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Perspectives of Accident Preventive Measures in Building Projects in Arusha City, Tanzania

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Abstract The study was to examine and prioritize accident preventive measures in construction sites at Arusha urban in Tanzania. Data used in this study was derived from both primary and secondary sources. Secondary data was collected from a detailed review of pertinent literature to the theme investigated. Primary data was collected through a structured questionnaire administered to 40 respondents (architects, quantity surveyors, engineers, technicians and artisans) involved in the construction activities, and have appreciable knowledge and work experience. Nevertheless, 30 questionnaire forms were returned constituting 75 percent response rate which was considered adequate for data analysis. The rated variables were ranked with regard to their importance and occurrence. Findings of the study revealed that the use of safety nets to secure falling objects is the first priority as it was ranked the first. This could help to reduce fatal accidents to construction workers. Provision of proper utilities at sites and proper handling of construction machineries were seen as important preventive measures of accidents as they were ranked second and third respectively. This indicates that, apart from the provision of the required standard utilities at construction sites, the construction workers must possess those necessary vocational skills needed for operating and handling of various construction machineries and equipment. This would help in reducing fatal accidents in construction sites. Awareness of accidents preventive measures was also seen by respondents as an imperative means of minimizing accidents as it was ranked fourth. The rest rated measures include assigning safety responsibilities to site personnel which was ranked twelfth as the lowest. This study suggests that, prioritizing accidents preventive measures with regard to health and safety budgets in construction projects would act as a catalyst for minimizing accidents, diseases, illness and fatalities. This could help construction professionals and other stakeholders in enhancing health and safety in the construction sector.

Keywords Accidents, construction sector, construction sites, preventive measures, Tanzania

1 Introduction

1.1 Research background

Preventive measures of accidents are essential for improving safety of workers at construction sites. Moreover, these measures could help to minimize cost of production, injuries and fatalities to workers, damage to equipment, loss of time, and loss of production. Previous studies confirm that accidents as an unplanned and unexpected occurrences result into loss of production, injury to personnel, damage to plant and equipment and eventually interrupting production flow [1, 2, 3]. In their study, Eguh and Adenaiya [4] maintain that preventive measures of disastrous accidents in the construction industry are vital. In fact, the industry embraces the process by which various resources are transformed into physical infrastructure such as buildings, roads, railways and pipelines, airports, harbors, electricity lines and dams. Arguably, the use of items such as compactors, stone crushers, scaffolding, explosives and earth moving machines, cranes, hoists and ladders in the construction

industry is inevitable, and they are related with the occurrence of accidents. Furthermore, it was noted that problems with machine design, installation, equipment and falling contribute significantly to the occurrence of injuries in occupational accidents [5, 6]. Currently, Tanzania is implementing strategic mega construction projects for the National Social and Economic Development (NSED). These projects include the Standard Gauge Railway Project (SGR), the Julius Nyerere Hydropower Project (JNHPP), Kigongo-Busisi Bridge Project (KBBP) (3200m) and Tanzanite Bridge Project (TBP) (1030m). Previous researchers [2, 7-14] insist that the construction industry is an important sector of the economy and plays a key role in the national social and economic development. However, construction work is considered to be one of the most hazardous industrial activities in the world [3, 15, 16, 17]. Furthermore, Dumrak et al. [18] contend that the construction industry by its nature is a dangerous one. Arguably, every year many people fall victim to injury, harm and even death caused by accidents on construction sites [19]. According to Ahn et al. [20] construction work has a high accident frequency and fatality rate compared to other industries, despite a constant attention on safety and accident prevention at the governmental level. In Tanzania, the Occupational Safety and Health Authority (OSHA) is responsible for supervising all mechanisms instituted at the workplace for preventing occupational accidents and diseases [21]. Nevertheless, it is estimated that more than 16,000 fatal occupational injuries occur in the established market economies with a fatality rate of 4.2 and accident rate of 3240 per 100,000 workers respectively [22]. Comparatively, these are lower rates than the fatality and accident rates in developing countries including Tanzania. Evidently, a report of the National Audit Office (N.A.O) as cited in Kiconco et al. [22] affirms that in 2013, occupational injuries in Tanzania were estimated at 36 fatal injuries per 1000 workers, a fatality rate of 23.73 per 100,000 workers. Khodabandeh et al. [17] assert that construction work has increased in developing and underdeveloped countries over the past few years, and with an increase in this type of work, occupational fatalities have increased. Salvi [1] argues that accidents on construction sites are inevitable but could be controlled to prevent minor or serious consequences on the workers. Indeed, several studies were carried out on issues relating to preventive and control measures of accidents in workplaces. However, most of these studies were not able to examine and prioritize the determined preventive and control measures of accidents at workplaces. For instance, Patel and Patel [23] investigated measures to prevent accidents at the Indian construction sites and found them as accident response, accident investigation, corrective actions and job safety analysis (JSA). Benny and Jaishree [16] in their research were able to identify accident control measures based on the source of an accident itself. Other researchers were [24] in Malaysia and [25] in Sri Lanka who managed to suggest fundamental accident preventive measures. Whereas, Leonavičiūtė et al. [26] suggested the use of a multiple criteria decision making (MCDM) methodology to select the most appropriate accident protection device to be used in the Lithuanian Construction Industry (LCI). Therefore, it is realized that, despite the extensive research on the accident preventive and control measures, there is a paucity of studies that examine and prioritize accident preventive measures in construction projects in developing countries, particularly in Africa. In fact, this scenario has fueled the need to study accident preventive measures in construction projects in Tanzania. The objective of this study was to examine and prioritize accident preventive measures in construction projects at Arusha urban. Study results would help construction practitioners and policy makers to prioritize the most important accident preventive measures in their health and safety budgets. The rest of this scientific research article presents a literature review, methods, discussions and conclusion sections to summarize the themes and main contributions of the study.

2 Literature review

2.1 Concept of accidents in construction

Accident is defined as an unplanned and unexpected occurrence, which upsets a planned sequence of work [1, 27]. Patel and Patel [23] define an accident as an unplanned, undesired event which may or may not result in injury or property damage that interferes with the completion of an assigned task. Accidents are normally resulting into loss of production, injury to personnel, damage to plant and equipment and eventually interrupting production flow [1, 2, 3]. Since accidents are unplanned events, an effective safety management can help avoid job injuries [28]. However, safety management is an area of research in the construction industry that still needs to be researched, as it has received limited attention. In fact, the occurrence of accidents could lead to a

temporary stoppage of work, which could result in delays, damage to finished work, an increase in operating cost, and quality issues [29]. Despite the occurrence of accidents, particularly in developing countries, building infrastructure for the national social and economic development of the societies is of high demand. However, preventive measures of catastrophic accidents in the construction industry are vital [4]. Moreover, it was argued that problems with machine design, installation, equipment and falling contribute significantly to the occurrence of injuries in occupational accidents [5, 6]. Likewise, the relevant sources of accidents in construction projects include incorrect work habits, incorrect use of equipment, tools or facilities, physical or mental defects, hearing deficiencies, deficient supervision, unsuitable policies towards safety and unsuitable work planning. According to Arunkumar and Gunasekaran [27], other sources of accidents are human errors (e.g., contact with moving machinery, Slips, trips or falls on same level) and non-human errors (e.g., weather, sunlight and dust). Ahn et al. [20] argue that construction work has a high accident frequency and fatality rate compared to other industries, such that their prevention is necessary. In fact, accidents prevention could help to minimize cost of production, injuries and fatalities to workers, damage to equipment, loss of time, and loss of production. Moreover, almost all construction stakeholders are interested with construction projects that are executed safely with negligible accidents. However, this is only possible if risky of accidents in all stages of a construction project development are properly identified, understood and managed. Thus, it is worth noting that accidents are just the tip of the iceberg, and understanding the preventive measures is of great importance for their prevention [6].

2.2 Preventive measures of accidents

Preventive measure can be defined as an act of limiting or making something happen in a particular way, stop something from spreading, going out of hand, or getting worse. Patel and Patel [23] insist that an accident prevention involves the identification and elimination of causes before an accident occurs. This helps to eliminate future accidents from a specific cause, but does nothing to address avoiding the accident that just occurred [23]. Therefore, key players in a building project have a big role to play in ensuring that accidents are prevented to enhance health and safety in construction sites. Ramya and Ramadasan [3] insist that safety is a collective co-operation of all persons involved in the construction industry ranging from contractor, operatives, supervisors and even the general public. Arguably, construction projects are complex in nature, in the sense that, they are impacted by many factors such as accidents, weather conditions, violation of safety regulations, and employment of large percentage of unskilled workers. In fact, several studies were carried out on issues relating to preventive measures of accidents in construction sites. For instance, Patel and Patel [23] suggested job safety analysis (JSA) as a preventive measure of accidents in the Indian construction industry. Chim et al. [30] insist that providing safety training for all employees, good safety and health management, keeping the workspace clean, maintaining the equipment and tools and effective safety inspection could help in preventing accidents in the Malaysian Construction Industry. Benny and Jaishree [16] claim that in order to prevent accidents proper training about safety should be provided for workers. Leonavičiūtė et al. [26] identified preventive measures of accidents in Lithuania as Training of workers at construction sites, appropriate planning of works and assessment of the potential risk of falling, and provision of instruction on various occupational health and safety issues. From the syntheses of literature review, a total of fifteen identified major preventive measures of accidents on construction sites were summarized in Table 1, and have formulated the basis of the second part of the questionnaire. Goh et al. [24] assert that regular training to workers regarding safety awareness at construction sites, accidents investigation and safety inspection are the appropriate preventive measures of accidents in the Malaysian construction industry. However, most of these previous studies were not able to scrutinize and prioritize the determined preventive measures of accidents. The next section discusses research methods and data analysis techniques used for the study.

Table 1: Preventive measures of accidents in construction projects

Code	Accidents preventive measure	Reference
AP1	Awareness of accidents preventive measures	[1, 17, 20, 22, 24, 30]
AP2	Assigning safety responsibilities to site personnel	[1, 3]
AP3	Conducting regular crew safety meetings	[1]

AP4	Application of safe work methods	[1, 3, 23]
AP5	Use of safety symbols throughout the site	[31, 32, 33]
AP6	Use of personal protective equipment	[31, 34]
AP7	Use of safe entry and exit points at sites	[8]
AP8	Maintain safe working conditions	[8, 23]
AP9	Appropriate use of first aid kit with all the basic tools	[31, 35]
AP10	Provision of proper utilities at sites	[8, 36]
AP11	Proper prevention of falls, slips and trips	[5, 17, 26]
AP12	Secure of falling objects by providing safety nets	[17, 26]
AP13	Compliant chemical storage	[23]
AP14	Proper handling of construction machineries	[6, 8, 30]
AP15	Adhere to OSHA guidelines and Regulations	[1, 21, 25]

3 Material and methods

3.1 Study area (Arusha city)

Arusha city is situated in northern Tanzania, just below Mount Meru at an elevation of 1,500m above the sea level [37]. The city has a total land area of 267 square kilometers. Arusha urban is divided into 19 wards, 3 divisions (Elerai, Suye and Themi) and Arusha Constituency [37]. Arusha city is between 03º 22′21″South latitude and 36º41′40″East latitude along the slopes of Mount Meru. The city is experiencing high rate of urbanizations resulting into a considerable growth of construction activities. To date, the estimated total population of Arusha city is 416,442 [38].

3.2 Research design and sampling

The research design of the study was a survey conducted in order to empirically examine and prioritize accident preventive measures on construction sites. Creswell [39] clarifies that research designs are plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis. A judgmental (purposive) sampling technique was used in this study. Kombo and Tromp [40] argue that judgmental sampling is a powerful technique for selecting objects for the study. They further insist that the power of judgmental sampling technique lies in selecting information rich cases for in-depth analysis related to the central issues being studied, and it can be used with both quantitative and qualitative studies. In this study, a total of 40 structured questionnaire forms were purposely distributed to 2 architects, 3 quantity surveyors, 4 engineers, 10 technicians and 21 artisans contacted in person to get individual perspectives from which 30 properly filled questionnaire forms were returned. During data collection, face to face approaches were used to remind the respondents to fill the questionnaire form. Table 2 shows that 1(3.33%) architect, 2(6.67%) quantity surveyor, 3(10.00%) engineers, 8 (26.67%) technicians and 16(53.33%) artisans constituted 30(75%) valid responses of which were considered adequate for data analysis. Basically, in this study, both primary and secondary data were used for the survey. The primary data were those collected from respondents. Conversely, secondary data were those from reviewed relevant literature such as pertinent scientific publications from reputable journals, websites of relevant themes and some textbooks that became helpful in building the context of the study. In the pre-testing phase, a judgement sample of 8 respondents with good spread of respondents' characteristics was chosen for the pre-testing of the questionnaire. Nevertheless, only 5 valid responses were received from respondents constituting 62.50% of which was considered adequate for validation. From the feedback received, minor corrections were made to improve questions, layout, format and the contents to validate the questionnaire prior to main survey. The validated structured questionnaire comprised two sections; the first section was designed to seek for the general information about the respondents related to issues such as experience in the field, gender and professional status. The second part was for respondents to rate variables regarding accident preventive measures in construction sites. In this case, 5-Point Likert scale (strongly disagree = 1; disagree = 2; neutral = 3; agree = 4 and strongly agree = 5) were used to rate the variables in the questionnaire. In fact, many previous researchers including [41, 42] have successful used Likert scale rating system to rate variables in their studies.

3.3 Data analysis

Statistical Package for Social Sciences (SPSS) was employed to process the data [43]. Data were carefully analyzed statistically using descriptive statistics, frequencies, one-sample t-test analysis, Cronbach's alpha reliability test, Kaiser-Meyer-Olkin (KMO), Bartlett's test and Chi-Square. Basically, several statistical analyses as illustrated in Table 2 were performed to explore and understand the underlying relationships between dependent and independent variables. Furthermore, generated frequencies resulted from a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) were used to calculate the relative importance index (RII) for each of the measure preventing occurrence of accidents in construction sites as assessed by the respondents. The RII values were then used to determine the rank of each item in descending order (from the highest to the lowest). The ranking enabled the researcher to cross compare the relative importance of the items as perceived by the respondents. The RII values were calculated by using the established equation 1. RII approach has been used by many researchers such as [44, 45] in their studies. RII is scientifically defined by the following formulae:

$$\text{Relative Importance Index (RII)} = \Sigma W/AxN \qquad (0 \leq \text{index} \leq 1) \qquad (1)$$

Where: W, N and A are the weight given to each factor by the respondents and ranges from 1 (strongly disagree) to 5 (strongly agree), the total number of respondents and the highest weight (5) respectively.

Table 2: Statistical analysis of the empirical data

Item of assessment	Method of assessment
Internal consistency of the questionnaire items	Cronbach's alpha reliability testing
Perceptions on accident preventive measures	Descriptive statistics; frequencies
Assessing significance in rating the variables	Compare means; one-sample t-test analysis
Hypothesis testing	Bartlett's test and KMO; Sampling adequacy, correlation

3.4 Research framework

The identified dependent variable in this study was the priority of an accident preventive measures in construction sites. The independent variables in this scientific study were determined to be an accident preventive measures on construction sites. Therefore, the preventive measures of accidents (AP1, AP2, AP3, AP4, AP5, AP6, AP7, AP8, AP9, AP10, AP11, AP12, AP13, AP14 and AP15) were included in the independent variables.

4 Results and discussion

4.1 Reliability testing

Reliability test was carried out to determine whether the questionnaire was capable of yielding similar scores if the respondents have used it twice. The test was conducted using Statistical Package for Social Sciences (SPSS) software. The determined Cronbach's alpha coefficient value for the rated 17 items of the questionnaire indicates that the questionnaire items form a scale that has reasonable internal consistency reliability. Impliedly, the survey instrument used was reliable and acceptable and that an agreement exists among the respondents in rating the performance of accident preventive measures. Table 3 illustrates that the calculated Cronbach's alpha coefficient value for the rated items of the questionnaire was 0.689. This reliability value demonstrated that the results from the survey are acceptable such that they provide proper ground for further analysis. It is argued that reliability is the total consistency of a certain measure [46]. According to Wim et al. as cited in [46], a value of Cronbach's alpha between 0.6 and 0.8 is acceptable.

Table 3: Cronbach's alpha reliability statistics

Reliability statistics		
Cronbach's alpha	Cronbach's alpha Based on standardized Items	N of items
0.689	0.670	17

4.2 Category of the respondents

Respondents were categorized in terms of gender and work experience as shown in Table 4. Result shows that 27(90%) were male and 3(10%) were female. These statistics indicate that females are few, in the sense that, most activities on construction sites are carried out by men. In their study, Sospeter et al. [47] found that women continue to be under-represented in the Tanzanian construction industry. The determined average of 15 years of work experience of respondents was considered suitable such that the responses given by those construction workers were considered reliable and trustworthy. Moreover, 50% of 30 participants have been in the construction activities for a period of 1-5 years. This is still worthwhile for the study because the experience suggests most participants might have been involved in construction projects not less than three years.

Table 4: Demographic of the respondents

Participant's category	Response(s)	Response rate (%)
Architects	1	3.33
Quantity Surveyor	2	6.67
Engineers	3	10.00
Technicians	8	26.67
Artisans	16	53.33
Total	*30*	*100*
Sex		
Male	**27**	**90**
female	3	10
Total	*30*	*100*
Work experiences		
1-5 years	15	50
6-10 years	9	30
11-15	4	13
16-20	2	7
21-25 years	0	0
>25 years	0	0
Total	*30*	*100*

Source: Researcher's field survey (2022)

4.3 Accident preventive measures

Table 5 shows the ranking of accidents preventive measures based on the weighted average of the Relative Importance Indices (RII). As a result, majority of the respondents agreed that use of safety nets to secure falling objects (RII = 0.900, R = 1) was the most important accident preventive measure on construction sites. This result is supported by [17, 26] who, in their studies, revealed that falling from heights formed the most frequent cause of fatal injury. Arguably, the use of safety nets to secure falling objects in construction sites is inevitable. Provision of proper utilities at sites was ranked the 2nd (RII = 0.893; R = 2). Osei-Asibey et al. [8] insist on the provision of sanitary facilities including adequate wholesome water in a suitable vessel if there is no standpipe-supply of water. Certainly, this helps to avoid probable diseases such as diarrhea. Furthermore, proper handling of construction machineries was ranked 3rd (RII = 0.886; R = 3). Other explored accident preventive measures include awareness of accidents preventive measures (RII = 0.880; R = 4); use of personal protective equipment(RII = 0.866; R = 5); proper prevention of falls, slips and trips (RII = 0.866; R = 5), adherence to OSHA health and safety guidelines and Regulations (RII = 0.866; R = 5), maintaining safe working conditions (RII = 0.860; R = 6) and appropriate use of first aid kit with all the basic tools (RII = 0.847; R = 7). These results, however, are supported by previous studies [1, 3, 8, 20, 22, 23, 24, 30, 34]. Conversely, from the viewpoints of the respondents, assigning safety responsibilities to site personnel (RII = 0.760; R = 12) was ranked the lowest. Arguably, site workers have different responsibilities such that there is a need for safety responsibilities to be assigned only to health and safety engineers.

Table 5: Ranking of accident preventive measures

Code	Accidents preventive measure	RII	Rank
AP1	Awareness of accidents preventive measures	0.880	4
AP2	Assigning safety responsibilities to site personnel	0.760	12
AP3	Conducting regular crew safety meetings	0.787	11
AP4	Application of safe work methods	0.866	5
AP5	Use of safety symbols throughout the site	0.827	9
AP6	Use of personal protective equipment	0.866	5
AP7	Use of safe entry and exit points at sites	0.833	8
AP8	Maintain safe working conditions	0.860	6
AP9	Appropriate use of first aid kit with all the basic tools	0.847	7
AP10	Provision of proper utilities at sites	0.893	2
AP11	Proper prevention of falls, slips and trips	0.866	5
AP12	Use of safety nets to secure falling objects	0.900	1
AP13	Compliant chemical storage	0.793	10
AP14	Proper handling of construction machineries	0.886	3
AP15	Adhere to OSHA Guidelines and Regulations	0.866	5

4.4 Hypothesis Testing

Hypothesis testing was done using SPSS software. Therefore, the t-test was used to test for any agreement in rating of the individual factors among the respondents, the t-test or the p-value at 5% significance level was adopted, and was used to test the following hypothesis: H0, there is no agreement among the respondents; H1, there is an agreement among the respondents. Conditionally, if the t-calculated is less than t-tabulated, accept H0 and reject H1. Alternatively, if p-value is greater than 0.05, then accept H0 and reject H1. Moreover, the opposite is true in both alternatives (i.e. reject H0 and accept H1 if t-calculated is greater than t-tabulated or p-value is less than 0.05). Table 6 shows that the determined value of Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA) was 0.567 of which is acceptable since it is over 0.5. On the other hand, the determined approximate Chi-square value from the Bartlett's test of Sphericity was 305.697, degree of freedom was 105 and the test was significant at 0.000 that led to null hypothesis (H0) been rejected.

Table 6: Bartlett's test and KMO for the rated accident preventive measures

KMO and Bartlett's test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.567
Bartlett's Test of Sphericity	Approx. Chi-Square	305.697
	df	105.000
	Sig.	0.000

4.5 One sample t-test analysis

One-sample t-test analysis was employed to test for significance in ranking accident preventive measures. The test value was set as 3 because the rating scale ranges from 1 to 5 with 3 being a neutral position. Results in Table 7 show that the analyzed 15 accident preventive measures demonstrate significant values less than 0.05. Impliedly, the difference in means is statistically significant at the 0.05 confidence level. Also the 95% interval of difference ($\rho = 0.05$) shows that all rated accidents preventive measures have both the upper and lower limits above zero meaning that they are practically significant. Therefore, it can be inferred that the ratings of the variables were significant.

Table 7: One Sample t-test for the rated accident preventive measures

Code	Test Value = 3 df = 29				
	t	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
AP1	15.389	0.0	1.400	1.214	1.586
AP2	6.595	0.0	0.800	0.552	1.048
AP3	5.413	0.0	0.933	0.581	1.286
AP4	12.042	0.0	1.333	1.107	1.559
AP5	12.234	0.0	1.133	0.944	1.323
AP6	10.269	0.0	1.333	1.068	1.599
AP7	8.074	0.0	1.167	0.871	1.462
AP8	13.310	0.0	1.300	1.100	1.499
AP9	9.280	0.0	1.233	0.962	1.505
AP10	12.775	0.0	1.467	1.232	1.702
AP11	13.359	0.0	1.333	1.129	1.538
AP12	12.042	0.0	1.500	1.245	1.755
AP13	6.547	0.0	0.967	0.665	1.269
AP14	11.564	0.0	1.433	1.179	1.687
AP15	10.269	0.0	1.333	1.068	1.599

4.6 Limitations of the study

The study was confined on construction sites in Arusha urban and the sample size of the study was 40 participants with response rate of 30 (75%). This is due to the fact that the resources such as time and cost needed for the research were limited. These could be considered as some limitations to the study. Despite these limitations, the findings of this study represent a snapshot of the perceptions of the respondents with regard to the importance of accident preventive measures on construction sites.

5 Conclusion and recommendations

The study was to examine and prioritize accident preventive measures in construction sites in Arusha urban. Moreover, the study suggests policy measures intended to reinforce application of accident preventive measures in construction projects. Further, the study revealed that construction industry is among the fastest growing and expanding economic sectors in Tanzania. This scenario is evidenced by the ongoing mega infrastructure projects such as the Julius Nyerere Hydropower Station Project (JNHS), Tanzania Standard Gauge Railway Project (SGR), Kigongo-Busisi Bridge Project (KBBP) (3200m) and the Tanzanite Bridge Project (TBP) (1030m) the country's biggest ever infrastructure projects. In this context, the increase of occupational accidents on the due course of implementing such mega infrastructure projects is predictable. Thus, the empirical findings of the study has revealed that the use of safety nets to secure falling objects is the first priority in mega construction projects as it was ranked the first. This could help to reduce fatal accidents to construction workers. Provision of proper utilities at sites and proper handling of construction machineries were seen as important preventive measures of accidents as they were ranked second and third respectively. This indicates that, apart from the provision of the required standard utilities at construction sites, the construction workers must possess those necessary vocational skills needed for operating and handling of various construction machineries and equipment. This would help in reducing fatal accidents in construction sites. Furthermore, awareness of accidents preventive measures was also seen by respondent as an imperative way of minimizing accidents as it was ranked fourth. Evidently, prioritizing accidents preventive measures with respect to the health and safety budgets in construction projects would act as a catalyst for minimizing accidents, diseases, illness and fatalities. This would help to enhance the health and safety in the construction sector. Based on the research objectives, the study recommends the following to practitioners, researchers and policies governing the OHS in the construction sector:

- Construction practitioners should prioritize accidents preventive measures with respect to the allocated health and safety budgets in construction projects.
- Occupational health services and OHS governing rules should be revised to respond to emerging challenges related to health and safety in the construction sector.
- Professionals and other construction workers should thorough be trained on the OHS issues to raise the level of health and safety awareness in construction activities.
- Occupational Safety and Health Authority (OSHA) and other relevant stakeholders should strongly support capacity building through Research and Development (R&D) programmes to promote research culture on occupational health and safety, in the sense that, this would help to build effective institutional framework in enhancing OHS in the construction sector.

Ethics committee permission

The Author confirms that no ethics committee permit was required in Tanzania for data collection through questionnaire. However, special permission and consent was sought and obtained from the respondents before they were given the questionnaire to respond, with the condition for their responses being processed, analyzed and published without revealing their identities.

Declaration of conflicting interests

The Author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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