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Article

An Appraisal of Availability and Use of Protective Clothing for Workers in Ghana

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Abstract: The study aimed to examine the availability of protective clothing and its usage among workers at the University of Cape Coast in the central region of Ghana. It used the Accident-Proneness Theory and the Theory of Reasoned Action to achieve the study's objectives. The study adopted the positivist research paradigm. The study used a descriptive design with mixed methods. The study population comprised all workers and supervisors whose work demands the use of protective clothing at the University of Cape Coast. The study used multistage sampling techniques (stratified, purposive, proportional and Systematic random sampling techniques) to select one hundred and ninety-six departmental workers and five (5) supervisors in the University. The main instruments for data collection were a Semi-structured questionnaire and an unstructured interview guide. Mean and standard deviation, frequency count, and percentages were used to analyse the quantitative data. The qualitative data was analysed through the development of data categories and themes. The study concluded that "not all the protective clothing for the various departments were available. The University ensured that workers used what was in stock at the department. The protective clothing supplied to the various departments was insufficient, so their continuous use of the existing ones got them defaced, bringing about shortages. The study also revealed that workers used protective clothing most often, but not all used it because safety laws were relaxed. The study recommended that the University ensure a regular and adequate supply of PPC, insist on its usage, and enforce the use of PPC by all workers whose work demands it.

Keywords: Personal, Protective, Clothing, Workers

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1. Introduction

Personal Protective Clothing (PPC) is a crucial functional element that guards against or minimises the effects of occupational hazards. Virtually all workplaces have recognisable hazards to which people are exposed. The International Labour Organization, in 2010, estimated that over 2 million people die every year from work-related incidents, and over 300 million non-fatal accidents are recorded each year [1]. The past five years have seen some improvements in safety performance as a result of a combination of efforts of civil society organisations, local labour unions and trade associations, engineers, safety officers, contractors, subcontractors, and designers and mainly due to vast sums of damage and lawsuits that were slapped on many firms as a result of occupational hazards and accidents [2]. Many businesses had to pay vast sums of money to employees who suffered from occupational hazards. The owners' involvement has favourably influenced project safety performance by setting safety objectives and participating in safety management during construction [3].

Despite the safety improvements that have taken place in recent decades, the safety record in some industries and institutions continues to be one of the poorest [3]. According to the Centre to Protect Workers' Rights (CPWR), the construction industry is consistently ranked among the most dangerous occupations, accounting for a large percentage of all work-related illnesses, injuries, diseases and deaths across the globe. The Occupational Safety and Health Administration (OSHA), the organisation responsible for outlining safety policies and procedures oversee the proper implementation of such policies, requires the use of personal protective clothing by workers to reduce employee exposure to occupational hazards when engineering and administrative controls are not feasible or effective enough in reducing these exposures to acceptable levels. Personal Protective Clothing (PPC) can be a significant determining factor between an accident and safety in every industry. Anecdotal evidence suggests that wearing the appropriate personal protection at all times is extremely important in reducing accidents and should be given utmost priority [4].

Protecting workers against occupational hazards and injuries has recently gained much attention and become an issue of utmost concern to employers, workers, work and trade associations, governments and the general public. In Africa and Ghana, there needs to be more data on occupational hazards and injury information in various industries due to non-existence or poorly developed reporting systems and lack of formalisation of the industries. In most cases, underreporting of occupational hazards and injuries impairs the availability of information on injuries or illnesses [5].

Despite the availability of personal protective clothing (PPC) and its widely known protective values, the frequency of occupational injuries and hazards remains very high throughout developed and developing economies across the globe. Studies worldwide show that workers' utilisation of PPC could be higher, more accurate, complete, and more consistent [6, 7]. This calls for organisations and individual workers to strive to ensure workers' safety by monitoring and ensuring PPC's availability and adequate utilisation in all working environments to motivate and optimise knowledge relating to workplace safety or risk or hazard management [8]. More recently, a study examined the availability and use of PPC by automobile artisans in the informal sector at Siwdu, a small community in the Cape Coast Metropolis in the Central region of Ghana. A study found that PPC is available to artisans, but they do not use them [9].

The University of Cape Coast is one of the oldest public universities in Ghana. Due to their hazardous conditions, many departments need protective clothing daily. These departments include departmental laboratories, hospitals, sanitary, grounds and gardens, and maintenance shops. As a place where rules and regulations are expected to be enforced, one would expect that protective clothing is provided and their utilisation enforced strictly. Personal protective clothing is one of the essential measures to safeguard workers from exposure to occupational hazards, especially in developing countries, of which Ghana is not an exception. However, more studies are needed to describe using personal protective clothing in Ghana. This study has determined the availability of personal protective clothing to workers and the utilisation rate among the workers of the various departments at the University of Cape Coast. It aimed to examine the availability of protective clothing and its usage among workers at the University of Cape Coast. The study seeks to address these research questions – (1) to what extent is protective clothing available to workers at the University of Cape Coast? (2) How often do the University of Cape Coast workers use protective clothing in their activities?

1.1. Personal Protective Clothing (PPC)

Personal Protective Clothing (PPC) refers to clothing, safety helmets, safety goggles, safety gloves, safety boots and harnesses, respirators and other garments or equipment designed to protect the wearer's body from injury. The hazards addressed by protective equipment include physical, electrical, heat, chemicals and biological hazards ([10].

Personal protective clothing is defined in the UK Regulations 1992 as all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects him against one or more risks to his health or safety, e.g. safety helmets, gloves, eye protection, high visibility clothing, safety footwear and safety harnesses. Personal protective clothing is equipment worn to minimise exposure to various hazards; it is also a method to protect a person from hot and cold temperatures [10]. Where health risks cannot be avoided, or processes cannot be improved, using appropriate personal protective clothing can also be an effective measure to protect workers' health. In an account of the development of personal protective clothing, a study states that "the initial focus was on protecting the worker and later, the focus shifted to worker comfort, functionality and performance issues, and finally to style issues" [11].

According to the Occupational Health and Safety Council OSHC, personal protective clothing is essential to prevent work injuries. It should only be relied upon as a last line of defence where controlling the hazards at source is not practicable. Personal protective clothing aims to reduce employee exposure to hazards when engineering and administrative controls are not feasible or practical to reduce these risks to acceptable levels [12]. PPC is needed when there are hazards present. For such equipment to be effective, workers must be trained in its use, and the equipment must fit properly and be inspected and maintained. Employers have duties concerning providing and using PPC at work [10]. To choose equipment that suits the user, consider the PPC's size, fit and weight. If users are helped to choose it, they will be more likely to use it. Never allow exemptions from wearing PPC for those jobs that only take a few minutes. PPC must be appropriately looked after and stored in a dry, clean cupboard. If it is reusable, it must be cleaned and kept in reasonable condition [13].

However, PPC has severe limitations in that it does not eliminate the hazard at the source and may expose employees to the hazard if the equipment fails. Any item of PPC imposes a barrier between the user and the working environment. This can create additional strains on the wearer, impair their ability to carry out their work and create significant levels of discomfort. These can discourage wearers from using PPC correctly, placing them at risk of injury and illness. Good ergonomic design through PPC can help minimise these barriers and ensure safe and healthy working conditions. Occupational safety and health practices can use hazard controls and interventions to mitigate workplace hazards that threaten workers' safety and quality of life.

The hierarchy of hazard control provides a policy framework which ranks the types of hazard controls in terms of absolute risk reduction. At the top of the hierarchy are elimination and substitution, which remove the hazard entirely or replace the hazard with a safer alternative. If elimination or substitution measures cannot apply, engineering and administrative controls are implemented to design safer mechanisms and coach safer human behaviour. Personal protective clothing ranks last in the hierarchy of controls, as the workers are regularly exposed to hazards with a barrier of protection. The hierarchy of controls is vital in acknowledging that while personal protective clothing has tremendous utility, it is not the desired control mechanism for worker safety [12].

1.2. Types of Protective Clothing

The primary aim of preventing workers' exposure to harmful substances or circumstances is prevention and administrative controls. When these measures are inappropriate, the worker is advised to use personal protective clothing or equipment. To get the full benefits of personal protective clothing or equipment, the employee or worker must know the various types of PPC available and when and how to use them. Personal protective clothing can be categorised by the area of the body it protects, the types of hazards, and the type of garment or accessory. An item, like boots, may provide multiple forms of protection: a steel toe cap and steel insoles for protection of the feet from crushing

or puncture injuries, impervious rubber and lining for protection from water and chemicals, high reflectivity and heat resistance for protection from radiant heat, and high electrical resistivity for protection from electric shock. The type of protective attributes of each piece of equipment must be compared with the hazards expected in the workplace [14].

Face and eye protection: Workers can be exposed to many hazards that harm their eyes and faces. Employers must ensure that employees have appropriate eye or face protection if they are exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapours, potentially infected material, or potentially harmful light radiation [15].

Many occupational eye injuries occur because employees are not wearing eye protection, while others result from improper or poorly fitting eye protection. Employers must be sure that their employees wear appropriate eye and face protection and that the selected form of protection is relevant to the work being performed and adequately fits each employee exposed to the hazard [16]. OSHA recommends that eye protection be routinely considered for use by carpenters, electricians, machinists, mechanics, millwrights, plumbers and pipefitters, sheet metal employees and tinsmiths, assemblers, sanders, grinding machine operators, sawyers, welders, labourers, chemical process operators and handlers, and timber cutting and logging workers. Employers of employees in other job categories should decide whether there is a need for eye and face PPC through a hazard assessment [15]. Eye protection choices include the following:

Safety Spectacles / Glasses: Eye protection must conform to the American National Standards Institute (ANSI), Standard Z87.1-1989 [16]. These protective glasses have safety frames constructed of metals or plastics and an impact-resistant lens that protects the eye.

Head protection: In any occupation, protecting employees from potential head injuries is critical to any programme. Head injury can be fatal and, if possible, impair a worker for life. Using head protection is one of the surest ways to prevent head injuries. Hard hats protect employees from impact, penetration, electrical shock, and burn hazards. Hard hats must have a hard outer shell and a shock-absorbing lining that incorporates a headband and straps that suspend the shell from 1 to 1 1/4 inches (2.54 cm to 3.18 cm) away from the head. This design provides shock absorption during an impact and ventilation during normal wear. Protective headgear must meet ANSI Standard Z89.1-1986 (Protective Headgear for Industrial Workers) or provide an equivalent level of protection [17].

Foot protection: Safety shoes are required to protect against injury from heavy falling objects (handling of objects weighing more than fifteen pounds, which, if dropped, would likely result in a foot injury), crushing by rolling objects (warehouses, loading docks, etc.), and laceration or penetration by sharp objects [16]. Safety footwear must meet ANSI minimum compression and impact performance standards in ANSI Z41-1991 (American et al. for Personal Protection-Protective Footwear) or provide equivalent protection (OSHA, 2017).

Respirators protection: Respirators are personal protective clothing against inhalation of hazardous substances in the workplace air [18]. Respirators may only be used with prior approval from the Industrial Hygiene section (919-515-6862) of the Environmental Health and Safety Centre. This assures that respirators are appropriately selected, users are adequately trained, and the appropriate medical exams are conducted according to OSHA regulations [16].

According to OSHA, determining the need to provide hearing protection for employees can be challenging. Employee exposure to excessive noise depends upon several factors, including the loudness of the noise as measured in decibels, the duration of each employee's exposure to the noise, and whether employees move between work areas with different noise levels [17].

Hand protection: The nature of the hazard and the operation involved will affect the selection of gloves. The variety of potential occupational hand injuries makes selecting the right pair of gloves challenging. Employees must use gloves specifically designed for the hazards and tasks found in their workplace because gloves designed for one function may not protect against a different function, even though they may appear to be an appropriate protective device [17].

Body protection: Workers often encounter possible body injuries, so they must wear the proper body protection while performing. Many varieties of protective clothing are available for specific hazards. Employers must ensure that their employees wear personal protective clothing only for the parts of the body exposed to possible injury. Body protection includes laboratory coats, coveralls, vests, jackets, aprons, surgical gowns, and full-body suits [17].

1.3. Availability of Protective Clothing

Employers have a duty concerning the availability and use of PPC at work (Health & Safety Executive, 2016). Employers must consider PPC's fit and comfort and the availability of appropriate items for their workplace. A PPC that fits well and is comfortable to wear will inspire employees to use it. Most protective devices are available in multiple sizes, and care should be taken to select the appropriate size for each employee [15]. In instances where an employee has to wear several different types of PPC together, one has to make sure they are compatible because if PPC does not fit properly, it can make the difference between being safely covered or dangerously exposed as it may not provide the level of protection desired and may discourage employee use [15].

A study obliges that many categories of PPC meet or be equivalent to standards developed by the American National Standards Institute (ANSI). Employers needing to provide PPC must ensure that any new equipment procured meets the cited ANSI standard. Existing PPC stocks must meet the ANSI standard in effect at their manufacture or provide protection equivalent to PPC manufactured according to the ANSI criteria. Employers should inform employees who provide their own PPC to ensure that any employee-owned PPC used in the workplace conforms to the employer's criteria based on the hazard assessment, OSHA requirements and American National Standard Institute (ANSI) standards (OSHA) [15]. OSHA requires PPC to meet the following ANSI standards:

- Eye and Face Protection: ANSI Z87.1-2015 (USA Standard for Occupational and Educational Eye and Face Protection).
- Head Protection: ANSI Z89.1-2003.
- Foot Protection: ASTM F2413-11 (Maaertz, 2015).
- There is no ANSI standard for gloves for hand protection. However, OSHA recommends that selection be based on the tasks to be performed and the performance and construction characteristics of the glove material. For protection against chemicals, glove selection must be based on the chemicals encountered, the chemical resistance, and the physical properties of the glove material [15].

1.4. Uses and Importance of Protective Clothing

Health and Safety in 2015 posits that protective clothing is equipment that will protect the wearer against any health or safety risk encountered at work. Although there are several types of protective clothing that an individual can use, the wearer or worker needs to know the specific use and importance of each PPC as the type of PPC changes based on the wearer's working conditions and regulations [18]. According to the Occupational Health and Safety Council (OSHC), using PPC generally implies working in a potentially hazardous environment [15]. Workers often do not use PPC because they

feel it is a nuisance to wear. After all, it slows them down when they are working, but if these statistics are made known, it will let them change their perception of the use of PPCs and their importance to their health [15]. A study showed that noise-induced hearing loss was one of the construction industry's most prevalent occupational hazards or accidents, damaging workers' health. It further indicated that these injuries resulted from the fact that most workers were found to be without PPC while working [20]. Moreover, a study found that workers are exposed to high injuries, diseases and risk levels, especially in the mining and printing industries [21].

1.5. Accident-Proneness Theory

It is believed that some individuals are more likely to be injured than others; they are "accident-prone". This could be due to personal factors and explains that injuries do not just happen by chance. Personality traits make certain workers more vulnerable than others. These traits include aggressive tendencies, social maladjustment and outgoingness, among others. Studies on groups of workers have shown that certain workers sustain more injuries than others and that chance alone is not a factor, so they need protective clothing at their workplace [22].

However, This theory is under scrutiny and often differs from the preferred accident causation theory. Factors like influence by fellow workers and personal problems should have been investigated and added to the invalidity of the theory. It is also believed that accident proneness may change with time; that is, one will take less risk when you have a family compared with when one was young and carried less responsibility. From this accepted pattern, it can be deduced that risk-taking reduces when workers have engagement with protective clothing [3]. Although accident-prone workers are seen as being "high risk", it was found that workers who attended health and safety training sessions had fewer accidents because they put on protective clothing [23]. The accident proneness theory needs to carry more evidence. More research is required into what actions lead to accidents, the variances in hazards, and whether the accident was due to a fellow worker.

1.6. Theory of Reasoned Action /Theory of Planned Behaviour

The Theory of Reasoned Action (TRA)/Theory of Planned Behaviour (TPB) asserts that an individual's behavioural intention at the workplace is the most important determinant of behaviour. The determinants of intention include attitudes towards performing the behaviour and the subjective norms associated with the behaviour. The reasoned action was whether workers should consider wearing protective clothing. Their attitude is determined by the person's beliefs about outcomes or attributes of protective clothing. The person's normative beliefs determine subjective norms and whether influential referent individuals approve or disapprove of the protective clothing [24].

The TPB is an extension of the TRA and adds a construct concerned with perceived control over the performance of protective clothing at the workplace. The construct of perceived behavioural control accounts for factors outside of the individual's control that may affect their intention and behaviour on the use of protective clothing [24]. The TRA/TPB states that individuals evaluate the benefits and drawbacks of health behaviours depending on the probability they will occur. This model plays a vital role in social influences on individuals, such as the subjective norms and the motivation of individuals to comply with work rules and references by wearing protective clothing [25]. The TRA/TPB has been applied to several healthy lifestyle behaviours, including protective clothing, exercise, and car seat belts [25]. Two studies modelled handwashing behaviour among nurses based on the TRA/TPB, and one demonstrated adherence to proper hand washing was predicted by nurses' beliefs in the benefits of the activity, peer pressure of senior physicians and administrators, and role modelling [26].

2. Materials and Methods

The study adopted the positivist research paradigm. The proponents of the positivist research paradigm suggested that the positivist approach to scientific research involves researching an observable social reality and making law-like generalisations as done by physical and natural scientists [27]. Supportively, the fact that such social reality is observable implies that it can be measured and quantified into variables. This implies that using the positivist research paradigm involves collecting data on the variables and analysing data using statistical tests of significance to make generalisations. The study used a descriptive design with mixed methods. The multiple methods used are both quantitative and qualitative. Quantitative methods measure to answer research questions and generalise outcomes. It also emphasises the measurement [28]). Qualitative methods, on the other hand, were used in the study to provide a more profound understanding of the use of protective clothing in the University of Cape Coast encounter in their use [28]. Quantitative and qualitative methods are used to examine the availability and use of protective clothing among workers whose work demands the use of protective clothing at the University of Cape Coast.

The study population comprises all workers whose work demands the use of protective clothing at the University of Cape Coast. The Departments whose workers demanded protective clothing at the University of Cape Coast were 12. The total target population of the selected departments was 400. These departments (Electricity, Fire service, Sanitary, Works and Maintenance, and Farms) were selected because their work demanded more use of PPCs than the others. The study used multistage sampling techniques (stratified, purposive, proportional and Systematic random sampling techniques) to select one hundred and ninety-six departmental workers and five (5) supervisors in the University. A stratified sampling technique was used to divide the University into homogeneous population groupings. Respondents were grouped into Departments whose work requires protective clothing. The purposive sampling technique was used to select 5 Departments and their supervisors out of the 12 because these 5 Departments are more prone to hazards than the rest of the departments. The proportional sample size allocation was adopted to assign sample sizes to each selected department. This technique is usually applied when no information except the stratum size is available. Out of the total number of 400 workers in the 5 Departments, the proportional sampling technique was used to get the appropriate number of participants to be used in the sample, 196.

Table 1. Sample Size Determination Using Yamane (1967) Proportional Distribution

Department	Target Population	Sampled size
Electricity	69	69/400*196=34
Fire service	4	4/400*196=2
Sanitary	225	225/400*196=110
Works and Maintenance	67	67/400*196=33
Farms	35	35/400*196=17
Total	400	400/400*196=196

Source: Field Data

The participants from each department were then selected using a systematic random sampling technique. The technique is operationalised by randomly selecting an element from the list, and then every k^{th} element in the frame is selected, where k is the sampling interval. Those who were included as participants in the study fell within the sampling interval. The main instruments for data collection were a Semi-structured questionnaire and an unstructured interview guide. A semi-structured questionnaire containing both open and closed-ended items was used to obtain information from

respondents. The questionnaire was on the availability of protective clothing. UCC workers from the five departments/sections were asked to show the appropriate level of protective clothing in their departments. A 5-point Likert scale was used to obtain their views on the level of availability. The level of availability on the Likert-type rating scale was scored from 1- Not available, 2- Less available, 3- Not sure, 4- Available, and 5- Highly available. The next part of the questionnaire was on the frequency of usage of protective clothing. UCC Workers from the 5 Departments/sections were asked to show the frequency of usage of protective clothing. Regarding the frequency of usage, a 5-point Likert scale was used to obtain workers' views. The level of adequacy on the Likert-type rating scale was scored from 1- Never, 2- Rarely, 3- Occasionally, 4- Frequently, and 5- Very frequently.

An unstructured interview guide was used to collect data to answer research questions. The five Supervisors from the five selected Departments were purposively sampled and interviewed about their views on the availability and use of protective clothing among workers in their outfits.

Research Question 1 was analysed using mean and standard deviation to assess the availability of protective clothing to workers. Research Question 2 was analysed using frequency count and percentages on the frequent use of protective clothing. The qualitative data was analysed by developing data categories and themes and recognising relationships to produce well-grounded conclusions.

3. Results

This section presents findings and discusses the research questions that guided the study. ***Research Question 1****:* To what extent is protective clothing available to University of Cape Coast workers? ***Research Question 2****:* How often do the University of Cape Coast workers use protective clothing in their activities?

3.1. Availability of Protective Clothing to UCC Workers

Responses at the University of Cape Coast regarding the extent to which protective clothing was available to workers were analysed and interpreted based on the decision rule: a mean close to 4.1- 5.0 represents Highly Available; 3.1-4.0, Available; 2.1-3.0, Uncertain; 1.1-2.0, Less Available; and below 1.0, Not Available. The findings are presented in Table 2.

From Table 2, the mean responses showed that the availability of protective clothing at the University of Cape Coast had varying responses from the various sections used in this study. The results show that the Electrical Department had six PPCs available with an average mean and standard deviation of 3.60 and 0.863, respectively. As noted by the respondents, the helmet was the most available (M = 3.88, SD = 0.721), while a nose mask (M = 3.11, SD = 0.926) was the least available for the electrical department. The fire service section had goggles, helmets and fire hoods, which accounted for an average mean and standard deviation of 3.31 and 0.982, respectively.

Also, Table 2 depicts that the Sanitary section had overcoats, boots, gloves, goggles, and a nose mask with an average mean and standard deviation of 3.72 and 0.656, respectively. The nose mask (M = 4.73, SD = 0.452) was the most available PPC, while goggles (M = 1.48, SD = 0.501) were the least available.

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Table 2. Availability of Protective Clothing to UCC Workers

Sections	Overcoats		Boots		Gloves		Goggles		Helmet		Nose Mask		Fire Hood		Face Mask		Ear Muff		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Sanitation	4.54	.500	3.38	1.327	4.49	.501	1.48	.501	-	-	4.73	.452	-	-	-	-	-	-	3.72	.656
Electricity	3.65	.596	3.40	1.026	3.87	.909	3.71	1.005	3.88	.721	3.11	.926	-	-	-	-	-	-	3.60	.863
Works and Maintenance	4.30	.459	3.01	.804	4.56	.498	3.55	.940	2.93	.462	-	-	-	-	2.74	1.243	4.04	.740	3.59	.878
Fire Service	2.92	.989	2.93	.892	2.82	1.326	3.89	.849	3.89	.709	3.02	.909	3.72	1.199	-	-	-	-	3.31	.982
Farms	4.12	.635	4.72	.452	2.78	.891	1.27	.447	-	-	1.73	.582	-	-	-	-	-	-	2.92	.601
Total	**3.91**	**.636**	**3.49**	**.900**	**3.70**	**.825**	**2.78**	**.748**	**3.57**	**.964**	**3.15**	**.717**	**3.72**	**1.199**	**2.74**	**1.243**	**4.04**	**.740**	**3.43**	**.796**

Source: Field Survey, Edzeani (2018)

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Similarly, the results show that PPC was available in the Works and Maintenance section with an average mean and standard deviation of 3.59 and 0.878, respectively, where the most available was gloves (M = 4.56, SD = 0.498) and the least was face mask (M = 2.74, SD = 1.243). The availability of PPC at the Farm section on the whole shows (M = 2.92, SD = 0.601). However, boots (M = 4.72, SD = 0.452) and overcoats (M = 4.12, SD = 0.635) have been indicated to be highly available, whilst goggles were the least available PPC (M = 1.27, SD = 0.447). The results showed (M = 3.4, SD = .796), which shows general availability. However, the Sanitary section has the highest availability (M = 3.72, SD = .656), with Farms having the lowest (M = 2.93, SD = .60).

The results also show that nine (9) PPCs were available, but only overcoats, boots, gloves, and goggles were available at all the sections. Works and maintenance were the only sections with nose masks and ear muffs. Looking at individual PPC, Sanitation had the highest mean for overcoats (M = 4.5), with Fire service having the lowest (M = 2.9). The Farms section recorded the highest mean for boots (M = 4.7), while the Fire Service recorded the lowest (M = 2.9). Only four sections had helmets available in their departments, with Fire Service having the highest mean (M = 3.9) and Works and Maintenance having the lowest (M = 2.9).

Interview Responses on Research Question 1

To what extent is protective clothing available to University of Cape Coast workers? The analysis of the interview data indicated two important categories relating to research question one.

3.1.1. Availability of PPC at Work Place

Three respondents indicated they were provided with some protective clothing, but they still needed more. They said workplace accidents and injuries are among the most important preventable health problems that the University needs to address by making protective clothing or equipment available to protect the workers. However, two of the respondents indicated that PPCs were less available. The following responses ensued during the interview.

Mr. A said, *"We have some equipment, but they are inadequate since our number keeps increasing*." Mr C indicated that "*the personal protective clothing available is insufficient."* Mr. E said, *"Any time protective clothing is provided, there should be supervision, proper maintenance, and replacement to ensure their availability at the various departments*."

3.1.2. Regular supply of PPC for workers

Four respondents said that protective clothing or equipment is vital in ensuring workers' health and safety in their workplace, so it must be supplied regularly. They lamented that the old stock had been available too long, and the University needed to replace it occasionally.

> *Mr. B said, "WorkersWorkers have been using their protective clothing for too long, and the university does not replace it until it is defaced."*
>
> *Mr D also indicated that "the supply of the protective clothing has been stagnant for some time now, so workers at times buy their protective clothing if it becomes old and the university has not brought new supply."*

3.2. Frequency of Protective Clothing Use by UCC Workers

This subsection discusses the respondents' responses at the University of Cape Coast regarding the frequency of wearing protective clothing at workplaces. Responses are interpreted based on the decision rule such that a mean close to 4.1- 5.0 represents Very Frequently; 3.1-4.0 frequently represents; 2.1-3.0 represents Occasionally; 1.1-2.0

represents Rarely; and a represents below 1.0 represents Never. The findings are presented in Table 3.

Table 3 indicates the mean responses to the frequency of UCC workers using protective clothing at the workplace. The results show that the Electrical Department occasionally uses PPC, as contained in Table 5, having an average mean and standard deviation of 3.0 and 1.28, respectively; the most frequently used PPC, as noted by the respondents, is overcoated (M = 3.28, SD = 1.312) whiles nose helmet (M = 2.69, SD = 1.167) was the least used at the Electrical Department. Again, the Table indicates that the Fire service section frequently uses PPC, with an average mean and standard deviation of 3.50 and 1.06, respectively. However, gloves (M = 3.79, SD = 0.920) and helmets (M = 3.79, SD = 1.107) have been indicated to be the most frequently used PPCs in the Fire service section, whilst overcoats (M = 3.08, SD = 1.293) was the least used.

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Table 3. Frequency of PPC Use by UCC Workers

Sections	Overcoats		Boots		Gloves		Goggles		Helmet		Nose Mask		Fire Hood		Face Mask		Ear Muff		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Sanitation	3.50	1.148	3.55	1.054	3.35	1.156	3.53	1.134	-	-	4.00	.778	-	-	-	-	-	-	3.60	1.05
Works and Maintenance	3.45	.941	-	-	3.92	1.009	3.53	1.230	3.91	1.171	-	-	-	-	3.31	1.228	3.02	1.353	3.52	1.16
Farms	3.79	1.389	3.80	1.055	3.05	1.022	3.17	1.223	3.70	1.235	3.56	1.224	-	-	-	-	-	-	3.51	1.19
Fire Service	3.08	1.293	3.28	1.012	3.79	.920	3.55	1.138	3.79	1.107	3.70	.980	3.19	.997	-	-	-	-	3.50	1.06
Electricity	3.28	1.312	2.79	1.321	2.83	1.280	3.07	1.194	2.69	1.167	2.82	1.448	-	-	-	-	-	-	3.00	1.28
TOTAL	**3.42**	**1.22**	**3.40**	**1.11**	**3.40**	**1.07**	**3.37**	**1.20**	**3.50**	**1.17**	**3.52**	**1.11**	**3.19**	**.997**	**3.31**	**1.228**	**3.02**	**1.353**	**3.43**	**1.15**

Source: Field Survey, Edzeani (2018)

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Also, the Table depicts that the Sanitary section frequently uses PPC per the average mean and standard deviation of 3.60 and 1.05, respectively, where the most frequently used PPC was nose mask (M= 4.00, SD= 0.778) whilst gloves (M= 3.35, SD= 1.156) was the least frequently used PPC. Similarly, the results show that the Works and Maintenance section frequently uses PPC by having an average mean and standard deviation of 3.52 and 1.16, respectively, where the most frequently used was gloves (M 3.92, SD= 1.009) and the least frequently used was ear muff (M= 3.02, SD= 1.353). Finally, the result shows that the Farm section frequently uses PPC with an average mean and standard deviation of (M= 3.51, SD= 1.19). However, boots (M= 3.80, SD= 1.055) were the most frequently used PPC and gloves (M= 3.05, SD= 1.022) have been indicated to be the least frequently used PPC.

The results indicate that there was (M = 3.4, SD = 1.15), which shows general frequency usage. However, sanitation has the highest (M = 3.6, SD = 1.1), and electricity has the lowest (M = 3.0, SD = 1.28). The results also show that nine (9) PPCs were frequently used, but only overcoats, gloves and goggles were frequently used at all the sections. Fire service was the only section that frequently used fire hood. Looking at individual PPC, farms that frequently used coats had the highest mean (M = 3.8), with fire service having the lowest (M = 3.1). The Farms section recorded the highest mean for boots (M = 3.8), while the Electricity section recorded the lowest (M = 2.8). Only four sections used helmets, with Fire Service having the highest mean (M = 3.9) and Works and Maintenance having the lowest (M = 2.9).

Interview Responses to Research Question 2

How often do the University of Cape Coast workers wear protective clothing in their activities? The analysis of the interview data indicated two important categories related to research question two.

3.2.1. frequency of use of PPC for work

Three respondents indicated that protective clothing augments one's appearance, gives observers an impression, and makes one confident if well-selected and used. The following discussion ensued:

> *Mr B said that "protective equipment plays an important role in the health and safety of workers and, when utilised at the workplace, minimises exposure to a variety of hazards."*
>
> *Mr C alluded to the importance of "ensuring that the equipment chosen as PPC is both reliable and effective and workers are guided in its usage."*
>
> *Mr E indicated that "although there is the need for protective clothing, some individuals choose not to wear protective clothing for a variety of reasons ranging from design specifications such as fit and comfort of the garment to restriction of movement due to poor design".*

The general feeling was that the willingness to use protective clothing differs across individuals since workers' selections are based on which protective clothing increased output in their working environment for a given situation.

3.2.2. motivation for using Protective Clothing

The five respondents raised the point that all organisations that employ more people must have a written safety policy, which sets out who is responsible for workplace health and safety and arrangements made for the health and safety of the workers. For now, the University needs a comprehensive instructional OHS policy for workers to use protective clothing to manage hazards at their workplace.

Mr. A indicated that "workers have raised concerns that policies and regulations concerning PPC need to be developed and implemented".

Mr. D said that "workers who are required to wear protective clothing such as overalls, gloves, and face shields may have a negative attitude toward such clothing because they associate it with manual jobs and low esteem".

4. Discussion of Results

This section discusses the study's results in the reviewed literature. The discussions are based on the research questions formulated for the study.

4.1. Availability of Protective clothing to workers at the University of Cape Coast

The study assessed the availability of protective clothing to University of Cape Coast workers. The results from the study revealed that PPCs were generally available for use by the workers in the departments under study (M = 3.43). The finding from this study corroborates an earlier study that 'The availability of PPC to artisans' shows that PPCs are available to workers where the nature of the work is perceived to have a moderate to high risk [29]. Also, the result agrees with another research that the availability of PPC to workers is essential for artisans; hence, most automobile companies have PPC to assist their workers and help prevent injuries at work or to enable a smooth flow of work and reduce workplace hazards [30]. In furtherance, many employers provide enough PPC to workers but always need to train employees on how to use them and encourage them to use them to achieve their desired aim of providing the PPC [31].

The Occupational Health and Safety Council noted that protective clothing is an essential means of preventing work injuries. However, it should only be relied upon as a last line of defence in places where it is not practicable to control the hazards at source. Protective equipment aims to reduce employee exposure to hazards when engineering and administrative controls are not feasible or practical to reduce these risks to acceptable levels [12].

4.2. Use of Protective Clothing by University of Cape Coast Workers

The main thrust of this research question was to assess the frequency of protective clothing used by UCC Workers. From the analysis, it can be concluded that the Sanitary section frequently used protective clothing due to the dangers associated with the sanitary work. The research indicated that because the Sanitary section dealt with faecal matter and other waste substances from humans, they knew the dangers they were exposed to, hence their frequent use of protective clothing. The results for the overall PPC usage indicated that PPCs have been frequently used in the departments under study (M = 3.43). This implies that PPC is frequently used by workers in the various departments used in this study.

In support of this discussion, the Occupational Health and Safety Council (OSHC) opines that using PPC generally implies working in a potentially hazardous environment. However, some workers need to adhere to PPC because they feel it is a nuisance to wear and slows them down when working [15]. A similar survey found that workers who refused to wear protective clothing are exposed to high levels of injuries, diseases, and risks [21].

In line with the discussion, OSHA asserts the need for employees to be informed about the importance of the use of protective clothing in higher institutions of learning, which has also been captured in the Environmental Health and Safety (EH & S) policies of the respective institutions in the United States of America. The EH & S policies conform to the Occupational Safety and Health Administration (OSHA) requirements, which require employers to protect employees from workplace hazards that can cause injury [15]. In similar evidence, the current study's results support the previous study's claims that

many workers use protective clothing frequently due to the risk associated with farm work. Further, these injuries resulted from the fact that most workers were found to be without PPC while working [20].

5. Conclusion and Recommendations

The study concluded that "not all the protective clothing for the various departments were available. The University ensured that workers used what was in stock at the department. The protective clothing supplied to the various departments was insufficient, so their continuous use of the existing ones got them defaced, bringing about shortages. The study also revealed that workers used protective clothing most often, but not all used it because safety laws were relaxed. The study recommended that the University ensure a regular and adequate supply of PPC, insist on its usage, and enforce the use of PPC by all workers whose work demands it.

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