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ASSESSMENT OF PERSONAL PROTECTIVE EQUIPMENT UTILIZATION AND ASSOCIATED FACTORS AMONG BUILDING CONSTRUCTION WORKERS IN THE LIDETA HOUSING PROJECT, ADDIS ABABA, ETHIOPIA

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Table of Contents

List of Tables

List of Figures

Acronyms

AAU – Addis Ababa University

AAHB – Addis Ababa Health Bureau

AAHDB – Addis Ababa Housing Development Bureau

AOR- Adjusted Odds Ratio

COR – Crude Odds Ratio

ETB – Ethiopian Birr

FDRE - Federal Democratic Republic of Ethiopia

IHDP - Integrated Housing Development Project

ILO - International Labor Organization

MOLSA – Ministry of Labor and Social Affairs

OSH - Occupational Safety and Health

PPE - Personal Protective Equipment

SPSS – Statistical Product and Service Solution

WHO – World Health Organization

Abstract

Background: The Construction world is regarded as one of the most dangerous sectors worldwide. It employs unskilled labor force with highly complex work done within a confined area, leading to a multitude of safety hazards. Building construction accidents are on the rise and can create several adverse consequences. Statistics on construction occupation injuries and ailments show it as one of the most dangerous occupations in the world. Personal Protective Equipments can prevent the various types of injuries that are likely to happen in construction work environment. This study is aimed at assessing personal protective equipment utilization and associated factors among Construction at the Lideta Housing Project located in Addis Ababa.

Methods: A Cross-sectional study was conducted among a total of 289 Workers employed in the Lideta Housing Project, Addis Ababa. Simple Random Sampling technique using Lottery Method on the Payroll lists was used to select participants from the Project's sites. Data was collected by using structured and pretested questionnaire then, data entry and cleaning was done using EPI-Info v7 and analyzed using SPSS software version 20 where Descriptive statistics like mean, frequency and Percent was performed for most variables then analysis using Binary Logistic Regression Model was performed. Variables with 95% confidence intervals and P value at <0.05 during the Bivariable Analysis were included in the Multivariable Logistic Regression Analysis to control for Confounders.

Result: A total of 289 workers participated in the study, PPE utilization was found to be 53 (18.3%). 222 (76.8%) were Male workers. 201 (69.6%) know about PPEs. 79 (39.3%) of them knew about Helmets, safety boots and the Overall Garments only. 263 (91%) responded there were no PPEs on their Sites. Workers main reason for not using PPEs was largely due to unavailability in the site 182 (86.3%). The study found terms of employment in construction site (AOR [95%] = 2.093 [1.280, 4.272]), where permanent employees were 2.093 times more likely to utilize PPEs and Prior experience of any construction related injury (AOR [95%] = 2.614 [1.300, 5.257]) as well as Workers with Prior Safety Trainings with (AOR [95%] = 2.676 [1.509, 5.512]) were found to be significantly associated with PPE Utilization.

Conclusion and Recommendation: The final report of this study indicated a very low utilization rate of Personal Protective Equipments among construction workers in contrast with other studies. The workers terms of employment variable- was found to be a key factor in

determining PPE Utilization as such permanently employed workers had higher odds of utilizing protective equipments. The Report reiterated a significant Association between PPE Utilization and Previous Experience of Occupational injuries. The construction workers with injury experience were Utilizing PPE's while those with no experience didn't utilize Appropriate PPE's. It is recommended AAHDB and MOLSA should integrate and set a much needed safety regulation with a method to systematically enforce them on the Construction Industry.

Key Words: - Personal Protective Equipments, Associated Factors, Construction Worker

1. Introduction

1.1. Background

Construction Industry has been regarded as one of the most Hazardous industries both in high income and low-income countries. Government investments in infrastructure and residential building projects is quickly turning Ethiopia into one of the continent's remarkably performing economies which in-turn creates much needed jobs for the minimum wage work-force (7).

Housing is universally considered as the second most important essential human need after food. The city of Addis Ababa is expanding at a rate of 3.3% each year, creating a housing need that urgently needs to be filled making affordable housing a priority for the Ethiopian government (1). Condominium Housing construction has been given the most attention and a collection of ongoing developments can be found across the city, all with different price points but each with for the low-income in mind. More than 1,290 apartment blocks, standing between 7-9 storeys tall have been completed in various locations throughout Addis Ababa (1). The rapidly growing need for housing all but failed to emphasize the general incompetence of the labor force that is being deployed all over the city. The activities in this sector are fairly sophisticated but they are being carried out by unskilled, untrained and an incompetent work-force. The availability of manpower (both skilled and unskilled) is imperative for the development of the construction industry of a country; and can primarily serve as a measure of the domestic capacity of the industry (2). In a more general sense, unskilled labor is the most widely found resource while the skilled ones are scarce. In terms of being skilled, which means handling equipment with care, undertaking sophisticated engineering jobs with skill and an in-depth understanding of building construction codes as well as health and safety codes. Such workers classified in that sense put simply can be the difference between life and death for themselves and workers around them.

Work-related accidents that cause serious injuries in the construction sector are identified as a major public health problem resulting in serious social and economic consequences that could be prevented where if appropriate measures are taken. These and other occupational health and safety issues can be characterized as work-related issues arising from ill-health, accidents and injuries among construction workers explained by a high variety of risk factors during the work process, physical issues arising from high physical work demands, Chemical risks arising from dust, smoke or other hazardous substances inhalation and allergies, and other biological and

psycho-social issues (3). These can be further classified into contexts of individual, work-site and organizational levels. Occupational accidents that cause serious physical injuries among these workers are high in all obviousness mainly due to illiteracy, poverty, lack of health and safety training and information on health hazards and risks at the work place. According to the International Labor Organization, 270 million workplace accidents occur annually (4). Accidents at construction sites are identified as a major public health problem throughout the world (5). Construction employees have 1 in 300 chance of dying while at workplace and the likelihood of becoming handicapped by injury is far greater than in other industries (6).

Personal Protective Equipment is one of the most crucial measures to safeguard workers from exposure to occupational hazards. Workplace controls in conjunction with personal protective equipment (PPE) utilization during the process of working in any construction related activity is not only necessary but vitally important (8). So, before the initiation of such activities foremen/supervisors need to determine the appropriate PPE for each hazard and must train each worker on when and how to use them. Additionally, there are lots of different work situations and in each of these work situations; workers need various kinds of PPE. Personal Protective Equipments role cannot be understated. Each item is uniquely designed to minimize exposure to certain risks of injuries/illnesses, as well as the damage caused by those hazards in an unfortunate event. Every construction site and job duty should be evaluated for specific and unique dangers, and appropriate PPE required. Inability to use the PPE, use of the wrong/faulty/damaged equipments will result in significant damage to health and in some cases loss of life (8, 9). Its role in most cases is undeniable but there are difficulties in assessing its impact in preventing injury and loss of life (9). If PPE were found to be effective in a hazardous work of a construction site then, generally an accident is prevented or a worker is protected from hazard. Such PPE utilization successes are almost never reported (9). The absence of appropriate PPE, or a PPE failure, may be reported by evaluators' accident reports if there were any. In terms of Accidents and potential loss of life, no PPE is one of the number of risks which lead to an accident or potential loss of life (9).

The value of this study is in it will provide additional dimension on the need for PPE and will further examine the general understanding of PPEs designed to prevent long term damage to health.

1.2. Statement of the Problem

Construction site accidents due to no protective equipments use result in considerable amount of pain, lowered productivity, substantial reduction in quality of life, and loss of time (10). On average, building construction accidents that bring about permanent disability reduce worker capacity by 37% (Ibid). Sadly, though that could be due to a number of factors and those due to improper/no PPE use remain unknown in most third world countries. The extent of construction occupation health and safety problem has been a serious issue in this country. The magnitude of injury from health and safety issues among building construction employees in Addis Ababa was reported to be 38.3 % and from that common types of injuries were cutting, falling accidents, leg injuries followed by finger/hand injuries (11). It was also stated that the significant association with PPEs meant those cases could have been effectively prevented if appropriate PPE had been utilized. Still this study was insufficient for it to be taken seriously or head-turning enough that policy makers engage to acknowledge the reality of the problem. According to a situational analysis done in Ethiopia, there is a high level of workplace injuries due to improper safe working environments and was often due to limited availability of PPEs that in-turn lead to an extended loss of productive working days. With inadequately organized Occupational safety and health services and limited practice in exposure assessment and monitoring, the situation has gone from bad to worse (12).

Almost all literatures mention only a single facet of the building construction industry which are never about the projects and are not in any way related to Housing. Since Housing is becoming a great need and government construction activities as mentioned are project based, information on whether or not these projects have strict compliance to construction codes or occupational health and safety codes is lacking. In the building construction zone, strict compliance to the utilization of personal protective equipment (PPE) like gloves, Hard-Hats, overalls, safety boots, and safety harnesses in conjunction with other safety codes and measures are highly critical in minimizing the incidences of injuries and loss of life (13). Accidents from falling down of railings, nail prick injuries, falling debris, operating any heavy machinery without wearing proper equipment are the main problems facing construction sites these days. The gap identified here is that housing construction industry in the city of Addis Ababa has given little to no attention to the working class that drives this industry. A serious information gap exists on how of much an important

variable Personal Protective Equipment (PPE) utilization is and those among building construction workers remains to be appropriately observed.

1.3. Significance of the Study

Safety and health problems are becoming a serious challenge in Addis Ababa because of low occupational hazards awareness, lack of workplace safety and health policy, and ineffective safety management systems. In violation of Article 41 of the labor proclamation no.75 377/2003 of the FDRE which states the employer is obliged to provide workers with the appropriate Personal Protective Equipment besides the employer is responsible for the maintenance of the PPE.

The findings of this study will make policy makers and various public health experts pay attention to the labor force with regards to the health hazards that could be prevented if appropriate measures were in place and the clear-cut legal and policy enforcements needed for the installment of proper safety codes. The unskilled Labor force found here in the study population is a vital part of the city's growing economy and data on how much that labor force utilizes and on whether it has all protective equipments it needs is of paramount importance. Conducting research on this area will be key in figuring out the utilization status and associated factors of PPE amongst construction workers employed at the Lideta Projects. The study will serve a critical role in providing information about the overall utilization status and to form rational foundation for occupational health and safety guidelines as well as public health policies.

2. Literature Review

2.1. Personal Protective Equipments

There are considerable amount of studies surrounding PPE use around industrial sites, Farming, Welding Practices & Textile workers but not pertaining to construction sites and its workers. Personal Protective Equipment is the final barrier against occupational hygiene hazards. It includes items such as: respirators, gloves, overalls and aprons, boots, glasses, goggles and hearing protection devices e.g. earmuffs, earplugs, helmets which if used appropriately and consistently will prevent the likeliness of injuries and illnesses (14, 15). Employers should provide PPE to all employees and ensure a safe working environment all the time to ensure safety of the worker (14).

PPE, Personal Protective Equipments, are the tools that ensure the basic health protection and safety of users (15). PPE is any device/appliance/gadget/accessory designed to be worn by an individual when exposed to one or more health and safety hazards (15). PPE includes all clothing and other work accessories designed to create a barrier against workplace hazards, and using PPE greatly requires hazard awareness and training on the part of the user (15). Head Protection of mostly the Class A Variety, Foot and Leg Protection sturdy and having an impact-resistant toe-line, Eye and Face Protection, Ear Protection, Arm and Hand Protection, Torso Protection, Respiratory Protection are needed in every building construction for it to be a complete and safe construction work space (15).

In a Recent study conducted in Mombasa Kenya, to evaluate PPE utilization among construction workers concluded despite the country's OSH demands for proper PPE practice, of the 45.2% of the Respondents that possessed PPE and utilized it, 34% had safety boots, 6.4% had dust masks, 4.3% had ear masks, 19.1% had helmets, 21.3% had overalls, 10.6% had goggles, 2.1% had heavy duty gloves (16). A study which further solidifies the argument PPE's are a barrier against injury was evident in study done to assess the prevalence of occupational injuries among construction workers in Bole Sub-city, Addis Ababa, which concluded more than half of its participants had injuries of some kind during their construction work, citing almost 47% of all injuries reason was not using PPE (25). From those that had PPE on duty almost half of them were only using Helmets/Hard Hats.

2.2. Personal Protective Equipment usage in Construction Sites.

The literatures that were found to be relevant to the research question raised here were somewhat confined to Africa and a few in Asia. The first study reviewed was a study in Nepal to assess utilization pattern of personal protective equipments that ended up concluding that the maximum proportion (87.2%) of workers used PPE of any kind related to their work. Workers (68.1%) regularly used all relevant PPE for work (17). More than half (57%) of the study subjects used PPE when they needed, 35% used PPE all the time during working and only 8% respondents used PPE only in the starting time of the work (17). The study also found that main reasons for not using PPE were unavailability of PPE (33.3%) and no necessity of using PPE felt (66.7%) (17). A report that came out from Malaysia that assessed causes of accidents at construction site and found 12.5% of the accidents were caused by lack of personal protective equipment usage (26). Another study in Malaysia sought to find out the level of knowledge and awareness of construction workers on PPE usage; it concluded only 16% don't know about PPEs (37). These studies done in the Far East are incomparable with what was found in Sub-Saharan Africa. In a research conducted in Kampala, Uganda to identify PPE utilization among Building Construction workers found low use of PPE (15.6%) (18). This study also found that permanently employed building construction workers used PPE more often than casual and temporarily employed workers. Another study based in Nigeria where PPE Utilization was assessed in terms of perception of respondents in respect of importance of PPE and its availability and different characteristics identified even though Protective Equipment was issued on sight for the workers, 81.1% do not wear the PPE provided (19). The Study further indicated that the workers usually wear clothing suitable for working on the construction sites such as trousers, long-sleeve shirt/T-shirt and boots, while many of them indicated wearing overalls. Considerable proportion of workers wears shorts, short-sleeve shirts/t-shirts, sandals and slippers which put at risk the exposed parts of the body and attracts to different types of injuries (19).

From the study mentioned in the previous section conducted in Mombasa County, Kenya to evaluate personal protective equipment utilization, showed that construction workers who confirmed that they had PPE's were 45.2% as low as that is, 49% of them confirmed availability of PPEs like safety boots, helmet, overall, heavy duty gloves, 2% dust masks, 5% ear masks, 10% helmet, 7% overalls, 3% goggles, only 2% wore heavy duty gloves, and 1% safety harness/

belts (16). It continued to explain that despite the high incidence of accidents 88.5%, all workers were aware of illness and injuries associated with construction work and the fact that Utilization of PPEs was low due to contractors not providing these equipments to workers responding that they were expensive and counter-productive buying unnecessary ones. The Study also further revealed that the site workers (46.2%) were not using PPE's despite having them in the Construction Site. That meant the aforementioned construction sites had PPE available onsite for workers to use but for those reasons workers were not using them. In conjunction with these reports, another study done in Nairobi Kenya on the provision of PPEs reported an undesirable level of 32% PPE provision to construction workers (36). The findings pointed out 91 cases of injuries were attributable to lack of PPE use which could probably have been eliminated were reported.

As mentioned above PPE Utilization among construction workers has been well emphasized to be a serious cause of injury and harm seen in major studies done in Ethiopia mostly being associated with occupational injuries but no indicative research studies have been conducted that closely identify utilization. The closest literatures found to be close in that regard was studies done on industrial complexes. A Situational Analysis undertaken in Ethiopia underlined the low use of personal protective devices was characteristic of the Housing construction and Textile industry workers, also having poor Job Satisfaction were among others mentioned (12). The study also stated in the manufacturing and construction sectors hazard causes for the workers were identified, inadequate use of personal protective devices was found to be (36%) (12).

A Study conducted in Arba-Minch to assess prevalence and associated factors occupational injuries showed from their behavioral characteristics section, absence of Personal Protective Equipment (PPE) (61.8%) was the commonest reason given for occupational injuries and 79.4% of the participants did not use PPE at all and the absence of PPE was found to be a Major factor for causing injury (21). This study was also on par with a finding of another Research which was conducted in Gonder Town, Ethiopia to assess prevalence of occupational injuries among construction workers which concluded that none (0%) of the workers were found to use PPE during performing their tasks (22). A similar study done in Dessie reported a 39.3% utilization rate (31). Another Major Study, which connects the other studies by further solidifying PPE's understated role, was conducted in Addis Ababa to assess occupational injuries among Building

Construction Workers found that 76.6% of the participants did not use PPE leading to some type of serious occupational injury requiring medical care (11). The workers there, 79.3% and 83.9%, served for less or equal to 2 years and did not use PPE, respectively.

2.3. Challenges to Personal Protective Equipment Use

There are obvious challenges to PPE use by the worker, most studies found here indicate unavailability, expensiveness and no OSH codes have been majorly discussed.

A New York study assessed access to properly fitting personal protective equipment for female construction workers where majority reported fit problems for many types of PPE (gloves, harnesses, safety vests, work boots, outerwear) were to blame for the issues with Utilization of PPEs (30). A study done in Turkey emphasized on the contractor's role for the appropriate utilization of PPEs which indicated that contractors avoid investing in PPE and consider it a costly burden on the total project cost, in-turn affected the health and safety of the Workers (35). The Research conducted in Kampala, Uganda to assess PPE utilization among building construction workers found low utilization (15.6%) indicated ignorance on the part of the work force and inadequate health and safety information were dual factors that contribute substantially to poor safety practices at construction sites adding lack of safety training in the use of PPE (17). In Kenya, lack of health and safety training among construction workers reduced use of PPE (6). The study done in Nigeria revealed PPE was provided in the sites but 81.1% of them did not equip themselves indicating conditions such as supervision and oversight were non-existent and PPE was issued daily in most sites, saying the equipment they receive is different every day and that was the reason for low utilization (19). Most of the workers felt that the PPE was uncomfortable, often oversized/undersized, not designed for hot weather and heavy. The study in Mombasa county, Kenya stated the respondents cited the uncomfortable nature of the equipments were the reason for low utilization (16).

In various third world countries where most of the laborers receive below minimum wages for the construction work which they use to support their families, are expected to provide necessary protective equipments for themselves out of their own pockets (16). This was a key finding of the study in Mombasa County, Kenya where 61.7% of the workers from all the construction sites bought PPEs needed for the job by themselves and those who didn't have these equipments indicate the cost of the PPE as a reason for not equipping themselves (16). A recent report that

came out of Dessie, Ethiopia identified no provision of PPEs from the employers, negligence of the workers and the uncomfortable nature of PPEs were the main reason workers don't utilize PPEs which in-turn caused occupational injuries of various types (31). In Arba-Minch town, a study revealed that due to lack of provision of PPEs from the employer and some of the workers not being trained on the importance of different PPEs in prevention and control of exposure to different occupational hazards and injuries in construction site, PPE utilization was low which made a 31.4% prevalence of injury (21). Studies have also shown majority of workers do not receive vocational trainings on what type of work is done and what type of PPE is appropriate for their tasks, which was evident in the study done in Gonder where (87.5%) did not take vocational training for the activities they perform and none of the workers attended any kind of occupational health and safety training (22). This was also seen in another independent study done in Addis Ababa, where common types of injuries 66.3% and 28.5% falling and 46.6 % leg injuries followed by 43.5 % finger/hand were found, and their cause of injuries was lack of safety awareness trainings (46.7 %) meaning matters such as how to handle equipments, where and when to use PPEs, which were appropriate PPEs were not given as a basic safety awareness training by the employing bodies (11).

2.4. Associated Factors to Personal Protective Equipment Utilization

Several literatures showed use of PPEs is considerably low. Some studies tried to understand and define what factors were associated to Personal Protective Equipment use. A research study done to examine work safety climate, personal protection use and injuries among Latino residential roofers (roof design in construction). Work safety climate was significantly correlated with the provision and use of most types of PPE (32). In similarity with the findings a study done in the UK reported aversion to use PPEs contributed to higher prevalence of musculoskeletal problems (33). Another study done in Hong Kong further revealed construction workers provided with inappropriate safety equipment at work (i.e. a kind of stressor) have a higher chance of suffering from physical stress (34). A study done in South Asia, Nepal revealed Respondents who were encouraged to used PPE were 26 times more likely to use PPE as compared to non-motivated ones and association of use of PPE with gender ($p=0.031$) and encourage to use PPE ($p=0.001$) were statistically significant whereas association of use of PPE with income ($p=0.109$), education status ($p=0.126$), age ($p=0.071$) and working experience ($p=0.445$) were in-significant (17).

These findings are highly unlikely to be seen in a country like Ethiopia where utilization is very low as compared to the study found out in Nepal which was 87.2%. Another study done in Malaysia concluded with high degree confidence failure to use personal protective equipments and operating equipments without safety devices were one of the main identified causes of Accidents in a Construction site (26). The Study done in Uganda Kampala showed Female sex (adjusted odds ratio (AOR = 6.64; 95% CI: 1.55–28.46; p = 0.011), temporary employment (AOR = 0.05; 95% CI: 0.01–0.27; p< 0.001) and casual employment (AOR = 0.01; 95% CI: 0.001–0.071; p< 0.001) employment, and previous knowledge of safety measures (AOR = 100.72; 95% CI: 26.00–390.16; p< 0.001) were found to be significantly associated with PPE utilization (18). A study on the awareness of construction workers on occupational hazard, illness and injuries associated with construction industry in Mombasa found strong association between PPE Use and Existence of occupational injuries (28). Another study conducted in the same city found almost similar results indicating that there was a significant association ($\chi 2=34.5$, df=12, p=0.00) between the existence of injuries and ailments associated with working in the construction sites and PPE utilization among the construction workers (16).

A major study done in Dessie to assess occupational injuries found PPE utilization to be significantly associated with occupational injury explaining the odds of occupational injury were 2.076 (95% CI 1.253, 3.439) times higher among workers who did not use PPE (30). The study conducted in Addis Ababa to assess occupational injuries among building construction workers proposed the same thing; Personal Protective Equipment use was one independent predictors of injury on the multivariable analysis which showed use of PPE was significantly associated with construction work related injury [AOR: 0.4, 95 % CI: (0.2, 0.7)] (11). Further connecting occupational injuries and use of PPE's was a study done to assess the prevalence of occupational injuries among construction workers in Bole Sub-city, Addis Ababa which concluded Personal Protective Equipment (PPE) utilization at all times was found to be significantly associated with occupational injury (25). Meaning the odds of occupational injuries were 2.34 times higher among PPE non-utilizers when compared with users of PPE's (AOR [95%CI] =2.34[1.24, 4.42]).

2.5. Rationale for the Study

As it is already established construction site injuries are becoming a major public health problem. So, from public health stand point understanding the magnitude of utilization and underlying factors associated with the use of construction personal protective equipments is important for preventing future mortality and the occurrence of injuries/harm. Identifying factors associated with PPE usage provides insight to give special attention for those who have a high risk in terms of being situationally aware and in terms of being adequately equipped before work. i.e. unskilled minimum wage construction workers. Identifying these factors is also crucial for developing sound prevention strategies against occupational injuries. This will further enable various responsible bodies starting from site supervisors to regulatory level policy makers modify construction sites with appropriate equipments usage codes and individualized health & safety practice/policy in-order to reduce all levels of injuries/harm and mortality. It will furthermore be an information source for prevention and deterrence of construction site accidents and it will ultimately create a knowledge base on the need for utilization of PPE.

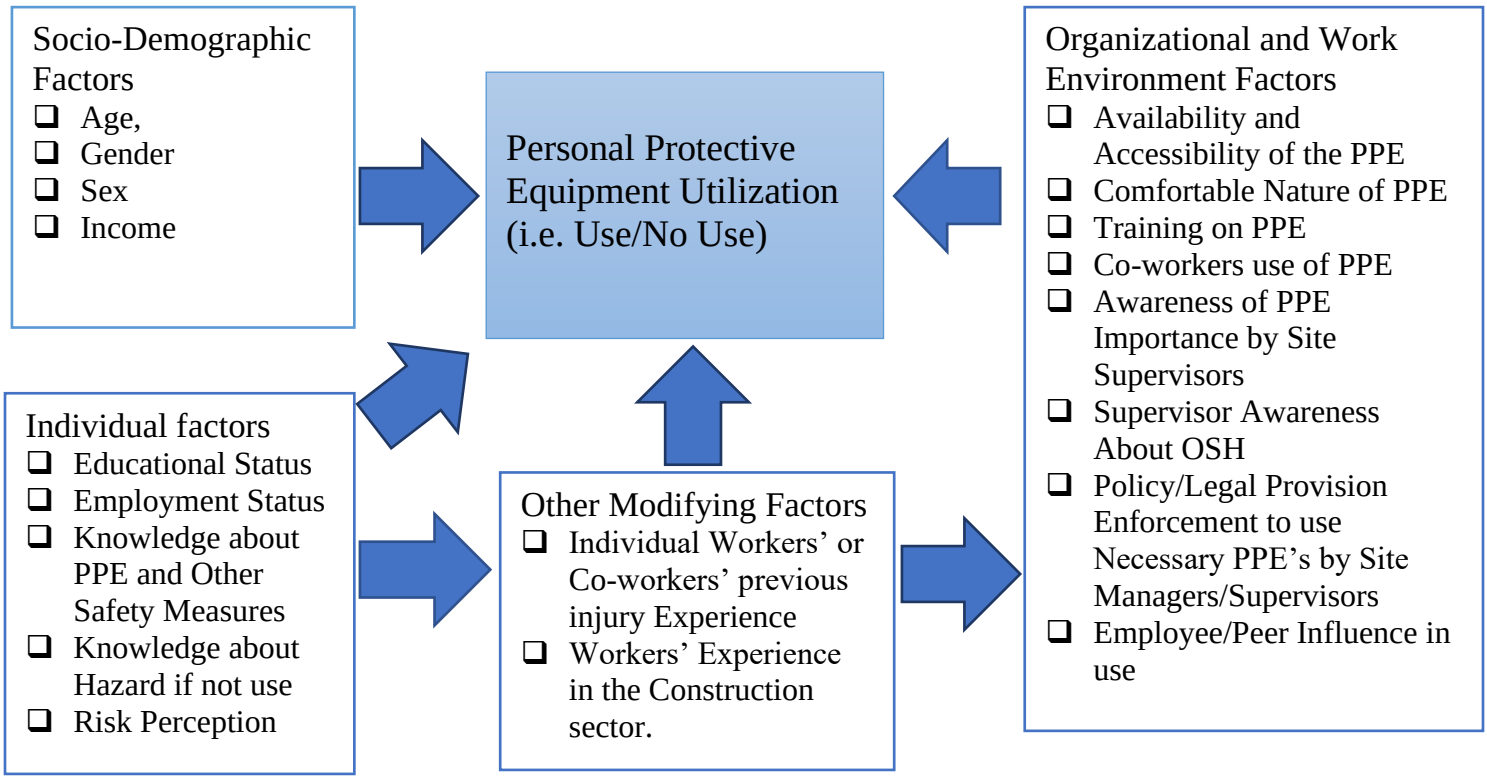

Figure 1- Conceptual Framework Adapted from Literature Reviews

In Summary, The Conceptual Framework (Figure-1) illustrates that there are several Factors influencing PPE Utilization. (Socio-demographic, Individual, Organizational and Work Environment Factors and Other Modifying Factors not necessarily related to the others). Relationships mainly direct and unilateral can be seen between factors that may contribute to Use or No Use of PPE in Construction Sites presented primarily in the workers perspective.

The findings of the study hope to contribute to the planning and implementation of interventions in these areas to improve prevention of Health Hazards found in Construction sites and Appropriate PPE Use.

3. Objectives

3.1. General Objective

→ To Assess Personal Protective Equipment Use and the Associated Factors among Building Construction workers in the Lideta Housing Project.

3.2. Specific Objectives

→ To Determine the magnitude of Personal Protective Equipment Use among Building Construction workers in the Lideta Housing Project.

→ To Identify Associated Factors of Personal Protective Equipment Use among Building Construction workers in the Lideta Housing Project.

4. Methods

4.1. Study Design and Period

A cross-sectional study was conducted from April to May 2019 to assess Personal Protective Equipment Use and Associated Factors among Construction workers found at the Lideta Housing Project condominium sites employing a wide number of workers.

4.2. Study Area

The Addis Ababa Construction and Housing Development Bureau, situated in Kirkos sub-city around Greek School controls and administers government housing constructions in the city, including condominiums under the 20/80, schemes and low-income housing under the 10/90 schemes.

Lideta Housing Project site is located in Addis Ababa Bole sub city just a few kms south-east of the Bole Arabsa finished condominium houses and adjacent to Yeka, Project 13 and 15 housing zones. The site started construction just around the time the Bole Arabsa Communal Houses were ready to be handed off to their respective owners. The Lideta Housing Projects has currently 2 Projects designated Projects 03 and 05. There are total of 84 Blocks of structure with 64 G+7 sites and 20 G+4 sites from those 69 of them are 60% completed and the 15 Blocks were at 10% with majority of concrete work still being done. There are 35 construction companies employed to oversee the work on the 84 Blocks with sub-contracts under them holding over 2150 workers where the majority of them are designated as skilled, uncertified Labor Force. The majority of concrete work is being done by these uncertified workers where the 69 blocks contain less of these laborers having 20-30 of them depending on the sub-contracts but the 15 sites have at least 50 workers at any period until the concrete and masonry work is done.

Though there are condominium housing projects (20/80) applied on the ten sub-cities which are 18 project sites in all of Addis Ababa, due to constraints of finance, time and the researcher's ability, the study was strictly bound to the Lideta Housing Project, and its 02 projects building 89 block structures. Upon contact with responsible bodies, Engineers & Contractors under the employ of the Addis Ababa Housing Development Bureau from the 18 sites the researcher was informed that The Lideta site was a lot more active than the other ones and indicated study on the

workers done on the Lideta site would highly resemble the results that would be found on the other 17 which meant applicability and generalization to those other 17 sites would be sound and possible. The Lideta Projects were therefore, purposively selected.

4.3. Source and Study Population

The Source Population is all construction workers employed in the public housing (Condominium) construction found in the 17 Projects currently underway in the city of Addis Ababa.

The Study Population is the Public Housing (Condominium) construction workers employed at the Lideta Housing Project, Projects 03 and 05. Workers directly involved in building construction are considered as the study population.

4.4. Inclusion & Exclusion Criteria

4.4.1. Inclusion Criteria

The Inclusion criteria for this study was condominium housing construction sites with already built Structure of 1 Storey & Above were selected because of information obtained from the project office prior to data collection entailing those classified as less than 1 storey by the researcher, some had no activity due to contract disputes with the government. In addition, the researcher was told worker unpredictability due to this turbulent time would make data collection strenuous. Furthermore, All Construction workers in the selected sites who have been on the payroll for at least a month or more prior to the date of research were included in the study.

4.4.2. Exclusion Criteria

Condominium Housing office workers who have no direct participation in the construction of the homes i.e. office workers and those who were absent or on leave during the study period was the exclusion criteria for this study.

4.5. Sampling Procedure

Data sampling was made in four levels. [01] Selection of study area which is the Integrated Housing Development Projects (IHDP) through purposive non-random sampling [02] Selection of Project made though Simple Random Sampling technique from a list of 17 Condominium Projects found to be high in activity which was none other than the Lideta Housing Project. [03] Selection/Recruitment of participants from the 84 Construction Blocks was done randomly during lunch break. The workers found are classified as 7 typical workers found at any of these blocks, i.e. Engineers, Foremen, Builders, Masons, Steel Workers, Mixers and Plasterers. These study subjects were recruited by following an assumption that factors of PPE Use are homogeneous on each construction block. [4] Finally, the study subjects were selected by Simple Random Sampling technique using worker payroll lists found on the period of data collection. Workers who were absent from work for more than 4 days during data collection were replaced by other workers rather than regard them as non-responses. The 84 Construction sites are registered and certified by the Addis Ababa Construction and Housing Development Bureau and the Lideta Housing Project and from that one storey and above were selected.

4.6. Sample Size

Sample Size was determined by using a single proportion formula. Although there were no specific studies regarding PPE use, a previous study done in Addis Ababa on construction injuries heavily associated these injuries with PPE non-use making a strong emphasis on PPE Utilization which showed that 23.4% was the utilization status of PPEs among Construction workers (11). With a Confidence Level (95%) and Marginal Error of 5%, the Sample Size is calculated by using a source population greater than 10,000.

Applying the Single Proportion Formula: $n = Z^2 p\,(1-p)/d^2$, where d = desired degree of precision with the study based on (95% CI Level, Margin of Error 0.05), n = Sample Size, p = proportion of Personal Protective Equipment Utilization and Z = 95% Confidence Level (1.96)

$$n = \frac{(1.96^2)\,(0.234)\,(1-0.234)}{(0.05^2)} = 275,$$

Adding 5% Non-response contingency, the Final sample size becomes 289

4.7. Study Variables

4.7.1. Dependent Variable – Personal Protective Equipment Utilization

4.7.2. Independent Variables

Socio-Demographic Factors - (Sex, Age (in Years), Marital Status, Education Level, Income Level)

Workplace/Worker Related Factors – (Job Title, Work Experience in the Construction Sector, Terms of Employment (Temporary/Permanent), Job Description, Availability of Safety Guidelines, Availability of Safety Training, Knowledge about Workplace Hazards, Knowledge about PPE and Other Safety Measures, Knowledge about Hazard if not use.

4.8. Data Collection Method

Data was collected through a series of standardized questionnaires. The questionnaires constitute close-ended questions. The language of the questioners was initially in English then translated to Amharic then back to English for Data Entry. Each information gathered was checked for its appropriateness and completeness before entering the data in to a computer and double checking of the data to ensure quality and readiness of data for analysis.

4.9. Operational Definitions

Personal Protective Equipments Utilization: - Use of specific clothing or equipment worn by employees for protection against health and safety hazards. Workers classified as those who used PPE when they are observed wearing the PPE that were necessary to be worn during a particular activity. Workers were designated as those who are equipped with PPE when they are observed wearing all of the PPE that are necessary to be worn during any of the work found in the site. The PPE that are necessary for the construction crews specifically are:

1. Engineers and Site Foremen: - are expected to have/be Equipped with Helmets/Hard Hats, Boots, and/or High Visibility Clothing.
2. Builders and Builders' Assistant: - should have/be Equipped with Helmets/Hard Hats, Boots, Heavy Duty Gloves and/or Overalls and High Vis Clothing.

3. Mason and Mason's Assistant: - should have Helmets/Hard Hats, Boots, Heavy Duty Gloves, Overalls and/or High Vis Clothing.
4. Steel Workers: - Should equip themselves with Helmets/Hard Hats, Boots, Heavy Duty Gloves, Goggles and/or Overalls and High Vis Clothing.
5. Carpenters (Wood Workers) and Plumbers Should equip themselves with Helmets/Hard Hats, Boots, Heavy Duty Gloves, Goggles and/or Overalls and High Vis Clothing.
6. Mixers and Mixers' Assistant: - should have Helmets/Hard Hats, Boots, Heavy Duty Gloves and/or Overalls and High Vis Clothing.
7. Plasterer & Plasterer's Assistant: - should have/be Equipped with Helmets/Hard Hats, Boots, Heavy Duty Gloves and/or Overalls and High Vis Clothing.

(i) Hard Hats, Boots, Heavy Duty Gloves, Overalls, High Visibility Clothing for all active site workers. *(ii)* All in (i) plus googles for all cutting, grinding, welding, chipping, and nailing activity workers. *(iii)* Construction workers working on windows, railings, wood work found on 2nd and above storeys Safety Harness along with the PPE mentioned in (i).

Hard Hats – Essential, must provide complete protection against head injuries related to swinging or falling objects, striking the head against something, or accidental head contact with an electrical hazard. Hard hats should be without dents, cracks, and other damage. No other Hats can be a substitute or be applied here.

Foot Protection (Boots) – Work boots should be worn on site that protect against crushed toes due to heavy or falling equipment or materials. Should be puncture-resistant, nonslip soles, as work surfaces can have sharp objects on them, and slips are a major hazard at the job site.

Hand Protection (Heavy Duty Gloves) – Should be heavy-duty leather and canvas gloves for protecting against cuts and burns, welding gloves for welders, heavy-duty rubber gloves for working with concrete.

Work Pants and Work Shirts (Overalls) – Clothing that effectively protects their full legs, full arms, and torso against cuts, scrapes, burns, and other superficial injuries with thick, flexible work pants and shirts. These should fit closely and never be baggy, while allowing for maximum mobility.

Face and/or Eye Protection – Safety glasses or face shields should be worn whenever there is a danger of flying debris or harmful dust getting in the eyes. Cutting, grinding, welding, chipping,

and nailing are some activities necessitate protective eyewear. Along with basic safety glasses, some other protective wear for the face include dust goggles.

Reflective/High-visibility Garments – Brightly colored and/or reflective jackets, vests, or other upper-body clothing is important for worker visibility, worn at all times at a job site. It is crucial along active roadways, in low lighting, and for dusk and nighttime work.

Other Personal Protective Equipments – For all types of elevated construction work, Safety Harnesses, Respiratory protection at places where workers are exposed to airborne hazards.

4.10. Data Management

Data entry was done using Epi-Info version 7.2 for editing, coding, cleaning, and checking then it was transported to SPSS version 20 software package for further analysis.

4.11. Data Quality

The quality of data was effectively ensured through thorough checking of the completeness, accuracy, and uniformity of the collected data at each day of data collection. Data Quality was maintained in the periods of before, during and after the data collection. Before the data collection initiation, designing/adapting structured standard questionnaire and from pre-testing of the questionnaire was undertaken in which a total of 15 respondents participated. During the data collection period, the collected data was checked for completeness and logical in-consistencies through close follow up. Finally, after data collection, the collected data was rechecked for its completeness and consistency by the principal investigator.

4.12. Data Analysis Procedures

The outcome variable, Personal Protective Equipment Utilization was computed as the percentage of respondents that had worn a pair of hand gloves, hardhat, overalls and safety boots with high Vis garments and goggles for those in the welding and cutting for those found on the 2nd storey and above. Participants were asked if they had worn any of the protective equipment during work in the day. Data was entered and cleaned using Epi info version 7 Statistical Software and analyzed on SPSS version 20. Using Descriptive Analysis Tools Frequencies and percentages for categorical variable were computed.

All independent variables were fitted separately into a Binary Logistic Regression model to evaluate the degree of association with PPE Utilization. Then, variables with a *p*-value < 0.05 were exported to Multivariable Logistic Regression model to control confounders. The odds ratio with a 95% confidence interval (CI) was used to test the statistical significance of variables. Only statistically significant variables are presented.

4.13. Ethical Consideration

The study was carried out after getting ethical clearance from the Research Ethics committee of the School of Public Health, AAU. Investigator/s were supported by formal Letters to the Addis Ababa Housing Development Bureau and the Lideta Housing Project. The objective and purpose of our study was explained in detail to the study participants, informing them that they have a full right to cooperate and participate and they can also decline if they don't want to participate in the study. The study subjects were politely requested to participate actively and honestly. Privacy and confidentiality were ensured whereby each participant was reassured with Oral Consent for confidentiality of the information they provide to this study on unsigned questionnaires. For confidentiality, the respondents were not asked to write their name at the time of responding to the question. The explanations and interviews were conducted by respondent's local Language, Amharic.

4.14. Dissemination and Utilization of Results

The study findings were relayed for those who need the study findings for various purposes primarily for the Addis Ababa Housing Development Bureau. Governmental and non-governmental organizations, institutions and individuals that have interest on the subject matter are among the utilizers of the findings. The findings of the results can be published in scientific journals if need be.

5. Results

5.1. Socio-Demographic Characteristics

A total of 289 workers participated in this study, with a response rate of 100%. Of the Participants 222 (76.8%) were male workers whilst female workers were 67 (23.2%) indicating a male dominance in the sector. Most of the workers 166 (57.4%) were in the ages between 26-30 and 70 (24.2%) were aged 31-35. Regarding Marital Status 153 (52.9%) of them were single while their Education status showed almost all 212 (73.4%) of the respondents completed Secondary (9^{th}-12^{th}) grade education, 40 (13.8%) completed their Primary Education while 19 (6.6%) were diploma level and 18 (6.2%) were found to be university graduates. The Respondents' level of income indicates more than half 180 (62.3%) earn between 1600-2000 ETB on monthly basis and only 46 (15.9%) earn less than 1600 ETB. Among the Respondents found at regular Government working hours, 111 (38.4%) were Builders, 60 (20.8%) were Masons, 35 (12.1%) were Plasterers, 24 (8.3%) were Mixers, 22 (7.6%) were Site Engineers and 17 (5.9%) were found to be Site Foremen. Based upon their job description most 152 (52.6%) were involved in concrete work, 48 (16.6) were plastering, 36 (12.4) had site supervisory roles, 28 (9.7%) were involved in structural form work and 12 (4.2%) were involved in welding related work. Regarding their work days in a week since the start of the Project, 218 (75.4%) indicated they worked every day in the construction site, 65 (22.5%) only worked 3 or 4 days a week depending upon the job that was required. In terms of Construction work experience more than half 189 (65.4%) claimed they had up to 5 years of experience and 100 (34.6%) had more than 5 years of experience. The Respondents terms of employment showed 148 (51.2%) of the participants were temporarily hired for the specific job on the site which is held by the contractors and 124 (42.9%) of them had contracts with their employers. (Table 1)

Table 1:- Selected socio-demographic determinants of Personal Protective Equipment Utilization among Building Construction Workers at the Lideta Housing Project, Addis Ababa, April 2019.

Variables (n=289)	Options	Frequency	Percent (%)
Sex	Male	222	76.8
	Female	67	23.2
Age	≤20	9	3.1
	21-25	35	12.1
	26-30	166	57.4
	31-35	70	24.2
	>36	9	3.1
Educational Status	Primary Education	40	13.8
	Secondary Education	212	73.4
	Diploma	19	6.6
	University Graduate	18	6.2
Income (Monthly)	<1600	46	15.9
	1600-2000	180	62.3
	>2000	63	21.8
Job Title	Builder	111	38.4
	Mason	60	20.8
	Plasterer	35	12.1
	Mixer	24	8.3
	Engineer	22	7.6
	Foreman	17	5.9
	Carpenter	9	3.1
	Steel Worker	10	3.5
Working Days a Week	Everyday	218	75.4
	2 Days only	6	2.1
	3-4 Days a Week	65	22.5

Experience in the Construction Sector	0-5 Years	189	65.4
	>5 Years	100	34.6
Terms of Employment	Temporary	148	51.2
	Permanent	17	5.9
	Contractual	124	42.9
	Concrete work (i.e. Mixing, Grinding)	152	52.6
Job descriptions in the site	Plastering Related	48	16.6
	Form Work	28	9.7
	Welding	12	4.2
	Wood work Related	9	3.1
	Electrical Equipments Handling	4	1.4
	Supervisory Duties	36	12.4

5.2. Measures of Availability and Utilization of Personal Protective Equipments

At the Beginning when the Respondents were asked if they knew about PPEs that had to be in place in a construction site to prevent the possibility of injuries almost all 201 (69.6%) of them responded 'Yes' and from those that knew about PPEs 11 (5.5%) knew about Helmets, Safety Boots, Heavy Duty Gloves, Overalls, Goggles and High Vis Garments, 12 (5.9%) knew of Helmets & Safety Boots only, 34 (16.9%) Helmets, Safety Boots & Heavy Duty Gloves only, 79 (39.3%) of them knew about Helmets, safety boots and the Overall Garments only and 49 (24.4%) knew Helmets, Safety Boots, Heavy Duty Gloves & Overalls only. Consequently, When the respondents were asked if PPEs were available in their site almost all of them 263 (91%) claimed there were none on the site; on par with finding 211 (73%) of the Workers had no PPEs whatsoever for their respective work activities while from the rest 26 (9%) that had PPE's 25 (32.1%) had Helmets, Safety Boots Overalls & Heavy Duty Gloves only, 21 (26.9%) had Helmets, Safety Boots and/or High Vis Garments and 17 (21.8%) equipped themselves with Helmets or Safety Boots only. When these respondents were asked by which means they

acquired their PPEs, 35 (44.9%) reiterated they borrowed these equipments from work mates, 26 (33.3%) were employer provided, 9 (11.5%) given from previous job and 8 (10.3%) claim it was self-bought. The participants that responded they had no PPEs for their tedious works, when asked why they didn't use 182 (86.3%) of them replied it wasn't available on site, 20 (9.3%) replied they don't important. (Table 2)

Table 2:- Availability and Use of Personal Protective Equipments of Construction workers employed at the Lideta Housing Construction, Addis Ababa, April 2019.

Variables	Options	Frequency	Percent (%)
Know about PPEs	Yes	201	69.6
(n=289)	No	88	30.4
If Know, types PPEs	Helmets, Safety Boots, Heavy	11	5.5
(n=201)	Duty Gloves, Overalls,		
	Goggles and High Vis		
	Garments		
	Helmets & Safety Boots only	12	5.9
	Helmets, Safety Boots &	34	16.9
	Heavy Duty Gloves only		
	Helmets, Safety Boots &	79	39.3
	Overalls only		
	Helmets, Safety Boots, Heavy	49	24.4
	Duty Gloves & Overalls only		
	Helmets, Overalls, and/or	16	8
	Goggles, High Vis Garments		
Are PPEs Available in the	Yes	26	9
Construction site (n=289)	No	263	91
Do You Personally have	Yes	78	27
PPEs to use (n=289)	No	211	73

If Yes, PPE Used (n=78)	Helmets, Safety Boots and/or High Vis Garments	21	26.9
	Helmets, Safety Boots & Heavy-Duty Gloves only	9	11.5
	Helmets, Safety Boots Overalls & Heavy-Duty Gloves only	25	32.1
	Helmets, Safety Boots, Heavy Duty Gloves, Goggles and/or Overalls, High Vis Garments only	6	7.7
	Helmets or Safety Boots only	17	21.8
Are PPEs Comfortable to Wear (n=78)	Yes	73	93.6
	No	5	6.4
By What means PPE Acquired (n=78)	Employer Provided	26	33.3
	Self-Bought	8	10.3
	Borrowed	35	44.9
	Given from Previous Job	9	11.5
What Reason for Not Using PPEs (n=211)	Don't Understand Need	20	9.5
	Not important	3	1.4
	Expensive	6	2.8
	Not Available at the site/not provided for each	182	86.3

The PPE utilization rates were matched with their respective work classes or job titles indicating proper PPE utilization; it had an overall rate of 53 (18.3%). Meaning, only 18.3% had protective equipments for their specific job.

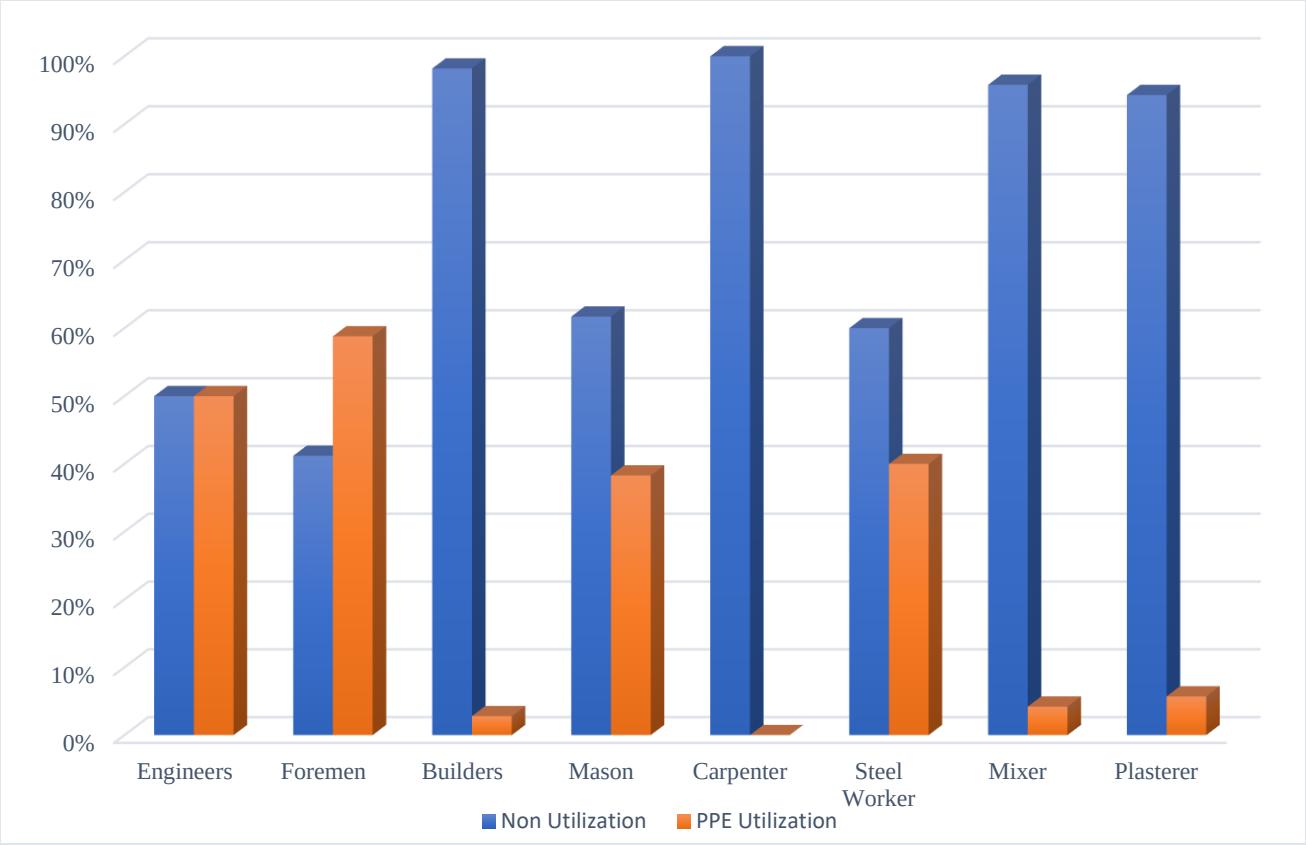

Figure 2:- PPE Utilization Percentages of the Construction Workers of the Lideta Housing Project, Addis Ababa, April 2019

5.3. Factors related to Personal Protective Equipment Utilization

Respondents were asked if they knew about the Risks and Hazards associated with construction work or just being in a construction site and almost all 276 (95.5%) said 'yes' claiming they know about them. Regarding whether the site supervisors or any responsible bodies made them aware about the occupational health and safety issues that would be in play in a construction environment, almost all 261 (90.3%) of them claimed no efforts were made as to improve their awareness. Prior Experience of Construction work related injury was another key factor inquired and 169 (58.5%) of the Respondents indicated they had at least one prior experience of construction work injury due to not wearing appropriate PPEs and 120 (41.5%) of them said they had none.

Respondents were asked if PPEs would protect them from construction work injuries 236 (81.7%) said 'yes', while a small number 53 (18.3%) said 'no' indicating PPEs have no role in

protecting them against harm. Almost all 254 (87.9%) of them have never had safety training regarding appropriate use of PPEs, only 35 (12.1%) of them had safety training. (Table 3)

Table 3:- Personal Protective Equipment Utilization Factors of Construction workers at the Lideta Housing Project, Addis Ababa, 2019.

Variables (n=289)	Options	Frequency	Percent (%)
Do you know of Construction work risks/hazards	Yes	276	95.5
(n=289)	No	13	4.5
worker awareness of occupational health and	Yes	28	9.7
safety by site supervisors (n=289)	No	261	90.3
Ever Experienced work place injury due to not	Yes	120	41.5
wearing Protective Equipment (n=289)	No	169	58.5
Do you think PPEs will protect from construction	Yes	236	81.7
work injuries/hazards (n=289)	No	53	18.3
Co-worker wearing PPE influence you to wear	Yes	4	1.4
PPEs (n=289)	No	285	98.6
Ever had Safety Training (n=289)	Yes	254	87.9
	No	35	12.1

Figure 3:- PPE protection of Hazards against Workers' Prior Safety Training

5.4. Bi-variable Logistic Regression Analysis

When the socio-demographic variables like Age, Sex, Income status and Educational status were fitted into the Binary Logistic Regression model none of them showed significant association with PPE Utilization. Variables like prior terms of employment of the workers, worker awareness of occupational health and safety by site supervisors, prior experience of occupational injury due to not wearing appropriate PPEs and prior safety trainings were significantly associated with Personal Protective Equipment Utilization.

Concerning Terms of Employment in a construction site Bi-variable Analysis showed Permanent employees were 3.49 times more likely to utilize PPE than temporary and contractual employees (COR [95%] = 3.49 [1.23, 9.89]). The variable which assessed workers with prior knowledge about PPEs did not have significant association with PPE Utilization in this Study.

As per this study, Workers who were made aware of occupational health and safety by the site supervisors had higher chances, 8.07 odds of Utilizing PPEs than those workers who were not made aware of occupational health and safety (OSH) by site supervisors. (COR [95%] = 8.07 [3.54, 18.43]). The Respondents with Prior Experience of any Occupational injuries that occur

due to not wearing appropriate PPEs were 3.454 times more likely to utilize appropriate PPEs than those with no experience. (COR [95%] = 3.454 [1.844, 6.47]). The Crude Analysis further revealed Safety Trainings were significantly associated with PPE utilization where workers with prior safety trainings had higher odds, 5.72 times more likely to utilize PPEs than those with no previous safety trainings (COR [95%] = 5.72 [2.70, 12.12])

Table 4:- Selected Socio-demographic and PPE Availability determinants of PPE Utilization among construction of the Lideta Housing Project, Addis Ababa, April 2019

Variables (n=289)		PPE Utilization (n=289)			
		Non-Utilization (n=236)	Utilization (n=53)	COR (95%) CI	p-value
Sex	Male	182 (82%)	40 (18%)	0.913 (0.455, 1.830)	0.797
	Female	54 (80.6%)	13 (19.4%)	1	
Educational Level	Primary (1-8th)	40 (100%)	0	0.753 (0.562, 1.112)	
	Secondary (9-12th)	178 (84%)	34 (16%)	0.191 (0.071, 0.516)	0.997
	Diploma	9 (47.4%)	10 (52.6%)	1.111 (0.306, 4.307)	
	Uni. Graduate	9 (50%)	9 (50%)	1	
Working days per week	Everyday	176 (80.7%)	42 (19.3%)	2.625 (0.330, 9.899)	
	2 Days only	5 (83.3%)	1 (16.7%)	2.200 (0.113, 12.735)	0.814
	3-4 Days a Week	55 (84.6%)	10 (15.4%)	1	
Terms of Employment	Temporary	141 (95.3%)	7 (4.7%)	0.121 (0.052, 0.285)	
	Permanent	7 (41.2%)	10 (58.8%)	3.492 (1.233, 9.888)	<0.001
	Contractual	88 (71%)	36 (29%)	1	
Work Experience in Construction	0-5 Years	181 (95.8%)	8 (4.2)	0.188 (0.107, 1.080)	0.709
	>5	55 (55%)	45 (45%)	1	
Prior PPE Knowledge	Yes	148 (73.6%)	53 (26.4%)	0.501 (0.128, 1.187)	0.896
	No	88 (100%)	0	1	
PPEs	Yes	8 (30.8%)	18 (69.2%)	0.068 (0.028, 0.169)	0.417

Available on Site	No	228 (86.7%)	35 (13.3%)	1	
Personally, have PPEs	Yes	25 (32.1%)	53 (67.9%)	0.122 (0.101, 1.013	0.794
to use (n=289)	No	211 (100%)	0	1	
Knowledge of the Risks	Yes	223 (80.8%)	53 (19.2%)	0.181 (0.102, 0.873)	0.899
Hazards of PPEs	No	13 (100%)	0	1	
worker awareness of	Y-es	12 (42.9%)	16 (57.1%)	8.072 (3.536, 18.426)	0.024
occupational health and	No	224 (85.8%)	37 (14.2%)	1	
safety by site					
supervisors					
Ever Experienced work	Yes	151 (89.3%)	18 (10.7%)	3.454 (1.844, 6.470)	<0.001
place injury due to not	No	85 (70.8%)	35 (29.2%)	1	
wearing Protective					
Equipment					
Do you think PPEs will	Yes	52 (98.1%)	1 (1.9%)	0.068 (0.019, 0.504)	0.009
protect from	No	184 (78.3%)	51 (21.7%)	1	
construction work					
injuries/hazards					
Ever had Safety	Yes	218 (85.8%)	36 (14.2%)	5.719 (2.699, 12.117)	0.001
Training	No	18 (51.4%)	17 (48.6%)	1	

5.5. Multivariable Analysis

The Variables that were found to be significant in the Bi-variable analysis, i.e. terms of employment in construction site, workers made aware of OSH by site supervisors, prior experience of occupational injury due to not wearing appropriate PPEs and prior safety trainings, significant with respective p-values, were entered for multivariable analysis against the response variable.

Multivariable logistic regression analysis was carried out to control potential confounders through determining adjusted odd ratio (AOR) of the independent factors of Personal Protective Equipment Utilization. It determined that Terms of employment in construction site (AOR [95%] = 2.093 [1.280, 4.272]) was significantly associated with PPE Utilization where workers who were permanently employed had twice the odds of Utilizing PPEs compared to those that weren't

employed on a permanent basis. Prior experience of any construction related injury (AOR [95%] = 2.614 [1.300, 5.257]) also exhibited significant association indicating those with Previous experience of any of the Occupational Injuries had twice the odds of Utilizing the Appropriate PPEs for their task. Safety trainings (AOR [95%] = 2.676 [1.509, 5.512]) indicated a significant association with PPE utilization where the Construction workers with Prior Safety Trainings had twice the odds of utilizing PPE as compared to those with no safety trainings. These variables which were significant before still showed significant association after adjusting for confounders in multivariable logistic regression. Availability and Utilization of PPE factor prior PPE knowledge and the other variables, previous knowledge about the risks and hazards with construction work and workers made aware of OSH by site supervisors showed no significant association with PPE Utilization. PPE utilization of the workers didn't have significant association with all PPE availability and use factors.

Table 5:- Summary of the Multivariable Analysis of the factors associated with PPE utilization among construction of the Lideta Housing Project, Addis Ababa, April 2019.

Variables (n=289)	**Options**	**PPE Utilization (n=289)**		**Crude OR (95%CI)**	**Adjusted OR (95%CI)**
		Non-Utilization (n=236)	Utilization (n=53)		
Terms of Employment in construction site	Temporary	141 (95.3%)	7 (4.7%)	0.121 (0.052, 0.285)	0.135 (0.056, 0.327)
	Permanent	7 (41.2%)	10 (58.8%)	3.492 (1.233, 9.888)	2.093 (1.280, 4.272)*
	Contractual	88 (71%)	36 (29%)	1	1
Worker Awareness of occupational health and safety by site supervisors	Yes	12 (42.9%)	16 (57.1%)	8.072 (3.536, 18.426)	0.255 (0.084, 0.777)
	No	224 (85.8%)	37 (14.2%)	1	
Ever Experienced work place injury due to not wearing Protective Equipment	Yes	151 (89.3%)	18 (10.7%)	3.454 (1.844, 6.470)	2.614 (1.300, 5.257)*
	No	85 (70.8%)	35 (29.2%)	1	1
Prior safety trainings	Yes	218 (85.8%)	36 (14.2%)	5.719 (2.699, 12.117)	2.676 (1.509, 5.512)*
	No	18 (51.4%)	17 (48.6%)	1	

6. Discussion

The Institution based cross-sectional study attempted to assess Personal Protective Equipment Utilization and associated factors among construction workers in the Lideta Housing Project located in Addis Ababa.

The study showed the overall Personal Protective Equipment Utilization rate to be 53 (18.3%). This finding seems to be in line with the PPE Utilization studies done. 15.6% utilization in Uganda (18), 18.9% utilization in Nigeria (19) with a little higher report found in Kenya, 45.2% (16) and another study in Nairobi reported 32% (36). The official OSH policies of the countries and the overall environmental health hygiene, which is considerably better than our country can be the reasons for the higher report found in their reports (16, 36). Another difference might be within the sample population characteristics and the sample size used in these studies. The study continued on to assess which key independent factors were particularly influencing PPE use in a construction site. No significant association could be made between Marital Status and PPE Utilization which was supported by the study done in Kenya, workers marital status (p=0.07) showed that there was no significant association although it underlined married workers are expected to be more vigilant in safeguarding their health by using PPE all the time while working (16). It was also evident that the construction workers' income 1600-2000 (62.3%), contrary to most studies, in these findings it had little to no relation with PPE use. This might be due to most respondents had others means of income during the study period and the responses might have not accounted for monthly income gained elsewhere. Another important variable assessed in this study was Educational status, it had no significant association with PPE utilization. Sample size being key here, the educational status of almost all (73%) of the respondents was found to be Secondary/Preparatory level meaning there weren't enough respondents in the other categories to truly observe whether this variable had any relationship with PPE utilization. Unavailability of PPEs on site (77.1%) was the main reason for not utilizing PPEs which was supported by the Report from Malaysia (26) which was also a recurring theme and a main finding in the two studies done in East Africa (17, 18). In further support of the findings, the study done in Gonder city recognized low PPE utilization and underlined no Provision of PPE (96.8%) was a major reason for not utilizing PPEs. Since unavailability was a major issue across most of the sites found in the Lideta Projects, PPE

knowledge didn't really matter during further cross-examination; those that knew only (26.4%) utilized PPEs. In contrast to this finding, a study from Malaysia concluded only 16% don't know about PPEs (26). This as explained in the study was due to workers being given basic safety training in their worksites. The workers with PPE on site, a good percentage had Helmets, Safety Boots Overalls & Heavy-Duty Gloves only (32.1%). These were barely enough to satisfy the requirement of PPEs for the different work classes. Although Availability Percentage was low in this study (27%) it was comparable and is in line with the study done in Mombassa county which consistently reiterated unavailability was an issue for a low PPE utilization prevalence (16). The comfortable nature or lack thereof, as it was seen in recent studies (16, 19, 30, 35) is a major challenge to PPE utilization; but contrary to that the study done here comfort didn't seem be the issue for low utilization; (93.6%) claimed it was comfortable and not really a deciding variable for the Low utilization.

Studies done in Ethiopia mostly focused on Occupational injuries but the secondarily assessed PPE Utilization seems to be in conformity with the result found; the situational analysis done in Ethiopia found 36% utilization (12), a study in Arba-Minch found 20.6% utilization (21). Furthermore, a study done in Gonder found 0% utilization (22). Another report from Dessie found 39.3% utilization (31) and Addis Ababa had 23.4% utilization (11). These studies, though they heavily emphasized on Occupational Injuries rather than PPEs, are on par with the findings of this study. They gave a picture about the Low Utilization status of PPEs which is the Primary finding here. In a much higher contrast, the study done in Nepal reported an 87.2% (17) Utilization rate. The difference here is due to a considerably better environmental, occupational health and safety climates where safety concerns and awareness and education of workers were given greater attention by the country's occupational health and safety policy (17).

The study tried to find which variables were significantly associated with PPE Utilization. Sex, Income, Education Status, Age had no significant relationship with PPE Utilization whereas it was found that Permanent terms of employment, Prior experience of any construction related injury and workers with Prior Safety Trainings were found to be significantly associated with PPE Utilization. The employment terms characteristic was key to utilizing PPEs and it meant that employees that were on the permanent roster had a stronger agreement with the contract

company which supplied them with PPEs relevant for their work whereas those that were not permanently employed were not given the same scrutiny.

Studies have concluded appropriate Personal Protective Equipment utilization would lead to a tremendous decrease in Occupational related injuries which is logical and must be inherently found. In support of the findings, the research done in New York that assessed safety climate, personal protection uses, and injuries found that Work safety climate was significantly correlated with the provision and use of most types of PPE (32). A study done in the UK also reported not using PPEs contributed to higher prevalence of musculoskeletal problems (33). A Hong Kong study concluded workers provided with inappropriate safety equipment at work have a higher chance of suffering from physical stress i.e. occupational injury (34). The Report from Malaysia singled out failure to use personal protective equipments as a major cause of accident in a Construction site (26). The finding that was also heavily supported by a study which evidenced significant association (χ_2=34.5, df=12, p=0.00) between the existence of injuries and ailments with working in the construction sites and PPE utilization among the construction workers (16, 28). Furthermore, A study done in Nairobi, Kenya on the Provision of PPEs isolated 91 cases of injuries that were attributable to lack of use of PPE which could probably have been eliminated were reported (36).

Most studies done in Ethiopia were consistent with the findings of the study. A study on occupational injuries conducted in Dessie found the odds of occupational injury were two times higher among workers who did not use PPE (AOR [95%] 2.07[1.253, 3.439]) (30). The study in Addis Ababa, Ethiopia showed a strong association of Occupational injury with Personal Protective Equipment Utilization (AOR [95%] = 2.34[1.25, 4.42]) where the workers who didn't utilize Personal protective equipment all times had more than twice the odds of having occupational Injury than workers who utilize Personal Protective Equipment all time which was further in support of the findings of this study (25).

In support of the other findings of this Report, the study done in Kampala, Uganda reported similarly as in this study that the workers employed on Temporary (AOR = 0.05; 95% CI: 0.01–0.27; *P*< 0.001) and Casual basis (AOR = 0.01; 95% CI: 0.001–0.071; p< 0.001) were less likely to utilize PPEs which meant in other words permanently employed construction workers had higher odds of utilizing PPEs than those construction workers who weren't employed Permanently (18). Contrary to these reports, a study done in Kenya revealed that there was no

significant association ($\chi 2$ = 16.0, df=12, p=0.9) between workers employment terms and PPE utilization (16). The Difference observed here could be due to sample population characteristics arising from the construction sector found there and found in Ethiopia especially in contractual agreements.

The study also found that Prior Safety training was significantly associated with PPE. The findings of the study done in Uganda seem to coincide with this where previous knowledge of safety measures was significantly associated with PPE utilization (AOR = 100.72; 95% CI: 26.00–390.16; P< 0.001) (18). Similarly, Safety Trainings were a major issue for a study done in Nairobi, indicating lack of professional safety trainings had significant impact on PPE utilization (36). Contradicting the findings, the Mombasa County findings reported there were no significant association between PPE use and Prior Safety Trainings, ($\chi 2$=5.0, df=12, p=0.72) implying the contractors of these sites are not keen on occupational safety of their workers (16).

In an ideal scenario the age of participants should be directly proportional to PPE utilization because the older workers due to Exposure to many hazards/risks for longer periods of time are very much aware of the need to utilize PPE, contrary to the results of this study where Age had no association with PPE utilization which was in line with the finding of the study done in Kenya (16). Another similarity with the Mombasa County findings was that the results showed that there was no significant association between the highest possible education level attained and PPE utilization ($\chi 2$=2.37, df=4, p=0.50). Most workers who have worked for longer years rightfully consider themselves more experienced, wrongfully though, they do not see the need to use PPE. This study found worker experience had no significant association with PPE Utilization, much in line with the Mombasa county finding where no significant association ($\chi 2$=2.37, df=6, p=0.25) between experience of the workers and PPE utilization was found (16).

The Studies done in Ethiopia main focus was Occupational Injuries as opposed to PPE Utilization rate to identify preventive capacities.

7. Strengths and Limitations of this Study

7.1. Strengths

The characteristics of the study population found in the Lideta Project site is much similar to the other 17 Housing projects currently underway in the country, which means the results of this report can be generalizable to the other projects.

The study used validated and standardized questionnaires which were pre-tested to ensure comparability.

7.2. Limitations

As a result of the cross-sectional study design used in this study which does not help determine cause and effect can be mentioned as a limitation. The Sample size was less than ideal for the project not to mention interviewer bias and time pressure of the respondents due to data collection techniques used here were found to be significant limitations. Furthermore, the study being limited to the housing construction industry makes generalizability to other construction sectors difficult.

8. Conclusion and Recommendations

8.1. Conclusion

The final report of this study indicated a very low utilization rate of personal protective equipments among construction workers in contrast with some findings. Most of the workers main reason for not utilizing personal protective equipments was the unavailability on the construction sites. The study isolated only few workers that knew about PPEs; PPEs such as Helmets, Safety Boots and/or Overalls were the ones most knew about. It can conclude that there was a significant association between PPE Utilization and Previous Experience of Occupational injuries. The construction workers with injury experience were Utilizing PPE's while those with no experience didn't utilize Appropriate PPE's.

Site Supervisors have a major responsibility of supplying PPEs and enforcing proper utilization during all working Hours. Safety trainings on occupational health and safety and PPE handling and use could crucial due to the fact that PPE Utilization was significantly associated with workers prior safety training. The simple safety trainings enacted by Responsible bodies had an impact on Utilization of Appropriate PPEs. The workers terms of employment was found to be a key factor in determining PPE Utilization as such permanently employed workers had higher odds of utilizing protective equipments.

8.2. Recommendations

- These findings could be an interest to MOH, Addis Ababa Health Bureau and Addis Ababa Housing Development Bureau and should be seen as a warning sign that most construction employees work in below par conditions. These Governmental Organizations mentioned should work in conjunction and set a much-needed safety regulation with a method to systematically enforce it on the Construction Industry.
- The Contractors employed to oversee constructions should not be allowed to move ahead with work unless appropriate work scenarios are fulfilled.
- The Ministry of Labor and Social Affairs in conjunction with Addis Ababa Housing Development Bureau should assign occupational health and safety professionals to distinctly monitor construction sites which will play an important role to safeguard the basic health and safety matters fulfillment.
- The Responsible Bodies of a construction site should assign persons to continuously give awareness on Occupational Health Safety issues and PPE handling and use as it could crucial for workers to Utilize Appropriate PPEs.
- Further studies integrating different factors should be done to identify preventative areas, as PPEs role would be pointless if not for prevention of Occupational Injuries.

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ANNEX

Annex 1: Participant's Information Sheet

Title of the Research Project: Assessment of Personal Protective Equipment Use and Associated Factors among Building Construction Workers in the Lideta Housing Project, Addis Ababa, Ethiopia.

Name of Principal Investigator: Michael Shanko Delelegne

Name of the Organization: Addis Ababa University College of Health Sciences School of Public Health

Introduction: Personal protective equipment is one of the important measures to safeguard workers from exposure to occupational hazards. The value of this study is in it will provide width in the apparent Lack of information or partial information on the need for PPE and the general low understanding of PPE designed to prevent long term damage to health. This study is also aimed at Assessing magnitude of utilization status of Personal Protective Equipment in the Public Housing construction sector in Addis Ababa from the sole perspective of the labor force.

This information sheet and consent form was prepared mainly for the Lideta Housing Project Office. The aim of the form is to make the above concerned body clear about the purpose of the research work, data collection procedures and get permission to undertake the research.

Aim of the Study: The aim of this study is to assess Personal Protective Use status and associated factors among Construction workers at the Lideta Housing Project. Almost all studies reviewed in this research show a high degree association of occupational injuries with PPE utilization so this study's biggest importance was towards the highly prevalent construction's occupational injuries by visualizing Protective Equipments utilization status in the industry by which it will show how much prevention efforts would be boosted if protective equipments are in place.

Procedure: In order to come up with the above mentioned findings, data was collected using pretested and structured Amharic version questionnaire via face to face interview of the study participants. The Questionnaire focuses on a multitude of factors that can determine PPE use in a Construction site. Each information gathered was checked for appropriateness and completeness

before entering the data in to a computer and double checked to ensure quality and readiness of data for analysis.

Risk and/or Discomfort: Though, we do not expect any harm resulting from the study, there was a moderate amount of time Respondents have to spend in order to Answer Questions.

Benefits: The Research will have no direct benefit the participants in this study. But the indirect benefit of the research for the participant and all other clients in the service is clear. It was an important instigator for prevention efforts to strengthen and policy makers to fill holes in OSH policies.

Study Period: February 2019 - March, 2019.

Confidentiality: In an Effort to keep confidentiality of the clients, the information collected from this study was kept confidential and information reviewed about the clients by this study is stored in a file, without name i.e. Investigator will use number codes to the record during the review. The information gathered is not accessible to anyone except the principal investigator and was locked with appropriate locks/password.

Person to Contact: This Research project proposal was reviewed and approved by the Institutional Review Board of The School of Public Health and College of Health Sciences, Addis Ababa University. If in any case you want to know more information about the research and its undertakings, you can contact through the address below.

Investigator's Name and Address: Michael Shanko (BSc) (+251(0)910872906) Kirkos Kifle Ketema - Email address: mickniktim@gmail.com

Advisor's Name and Address:

1. Girma Taye (PhD), Addis Ababa University, School of Public Health, Addis Ababa. Email address: girmataye2009@gmail.com
2. Yifokire (MSc.), Addis Ababa University, School of Public Health, Addis Ababa Email address: yifoomitu@yahoo.com

Permission: Finally, you are kindly requested to permit and forward your permission to concerned body in your organization so that the researcher can get cooperation from the Lideta Housing Project Office.

Annex 2: Consent Form

Consent form (English and Amharic)

Addis Ababa University, School of Public Health, a Study on Personal Protective Equipment use and Associated Factors among Building Construction Workers at the Lideta Housing Project.
Good morning/Good afternoon, my name is _____. I am working with Mr Michael Shanko who is doing a research as partial fulfillment for the requirement of MPH at Addis Ababa University College of health science school of Public Health.

We are conducting a study about Personal Protective Equipment use and Associated Factors among Construction Workers. The study is aimed to fill the information gap and provide evidence for program planners, implementers and decision makers at different levels by visualizing Protective Equipment Utilization and factors related with it. There are no risks or direct benefits to you from participating in the study but your participation will contribute in boosting prevention efforts by underlining Protective Equipment use and need for stronger OSH Policies. Please be assured that the information is confidential and you may choose to stop your participation at any time or refrain from answering any questions. This will not have any impact on the service you are getting now and the future. Your name will not be used or made public. And this question will take about 20-30 minutes.

Do I have your agreement to participate?

1. Yes 2.No. Stop 35.

For any information you can contact:

1. Girma Taye (PhD), Addis Ababa University, School of Public Health, Addis Ababa.
   Email address: girmataye2009@gmail.com
2. Yifokire (MSc.), Addis Ababa University, School of Public Health, Addis Ababa
   Email address: yifoomitu@yahoo.com Jemal Musa (BSc) Addis Ababa Foods, Medicine and Health Care Administration and Control Authority.

Consent Form

I have Read/Listened to the information sheet above and clearly understood the purpose and anticipated benefit of the research. I hereby need to assure with my signature below that without any coercion or forceful act by the research team, have decided to voluntarily participate in the study to contribute my part in the effort being made.

Participant unique ID No_____ Signature _____ Date_____

Interviewer's name_____ Signature_____ Date_____

Date of interview_____ Time started_____ Time finished_____

Supervisor's Name_____ Signature_____ Date_____

For any information you can contact:

Mr. Michael Shanko Delelegne

E-mail: mickniktim@gmail.com Tel: +251(0)910872906

I THANK YOU FOR YOUR COOPERATION!

Annex 2: English Version Questionnaire

Questionnaire Sheet on Study of Assessment of Personal Protective Equipment Utilization and Associated Factors among Build Construction Workers in the Lideta Housing Project.

Questionnaire ID: _____

S.N.	Query	Response
Part (I) - Socio Demographic Queries		
1	Sex/Gender: -	1) Male 2) Female
2	Age: -	_____
3	Marital Status: -	1) Married 2) Single 3) Divorced 4) Widowed
4	Educational Level: -	1) Illiterate 2) Primary (1-8th Grades) 3) Secondary (9-12th Grades) 4) Tertiary (Diploma) 5) University Level (Degree) 6) Post Graduate
5	Income Level	1) <800 Birr 2) 800-1500 Birr 3) 1600-2000 Birr 4) >2000 Birr
Part (II)Work Place/Worker Information		
6	Workplace Job Title: -	1) Engineer 2) Foreman 3) Builder 4) Plumber 5) Mason 6) Carpenter 7) Steel Worker 8) Mixer 9) Plasterer 10) Others, Specify _____
7	How Many days Per week do you Work?	1) Everyday 2) 2 Days per week 3) 3 Days 4) 4 Days

8	Years worked in the Construction Sector: -	1) 0-5 Years 2) 6-10 Years 3) 11-15 Years 4) Over 16 Years
9	Terms of Employment in the Construction Sector: -	1) Permanent Employ 2) Temporary Employ 3) Contractual/Casual Basis
10	Job Description/Position in the Workplace	1) Concrete Work 2) Wood Work 3) Welding 4) Electrical Equipments and Installation 5) Plastering 6) Excavation 7) Form work 8) Supervision
Part (III) Personal Protective Equipment Utilization Queries		
11	Do You Know about Personal Protective Equipments needed during Construction?	1) YES 2) NO
12	If 'YES' to Q No. (11) What types of equipments are utilized in your Site? (Can Mention More Than one)	1) Hard Hats/Helmets 2) Safety Boots 3) Heavy Duty Gloves 4) Overalls 5) Face and Eye Protection (Goggles) 6) High Visibility Garments 7) Others, Specify _____
13	Are All the Required Protective Equipment Available at the Construction site?	1) YES 2) NO
14	Currently, Do You personally Have Protective Equipments to utilize in a Construction site? (Observation)	1) YES 2) NO
15	If Yes to Q No. (14) What types of PPE's do you use for your task?	1) Hard Hats/Helmets 2) Safety Boots 3) Heavy Duty Gloves 4) Overalls 5) Face and Eye Protection (Goggles) 6) High Visibility Garments 7) Others, Specify _____
16	If Yes to Q No. (14) Are the Equipments Comfortable to wear?	1) YES 2) NO
17	If 'Yes' to Q No. (14) By What means did you Acquire them?	1) Employer Provision 2) Self-Bought 3) Borrowed 4) Given for Free from Previous Job 5) Others, Specify _____

18	If 'No' to Q No. (14) What is the Reason for you not using PPE's?	1) Don't Understand Need 2) Not Important 3) Expensive 4) Not Available at site
Part (IV) - Personal Protective Equipment Utilization Associated Factors		
19	Do you know of the Risks/Hazards associated with working in a Construction Site?	1) YES 2) NO
20	Are you made aware by the site supervisors of Occupational Safety and Health?	1) YES 2) NO
21	Have you Experienced workplace injury due to not wearing Protective Equipment?	1) YES 2) NO
22	Do You Think PPE will Protect you from Workplace Hazards?	1) YES 2) NO 3) Don't understand the need.
23	Do you think your co-worker/friend wearing PPE's influence your decision to equip yourself with appropriate PPE's for the task?	1) YES 2) NO
24	Have you ever had any Safety Training?	1) YES 2) NO

Annex 2: Amharic Version Questionnaire

አባሪ 2፡ የአማሪኛ ትርጉም መጠይቅ

በጥናቱ ላይ ለሚሳተፉ የሚሰጥ መረጃ

ጤና ይስጥልኝ፡ እኔ _____ እባላለሁ። እዚህ የመጣሁት ይህንን ጥናት ለማካሄድ የአዲስ አበባ ዩኒቨርሲቲ የጥናት ቡድን ሆኜ ነዉ። ስለ የግንባታ ስፍራ የግል ራስን ከአደጋ መከላከያ መሳሪያዎች ተጋዳኝ/ተያያዥ ነገሮች ለሰላሳ ደቂቃ ብቻ የሚፈጅ ትንሽ ጥያቄ ልጠይቅዎት እፈልጋለሁ ። እርስዎ የሚሰጡን ትክክለኛ መልስ በግንባታ ስፍራ የሚከሰቱ አደጋዎች ምን ያህሉን በግል አደጋ መሳሪዎች መከላከል ይቻላል በተጨማሪም የሙያ ደህንነት ላይ ጠንከር ያሉ ማሻሻያዎች እንዲፈጠሩ ይረዳል። በዚህ ጥናት ላይ የሚሳተፍ ማንኛዉም ሰዉ ከዚህ በታች ስለ ጥናቱ የተሰጠዉን መረጃ በትክክል ተረድቶ ፍቃደኝነቱን ሲያሳይ ብቻ ነዉ።

የጥናቱ ርዕስ፡ በልደታ የቤቶች ፕሮጀከት ፅ/ቤት የሚገኙ የግንባታ ሰራተኞች ያላቸው የግል ራስን ከአደጋ መከላከያ መሳሪያዎች አጠቃቀም ሁኔታና ተያያዥነት ያላቸውን ነገሮች በተመለከተ

የጥናቱ ዋና አላማ፡ የቤቶች ፕሮጀከት ፅ/ቤት የሚገኙ የግንባታ ሰራተኞች ያላቸው የግል ራስን ከአደጋ መከላከያ መሳሪያዎች አጠቃቀም ሁኔታና ተያያዥነት ያላቸውን ነገሮች በተመለከተ ያለበትን ሁኔታ ለመለየት

የተጠኝዎች መብት፡ በጥናቱ ላይ መሳተፍም ይሁን አለመሳተፍ ይችላሉ፡ ተሳታፊዎች ጥናቱን በፈለጉት ቦታ ማቋረጥ ይችላሉ፡ መመለስ ያልፈለጉትንም ጥያቄ መዝለልም ይችላሉ። ተሳታፊዎች ማንኛዉንም ያልገባቸዉን ጥያቄ መጠየቅ ይችላሉ።

የጥናቱ ሚስጢራዊነቱ፡ በመላሾች የሚሰጥ ማንኛዉም አይነት መልስ በሚስጢር ይያዛል፡ ስማቸዉም አይገለፅም።

የተሳታፊዎች የፈቃደኝነት መጠየቂያ ቅፅ

ይህ መጠይቅ በአይካ አዲስ ጨርቃጨርቅ ፋብሪካ ሰራተኞች ላይ በሚደርስ ከስራ ጋር የተያያዙ ጉዳቶችን ለማጥናት የተዘጋጀ ነዉ።

የመጠይቁ መለያ ቁጥር _____

ከላይ ያለዉን ቅፅ ብታነቡት ወይም ቢነበብልዎት እና ስለ ጥናቱ ፍሬ ሀሳብ ቢረዱ እርስዎ በዚህ ጥናት ላይ ይሳተፉ ነበር?

አዎ _____ **አልሳተፍም** _____

የተሳታፊዎች ፊርማ_____

ተ.ቁ.	ጥያቄዎች	መልስ
ክፍል (1) - እርስዎን የሚመለከቱ ጥያቄዎች		
1	ፆታ	1. ወንድ 2. ሴት
2	የእድሜ ክልል	1. 18-20 ዓመት 2. 21-25 ዓመት 3. 26-30 ዓመት 4. 31-35 ዓመት 5. 36-40 ዓመት 6. 41-45 ዓመት 7. ከ46 ዓመት በላይ
3	የጋብቻ ሁኔታ	1. ያገባ 2. ያላገባ 3. የፈታ 4. ባል/ሚስት የሞተበት
4	የትምህርት ደረጃ	1. ያልተማረ 2. አንደኛ ደረጃ (ከ1ኛ-8ኛ ክፍል) 3. ሁለተኛ ደረጃ (ከ9ኛ-12ኛ ክፍል) 4. ዲፕሎማ 5. ዩኒቨርስቲ ደረጃ (ዲግሪ) 6. ሁለተኛ ዲግሪ
5	በወር ውስጥ የገቢዎ መጠን	1. ከ800 ብር በታች 2. ከ800-1500 ብር 3. ከ1600-2000 ብር 4. ከ2000 ብር በላይ
የሰራተኛውን ወይም የመስሪያ ቦታ ሁኔታውን የሚመለከቱ ጥያቄዎች		
6	የስራ ቦታዎት መደብ ወይም መጠሪያ ስም	1. ኢንጂነር 2. ፎርማን 3. አናፂ 4. ባንቧ ሰራተኛ 5. ግንበኛ 6. የእንጨት ሰራተኛ 7. የብረት ሰራተኛ 8. ሚክሰር 9. ለሳኝ 10. ሌላ፣ ጥቀስ _____
7	በሳምንት ውስጥ ምን ያህል ቀን ስራ ይሰራሉ	1. በየቀኑ 2. 2 ቀን 3. 3 ቀን 4. 4 ቀን
8	በኮንስትራክሽን ዘርፍ የስራ ልምድዎት	1. ከ0-5 ዓመት 2. ከ6-10 ዓመት

		3. ከ11-15 ዓመት 4. ከ16 ዓመት በላይ
9	በስራ ቦታዎት የቅጥር ሁኔታ	1. በጊዜያዊነት 2. በቋሚነት 3. በኮንትራክት
10	የስራዎት መዘርዝር	1. የሲሚንቶ ስራዎች 2. የእንጨት ስራዎች 3. ብየዳ 4. ኤሌክትሪክ ገጠማ ወይም የኤሌክትሪክ ስራዎች 5. የልሰና ስራዎች 6. የቁፋሮ ስራዎች 7. ሌላ፣ ጥቀስ _____
ክፍል (2) - ስለ የግል ራስን ከአደጋ መከላከያ መሳሪያዎችን የሚመለከቱ ጥያቄዎች		
11	በግንባታ ስራ ላይ ስለሚያስፈልጉ የግል ራስን ከአደጋ መከላከያ መሳሪያዎች ያውቃሉ	1. አዎ 2. አላውቅም
12	ለጥያቄ ቁጥር 11 አሉ ወይም ይገኛሉ ብለው ከመለሱ ምን ዓይነት መሳሪያዎች ናቸው (ከአንድ በላይ መጥቀስ ይችላሉ)	1. ጠንካራ ኮፍያ ወይም ቆብ 2. ጠንካራ ቦቲ ጫማዎች 3. ጠንካራ የፕላስቲክ ጓንቶች 4. ሁሉንም የሰውነት ክፍል የሚሸፍኑ ቱታዎች 5. የዓይን መከላከያ መነፅር 6. አብረቅራቂ ሰደርያ ወይም ጃኬቶች 7. ሌሎች፣ ጥቀስ _____
13	እነዚህ ከአደጋ መከላከያ መሳሪያዎች በዚህ የግንባታ ስፍራ ይገኛሉ	1. አሉ ወይም ይገኛሉ 2. የሉም
14	በአሁኑ ሰዓት እርስዎ ለግልዎት የሚጠቀሙበት የአደጋ መከላከያ መሳሪያ አለዎት	1. አዎ 2. የለም
15	ለጥያቄ ቁጥር 14 መልስዎት አዎ ከሆነ በስራ ወቅት ምን ዓይነት መሳሪያ ይጠቀማሉ	1. ጠንካራ ኮፍያወይምቆብ 2. ጠንካራ ቦቲ ጫማዎች 3. ጠንካራ የፕላስቲክ ጓንቶች 4. ሁሉንም የሰውነት ክፍል የሚሸፍኑ ቱታዎች 5. የዓይን መከላከያ መነፅር 6. አብረቅራቂ ሰደርያ ወይም ጃኬት 7. ሌሎች፣ ጥቀስ _____
16	ለጥያቄ ቁጥር 14 መልስዎት አዎ ከሆነ መሳሪያዎቹ ለአጠቃቀም ምቾት አላቸው	1. አዎ 2. የለም
17	ለጥያቄ ቁጥር 14 መልስዎት አዎ ከሆነ በምን ዓይነት መንገድ እነዚህን መሳሪያዎች አገኙ	3. አሰሪ አዘጋጅቶ 4. በራሴ የገዛሁት 5. ሰው ሰጥቶኝ ወይም ከሰው የተዋስኩት 6. ከዚህ ቀደም ስሰራበት ከነበረ የተሰጠኝ 7. ሌላ፣ ጥቀስ _____
18	ለጥያቄ ቁጥር 14 መልስዎት የለም ከሆነ የማይጠቀሙበት ምክንያት ምንድን	1. አስፈላጊነቱ ግልፅ አይደለም

	ነው	2. ጠቃሚ አይደለም 3. ውድነው 4. ሌላ፣ ጥቀስ _____
ክፍል (3) - ለስለ የግል ራስን ከአደጋ መከላከያ መሳሪያዎች ተጓዳኝ ነገሮችን የሚመለከቱ ጥያቄዎች		
19	በግንባታ ስፍራ ስለሚከሰቱ ተጋላጭነቶችና አደጋዎች ያውቃሉ	1. አዎ 2. የለም
20	በዚህ ግንባታ ስፍራ ሊከሰት ስለሚችል ተጋላጭነቶችና አደጋዎች በአሰሪዎቹ አማካኝነት ግንዛቤ ተሰጥቶታል	1. አዎ 2. የለም
21	በግንባታ ስፍራ ከዚህ ቀደምም ቢሆን አሁን የአደጋ መከላከያ መሳሪያ ባለመጠቀሞት አደጋ ወይም ህመም አጋጥሞዎት ያውቃል	1. አዎ 2. የለም
22	በእርስዎ አመለካከት የግንባታ ስፍራ የግል ራስን ከአደጋ መከላከያ መሳሪያዎችን መጠቀም ለአደጋ ተጋላጭነትን የሚቀንስ ይመስሎታል	1. አዎ 2. የለም
23	ጓደኛዎት ወይም የስራ ባለደረባዎት ለግንባታ ስራ ከአደጋ መከላከያ መሳሪያ የሚጠቀሙ ቢሆን እርስዎም ለመጠቀም ያነሳስዎት ነበር	1. አዎ 2. የለም
24	ስለ ግንባታ ስፍራ ሙያ ደህንነትና ጤንነት ከዚህ ቀደምም ቢሆን አሁን ስልጠና ወስደው ያውቃሉ	1. አዎ 2. የለም