Internship Report:

Knowledge, Attitude and Self- Reported Practices Related to Occupational Health and Safety in Informal Construction Sector: Observation from the RAISE Project in Jashore, Bangladesh

Submitted to

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Declaration

I, Sirazum Munira Raiyan, declare that this research paper titled " Knowledge, Attitude and Self-Reported Practices Related to Occupational Health and Safety in Informal Construction Sector: Observation from the RAISE Project in Jashore, Bangladesh" is an original work undertaken by me under the guidance and direct supervision of Dilip Kumar Chakravorty (General Manager (Programme) & Project Coordinator, RAISE Project), and Golam Gilane, Manager (Programme), PKSF. My internship was conducted at RAISE Project of PKSF as a requirement for the completion of my Bachelor's Degree in Health Economics at University of Dhaka. I confirm that:

1. The research presented in this paper is original and has been conducted by me in accordance with the ethical standards of the Recovery and Advancement of Informal Sector Employment (RAISE) Project.

2. Any assistance received during the research and the writing process has been acknowledged, and the work of others is properly cited and referenced.

3. This paper has not been submitted to any other institution for the purpose of earning a degree or qualification.

4. I acknowledge that in accordance with PKSF regulations, any violation of academic integrity, such as plagiarism, may potentially lead to significant repercussions.

……
(Sirazum Munira Raiyan)
Intern, RAISE Project, PKSF

Abstract

According to the International Labor Organization, Occupational safety and health (OSH) deals with all aspects of health and safety in the workplace. Its goal is to prevent the occurrence of occupational accidents and diseases. The Asia and the Pacific region has the highest work-related mortality (63 per cent of the global total) because of the size of the region's workforce. Agriculture, construction, forestry and fishing and manufacturing are the most hazardous sectors, accounting for 200,000 fatal injuries per year, which represents 63 percent of all fatal occupational injuries (ILO, 2023). This study used the Knowledge-Attitude-Practice model to observe Occupational Health and Safety (OHS) related knowledge, attitudes, and practices among current and graduated apprentices in the informal construction sector under RAISE Project. Among the respondents, 91% reported using personal protective equipment. Across both of the groups (Current and Graduate Apprentices), usage of 3 Personal Protective Equipment had the highest frequency. The study found that 87.50% of the current apprentices had good attitude towards occupational health and safety, while the proportion was 67.75% among the graduates. Better knowledge level was observed among the graduates regarding occupational hazards and usage of Personal Protective Equipment. Better attitude was observed among the apprentices in relation to occupational health and safety. Interactive learning modules for apprentices, regular monitoring o and addressing the knowledge gap regarding OHS has been recommended.

Preface

This research effort stands as a testament to the enriching experience garnered during an internship period from 10 December, 2024 to 10 March, 2025 under the Palli Karma-Sahayak Foundation (PKSF). Throughout this internship, supervised by Dilip Kumar Chakravorty (General Manager (Programme) & Project Coordinator, RAISE Project) and Golam Gilane, Manager (Programme), I delved into the multifaceted realm of the Recovery and Advancement of Informal Sector Employment (RAISE) Project. The study focused specifically on the aspects of the "Apprenticeship Program" and the Occupational Health and Safety. The genesis of this study was shaped collaboratively, having consulted with my supervisor Golam Gilane, and Quazi Moshrur-Ul-Alam (Program Manager, RAISE Project), Faruk Hossain (Program Manager, RAISE Project) and Md. Shahinur Rahman (Environment Specialist, RAISE Project), whose invaluable insights guided the formulation of the study's foundational objectives. On this intellectual journey, I embarked upon a meticulous path to observe the knowledge, attitude and practices regarding occupational health and safety among the informal sector workers which included graduates and current apprentices from RAISE Apprenticeship Program. The trajectory commenced with the formulation of a title that captured the essence of this research. The initial phase involved crafting a preliminary questionnaire, setting the stage for supplementary field research. The journey to Jashore and the field research facilitated by collaboration with Jagorani Chakra Foundation, Ad-Din Welfare Foundation and Shishu Niloy Foundation was pivotal.

Acknowledgement

I extend my gratitude to the Institute of Health Economics, University of Dhaka for mandating a three-month internship for completing my bachelor's degree in Health Economics. This experience has highlighted the invaluable nature of practical exposure in this field. I am thankful to Dr. Syed Abdul Hamid, Professor, Institute of Health Economics, University of Dhaka and Ashraful Kibria, Lecturer, Institute of Health Economics for providing a comprehensive training on internship process and research methodology and facilitating my internship at PKSF, an esteemed organization in Bangladesh. This internship has been instrumental in bridging the gap between theoretical concepts and their real-world applications, contributing significantly to my academic journey.

My sincere appreciation goes to my academic mentor Farah Ishaq, Assistant Professor at Institute of Health Economics, whose guidance profoundly influenced my research project at PKSF and steered the trajectory of my academic pursuits. Her mentorship enhanced my understanding of health economics and its practical implications. I express my gratitude to Dilip Kumar Chakravorty (General Manager (Programme) & Project Coordinator, RAISE Project) and Golam Gilane (Manager (Programme) & Deputy Project Coordinator, RAISE project at PKSF). Their steadfast support and guidance were instrumental in creating a comprehensive and growth-oriented learning experience during my internship. They served as my internship supervisors, extending valuable support throughout the journey.

The assistance and guidance provided by Quazi Moshrur-Ul-Alam (Program Manager, RAISE Project), Faruk Hossain (Program Manager, RAISE Project), and Md. Shahinur Rahman

(Environment Specialist, RAISE Project) were pivotal in shaping my study's direction and resulting report.

A special thanks to Noman Ibne Foysal (ICT Specialist, RAISE Project) for providing insights and detailed information on the employment status of graduate apprentices which significantly enhanced our knowledge on the effect and outreach of the project as well as served as an instrumental part for determining the study area. My sincere appreciation goes to Anjuman Ara Begum (Program Manager, RAISE Project) for arranging a daylong field visit to Savar prior to the data collection phase of my research, which was an eye-opening experience to the practical dimensions of the project in enhancing employability in the informal sector which profoundly influenced my research project. I express heartfelt thanks to Babul Moral (Coordinator, RAISE Project at Social Upliftment Society (SUS)) for arranging the visits and dining facilities at Social Upliftment Society (SUS) in Savar, Dhaka.

I extend my gratitude to Dilip Kumar Chakravorty (General Manager (Programme) & Project Coordinator, RAISE Project) and Asfak Mahmud (Deputy Manager, PKSF) for their warm welcome on the commencement of my internship. My heartfelt appreciation goes out to Sharmin Sultana (Assistant Accounts Officer, RAISE Project), Anamika Laskar (Assistant Accounts Officer, RAISE Project) and Suma Saha (Accounts Officer, RAISE Project) for their valuable insights and assistance during my internship tenure.

The three enriching field visits to Jagorani Chakra Foundation, Ad-Din Welfare Center and Shishu Niloy Foundation Jashore, arranged by Golam Gilane, and Quazi Moshrur-Ul-Alam, was an

invaluable experience. Special thanks to Mr. Alamgir (Coordinator, RAISE Project, Jagorani Chakra Foundation) for arranging accommodations and dining facilities at Arebpur, Jashore during my visit. I express heartfelt thanks to Md. Abdulla Al Mamun (Officer, RAISE Project, JCF), Md. Monirul Islam (Case Management Officer, RAISE Project, Ad-Din Welfare Foundation), Ujjal Kumar Chakrabortty (Case Management Officer, RAISE Project, Shishu Niloy Foundation) and everyone else at Jagorani Chakra Foundation, Ad-Din Welfare Center and Shishu Niloy Foundation for their assistance during data collection.

Lastly, I am grateful to everyone who contributed to making this unique internship possible. My time at PKSF was filled with positivity and enthusiasm. As an intern at PKSF, this experience has significantly contributed to my professional growth and prospects. The insights gained will undoubtedly be applied to my forthcoming endeavors.

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List of Abbreviations

IMF International Monetary Fund

ILO International Labor Organization

KAP Knowledge Attitude Practice

MCP Master Crafts Person

OHS Occupational Health and Safety

PKSF Palli Karma-Sahayak Foundation

PPE Personal Protective Equipment

RAISE Recovery and Advancement of Informal Sector Employment

WEWB Wage Earners Welfare Board

WHO World Health Organization

1.Introduction

1.1 About Palli Karma-Sahayak Foundation (PKSF)

In the 1980s the Bangladeshi government recognized the need to create a dedicated organization for reducing poverty by creating jobs. Following years of deliberation with several ministries, development partners, and leading development specialists, the government ultimately chose to establish Palli Karma-Sahayak Foundation (PKSF). On November 13, 1989, this apex development body was formally established following the proposal's approval by the Bangladeshi president (Palli Karma-Sahayak Foundation (PKSF), 2024). Since then, PKSF has not stopped fighting poverty and enhancing people's lives all throughout the nation. Palli Karma-Sahayak Foundation (PKSF), serves as a prominent institution dedicated to poverty alleviation and rural development enhancement. PKSF serves 15.4 million people nationwide, including microentrepreneurs, the extremely poor, and those from socioeconomic and ethnoculturally disadvantaged backgrounds. For them, PKSF provides suitable, non-time-bound interventions. Officially, these are referred to as "programs." As long as there is a demand in the field, they will continue to operate. Only PKSF's own funds are used to run the programs (Palli Karma-Sahayak Foundation (PKSF), 2024). In accordance with the changing needs of people, the nature of the organization’s interventions constantly evolves. PKSF takes up tailor-made projects with specific objectives to ensure services that are out of the purviews of its programs by partnering with various development partners, who co-finance such projects that usually have a specific duration (Palli Karma-Sahayak Foundation (PKSF), 2024). PKSF assists 19.96 million poor and disadvantaged people across the country through a variety of demand-driven interventions. These interventions respond to the changing requirements of the communities concerned. Furthermore, PKSF

implements specialized, time-bound projects, co-financed by development partners, to address the needs of the poor in order to go forward with their dreams of a more prosperous future ((Palli Karma-Sahayak Foundation (PKSF), 2024). PKSF's dedicated Training Unit aims to strengthen the capacity of officials from its Partner Organizations (POs). It organizes highly tailored training courses with carefully built training modules that span a wide range of topics such as financial services management, sustainable development, and poverty reduction (Palli Karma-Sahayak Foundation (PKSF), 2024). PKSF established the "Special Fund" in 2010 to provide specialized support to the poor and extremely poor during humanitarian or social crises and natural catastrophes. Participants in various PKSF programs/projects, including staff members of PKSF and its Partner Organizations (POs), can request assistance from the Fund. The Special Fund also supports vulnerable and ailing liberation warriors, teachers, and development workers. The fund is managed by a four-member committee led by PKSF's Managing Director (Palli Karma-Sahayak Foundation (PKSF), 2024). With the vision of, "A Bangladesh where poverty has been eradicated; the ruling development and governance paradigm is inclusive, people-centered, equitable and sustainable; and all citizens live healthy, appropriately educated and empowered and humanly dignified life." PKSF acts as a bridge between the government and non-government organizations, to work together towards reducing poverty and enhancing rural communities.

1.2 Recovery and Advancement of Informal Sector Employment (RAISE Project)

In order to effectively address the gaps in the services offered under the micro-enterprise programs and projects, the World Bank, in collaboration with PKSF, conducted a Gap Analysis Study in 2018. It found that the informal sector's micro-enterprises are hindered by a number of factors, including the entrepreneurs' lack of life, entrepreneurial, and technical skills, inability to obtain financing for start-ups and entrepreneurs who are lagging behind, use of low levels of technology

and significant gender disparities in labor market outcomes. Furthermore, many talented young people, especially women, would like to be self-employed but are unable to do so due to start-up capital limits and a lack of business experience. Since the urban and peri-urban informal sector has been disproportionately impacted by the COVID-19 shocks, the urgency of the need for specific labor market programs for people working in the informal sector has increased, particularly for youth in these areas. On such a note, PKSF began the "Recovery and Advancement of Informal Sector Employment (RAISE)" Project in February 2022. The initiative is being carried out by PKSF via its 70 Partner Organizations spread all across Bangladesh. 175,000 young people and micro entrepreneurs from the informal sector are getting inclusive financial services and assistance with capacity building as part of this USD 250 million project. The activities also branch out to COVID-affected returnee migrants. The Wage Earners' Welfare Board (WEWB), a part of the Ministry of Expatriates' Welfare & Overseas Employment, is responsible for the recovery and reintegration of COVID-affected returnee migrants as part of the RAISE project. The centuries-old "Ustad-shagred" system of passing down skills from one generation to the next benefits both ustads (masters) and shagreds (apprentices), RAISE project has adapted this system of training. Young people from low-income families are paired with knowledgeable and competent Master Craftspeople (MCPs) chosen by the POs based on the eligibility and selection requirements to host an apprentice under the RAISE project. To build his or her ability to guarantee long-term wage employment, the apprentice receives life-skills development instruction from a qualified trainer in addition to on-the-job training under the MCP.

1.3 Occupational Health and Safety in the Informal Sector

The majority of third world cities can be described as "Having two opposing systems of production—one from the peasant system of production, the other from capitalist forms of

production" (Mcgee, 1973). The International Labor Organization (ILO) defines the informal sector as small, unincorporated, unregistered private businesses that are at least partially involved in the production of goods and services for the market (ILO, 2015). The informal economy activities have market value and would be able to add to tax revenue and Gross Domestic Product if they were recorded (International Monetary Fund, 2020). A business is considered unregistered if it is not registered under national laws, such as commercial acts, tax or social security legislation, or the regulating acts of professional association. A business is deemed small if it employs fewer regular staff members than a specific threshold, such as five. The national context determines the number. If a business is not a separate legal entity from its owners, it is considered unincorporated. This typically indicates that no full set of accounts is maintained (ILO, 2015). About one third of low and middle-income countries' economic activities and 15 percent in advanced economies are covered by the informal sector (Delechat & Medina, 2020). Approximately 49 to 64 percent of Bangladesh's GDP currently derives from operations in the informal sector, which employs 35 to 88 percent of the country's labor force (Yeasin, 2021). According to the World Health Organization (WHO), Occupational Health is defined as "An area of work in public health to promote and maintain highest degree of physical, mental and social well-being of workers in all occupations." (WHO, 2019). Several disciplines under occupational health are occupational medicine, psychology, hygiene, safety, etc. The objectives of occupational health are (WHO, 2019):

"1. Maintenance and promotion of workers' health and working capacity

2. Improvement of working conditions and the working environment to become conducive to safety and health.

3. Development of work organization and working cultures that should reflect essential value systems adopted by the undertaking concerned, and include effective managerial systems, personnel policy, principles for participation, and voluntary quality-related management practices to improve occupational safety and health."

According to the International Labor Organization, Occupational safety and health (OSH) deals with all aspects of health and safety in the workplace. Its goal is to prevent the occurrence of occupational accidents and diseases. Under the RAISE project, apprentices learn about proper safety procedures and the use of Personal Protective Equipment (PPE) in accordance with their specific trades through the RAISE project's occupational safety and health training.

1.4 Objectives

In order to improve the safety measure adherence, assessment of the existing level of knowledge, attitude and practices will assist in understanding the current scenario as well as the development of appropriate interventions for improvement. The research questions are as follows:

- How much do the informal sector workers know regarding occupational hazards and safety practices?
- How do informal sector workers perceive the importance of OHS?
- To what extent are they practicing OHS?

To investigate the impact of the RAISE project on Occupational Health and Safety (OHS) knowledge, attitudes, and practices among workers in the informal construction sector. Specific objectives include:

- To observe the knowledge level on occupational hazards and safety measures.

- To observe differences in workers' attitudes towards occupational safety.
- To observe practices related to occupational safety among workers in the RAISE Project.

2. Literature Review

Globally almost 3 million workers die annually due to work related injuries and disease (ILO, 2023). The Asia and the Pacific region have the highest work-related mortality (63 per cent of the global total) because of the size of the region's workforce. Agriculture, construction, forestry and fishing and manufacturing are the most hazardous sectors, accounting for 200,000 fatal injuries per year, which represents 63 percent of all fatal occupational injuries (ILO, 2023). The Bangladesh Labour Act (Amendment), 2013 was passed by the government of Bangladesh as a result of OSH-related concerns that surfaced following the tragic 2013 collapse of the Rana Plaza complex, which claimed 1,134 lives (National Profile on Occupational Safety and Health in Bangladesh, 2019). A new section on hazardous work for children, emergency exits, worker access to gangways, stairs, etc., the requirement to wear personal protective equipment, the notification of the appropriate authority in the event of an incident, the establishment of a health center in businesses with more than 5,000 employees, and a new section on the creation of a safety committee are all included in the amended provisions (National Profile on Occupational Safety and Health in Bangladesh, 2019). Despite the severity, evidence related to occupational hazards and safety measures is still scarce in Bangladesh. Numerous studies related to occupational health and safety have been conducted across Africa. A study on construction workers in Nigeria revealed that 61.9% of the respondents had good knowledge of construction occupational hazards (Oluwafemi et al., 2017). Similar findings on knowledge level have been found in multiple studies. A 2014 study on textile workers in Ethiopia found that 69% of respondents had knowledge

on safety information (D et al., 2014). This finding is supported by another 2023 study conducted on factory workers in Ethiopia, with 53.4% of respondents being aware of safety precautions (Mengesha et al., 2023). Another study by Onowhakpor et al. on sawmill workers in Nigeria found that 92.7% of respondents were aware of specific issues as occupational hazards in sawmill. A study on garment workers in India found that among three sections of ready-made garments factory, it has been found that the workers employed in the three sections had high levels of knowledge of the health problems, but the knowledge of personal protective equipment differed by section (Parimalam et al., 2007). However, poor attitude to occupational safety and poor practice of occupational safety measures were observed as well. Common indicators of practice were usage of PPE, reporting of unsafe conditions, cleanliness (Onowhakpor et al., 2017, D et al., 2014, Mengesha et al., 2023). Among construction workers, 85.7% of respondents reported poor practice of safety measures according to Oluwafemi et al. 2017. A study on textile workers in Ethiopia found 54% using personal protective equipment. Respondents' knowledge of occupational hazards was found to be statistically associated with their attitude to and practice of occupational measures while their attitude to safety measure is statistically associated with their practice (Oluwafemi et al., 2017). Because the informal sector is complicated and unregulated, it is challenging to monitor its adherence to labor law norms and practices. Nonetheless, OHS is a major area of concern that highlights the significance of a safe work environment, understanding, and practices given the contribution and kind of labor included in the informal sector. Risks associated with occupational hazards can be avoided or reduced by following appropriate safety procedures. Knowledge of work-related risks and the understanding of the necessity of adopting proper behavior as well as the proper use of personal protective equipment (PPE) are crucial in ensuring adherence to safety measures.

3. Methodology

3.1 Conceptual Framework

This study used the KAP model to explore worker's knowledge, attitudes, and practices of occupational health and safety. Knowledge is defined as the understanding of information, which is the non-symbolic and conscious perception of meaning (Wessman, 2006). Attitude is defined as a positive or negative assessment of an objective (Ajzen and Fishbein, 2000). And, regular activities influenced by widely shared beliefs and social norms are referred to as Practice (Bourdieu, 1990). Originating from the fields of family planning and population studies in the 1950s, the KAP model is a structured, standardized questionnaire completed by a target population that can quantify and analyze what is known (knowledge), believed (attitudes), and done (practices) with regard to a topic of interest (Andrade et al., 2020). As such, the data can help to identify knowledge gaps, attitudes barriers, and practice patterns that may facilitate understanding and actions regarding a particular issue (World Health Organization, 2008). In addition, integrating qualitative methods, such as interviews, can enhance the viability and reliability of the survey (Launiala, 2009). The KAP study can have different objectives such as exploration, hypothesis testing and creating a baseline (World Health Organization, 2008). This study has implemented the model for exploration and observational purposes.

3.2 Study Design

For the quantitative analysis, a questionnaire was developed that covers the following variables:

- Socio-demographics (gender, age, marital status, education level)
- Basic Knowledge of occupational hazards and safety measures (knowledge on basic safety instructions and occupational hazards)

- Attitudes towards safety protocols (perceived need for safety protocols)
- Current practices related to safety. (Usage of PPE, Availability of safety measures, Workplace injuries, type of injury, how it was addressed)

3.3 Sampling Method

RAISE projects activities are implemented through 70 partner organizations that are operating all over Bangladesh. The study population comprises current and graduate apprentices involved in the following trades: Welding and Fabrication, Aluminium Fabrication, Refrigeration and Air Conditioning. Workers engaged in the construction sector were the study population including current apprentices and graduate apprentices who are now in employment. According to the latest data on employment status of RAISE apprentices, Jashore district has 79 employed graduate apprentices in the construction sector, namely the Welding and Fabrication, Aluminum Fabrication, Refrigeration and Air Conditioning trades. The RAISE apprentice information hub reported 27 current apprentices involved in these trades in Jashore. Random sampling was used. The calculation derived a sample size of 37 for graduate apprentices and 20 for current apprentices with a 90% confidence interval and 10% margin of error.

3.4 Data Collection

Data was collected from 31 graduate apprentices and 24 current apprentices under the RAISE project using a structured questionnaire. Face to face interviews were conducted to collect the information. The three field visits were facilitated by Ad-Din Welfare Foundation, Jagorani Chakra Foundation and Shishu Niloy Foundation. The partner organizations assisted by contacting the current and graduate apprentices and getting them together in one place, which significantly

contributed to the ease of data collection. The data collected from the respondents was used for research purposes only. The purpose of the study was clearly explained to the study participants and every respondent was asked for verbal consent. Only those who consented were interviewed. Confidentiality and anonymity of the study participants was strictly maintained throughout the research period.

3.5 Data Analysis

The data were entered using Microsoft Excel and cleaned, edited and analyzed using STATA SE 14. Additionally, the charts were made using Microsoft Excel.

3.6 Organizational Assistance

The three field visits were facilitated by Ad-Din Welfare Foundation, Jagorani Chakra Foundation and Shishu Niloy Foundation. The partner organizations assisted by contacting the current and graduate apprentices and getting them together in one place, which significantly contributed to the ease of data collection.

3.7 Ethical Consideration

The data collected from the respondents was used for research purposes only. The purpose of the study was clearly explained to the study participants and every respondent was asked for verbal consent. Only those who consented were interviewed. Confidentiality and anonymity of the study participants was strictly maintained throughout the research period.

4. Results

4.1 Socio Demographic Characteristics

There were 55 respondents in total. The age range of the respondents were from 17 to 32 with a mean age of 22.7. 100% of the respondents were male. The educational qualification of the respondents is summarized in the following figure:

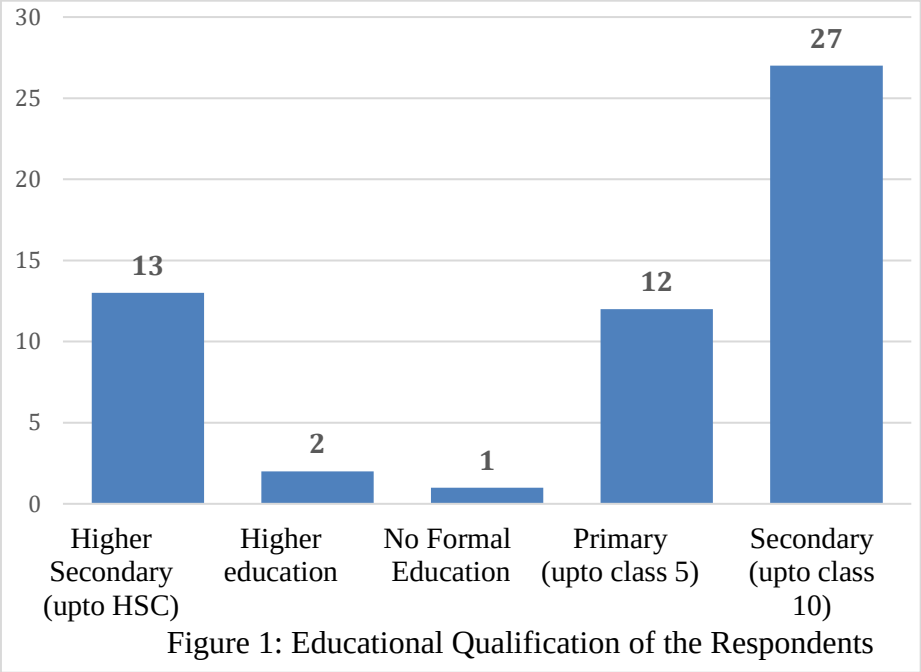


Figure 1: Educational Qualification of the Respondents

Around 49.09% of the respondents had an educational qualification in the Secondary level, followed by Higher Secondary level (23.64%), Primary level (21.82%), Higher Education (3.64%) and only 1 respondent did not receive any formal education.

The distribution of respondents based on the trades is illustrated with a pie chart in Figure 2:

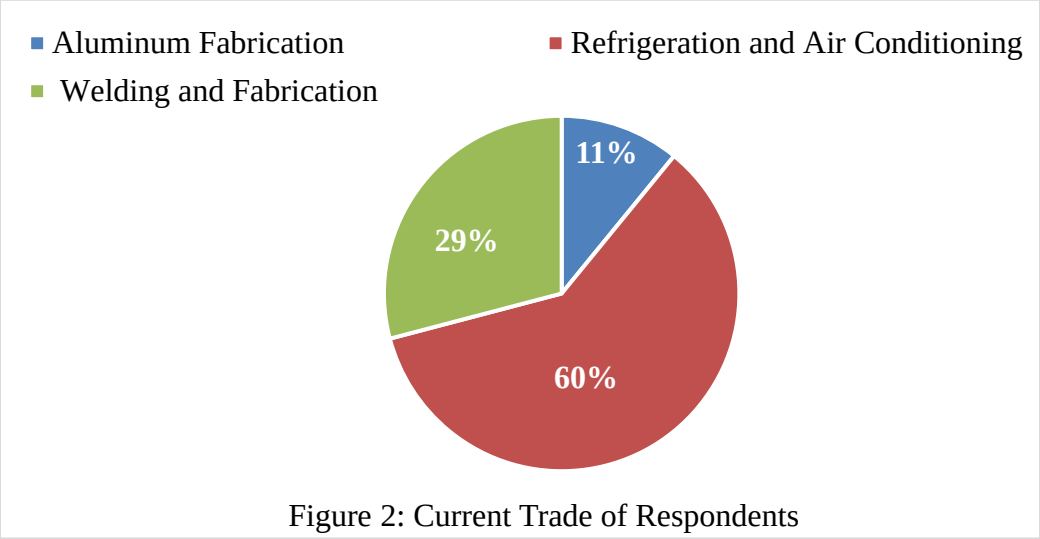


Figure 2: Current Trade of Respondents

Majority of the respondents were engaged in Refrigeration and Air Conditioning Trade (60%) with 33 respondents, followed by 29% Welding and fabrication with 16 respondents and 11% in Aluminum Fabrication.

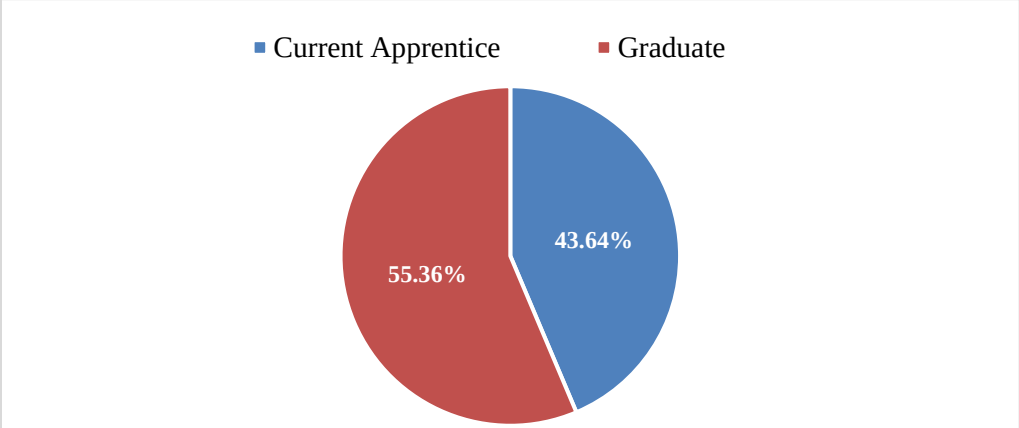


Figure 3: Apprenticeship Status

As figure 3 illustrates, 24 respondents (43.64%) were currently enrolled under the RAISE apprenticeship program and 31 (55.36%) were graduates currently employed in their respective trades.

Table 1: Years of Employment of RAISE Graduates		
Duration	Frequency	Percentage
Less than 1 year	14	45.16%
1 to 3 Years	16	51.61%
4 to 6 Years	0	0%
7 to 9 Years	1	3.23%
More than 10 Years	0	0%

Table 1 summarizes the years of employment among RAISE graduates in their respective trades. 51.61% were involved in the trades between 1 to 3 years, 45.16% were involved for less than a year. One respondent reported being involved in the trade before the apprenticeship training, having an experience falling in the range of 7-9 years. The **monthly income** of the graduate apprentices ranged from **BDT 4000 to BDT 30000** with a mean monthly income of BDT 10483.87. The **average work hour per day** ranged from 6 to 16 hours with a mean of around 8 hours. The duration of apprenticeship training of the current apprentices is shown in figure 4:

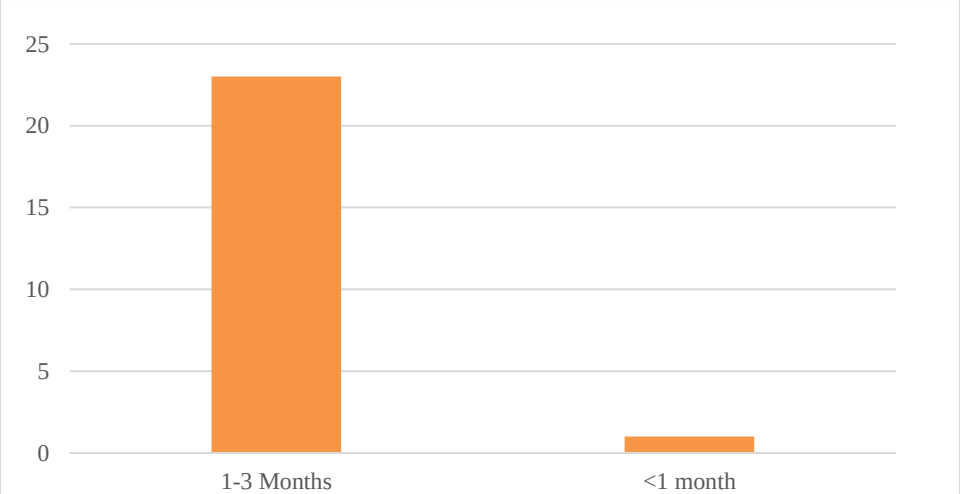


Figure 4: Duration of Apprenticeship Training

The duration of apprenticeship training of the respondents currently involved in the construction related trades was 1-3 months (23 respondents) and less than a month (1 respondent). Furthermore, 91.67% (22) of the apprentices reported receiving information on occupational health and safety.

4.2 Knowledge of Occupational Hazards and Personal Protective Equipment

Knowledge of occupational hazards had 9 risk components common to the three trades. They were: cuts, toxic fumes/breathing difficulties, dust, noise, eye injury, harmful rays, falls, electric hazard, fire hazard. The responses are summarized in the following table:

Table 2: Occupational hazards associated with work	
Name of Hazard	Frequency
Cuts	32
Noise	11
Dust	7
Fire hazard	25
Electric Hazard	23
Slips and Falls	30
Exposure to Harmful Rays	1
Toxic Fumes Inhalation	8
Eye Injury	28

The most common hazard reported were cuts, followed by slips and falls, eye injury, fire hazard and so on. The least reported occupational hazard was exposure to harmful rays. The source of information regarding the occupational hazards are summarized below:

Table 3: Source of Hazard related information	
Source	Frequency
RAISE Training	45
Information from Co-workers	7
Through Work Experience	33
Social media platform	1
Television	2
Others	3

The most reported source of information was the RAISE apprenticeship training, followed by work experience. It was also noticeable that very little awareness was gained through information and communication technology. The other sources of information were awareness related posters. Respondents were shown four hazard signs (Toxic, Fire hazard, Electric Shock Hazard, Explosion) and asked how many they were familiar with. The Following chart illustrates the proportions:

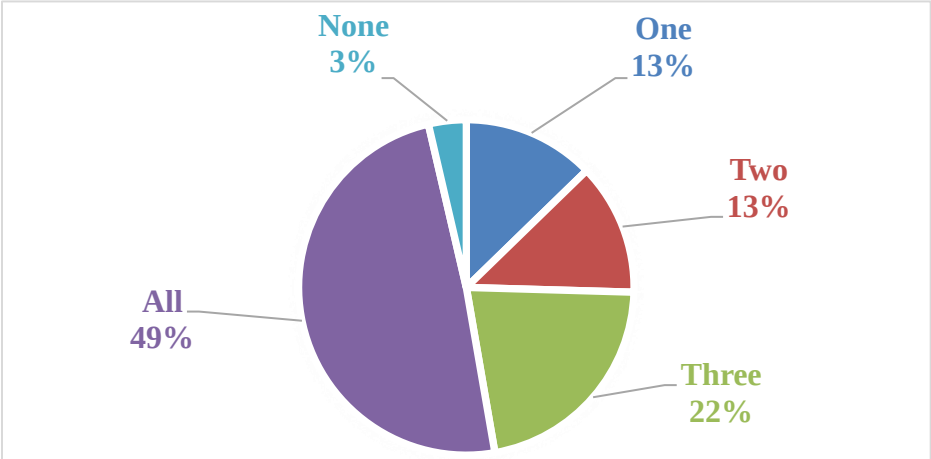


Figure 5 : Number of Familiar Hazard Symbols

Here 49% were familiar with all four of the hazard symbols, 22% were familiar with three hazard symbols, 13% with two and 13% with one and lastly, 3% were not familiar with any hazard symbol shown.

The respondents who were familiar with at least one hazard symbol were asked to explain what was meant by one of the symbols they are familiar with. Correct identification was done by 96% where only 4% or 2 respondents gave incorrect answers. The summary is illustrated in the following chart:

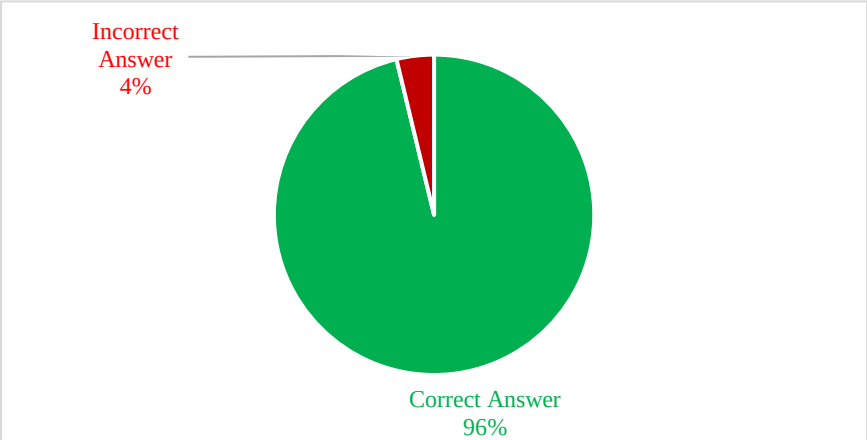


Figure 6: Identification of Hazard Symbol

When asked if they knew about the term PPE, 57% responded with yes and 43% responded with no (Figure 7). The respondents who had a negative response were given an explanation about the term.

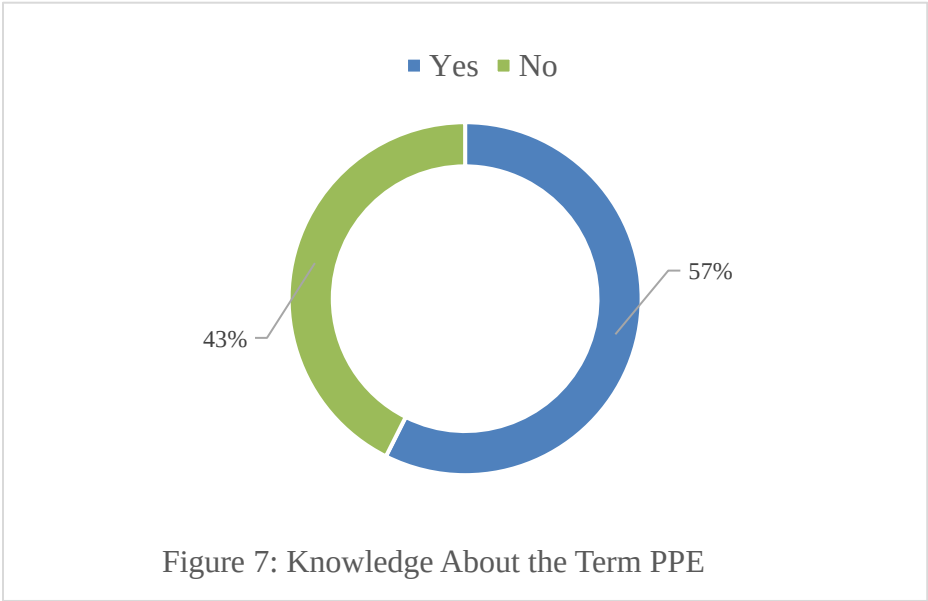


Figure 7: Knowledge About the Term PPE

The source of information related to PPE is summarized in table 4:

Table 4: Source of PPE Related Knowledge	
Source	Frequency
RAISE Training	28
Information from co-workers	4
Through Work Experience	11
Others	4

Similar to the occupational hazard related information sources, the primary source of information related to PPE was the RAISE apprenticeship training, followed by work experience, information from the co-workers and others. Next, the respondents were asked if they knew about the existence of any OHS related law in Bangladesh. The results are illustrated in the following chart:

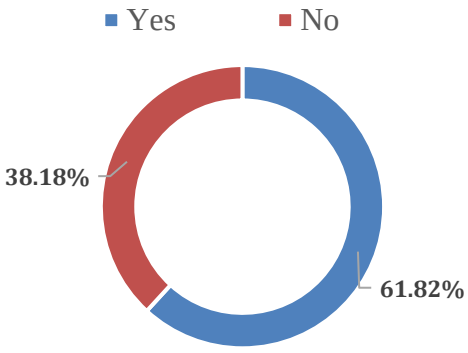


Figure 8: Knowledge About the Existence of any OHS related Law in Bangladesh

The respondents were asked if they knew about the existence of OHS-related law in Bangladesh. In response, 34 (61.82%) responded with yes, and 21 (38.18%) responded with no. However, the positive response was not further specified through more questions due to time constraints.

4.3 Practice Related to Occupational Safety

For understanding safety related practices, the respondents were asked about some workplace safety related factors. The results are summarized as follows:

Table 5: Frequency Distribution of Workplace Environment Related Practices

	Yes	No	Don't Know
Fire Extinguisher at workplace/training area	39 (70.91%)	15 (27.27%)	1(1.82%)
First Aid box at workplace/training area	52(94.55%)	2(3.64%)	1(1.82%)
Safe drinking water at workplace/training area	53(96.36%)	2(3.64%)	_____
Toilet facilities at workplace/training area	45(81.82%)	10(18.18%)	_____
Poster on Safety Measures at workplace/training area	43(78.18%)	10(18.18%)	2(3.64%)

70.91% reported having fire extinguisher at their workplace/training area, 27.27% did not have a fire extinguisher and 1.82% did not know if there was one. Secondly, 94.55% reported having first aid box, 3.64% had a negative response and 1.82% were not aware. The workshops under the RAISE project are provided with a fist aid box, which explains the high rate of positive response. 96.36% had safe drinking water available at their workplace/training area., 81.82% had toilet facilities. 78.18% had posters regarding safety measures at their workplace.

The respondents were asked if they used any Personal Protective Equipment. The response is illustrated below:

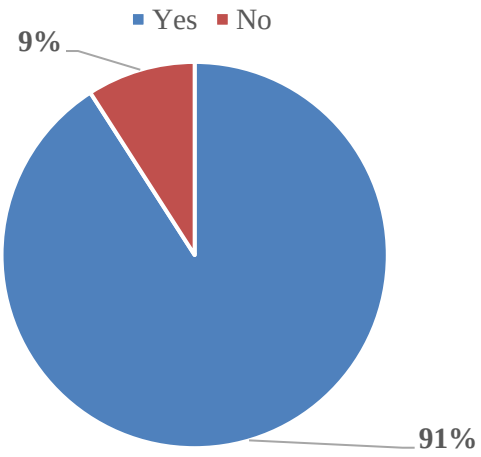


Figure 9: Use of Personal Protective Equipment

Among the respondents, 91% reported using personal protective equipment. Only 5 respondents had a negative response, 2 from Aluminum Fabrication Trade and 3 from Refrigeration and Air Conditioning Trade. Their reason for not using PPE is that it is not necessary.

Next, the respondents who reported using PPE were asked to specify which protective equipment they used. Their responses are summarized below:

Table 6: Usage of PPE

Name of PPE	Frequency	Percentage
Gloves	42	84%
Mask	18	36%
Safety Boot	19	38%
Protective Eyewear (Goggles/Glasses/Face Shield)	34	68%
Apron	1	2%
Helmet	23	46%
Ear Protection	11	22%
Safety Belt/Harness	19	38%

The most commonly used PPE was Gloves, followed by Protective Eyewear (Goggles/Glasses/Face Shield). Usage of mask was not as common, indicating poor personal protection practice given the risks associated with dust and fumes. Among the respondents, 85.19% reported regularly inspecting their work-related machineries and equipment before using them and 81.48% reported unsafe work conditions to their supervisors. 74.55% reported not having regular health check-ups.

Employed graduates were asked about injuries in the past 6 months while working. The responses are summarized as follows:

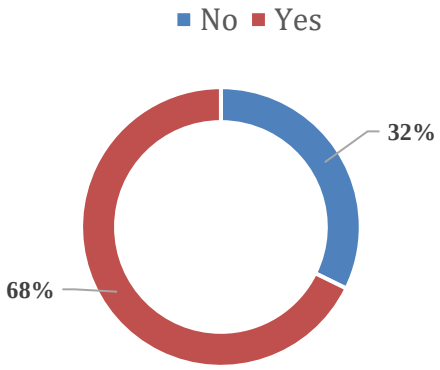
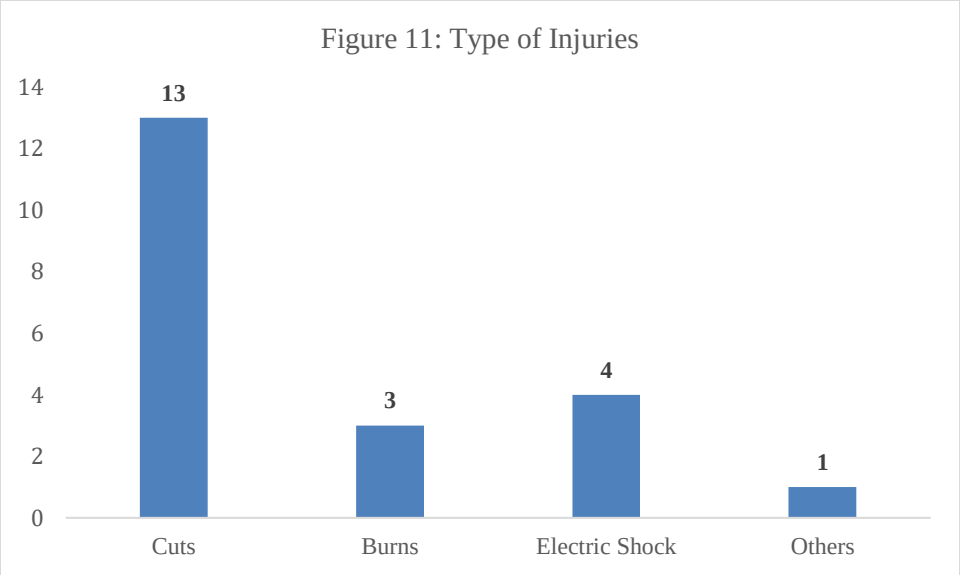


Figure 10: Injury while working in the past 6 months

83.64% reported inspecting the work equipment regularly before work. Only 25.45% reported getting regular health check-ups. Among 31 graduate apprentices, 68% were injured while working in the past 6 months. The type of injuries is summarized in the following bar chart in figure 11:



The most common type of injury was cuts followed by electric shock, burns and others. Among the individuals that got injured in the last 6 months, only 4 needed medical treatment for their injuries. The rest of the respondents reported using first aid available at hand or medication from the local pharmacist to address the injuries. Among the respondents who got injured during work, 16 (76.19%) did not need to take time off from work. 23.81% reported taking time off from work for less than a week.

4.4 Attitude Regarding Occupational Safety Practices

In response to the statement "Usage of Personal Protective Equipment Reduces Work-Related Risk" 92.73% of the responded agreed, 5.45% didn't agree and 1.82% responded with neutral. 80% agreed with "Ensuring Occupational Safety is the responsibility of the employer", while 14.55% did not agree and 5.45% responded with neutral. Furthermore, in response to "Workers are responsible for their own safety", 76.36% agreed, 21.82% did not agree and 1.82% chose a neutral response. A significant portion shared that there is a joint responsibility of both owners and

employees to ensure Occupational Health and Safety. 76.36% were willing to buy more Personal Protective Equipment, 18.18% were not willing and 5.45% were neutral between buying more and getting by with what they already had. 96.36% agreed with the need for OHS training in the informal sector. Lastly, 65.45% agreed with the statement, “using PPE is important for small tasks” with which, 32.73% disagreed and 1.82% did not have any opinion.

5. Discussion

Among the current apprentices involved in the construction sector, 66.67% knew about 1-3 hazards, and the rest were knowledgeable about 4-6 occupational hazards. Among the graduates, 54.84% knew about 1 to 3 hazards, and the rest were knowledgeable about 4-6 occupational hazards. Neither the apprentice group, nor the graduate group reported knowing more than 6 occupational hazards. Familiarity with the term PPE was observed among 54.17% of the current apprentices and 58.06% of the graduates. This might be due to the impact of other factor such as work experience on the knowledge level. Both of the groups had good knowledge regarding hazard signs and symbols with correct explanations being more than 90% in both of the groups. The number of PPE used ranged from 0 to 4 in the apprentice group, whereas it ranged from 0 to 8 among the graduates. Across both of the groups, usage of 3 Personal Protective Equipment had the highest frequency. Usage of PPE was significantly associated with education level (with a p value of 0.017). Assigning attitude scores 1 for “agree”, 0 for “neutral” and minus 1 for “don’t agree” and setting scores below 3 as poor attitude and scores equal and above 3 as good attitude, the study found that 87.50% of the current apprentices had good attitude towards occupational health and safety, while the percentage was 67.75% among the graduates. Better knowledge level was observed among the graduates regarding occupational hazards and usage of Personal

Protective Equipment. Better attitude was observed among the apprentices in relation to occupational health and safety. Occupational Health and Safety is a small component of the project, however if we compare the findings with existing literature, the individuals under the project have shown remarkable results in terms of knowledge, attitude and practices. This, however, cannot be concluded definitively in the context of Bangladesh, as there is a lack of studies on OHS in informal sector. The trades had no female participants. Possible reasons behind this may be the nature of work under these trades, societal norms, lack of women friendly work environment etc.

6. Limitations

The study was initially designed for comparing RAISE and non-RAISE workers on site. Due to logistical and time constraints, only participants under RAISE project were interviewed. The sample size was calculated based on the data from the RAISE Information Hub, which is constantly being updated. Therefore, the sample calculation might have limitations in terms of being representative. Due to time and logistical constraints, apprentices and graduates were brought together in their respective Partner Organization, which may have influenced their responses, especially regarding the specifics of the project. Due to the same reason, the workplaces could not be observed, offering limited scope in assessing the true practice level. The study might also be subjected to selection bias, as the nature of the trades selected are highly risk prone, it is possible that the knowledge, attitude and practices have been impacted.

7. Recommendations

This study was conducted under the realm of RAISE project. The insights and observations gathered from the study has highlighted the need for Occupational Health and Safety in informal construction sector. For the project as well as the informal construction sector of Bangladesh, some recommendations are as follows:

- Including importance of OHS in the apprentice's life skill training module. Using interactive materials such as animated videos, games can be considered including in the modules for ensuring engagement.
- Including importance of OHS in MCP orientation to sensitize them regarding the need for prioritizing safety at workplace.
- Trade related hazards and usage of PPE should be further emphasized during the apprenticeship training, as these areas have significant room for improvement. For instance, posters illustrating trade related hazards can be used along with the existing poster.
- Regular monitoring of workplace environment and safety should be conducted.
- Addressing the knowledge gap regarding OHS through studying both formal and informal sector can ensure inclusivity and inform decisions in a more efficient manner.

8. Conclusion

OHS is a major area of concern that highlights the significance of a safe work environment, understanding, and practices given the contribution and kind of labor included in the informal sector. Risks associated with occupational hazards can be avoided or reduced by following appropriate safety procedures. From the study on individuals engaged in the informal construction sector, across both of the groups (Current and Graduate Apprentices), usage of 3 Personal Protective Equipment had the highest frequency. There were no female respondents which can be attributed to the nature of work under these trades, societal norms, lack of women friendly work environment etc. Larger portion of both of the groups(current and graduate apprentices) had poor knowledge regarding occupational hazards. Better attitude was observed among the apprentices in relation to occupational health and safety. Interactive learning modules, regular monitoring and addressing the knowledge gap has been recommended for improving OHS related status.

9. Appendices

Appendix 1:

The following structured questionnaire for the knowledge attitude and practice study. The questionnaire was developed in Bangla, the responses were recorded and translated in English for analysis.

সেকশন ১০ঃ আর্থসামাজিক অবস্থা সংক্রান্ত তথ্য				
ক্রমিক	প্রশ্ন	উত্তর	কোড	স্কিপ
১০১	বয়স			
১০২	জেন্ডার		১। নারী ২।পুরুষ	
১০৩	ফোন নাম্বার			
১০৪	শিক্ষাগত যোগ্যতা		১।কোন প্রাতিষ্ঠানিক শিক্ষা নেই ২।প্রাথমিক(ক্লাস ৫ পর্যন্ত) ৩।মাধ্যমিক(ক্লাস ১০ পর্যন্ত) ৪।উচ্চ মাধ্যমিক (এইচএসসি পর্যন্ত) ৫।উচ্চতর শিক্ষা (এইচএসসি এর উর্ধ্বে)	
১০৫	বর্তমানে কোন ট্রেডে অন্তর্ভুক্ত আছেন?		১।অ্যালুমিনিয়াম ফেব্রিকেশন	

			২।ওয়েল্ডিং অ্যান্ড ফেব্রিকেশন ৩।রেফ্রিজারেশন অ্যান্ড এয়ার কন্ডিশনিং	
১০৬	আপনি কি বর্তমানে RAISE এর শিক্ষানবিশি কার্যক্রমে অন্তর্ভুক্ত আছেন?		১।বর্তমানে শিক্ষানবিশ হিসেবে আছি ২।গ্রাজুয়েট	১১০ ১০৭-১০৯
১০৭	কতদিন ধরে এই ট্রেডে কাজ করছেন?		১।১ বছরের কম ২।১-৩বছর ৩।৪-৬ বছর ৪।৭-৯ বছর ৫।১০ বছর ও তার উর্ধ্বে	
১০৮	মাসিক আয়ের পরিমান			
১০৯	দৈনিক কত ঘন্টা করে কাজ করেন?			
১১০	RAISE এর শিক্ষানবিশি কার্যক্রমে কতদিন ধরে অন্তর্ভুক্ত আছেন?		১। ১ মাসের কম ২।১-৩ মাস ৩। ৩-৫ মাস	
১১১	পেশাগত স্বাস্থ্য ও সুরক্ষা সম্পর্কিত প্রশিক্ষণ পেয়েছেন?		১। হ্যা ২। না	

সেকশন-২০ঃ পেশাগত ঝুঁকি সম্পর্কিত জ্ঞান				
২০১	আপনার ট্রেড সম্পর্কিত ঝুঁকিগুলো কি কি?		১।ধুলাবালি ২।বিষাক্ত ধোয়া ৩।অগ্নি দূর্ঘটনা ৪।বৈদ্যুতিক ঝুঁকি ৫।ক্ষতিকর রশ্মি ৬।কাঁটা ছেড়া ৭।উচ্চ শব্দ ৮।চোখের ক্ষতি ৯।ঝুঁকি সম্পর্কে জানা নেই ১০। অন্যান্য ঝুঁকি	২০৩
২০২	পেশাগত ঝুঁকিগুলো সম্পর্কে আপনি কিভাবে জানতে পেরেছেন? (একটির বেশি অপশন নেয়া যাবে)		১।রেইজ প্রশিক্ষণের মাধ্যমে ২।সহকর্মীদের কাছ থেকে ৩।কাজ করতে করতে অভিজ্ঞতার মাধ্যমে ৪।টেলিভিশন ৫।সামাজিক যোগাযোগ মাধ্যম থেকে ৬। অন্যান্য	

২০৩	এই চিহ্নগুলোর মধ্যে কয়টির সাথে আপনি পরিচিত?  *[চিহ্নগুলো প্রিন্ট করে নেয়া হবে এবং উত্তরদাতাদের দেখানো হবে, তারা কয়টির সাথে পরিচিত তা একটি করে চিহ্ন দেখিয়ে প্রাথমিকভাবে যাচাই করা হবে]*		১।একটি ২।দুইটি ৩।তিনটি ৪।সবগুলো ৫।কোনটি ই নয়	২০৪ ২০৪ ২০৪ ২০৪ ২০৫
২০৪	আপনার পরিচিত চিহ্নের মধ্যে যেকোন একটি চিহ্ন দ্বারা কি বোঝায় সে সম্পর্কে বলুন *[উত্তরদাতা সঠিকভাবে বলতে পারছেন কিনা সে হিসেবে সঠিক অথবা ভুল রেকর্ড করা হবে]*		১।সঠিক উত্তর ২।ভুল উত্তর ৩।জানি না	
২০৫	আপনি কি পিপিই /ব্যক্তিগত সুরক্ষা সরঞ্জাম সম্পর্কে জানেন?		১।হ্যা ২।না	২০৫ পরবর্তী সেকশন
২০৬	পিপিই সম্পর্কে আপনি কিভাবে জানতে পেরেছেন?		১।প্রাতিষ্ঠানিক প্রশিক্ষণের মাধ্যমে ২।সহকর্মীদের কাছ থেকে	

			৩।কাজ করতে করতে অভিজ্ঞতার মাধ্যমে ৪।টেলিভিশন ৫।সামাজিক যোগাযোগ মাধ্যম থেকে ৬।অন্যান্য	
সেকশন-৩০ঃ ব্যাক্তিগত সুরক্ষা সম্পর্কিত তথ্য				
৩০১	আপনার কর্মস্থলে/প্রশিক্ষণের স্থানে অগ্নি নির্বাপক যন্ত্র আছে?		১।হ্যা ২।না ৩।জানি না	
৩০২	আপনার কর্মস্থলে/প্রশিক্ষণের স্থানে প্রাথমিক চিকিৎসা সরঞ্জাম আছে?		১।হ্যা ২।না ৩।জানি না	
৩০৩	আপনার কর্মস্থলে/প্রশিক্ষণের স্থানে কি পরিষ্কার পানীয় জল সরবরাহ করা হয়?		১।হ্যা ২।না ৩।জানি না	
৩০৪	আপনার কর্মস্থলে/প্রশিক্ষণের স্থানে কি ভালো টয়লেট ব্যাবস্থা আছে?		১।হ্যা ২।না ৩।জানি না	

৩০৫	আপনার কর্মস্থলে/প্রশিক্ষণের স্থানে কি কোনো লিখিত পেশাগত স্বাস্থ্য ও নিরাপত্তা সম্পর্কিত পোস্টার আছে?		১।হ্যা ২।না ৩।জানি না	
৩০৬	কাজ করার সময় আপনি কি কো্নো ধরনের পিপিই ব্যবহার করে থাকেন?		১।হ্যা ২।না	৩০৭ ৩০৮
৩০৭	কাজ করার সময় আপনি কোন পিপিই ব্যবহার করে থাকেন?		১।গ্লাভস ২।মাস্ক ৩।সেফটি বুট/গামবুট/সুরক্ষামুলক জুতা ৪।চোখের সুরক্ষা সরঞ্জাম (গগলস/ফেসশিল্ড/কালো চশমা) ৫।অ্যাপ্রোন ৬।হেলমেট ৭।ইয়ারমাফ	
৩০৮	কেন পিপিই ব্যবহার করেন না?		১। দরকার হয়না ২।মালিকপক্ষ ব্যাবস্থা করেন না ৩।অনেক দাম ৪।ব্যাবহার সম্পর্কে জানা নেই	
৩০৯	নিয়মিত আপনার ব্যবহৃত যন্ত্রপাতি পরীক্ষা করে থাকেন কি?		১।হ্যা ২।না	

৩১০	অনিরাপদ কর্মপরিবেশ সম্পর্কে আপনার ওস্তাদ/মালিকপক্ষকে অবহিত করে থাকেন কি?		১।হ্যা ২।না	
৩১১	আপনি কি নিয়মিত স্বাস্থ্য পরীক্ষা করিয়ে থাকেন?		১।হ্যা ২।না	
৩১২	গত ৬ মাসে আপনি কাজ করার সময়ে আহত হয়েছেন কি না?		১।হ্যা ২।না	৩১২-৩১৫ পরবর্তী সেকশন
৩১৩	আঘাতের ধরন		১।কাঁটা ছেড়া ২।পোড়া ৩।বৈদ্যুতিক শক ৪।হাড় ভেঙ্গে যাওয়া ৫। ভারি জিনিস উত্তোলন করতে গিয়ে প্রাপ্ত আঘাত ৬।শ্বাসকষ্ট ৭।চোখে আঘাত ৮।অন্যান্য	
৩১৪	আঘাতের কারনে আপনার কি হাসপাতালে চিকিৎসা নিতে হয়েছিলো?		১।হ্যা ২।না	৩১৪ ৩১৫
৩১৫	চিকিৎসা খরচের উৎস কি ছিলো?		১। কর্মস্থল থেকে দেয়া হয়েছে ২।বেতন	

			৩।ঋণ ৪।অন্যান্য	
৩১৬	এই আঘাতের কারনে আপনার কাজ থেকে কতদিন বিরতি/ছুটি নিতে হয়েছিলো?		১।বিরতি/ছুটি নেয়ার প্রয়োজন হয়নি ২।এক সপ্তাহের কম ৩।এক থেকে দুই সপ্তাহ ৪।দুই সপ্তাহের বেশি	
সেকশন ৪০ঃ পেশাগত স্বাস্থ্য ও সুরক্ষা সম্পর্কিত মতামত				
৪০১	পিপিইর ব্যবহার কর্মক্ষেত্রের ঝুঁকি কমাতে পারে		১।একমত ২।নিরপেক্ষ/মতামত নেই ৩।একমত নই	
৪০২	পেশাগত সুরক্ষার নিশ্চিত করার ক্ষেত্রে নিয়োগকর্তা/মালিকের দায়িত্ব রয়েছে		১।একমত ২।নিরপেক্ষ/মতামত নেই ৩।একমত নই	
৪০৩	পেশাগত সুরক্ষার নিশ্চিত করার ক্ষেত্রে কর্মচারিদেরও দায়িত্ব রয়েছে		১।একমত ২।নিরপেক্ষ/মতামত নেই ৩।একমত নই	
৪০৪	নিজস্ব সুরক্ষার জন্য আমি সরঞ্জাম কিনতে রাজি আছি		১।একমত ২।নিরপেক্ষ/মতামত নেই ৩।একমত নই	

৪০৫	পেশাগত স্বাস্থ্য ও সুরক্ষার ওপর কর্মচারীদের প্রশিক্ষন/ট্রেনিং দেয়া উচিত		১।একমত ২।নিরপেক্ষ/মতামত নেই ৩।একমত নই	
৪০৬	ছোটখাটো কাজের জন্যেও পিপিই ব্যবহার করা গুরত্বপূর্ন		১।একমত ২।নিরপেক্ষ/মতামত নেই ৩।একমত নই	

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