture sector.

Figure 8. Number of workers employed in other work during kiln season by district



3.9 Respondents' participation in house hold work

Males in both the worker and control group contributed mainly by shopping (79% and 51% respectively) for their household, while females contributed in more labour intensive tasks like cooking, cleaning utensils/house, and washing clothes. The contribution of females in labour intensive household tasks was greatest among the control group. 21 per cent of female kiln workers contributed in labour intensive household tasks while 65 per cent of the controls performed labour intensive household tasks.

Table 9. Type of household work done by gender of the respondent

	Workers		Controls	
	Female	Male	Female	Male
Household tasks	N (%)	N (%)	N (%)	N (%)
Shopping for household	1(1)	79(29)	1(3)	27(51)
Repairing any household equipment		2 (1)	-	-
Cooking	10 (10)	1(0)	7(19)	-
Cleaning utensils/house	11 (11)	4 (1)	13(35)	-
Washing clothes	9(9)	-	4(11)	-
Caring for children/old/sick	1(1)	-	-	-
Other household tasks	-	2(1)	-	-
Total	32(32)	91(33)	25(68)	27(51)

3.9.1 Hours spent per day doing house hold work

Compared to the cases, males and females in the control group tended to participate more in house hold work compared to the cases. 68 per cent of the females in the control group spent more than 2 hours every day doing household work. Similarly, 69 per cent of the males in the control group participated for 2 hours or less in household work every day.

Table 10. Hours per day spent by respondent doing household work by gender

	Workers			Controls		
	2 hours or less	>2 hours	Total	2 hours or less	>2 hours	Total
Female	29 (29)	24 (24)	49 (49)	13 (35)	24 (68)	37 (100)
Male	114 (41)	6 (2)	120 (32)	36 (69)	12 (23)	48 (92)

3.10 Health Determinants

3.10.1 Recent health events

Overall, workers were significantly more likely than controls to experience exhaustion (cases = 95% and controls = 21%), minor injuries (cases = 87% and controls = 40%), pains (cases = 77% and controls = 18%) and fear/anxiety (cases = 42% and controls = 11%) in one month. Therefore, young brick kiln workers are more physically and psychologically vulnerable in their day to day compared to the controls.

More importantly, child workers and adolescent workers compared to the controls suffered significantly more exhaustion (cases = 92% and controls = 14%), injuries (cases = 84% and controls = 37) and pains (cases = 68% and controls = 17) in one month. Therefore, compared to the controls underage kiln workers were much more physically and psychology vulnerable in their day to day routine.

Table 11. Negative health events experienced by respondents in the last month by province and age

	Exhaustion in last month		Minor injuries in last month		Any pain in last month		Fear or anxiety in last month	
	Workers	Controls	Workers	Controls	Workers	Controls	Workers	Controls
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Punjab								
11-14 years	58 (92)	5 (14)	53 (84)	13 (37)	43 (68)	6 (17)	21 (33)	5 (14)
15-17 years	85 (97)	14 (26)	69 (79)	23 (43)	49 (77)	10 (18)	28 (26)	5 (14)
18-24 years	73 (96)	NS	66 (87)	NS	54 (71)	NS	27 (35)	NS
Sindh & KPK								
11-14 years	34 (97)	NS	30 (86)	NS	32 (91)	NS	17 (48)	NS
15-17 years	65 (100)	NS	63 (97)	NS	65 (100)	NS	38 (58)	NS
18-24 years	48 (100)	NS	44 (91)	NS	48 (100)	NS	27 (56)	NS
Total	363 (97)	19 (21)	325 (87)	36 (40)	291 (77)	16 (18)	158 (42)	10 (11)

In green= Chi Square value < 0.01

Other important findings about recent health events among workers are presented below.

3.10.2 Gender and recent negative health events by gender of the worker

Majority of both male and female workers had suffered from exhaustion in the last month. 94% of the females and 98% male workers had experienced exhaustion in the last month. Overall, males were more likely than females to report minor injuries in the last week (91% vs. 77%). Male workers between the ages of 11 – 14 were more likely than females to report minor injuries (88 % vs. 69%).

Females in all three age categories were significantly more likely to experience fear or anxiety in the last month, compared to males. Findings suggest that males were more vulnerable to the physical hazards while females were more vulnerable to the psychological hazards.

Table 12. Recent health events experienced by kiln workers by gender and age

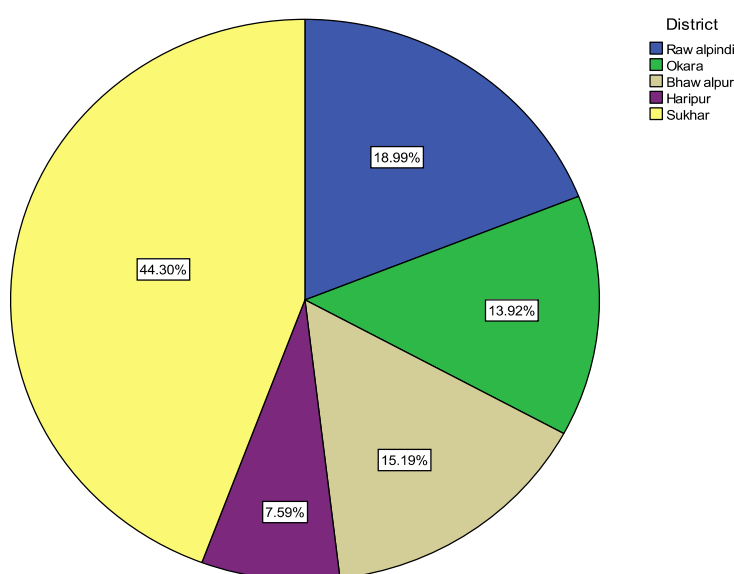
	Exhaustion in last month		Minor injuries in last month		Any pain in last month		Fear or anxiety in last month	
	Females	Males	Females	Males	Females	Males	Females	Males
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Worker's age								
11-14 years	25 (86)	67 (97)	22 (69)	61 (88)	24 (83)	51 (74)	20 (69)	18 (26)
15-17 years	32 (100)	118 (98)	27 (84)	105 (88)	31 (97)	83 (69)	23 (72)	43 (36)
18-24 years	36 (94)	85 (99)	28 (75)	82 (95)	34 (89)	68 (79)	28 (73)	26 (30)
Total	93 (94)	270 (98)	77 (77)	252 (91)	291 (77)	202 (73)	71 (71)	117 (42)

In green= Chi Square value < 0.01

3.10.3 District and recent negative health events by gender of the worker

44 per cent of workers that experience fear or anxiety belonged to the Sukhak district in Sindh. Consistent findings of differences in social vulnerability and health hazards faced by underage brick kiln workers indicates towards the necessity of studying this issue separately in all provinces in Pakistan.

Figure 9. Workers experiencing fear or anxiety in last month by districts



3.10.4 Negative health events in last year

Workers in all three age groups experienced more cuts and bruises, fractures, sprains and burns as compared to workers. Youth workers and adolescent workers experienced all four types of injuries in both provinces.

Table 13. Incidence of negative health events among respondents by province and age

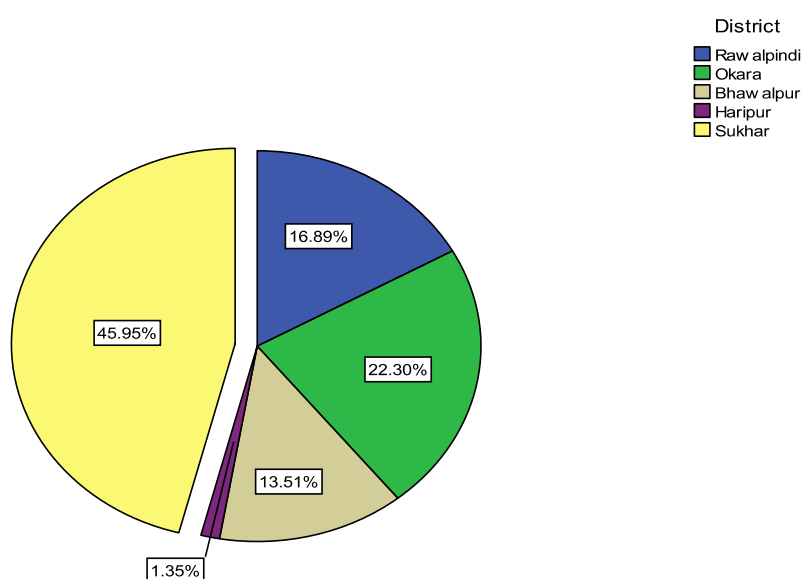
	Cuts or bruises in the last year		Broken bones in the last year		Sprains / dislocations in the last year		Bad buns or scalds in the last year	
	Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Punjab								
11-14 years	15 (23)	4 (11)	8 (13)	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)
15-17 years	21 (24)	11 (31)	7 (8)	0 (0)	2 (2)	0 (0)	1 (1)	0 (0)
18-24 years	17 (22)	NS	7 (9.2)	NS	1 (1)	NS	1 (1)	NS
Sindh & KPK								
11-14 years	12 (34)	NS	4 (11)	NS	0 (0)	NS	1 (3)	NS
15-17 years	36 (55)	NS	1 (2)	NS	0 (0)	NS	0 (0)	NS
18-24 years	21 (43)	NS	3 (6)	NS	0 (0)	NS	2 (4)	NS
Total	122 (35)	15 (16)	30 (8)	1 (1)	3 (1)	0 (0)	3 (1)	0 (0)

In green = Chi Square value < 0.01

3.10.5 Negative health events in last year by district

A descriptive analysis of the all the negative health event variables by districts revealed only one significant finding. The kiln workers in Sukhar reported more than 45 per cent of the injuries recorded in the data. In the previous section it was shown that brick kiln workers in Sukhar, were most likely to have experienced anxiety or fear in the last month. It is possible that underage brick kiln workers experience more anxiety because they and their peers get injured more. Further investigation into this issue is recommended.

Figure 10. Injuries experienced last year by workers district-wise



3.10.6 Body parts most vulnerable to injuries

Table 14. Body part of respondents that was injured in the last year by province and age

		Leg, hip and foot		Arm, hand and shoulder		Head and back		Other body part	
		Worker	Control	Worker	Control	Worker	Control	Worker	Control
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Punjab	11- 14 years	16 (25)	1 (3)	7 (11)	2 (6)	0 (0)	1 (3)	0 (0)	1 (3)
	15 - 17 years	12 (13)	5 (9)	16 (18)	4 (8)	1 (1)	2 (4)	0 (0)	0 (0)
	18 -24 years	15 (20)	NS	7 (9)	NS	2 (3)	NS	1 (1)	NS
	Total	43 (19)	6 (7)	30 (13)	6 (7)	3 (1)	3 (3)	1 (1)	1 (1)
Sindh and KPK	11- 14 years	0 (0)	NS	9 (14)	NS	0 (0)	NS	0 (0)	NS
	15 - 17 years	4 (6)	NS	29 (45)	NS	0 (0)	NS	0 (0)	NS
	18 -24 years	3 (6)	NS	15 (31)	NS	1 (1)	NS	0 (0)	NS
	Total	7 (5)	-	53 (35)	-	1 (1)	-	0 (0)	NS

In green = Chi Square value < 0.01

The limbs of underage brick kiln workers (arms, hands, legs, hips and feet) were found significantly more susceptible to injury compared to the control group. In Punjab children received more injuries in their legs, hips and foot (19 %). This percentage was 25 per cent among child workers, which was the highest in Punjab. In Sindh and KPK workers were more likely to sustain injuries in their arm, hand and shoulder. 35% per cent of the workers in Sindh and KPK received injuries in the arm, hand and shoulder while 13 per cent of the workers in Punjab were injured in the arm, hand and shoulder. The difference between provinces is statistically significant. 45% of the adolescent workers in Sindh and KPK received the most injuries in their arm, hand and shoulder.

13 workers from Punjab had suffered from major injuries during the years that they had worked in brick kilns. 6 child workers sustained major injuries in Punjab, thus younger workers are more at risk of sustaining major injuries. The number of major injuries sustained by brick kiln workers in Sindh and KPK is greater than Punjab. Again the younger worker i.e. child workers (7 injuries) and adolescent workers (9 injuries), sustained the most injuries.

Table 15. Major injuries at any time

Bad Injury		
	Workers	Controls
Punjab		
11-14 years	6	2
15-17 years	4	1
18-24 years	3	NS
Sindh & KPK		
11-14 years	7	NS
15-17 years	9	NS
18-24 years	5	NS
Total	31	3

3.11 Specific health problems

3.11.1 Health problems in last year

Overall, the worker reported significantly more breathing problems, eye and ear problems and skin problems in the last year. 33 per cent workers experienced breathing problems. Only 10 per cent of controls experienced breathing problems. 20 per cent of the workers had eye or ear problems in the last month compared to 10 per cent controls. Finally the percentages of the stomach problems reported by workers and controls are 41 per cent and 18 per cent, respectively.

Table 16. Health problems experienced in the year by the respondents by province and age

	Breathing problems		Eye/ear problem		Skin problems		Stomach problems	
	Workers	Control	Workers	Control	Workers	Control	Workers	Control
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Punjab								
11-14 years	13 (20)	3 (9)	6 (10)	4 (11)	1 (2)	0 (0)	15 (24)	5 (8)
15-17 years	18 (20)	6 (11)	9 (10)	6 (11)	6 (7)	2 (4)	25 (29)	11 (21)
18-24 years	20 (26)	NS	16 (26)	NS	4 (5)	NS	20 (26)	NS
Sindh & KPK								
11-14 years	14 (40)	NS	10 (28)	NS	4 (11)	NS	16 (46)	NS
15-17 years	37 (57)	NS	22 (33)	NS	2 (3)	NS	38 (58)	NS
18-24 years	23 (47)	NS	10 (20)	NS	1 (2)	NS	33 (68)	NS
Total	125 (33)	9 (10)	73 (20)	10 (11)	17 (4)	2 (2)	155 (41)	16 (18)

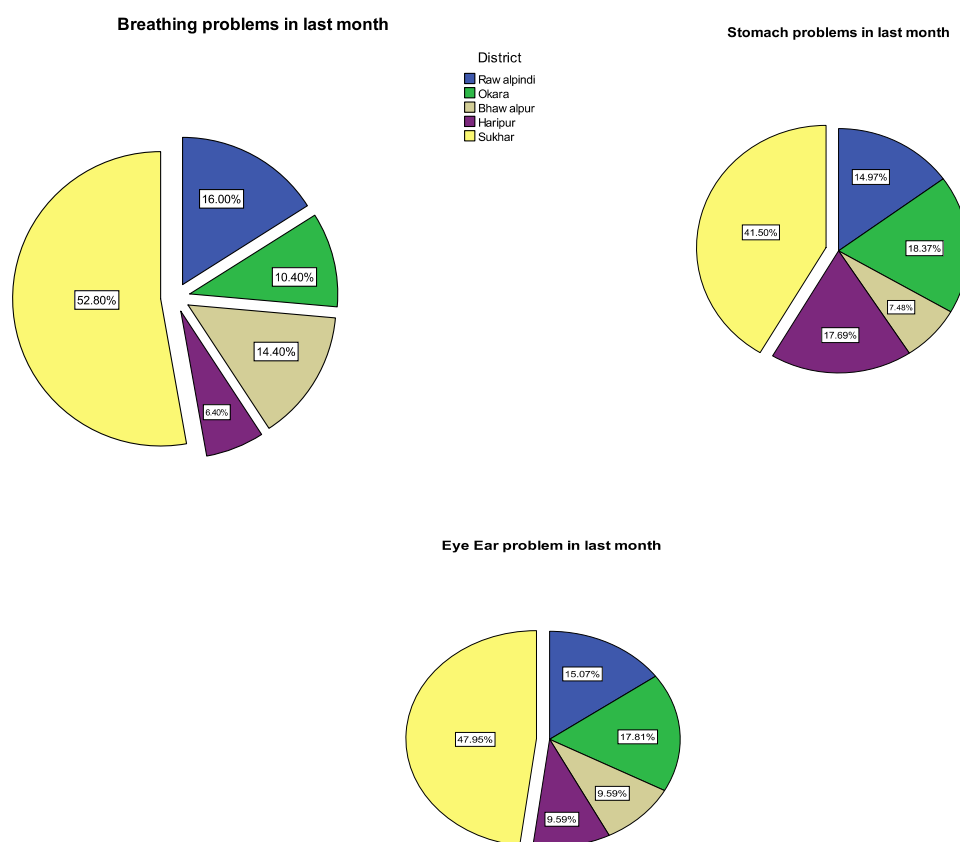
In yellow= Chi Square value < 0.01.

In green = High percentages of interest to this analysis.

However, the cells highlighted green in the table show that the incidence of health problems was not evenly distributed between provinces. A greater percentage of workers from Sindh and KPK reported breathing problems eye/ear problems and stomach problems in the last year, compared to Punjab. Specifically, adolescent and child workers in Sindh and KPK reported a lot more health problems than in Punjab.

3.11.2 Negative health events in last year by district

Figure 11. Reports of breathing problems, eye/ear problems and stomach problems in the last year by district



District-wise comparison shows that almost half of the breathing problems, eye/ear and stomach problems in the data were reported in Sukhar. Out of all reported health incidents in the last month, 52% of all breathing problems, 47 per cent of all eye/ear problems, and 41 per cent of all stomach problems were reported in Sukhar. It has been noted previously that Sukhar had the most number of reported injuries. Findings reinforce that health hazards faced by underage brick kiln workers may vary by location and context. Therefore, a separate study separate studies on underage brick kiln workers should be conducted in each province of Pakistan.

3.11.3 Specific health problems in last year (Headache or fever)

Child worker and adolescent workers were significantly more likely to suffer from headache or fever in the last year, compared to the controls. More than half of the child workers in Punjab (54%) suffered from headaches the last year. More than three-fourth (76%) of the child workers in Sindh and KPK suffered from headaches in the previous year. Similarly, 87 per cent and 82 per cent of the child workers in Punjab and Sindh and KPK respectively, had fever in the last year, compared 50 per cent controls. The percentage of headaches or fever in youth workers was also very high.

Table 17. Specific health problems experienced by respondents in the last year

	Headache		Fever	
	Workers	Control	Workers	Control
	N (%)	N (%)	N (%)	N (%)
Punjab				
11-14 years	34 (54)	9 (25)	55 (87)	18 (50)
15-17 years	50 (57)	30 (57)	64 (74)	20 (38)
18-24 years	38 (50)	NS	63 (83)	NS
Sindh & KPK				
11-14 years	26 (76)	NS	28 (82)	NS
15-17 years	59 (91)	NS	56 (86)	NS
18-24 years	40 (83)	NS	38 (79)	NS
Total	247 (66)	39 (44)	304 (82)	38 (43)

In green = Chi Square value < 0.01

Compared to Punjab, the percentage of workers in all three age categories that experienced headaches or fever in the last year was greater in Sindh and KPK.

3.11.4 Specific health problems in last year (Weakness, lack of energy, or hunger)

Workers were significantly more likely to have experienced weakness in the last year compared to the controls. In all three provinces, the percentage of experiencing weakness among workers is more than 50 per cent in all three age groups.

Interestingly, controls were more likely to have experienced lack of energy in the last year. 94 per cent of the controls in the 11 – 14 years age group and 96 per cent of the controls in the 15 – 17 years age group experienced lack of energy in the previous year.

Compared to controls, child workers were significantly more likely to have experienced hunger, during the previous year. 79 per cent of the child workers in Punjab, Sindh, and KPK recalled experiencing hunger in the last year.

Table 18. Specific health problems (weakness, lack of energy or hunger) in the last year by province and age of respondent

	Feeling weak		Lack of energy		Hungry	
	Workers	Controls	Workers	Controls	Workers	Controls
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Punjab						
11-14 years	35 (56)	13 (36)	53 (84)	33(94)	50 (79)	17 (47)
15-17 years	47 (54)	18 (34)	64(74)	51(96)	26 (30)	21 (40)
18-24 years	39 (51)	NS	57(75)	NS	1 (1)	NS
Sindh & KPK						
11-14 years	20 (59)	NS	25(71)	NS	27 (79)	NS
15-17 years	38 (58)	NS	49(75)	NS	57 (88)	NS
18-24 years	29 (60)	NS	33(69)	NS	0 (0)	NS
Total	208 (56)	31 (35)	281(75)	84(94)	161 (43)	38 (43)

3.11.5 Specific health problems in last year (Feeling bad, body tension, or dizziness)

Youth and underage workers in Sindh and KPK were more likely to have felt bad in the last year compared to the controls and the workers in Punjab. The incidence of experiencing body tension in the last year was alarmingly high among both the workers (80%) and the controls (84%). Lastly, in KPK and Sindh almost 90 per cent of the workers in all three age categories had experienced dizziness in the last year. This figure is worth noting because the feeling of dizziness during work hours could lead a child or adolescent to greater harm at the brick kiln.

Table 19. Specific health issues by province and age of respondent

	Feeling bad		Body tension		Dizziness	
	Workers	Controls	Workers	Controls	Workers	Controls
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Punjab						
11-14 years	0 (0)	0 (0)	52 (83)	29 (81)	49 (78)	25 (69)
15-17 years	3 (3)	1 (2)	69 (79)	46 (87)	44 (51)	30 (51)
18-24 years	1 (1)	NS	52 (68)	NS	58 (76)	NS
Sindh & KPK						
11-14 years	6 (18)	NS	29 (85)	NS	30 (88)	NS
15-17 years	19 (29)	NS	52 (80)	NS	60 (92)	NS
18-24 years	11 (23)	NS	44 (92)	NS	44 (92)	NS
Total	40 (11)	1 (1)	298 (80)	75 (84)	285 (76)	55 (62)

3.12 Musculo-skeletal problems

3.12.1 Experiencing pain

Workers were more likely to have experienced pain in the last month and year compared to the controls. The percentage of experiencing pain in the last month and year is consistently high among workers from all three age categories. The incidence of pain in the last month among workers is extremely high, ranging from 94 to a 100 per cent, in Sindh and KPK.

Table 20. Respondents experiencing pain in the last month or year by province and age

	Any pain in last month		Any pain in last year	
	cases	controls	cases	controls
Punjab				
11-14 years	43 (68)	6 (17)	30 (48)	2 (6)
15-17 years	49 (56)	10 (19)	51 (59)	3 (6)
18-24 years	54 (71)	NS	41 (54)	NS
Sindh & Kpk				
11-14 years	32 (94)	NS	16 (47)	NS
15-17 years	65 (100)	NS	41 (63)	NS
18-24 years	48 (100)	NS	26 (54)	NS
Total	291 (78)	16 (18)	205 (55)	5 (6)

3.12.2 Part of body pain experiencing in last year

Underage brick kiln workers significantly experience more pain in their back, neck arms and hands. 46% and 56% per cent of the child and adolescent workers experienced pain in their back and neck. Similarly, 29% and 37% per cent of the child and adolescent workers experienced pain in their arms and hands. The complaint of pain in all parts of the body is consistently high among workers across all three age groups within the three provinces included in this study.

Table 21. Pain in different body parts in the last year by province and age of respondent

		Back & neck pain in last year		Pain in arms, hands		Pain in hips, legs, feet	
		Cases	Controls	Cases	Control	Cases	Controls
Punjab							
	11 – 14	29 (46%)	2 (6%)	18 (29%)	2 (6%)	9 (14%)	0 (0%)
	15 – 17	49 (56%)	2 (4%)	32 (37%)	1 (2%)	15 (17%)	0 (0%)
	18 – 24	40 (53%)	NS	19 (25%)	NS	18 (24%)	NS
Sindh and KPK							
	11 – 14	15 (44%)	NS	14 (41%)	NS	1 (3%)	NS
	15 – 17	38 (58%)	NS	33 (51%)	NS	32 (49%)	NS
	18 – 24	26 (54%)	NS	21 (44%)	NS	20 (42%)	NS
Total		197 (53%)	4 (4%)	3 (37%)	3 (3%)	107 (29%)	0 (0%)

In green = Chi Square value < 0.01

Tables 20 and 21 show that brick kiln workers, especially child and adolescent workers, experience musculoskeletal pain in the short and long run. These pains may primarily be caused by the nature of toil involved in brick making. However, keeping in mind the climate of Pakistan, there is a strong possibility that these pains may even be caused by heat cramps. Further, research into the specific causes of higher incidence of musculo-skeletal among underage brick kiln workers is recommended.

3.13 Respiratory problems

Controls were found significantly more likely to self-report respiratory problems in the last year than workers. In this study physical evidence on the condition of the respondents lung function was also collected. During data collection each respondent was asked to take the Spirometric test to check their lung function. Results of the test showed that the percentage of poor lung functioning was almost comparable among the cases (25%) and controls (21%). Therefore both groups were almost equally likely to have poor lung functioning.

A majority of the respiratory problems were reported in Sindh and KPK.

Table 22. Respiratory problems of respondents by province and age

	Respiratory		Poor lung function	
	cases	Controls	cases	controls
Punjab				
11-14 years	13 (2)	3 (9)	22 (35)	11 (31)
15-17 years	18 (2)	6 (11)	31 (36)	8 (15)
18-24 years	20 (26)	NS	19 (25)	NS

	Respiratory		Poor lung function	
	cases	Controls	cases	controls
Sindh & KPK				
11-14 years	14 (40)	NS	3 (9)	NS
15-17 years	37(57)	NS	9 (14)	NS
18-24 years	23 (48)	NS	10 (21)	NS
Total	125 (36)	9 (10)	94(25)	19(21)

3.14 Body mass index and anemia

A significantly greater percentage of controls was found to be underweight compared to the workers. It indicated that working children are better fed than the controls. However, the incidence of Anaemia among the workers was significantly higher among the workers. The percentage was found to be highest among the child (43%) and youth (63%) workers.

Table 23. BMI of respondents and incidence of anemia by province and age

	Underweight		Anaemia	
	cases	controls	cases	controls
Punjab				
11-14 years	24 (38%)	16 (44%)	27 (43%)	7 (19%)
15-17 years	27 (31%)	24 (45%)	35 (40%)	9 (17%)
18-24 years	28 (37%)	NS	46 (61%)	NS
Sindh & KPK				
11-14 years	10 (29%)	NS	11 (32%)	NS
15-17 years	10 (15%)	NS	6 (9%)	NS
18-24 years	14 (29%)	NS	30 (63%)	NS
Total	113 (30%)	40 (45%)	155 (42%)	16 (18%)

3.15 Psychosocial factors

The respondents were asked a total of 48 questions relating to their psychosocial health. These questions measured the respondents' psychosocial state across 12 dimensions. In the table 24 provides the statement of each question along with the psychosocial dimension it measured.

Table 24. Dimensions of psychosocial condition measure along with questions/items

Dimension	Question/items
Self-esteem	Are you proud of your work?
	Do you feel like you have the skills needed to do your job well?
	Do you think others appreciate the work you do?
	Do you feel that some people look down on this kind of work or on you because of the work you do?
	Do you feel that your family relies on you and needs your help
Stress	Do you feel under pressure to work faster and harder?
	Do you feel bored because there is not enough to do?
	Does your family, employer or others ask too much of you?
	Do you get bored at work doing the same thing for many hours in a row?
	Do you feel tired because of the long working hours or heavy work load?
Personal agency	Do you feel like your work is prevents you from doing things you would like to do?
	Do you feel that, if you wanted to, you could choose what to do and what not to do?

Dimension	Question/items
Relationship	Does the environment in which you are working bother you at all?
	Are you comfortable with the people you work with?
Supervision and training	At work, do you feel that people watch over you to make sure you don't get hurt?
	Do people at work teach you what to do and how to do it?
Leisure	Do you have free time each day to do just what you want?
Emotional issues	Do you have lots of energy?
	Do you generally feel pretty confident?
	Do you have any difficulty sleeping?
	Do you have trouble concentrating?
	Do you feel restless and cannot stay still very long?
	Do you feel sad and like crying?
	Do you get into fights or quarrels easily?
	Do you feel lonely?
	Do you get very angry and often lose your temper?
	Do you have little appetite or interest in food?
	Do you find that you forget things?
Somatic issues	Do you feel tension in your body?
	Do you feel dizzy?
Chronic fear and anxiety	Do you feel afraid or nervous?
	Do you worry and think a lot?
	Do you think back about all the bad things that have happened to you?
Hopelessness and helplessness	Do you think your life will get better some day?
	Do you think your life is worse than that of other children?
	Do you think life isn't worth living?
Social factors	Do you feel supported and loved by your family?
	Is there conflict in your family?
	Do you feel accepted by the other families around here?
	Do you have one or more good friends that support you?
	Do you people reject or tease you or call you names?
	Do you play games or sports with friends?
	Do you feel very different from other children your age?
Abuse and maltreatment	You get scolded, or criticized or made to feel small or stupid?
	Do you get beaten at home or work?
	Has anyone at work tried to touch you in a bad way?
	Have you been severely punished for mistakes made at your work?
	In your day-to-day life do you feel safe?

Each item was measured on a 4 point Likert scale. During analysis the items measuring each dimension were added and divided by the total number of questions in that dimension to generate a composite score. This composite score ranged from 1 to 4; '1' being less and '4' being more. In the following section these composite scores will be used to present a dimension-wise analysis of the psychosocial measures.

3.15.1 Self-esteem

Brick kiln workers on average reported significantly low level of self-esteem than the controls. The average score of workers' self-esteem was 2.1 and that of the controls was 3.3. The comparison between workers and controls within the child and adolescent category was also significant. Data suggest that child and adolescent workers tended to have lower self-esteem compared to the controls.

Comparison of regions indicates that brick kiln workers in Punjab (2.3) had slightly higher self-esteem than brick kiln workers in KPK and Sindh (2.1). However, this difference is statistically significant.

Table 25. Respondents' self-esteem by province and age

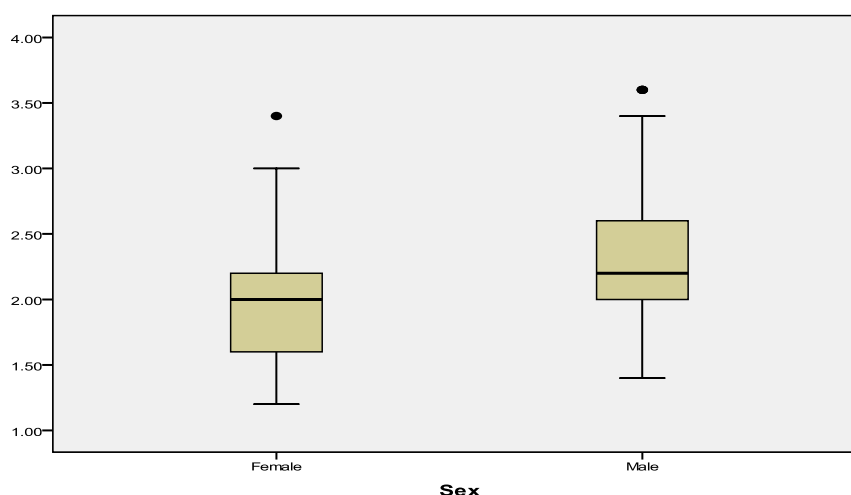
Self-esteem							
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.3	0.5	36	3.2	0.7
	15 - 17 years	87	2.2	0.5	53	3.3	0.6
	18 -24 years	76	2.3	0.6	NS	NS	NS
	Total	226	2.3	0.5	89	3.3	0.6
Sindh and KPK	11- 14 years	35	2.0	0.3	NS	NS	NS
	15 - 17 years	65	2.2	0.3	NS	NS	NS
	18 -24 years	48	2.2	0.4	NS	NS	NS
	Total	148	2.1	0.3	89	3.3	0.6

In yellow: Punjab: Workers vs. Controls = t test significant at 0.01

In green: Punjab vs. KPK and Sindh = t test significant at 0.01

Self-esteem and gender of worker

Figure 12. Kiln worker's self-esteem by gender



Male workers scored slightly higher on the self-esteem scale than females. The average composite score of females on the self-esteem items was 2, while for males it was 2.3. The box plot also reveals that a majority of the composite scores of the female workers were below the mean and that some extreme values have pulled the mean up. This indicated that the self-esteem score of the female workers would fall further if extreme values were taken out of the data.

3.15.2 Stress

The average composite scores of the self-reported stress indicated that workers are significantly more mentally stressed than the controls. The mean difference between the workers and controls is 0.7 (2.7 – 2.0). This difference is higher than the standard deviation

of both variables, indicating that the difference was more than the average variation in both variables.

Regional comparisons show that child and adolescent workers in Punjab reported significantly less stress than adolescent and child workers in KPK and Sindh. The mean of adolescent and child workers in Punjab is 2.4 each, whereas the mean of child and adolescent workers in Sindh and KPK was 2.6 and 2.9, respectively. The overall mean difference between workers in Punjab compared to Sindh and KPK is also significant. Therefore, workers in Punjab reported experiencing significantly less stress compared to workers in Sindh and KPK.

Table 26. Respondents' stress by province and age

		Stress					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.4	0.5	36	2.0	0.5
	15 - 17 years	87	2.4	0.6	53	2.1	0.5
	18 -24 years	76	2.5	0.4	NS	NS	NS
	Total	226	2.4	0.5	89	2.0	0.5
Sindh and KPK	11- 14 years	35	2.6	0.6	NS	NS	0.5
	15 - 17 years	65	2.9	0.6	NS	NS	NS
	18 -24 years	48	2.7	0.6	NS	NS	NS
	Total	148	2.7	0.6	89	2.0	0.5

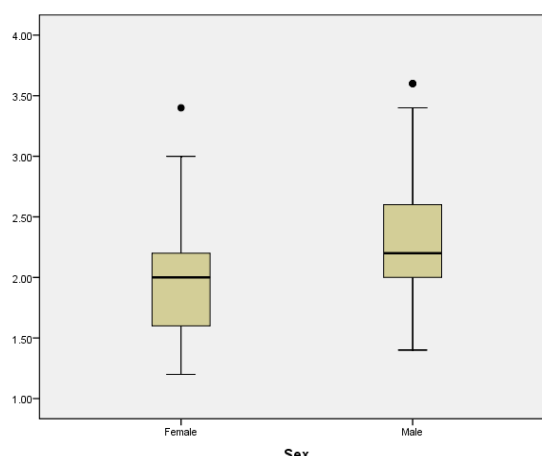
In yellow: **Punjab: Workers vs. Controls**= t test significant at 0.01

In green: **Punjab vs. KPK and Sindh**= t test significant at 0.01

Stress and gender of worker

On average female workers scored lower on the stress scale than males. The average composite score of the male and female workers on the stress scale was 2 and 2.3 respectively.

Figure 13. Kiln worker's stress by gender



3.15.3 Personal agency

Child and adolescent workers in Punjab believed that they had significantly less personal agency compared to controls. The difference between the composite means of the workers and controls was 0.4 for children (2.6 – 2.2) and 0.3 for adolescents (2.7 – 2.4). Comparison of brick kiln workers by region showed that workers in Punjab on average scored less on the personal agency scale compared to brick kiln workers in Sindh and KPK. The difference in mean composite score (2.4 – 2.6 = -0.2) is slight but significant.

Table 27. Respondents' agency by province and age

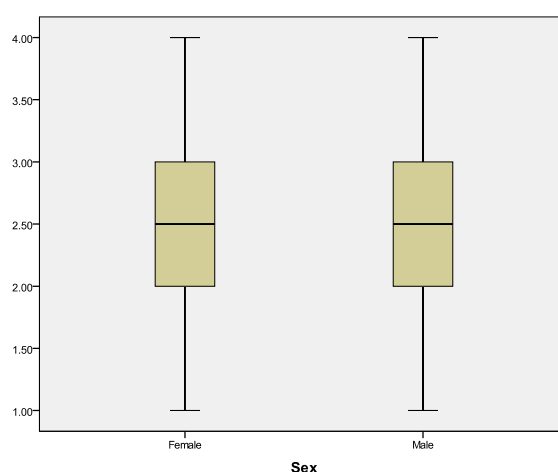
		Personal agency					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.2	0.6	36	2.6	0.7
	15 - 17 years	87	2.4	0.8	53	2.7	0.8
	18 -24 years	76	2.4	0.6	NS	NS	NS
	Total	226	2.4	0.7	89	2.6	0.8
Sindh and KPK	11- 14 years	35	2.5	0.9	NS	NS	NS
	15 - 17 years	65	2.7	0.8	NS	NS	NS
	18 -24 years	48	2.6	0.8	NS	NS	NS
	Total	148	2.6	0.8	89	2.6	0.8

In yellow: Punjab: Workers vs. Controls= t test significant at 0.01

In green: Punjab vs. KPK and Sindh= t test significant at 0.01

Personal agency and gender of worker

Figure 14. Personal agency of Kiln workers by gender



The mean of the composite scores for both male and female workers is almost similar at 2.5. Figure reveals that females brick kiln workers believed that they as much personal agency as male brick kiln workers. These findings are counter intuitive because Pakistani society is generally considered as a patriarchal and conservative. Further investigation is required to validate these findings and to determine whether this sense of personal agency is consistent in a majority of young females in Pakistan or is this attribute consistent in girls who start working at a young age.

3.15.4 Relationship

Overall, brick kiln workers were significantly less satisfied with their social relationships compared to the controls. The score was lowest for the adolescent workers in Punjab, i.e. 2.2. The difference between the composite mean score of adolescent brick kiln workers and controls is 1.1 (2.2 – 3.3).

Table 28. Respondents 'perception about relationships by province and age

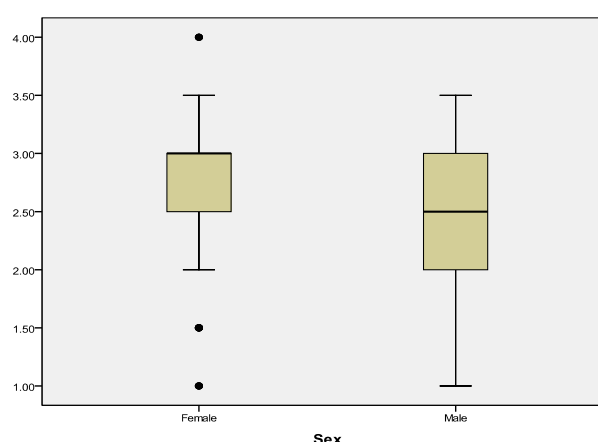
		Relationship					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.9	0.4	36	3.4	0.4
	15 - 17 years	87	2.2	0.7	53	3.3	0.5
	18 -24 years	76	2.7	0.6	NS	NS	NS
	Total	226	2.6	0.7	89	3.4	0.8
Sindh and KPK	11- 14 years	35	2.6	0.8	NS	NS	NS
	15 - 17 years	65	2.4	0.8	NS	NS	NS
	18 -24 years	48	2.8	0.6	NS	NS	NS
	Total	148	2.6	0.7	89	3.4	0.5

In yellow: Punjab: Workers vs. Controls = t test significant at 0.01

In green: Punjab vs. KPK and Sindh = t test significant at 0.01

Relationships and gender of worker

Figure 15. Brick kiln workers' perceptions about relationships by gender



Female workers scored higher than male workers on the relationship scale. The average composite scores for male and female workers were 3.0 and 2.5, respectively. Thus, female workers were more satisfied with their relationships, than male workers.

3.15.5 Supervision and training

Only brick kiln workers were asked questions about supervision and training. The descriptive statistics of this scale are presented in table 29.

Table 29. Brick Kiln Workers' perception about supervision and training by province and age

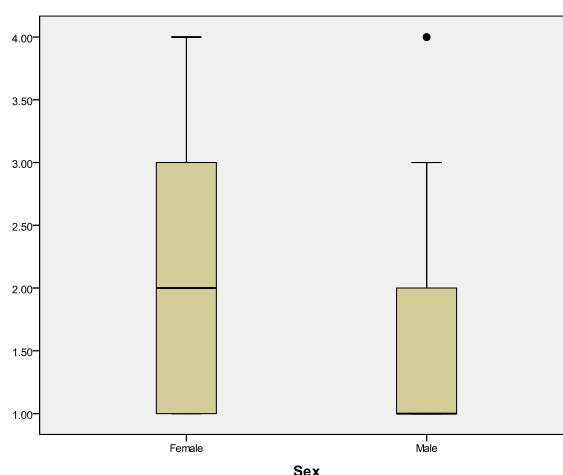
Worker		N	Mean	Std. Dev.
Punjab	11- 14 years	63	1.6	0.8
	15 - 17 years	87	1.6	0.6
	18 -24 years	76	1.9	0.9
	Total	226	1.7	0.8
Sindh and KPK	11- 14 years	35	1.4	0.8
	15 - 17 years	65	1.3	0.6
	18 -24 years	48	1.4	0.6
	Total	148	1.4	0.6

In green: **Punjab vs. KPK and Sindh**= t test significant at 0.01

In Sindh and KPK, adolescent workers and youth workers were less satisfied with their supervision and training, compared to Punjab. Overall, workers in Punjab were significantly more satisfied with their supervision and training when compared to the other provinces.

Supervision and training and gender of worker

Figure 16. Brick kiln workers' perception of supervision and training by gender



Female workers were more satisfied with the supervision and training they received than male workers. The difference between averages of composite score for female and male workers' satisfaction with their supervision and training was 1.0 (2.0 – 1.0).

3.15.6 Leisure

Table 30. Respondents' perceptions about leisure by province and age

		Leisure					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	1.8	0.8	36	2.3	0.8
	15 - 17 years	87	2.1	0.9	53	2.6	0.7
	18 -24 years	76	1.9	0.7	NS	NS	NS
	Total	226	2.0	0.8	89	2.5	0.8
Sindh and KPK	11- 14 years	35	1.1	0.4	NS	NS	NS
	15 - 17 years	65	1.2	0.4	NS	NS	NS
	18 -24 years	48	1.2	0.4	NS	NS	NS
	Total	148	1.1	0.4	89	2.5	0.8

In yellow: **Punjab: Workers vs. Controls**= t test significant at 0.01

In green: **Punjab vs. KPK and Sindh**= t test significant at 0.01

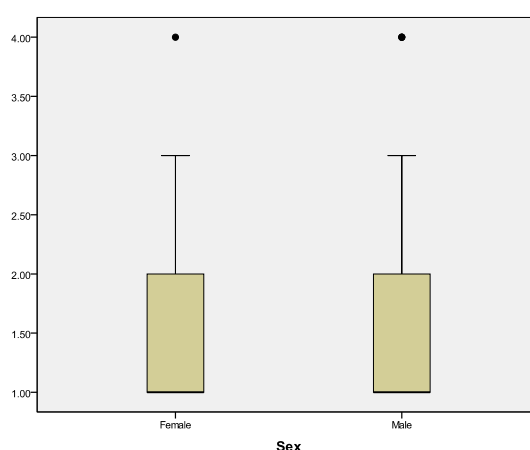
Child workers and adolescent workers felt that they had less leisure time compared to the controls. The difference between the mean composite scores between child workers and controls (1.8 – 2.3), and between adolescent workers and controls is 0.5 (2.1 – 2.6), each.

Brick kiln workers in KPK and Sindh felt that they had less time for leisure compared to the workers in Punjab. This difference was significant for all three age groups. This and previous findings indicate that there may be region specific differences in work environment and work culture in the brick kilns of Pakistan. Therefore, the risk and dangers faced by underage brick kiln workers in Pakistan may also vary by region.

Leisure and gender of worker

Both male and female workers on average scored very low on the leisure scale.

Figure 17: Respondents' perceptions about leisure by gender



3.15.7 Emotional issues

Workers perceived themselves slightly more emotionally challenged than the controls. The difference between composite scores of child workers and control ($2.1 - 1.8 = 0.3$) and adolescent workers and controls ($2.2 - 1.9 = 0.3$) was found to be statistically significant.

Table 31. Perception about emotional issues by province and age

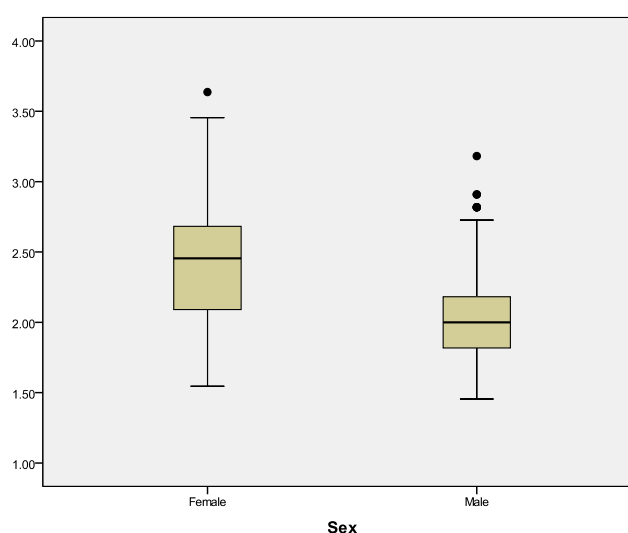
		Emotional					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.2	0.3	36	1.9	0.3
	15 - 17 years	87	2.1	0.4	53	1.9	0.4
	18 -24 years	76	2.2	0.4	NS	NS	NS
	Total	226	2.2	0.4	89	1.9	0.8
Sindh and KPK	11- 14 years	35	2.1	0.3	NS	NS	NS
	15 - 17 years	65	2.0	0.3	NS	NS	NS
	18 -24 years	48	2.1	0.3	NS	NS	NS
	Total	148	2.1	0.3	89	1.9	0.4

In green: Punjab: Workers vs. Controls= t test significant at 0.01

Perceptions about emotional well-being and gender of worker

Female workers perceived themselves as more emotionally challenged than male workers. The composite mean score for females on the emotion scale is 2.5 while the mean score of male workers is almost 1.75.

Figure 18. Perceptions about emotional well being and gender of worker



3.15.8 Somatic stress

Somatic stress was the only factors in the psychosocial instrument used for this study that asked the respondents to report whether they had been experiencing any physical manifestations of psychosocial stress. These manifestations include feeling tension and dizziness. Table 32 shows that 11 – 14 years old children working at brick kiln in Punjab

experienced slightly more somatic stress than the control. The mean difference was 0.2 (2.2 – 2.0) and was significant.

Table 32. Somatic measures by province and age of respondent

		Somatic					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.2	0.6	36	2.0	0.6
	15 - 17 years	87	2.1	0.8	53	2.0	0.6
	18 -24 years	76	2.3	0.7	NS	NS	NS
	Total	226	2.2	0.7	89	2.0	0.6
Sindh and KPK	11- 14 years	35	2.7	0.6	NS	NS	NS
	15 - 17 years	65	2.6	0.5	NS	NS	NS
	18 -24 years	48	2.7	0.6	NS	NS	NS
	Total	148	2.7	0.6	89	2.0	0.6

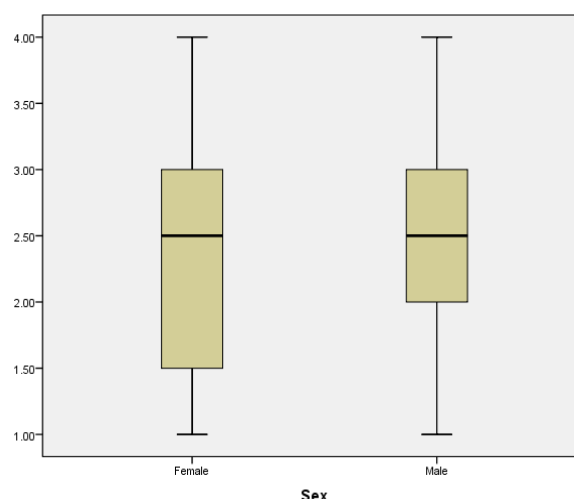
In yellow: **Punjab: Workers vs. Controls** = t test significant at 0.01

In green: **Punjab vs. KPK and Sindh** = t test significant at 0.01

Regional comparisons in the self-reported level of somatic stress showed that workers in Sindh and KPK experienced significantly more somatic stress than workers in Punjab. The differences were consistent in all three age categories. Findings indicate that there may be region specific causes of somatic stress among underage brick kiln workers in Pakistan.

Somatic stress and gender of worker

Figure 19. Somatic measures by workers' gender



Both males and females workers reported experiencing symptoms of somatic stress. The means of the composite score of somatic stress reported by male and female workers was almost equal at 2.5.

3.15.9 Chronic fear or anxiety

The mean composite score of chronic fear or anxiety for the workers is 1.9. The mean score of chronic fear or anxiety for the controls is 1.8. The difference between the two means is

not significant. On average the controls and workers reported experienced the same amount of fear or anxiety.

Regional comparison shows that child brick kiln workers in Sind and KPK reported experiencing more fear and anxiety compared to the child workers in Punjab.

Table 33. Chronic fear or anxiety experienced by respondents by province and age

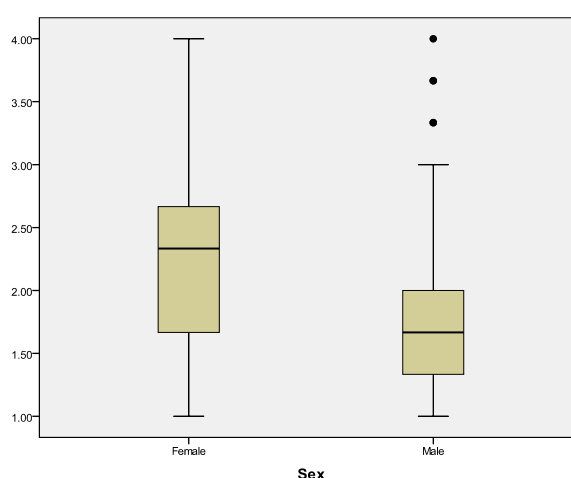
		Chronic fear or anxiety					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	1.7	0.6	36	1.8	0.5
	15 - 17 years	87	2.0	0.7	53	1.9	0.5
	18 -24 years	76	2.0	0.7	NS	NS	NS
	Total	226	1.9	0.7	89	1.8	0.5
Sindh and KPK	11- 14 years	35	2.0	0.6	NS	NS	NS
	15 - 17 years	65	1.8	0.5	NS	NS	NS
	18 -24 years	48	1.9	0.6	NS	NS	NS
	Total	148	1.9	0.5	89	1.8	0.5

In yellow: **Punjab: Workers vs. Controls** = t test significant at 0.01

In green: **Punjab vs. KPK and Sindh** = t test significant at 0.01

Chronic fear or anxiety and gender of worker

Figure 20. Chronic fear or anxiety experienced by respondents by gender



Female brick kiln workers reported experiencing substantially more fear or anxiety compared to the male workers. The mean composite score measuring intensity of experiencing chronic fear or anxiety for the female workers was almost 2.45, while for males it was around the score of 1.5.

3.15.10 Hopelessness and helplessness

Child workers felt significantly more hopelessness and helplessness compared to the controls. The mean difference between child workers and controls was 0.5 (2.5 – 2.0).

Furthermore, adolescent workers in KPK and Sindh experienced significantly less fear and anxiety compared to adolescent workers in Punjab.

Table 34. Feelings of hopelessness and helplessness among workers by gender

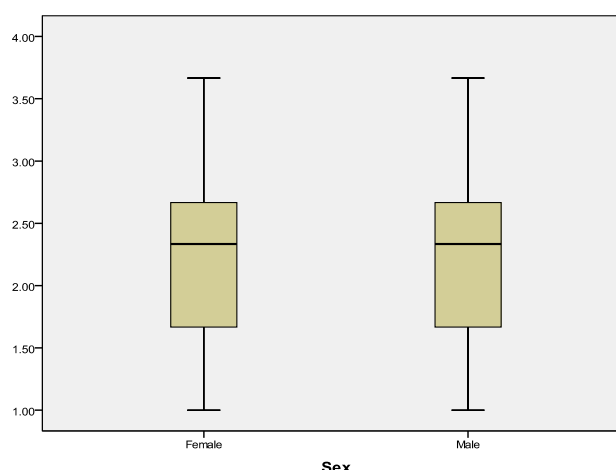
		Hopelessness and helplessness					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.0	0.7	36	2.5	0.6
	15 - 17 years	87	2.4	0.7	53	2.6	0.5
	18 -24 years	76	2.1	0.7	NS	NS	NS
	Total	226	2.2	0.7	89	2.6	0.5
Sindh and KPK	11- 14 years	35	2.2	0.7	NS	NS	NS
	15 - 17 years	65	2.0	0.7	NS	NS	NS
	18 -24 years	48	2.3	0.6	NS	NS	NS
	Total	148	2.1	0.7	89	2.6	0.5

In yellow: **Punjab: Workers vs. Controls** = t test significant at 0.01

In green: **Punjab vs. KPK and Sindh** = t test significant at 0.01

Hopelessness and helplessness by gender of worker

Figure 21. Feelings of hopelessness and helplessness among brick kiln workers by gender



Male and female brick kiln workers on average reported experiencing the same amount of hopelessness and helplessness. While, female brick kiln workers experienced more fear and anxiety, their measured levels of experiencing hopelessness and helplessness were similar to that of male brick kiln workers. Further research to validate and investigate this finding is recommended.

3.15.11 Social factors

Controls were significantly more comfortable with their social settings than the workers. Child and adolescent workers in Punjab scored the lowest on the social scale. Thus, according to the data, child and adolescent workers were significantly more likely to feel socially maladjusted.

Table 35. Social factors by province and age of respondents

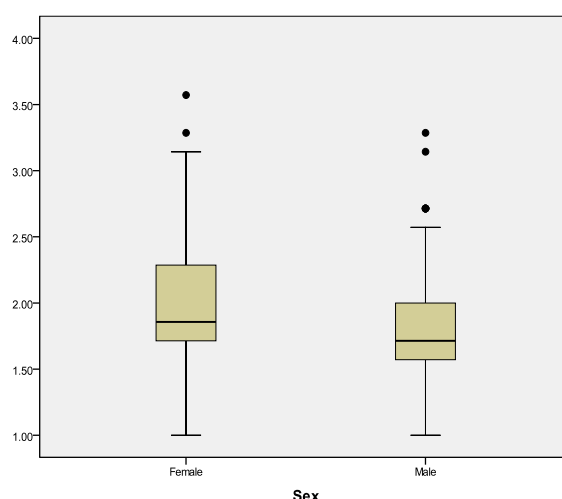
		Social factors					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	2.0	0.4	36	2.4	0.5
	15 - 17 years	87	1.8	0.5	53	2.5	0.4
	18 -24 years	76	1.9	0.3	NS	NS	NS
	Total	226	1.9	0.4	89	2.4	0.4
Sindh and KPK	11- 14 years	35	1.9	0.5	NS	NS	NS
	15 - 17 years	65	1.7	0.4	NS	NS	NS
	18 -24 years	48	1.8	0.4	NS	NS	NS
	Total	148	1.8	0.4	89	2.4	0.4

In green: **Punjab: Workers vs. Controls** = t test significant at 0.01

Social factors by gender of worker

Females scored slightly higher on the social scale than males. The mean score for females was 1.85 and for males was 1.70.

Figure 22. Social factors by province and age of respondents



3.15.12 Abuse and maltreatment

Contrary to expectations, controls in Punjab felt that they were slightly more abused and maltreated than the brick kiln workers in Punjab. The difference however, is not significant.

Regionally, with a small yet significant mean difference of 0.3 each, adolescent and youth workers in Punjab felt that they were abused more than adolescent and youth workers in Sindh and KPK.

Table 36. Abuse and maltreatment experienced by respondent by province and age

		Abuse and maltreatment					
		Worker			Control		
		N	Mean	Std. Dev.	N	Mean	Std. Dev.
Punjab	11- 14 years	63	1.8	0.5	36	1.9	0.2
	15 - 17 years	87	1.8	0.4	53	1.8	0.2
	18 -24 years	76	1.8	0.5	NS	NS	NS
	Total	226	1.8	0.4	89	1.9	0.2
Sindh and KPK	11- 14 years	35	1.7	0.4	NS	NS	NS
	15 - 17 years	65	1.5	0.4	NS	NS	NS
	18 -24 years	48	1.5	0.3	NS	NS	NS
	Total	148	1.6	0.4	89	1.9	0.2

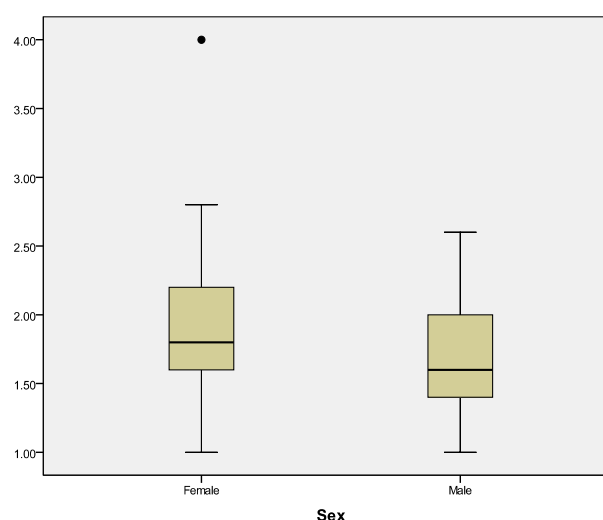
In yellow: **Punjab: Workers vs. Controls** = t test significant at 0.01

In green: **Punjab vs. KPK and Sindh**= t test significant at 0.01

Abuse and maltreatment by gender of worker

Female workers reported slightly higher rates of abuse and maltreatment compared to the male workers. The mean composite score of abuse and maltreatment for females was 1.65 and for males was approximately 1.55.

Figure 23. Abuse and maltreatment experienced by respondent by province and age



3.15.13 Psychosocial factors: Summary of findings and recommendations

The psychosocial factors were compared across work status, region and gender. A summary of each comparison is provided below.

- Brick kiln workers were found consistently more vulnerable on psychosocial factors when compared to children who did not work at brick kilns.
- Underage brick kiln workers in Punjab had significantly less self-esteem compared to children and adolescents who did not work at brick kilns.

- Underage brick kiln workers in Punjab, experienced significantly more stress than the controls. Stress can not only result in psychological discomfort, but also increases the children's risk of getting injured at work.
- In comparison to the controls, the underage brick kiln workers believed that they had less personal agency and less time for leisure. Leisure abates the negative effects of stress. Thus, feeling that they have less time for leisure may be indirectly contributing the underage brick kiln workers' overall level of stress.
- Underage brick kiln workers in Punjab, were found to be more socially maladjusted compared to controls. Underage brick kiln workers reported significantly more emotional issues, and were less satisfied with their work related relationships and social milieu.
- Child workers, between the ages of 11 – 14, experienced more somatic stress and hopelessness/helplessness compared to the controls. Somatic stress is the physical manifestation of mental stress and can result in temporary physical debilitation. This puts child brick kiln workers at more risk of getting injured at their work place.

Looking at these findings collectively reveals that underage brick kiln workers were more vulnerable to psychosocial pressures in comparison to the children who did not work at brick kilns. Further empirical validation of these findings is recommended. If these findings are found to be valid by future research, an intensive study into the short and long term health outcomes of these pressures is recommended.

Psychosocial factors of underage brick kiln workers by region

Study revealed evidence that there were differences in the underage and youth brick kiln workers' psychosocial condition across different regions in Pakistan. Specifically, study found that the brick kiln workers from KPK and Sindh were more vulnerable to psychosocial problems when compared to the brick kiln workers in Punjab.

Compared to brick kiln workers in Punjab;

- Underage brick kiln workers in Sindh and KPK experienced more stress and believed that they had less time for leisure,
- Workers in all three age ranges experienced significantly more somatic stress,
- Adolescent and youth workers in KPK and Sindh were less satisfied with their supervision and training at work and believed that they were abused/maltreated more,
- Child workers in KPK and Sindh had lower self-esteem and experienced significantly more fear and anxiety.

Further validation of these results is recommended. If the physical and psychological vulnerability of underage brick kiln workers varies across different regions, then only region-specific analyses of brick kilns across Pakistan can provide viable and contextually relevant solutions for improving the plight of underage brick kiln workers in Pakistan.

Psychosocial factors of underage brick kiln workers by gender

Some important gender based differences found between male and female brick kiln workers are summarized below.

- Female brick kiln workers were more satisfied with their supervision/training and relationships at their work than male workers. Findings indicate that female workers may be given better protection and care in brick kilns compared to males.
- Conversely, female brick kiln workers reported that they experienced more fear and anxiety, were abused/maltreated more and had more emotional problems compared to the male workers.

Preliminary findings indicate that there are gender specific differences in the psychosocial effects of brick kiln work on underage workers. These results warrant further investigation in future studies.

Recommendations

As is evident from the analysis of data and other findings of this study, the working and non-working members of the brick kiln making families face a number of hazards and problems in their working and living places which often are the same, and which jeopardize their physical and psychosocial well being. However these workers are playing important role in the supply of materials for the construction industry which has seen unprecedented growth in the last decade in Pakistan. The work at brick kiln is also an important source of livelihood for the marginalized segments of the society with very low level of literacy, no permanent residence and no property of their own. However the full potential of these workers has to be realized without jeopardizing their health and safety and the problems they are facing must be resolved to encourage healthier employment conditions at brick kilns. The focus on health and safety will also result in enhanced productivity, better earnings and reduction in the possibilities of worst forms of child labour conditions at the brick kilns. A number of actions if taken by the government, employers, and other concerned stakeholders can promote healthier and safer employment of young persons.

1. Statutory reforms and implementation of laws

The present laws though in theory cover brick kilns like any other manufacturing facility; however the implementation of laws in this sector has been patchy at best so far.

Though theoretically the brick kiln workers are eligible for coverage under the Social Security Scheme, but practically only a handful number of workers have been issued social security cards as this sector does not pay the mandatory social security contribution. Such practices make the workers more vulnerable as they are denied the comprehensive health coverage and social benefits under the social security scheme. Coverage under social security scheme would also lead to fewer turnovers of workers and less reliance on hefty loans and advances these workers have to ask their employers to provide them in order to meet their health and other social burdens. Health and safety issues and social protection measures pertaining to brick kilns are:

- Social Security Ordinance 1965
- Factories Act 1934
- Workmen Compensation Act, 1923
- Employment of Children Act 1991.
- Shops and Establishments Ordinance 1969

2. Introduction of Technology for brick making and brick firing

Brick making is a labour intensive task in which the whole families of brick makers are involved. As found during this study, many workers suffer from musculo-skeletal and other disorders due to their long working hours, awkward posture and repetitive and monotonous work. Due to low earnings and outdated methods of production the workers in this sector are vulnerable to exploitation. Many of these workers become trapped in debts which force them to pledge the work by their families in return for the debt incurred by them. According to some estimates there are over 6000 brick kilns in Pakistan with over half million persons involved in brick making¹. The brick making is being done manually in the sub-continent for much of the past 4000 years. Though technology has been introduced in this sector all over the world, the suitable technology in Pakistan has not yet been introduced. Though extruder-based technology has been introduced at some brick kilns, it has not so far succeeded due to a number of technical and financial reasons to replace the hand-molding of bricks. There is urgent need to introduce a worker-friendly technology which can liberate the children and women from arduous labour so the children can go to schools and the women can contribute in the household income by engaging in more productive and less hazardous work like raising cattle, handicraft making and agriculture.

Similarly the brick firing technology needs are viewed in order to replace the environmentally polluting and hazardous Bull's Trench Kiln with a worker and environment friendly technology.

3. Awareness raising and education

The workers and family members in the brick kilns need to be made aware of the hazards and risks to which they are exposed. The awareness campaign through documentaries, illustrated booklets, leaflets posters and street theatre can be launched on this issue.

4. Capacity Building

Presently very little if any expertise is available within the government and private sector in the area of health and safety. The existing OSH institutions like Centre for the Improvement of Working Conditions & Environment in the Labour Department Punjab may be strengthened to play more effective role in recognizing, evaluating and suggesting controls to the health and safety hazards faced by workers in brick kiln sector and other sectors which have so far not been studied.

5. Healthcare facilities

It was found during the informal discussions during the study that workers in the brick kilns have no access to even the minimum healthcare facilities. In most cases such workers are not listed. Any effort at elimination of hazardous child labour in this

¹ Labour, debt and bondage in Brick Kilns, Pakistan Institute of Labour Education & Research, 2003

sector should have a health component, whereby the workers should be provided basic health facilities and taught the importance of basic personal hygiene and health care. They also need to be educated on the harmful impact of certain kinds of works and dangerous practices.

6. Improving Living Conditions

The living conditions of the brick kiln families are very basic and shanty-like. Animals like donkeys and goats share the same sleeping quarters with the family members. The shabby structures are inadequate to protect the inhabitants from elements of nature. There is need to provide adequate housing facilities at the brick kilns.

Further investigation is required into the diet and hydration needs of underage brick kiln workers. Preparing a complete diet plan, including liquid intake, for underage brick kiln workers would not only ensure normal physical and mental growth, but could also help arrest their present physical discomfort. For instance, providing drinking water with electrolytes to underage brick kiln workers would prevent heat cramps. Heat cramps may be one of the causes of the excessive musculo-skeletal pains that underage brick kiln workers experience in comparison to children who do not work at brick kilns.

7. Further study

The study consistently found differences in the health and social conditions of brick kiln workers across districts and provinces. There is a definite need to study health hazards faced brick kiln workers across a wider cross section in Pakistan.