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Research Article

ASSESSING OCCUPATIONAL HEALTH AND SAFETY AMONG CERTIFIED REGISTERED ANESTHETISTS AT THE TAMALE TEACHING HOSPITAL

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ABSTRACT

Certified registered anesthetists face various occupational health and safety dangers arising from the perpetual lengthy hours spent within the operating room where persistent noise, anesthetic vapors, ionizing radiation, infectious agents and psychological stress are prevalent. While they concentrate in providing healthcare, they are subject to hazards that by and large endanger their health and well-being. This is particularly true in developing countries where health service delivery is fraught with dangers. This study assessed the occupational health and safety of certified registered anesthetists at the Tamale Teaching Hospital. The cross-sectional study used a purposive and simple random sampling method to select 38 respondents all of whom were anesthetists. Data was collected with a structured questionnaire and analyzed using the Statistical Package for Social Science, version 25.0. Findings of the research showed that 100% of the respondents were aware of the various potential hazards to anesthetists in the hospital. 80% recognized recapping of used needles as a risky practice. 97.2% acknowledged the importance of effective hand washing after each clinical procedure in order to prevent cross infections. Majority of respondents (94.4%) felt anesthetist were at risk of occupational hazard while an average of them (50%) perceived the risk as high among anesthetists. Only 64% always complied with standard procedures while those who failed to comply (36%) saw standard procedures as waste of time apart from the inadequate safety kits. 83.4% and 44.4% of respondents had received Hepatitis B and Tetanus vaccinations respectively at the time of the study. Anesthetists' compliance on occupational health and safety was moderate which calls for the need of regular and routine training of certified registered anesthetists on occupational health and safety. The study recommended the provision of resources for certified registered anesthetists as an enhancement to encourage and sustain compliance of occupational health and safety protocols established by the profession.

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INTRODUCTION

Work is an essential part of peoples' lives and it is widely conceded that individuals should work in a safe and healthy environment (Warr, 1987). The working environment greatly influences employee wellbeing and health. A non-conducive working environment can be harmful if not addressed. Therefore, occupational health and safety take into consideration the health, safety, and welfare of people at work to improve employee performance and proficiency to work. Occupational health and safety, defined by (World Health Organization, 1995) aims at the promotion and maintenance of highest degree of physical, mental and social wellbeing of workers in all occupation. The definition indicates a

comprehensive approach that accounts for individual physical, mental, social, and personal development. Maier (2009) defines occupational health hazards as the potential risks to health and safety for those who work outside the home.

The World Health Organization (2006) defined health workers as people whose job is to protect and improve the health of their communities. As one in harmony, these health workers, in all their multiplicity, make up the global health workforce. The health sector provides vital healthcare services as well as jobs that contribute considerably to the socioeconomic development agenda of emerging countries. Their contributions are required for the effective running of most of the health system (Ghost, 2013). These health workers may include nurses, anesthetists,

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doctors, pharmacists, and other allied health professionals working within the healthcare system. They work in an environment that is among some of the most hazardous places to work in order to provide health care services (Guidotti, 2011). Health service providers are exposed to a wide range of hazards at the workplace, including back injuries, needle stick injuries, radiations, violence, blood borne diseases (Pruss *et al.*, 1999). These personnel are at higher risk of infection from hazardous agents than the general population. The most at risk include workers whose work requires exposure to blood and blood products (MOH/GHS, 2010). According to WHO (2002), estimates from sharp injuries contribute to 30% of new cases of HBV and 2.5% of the annual infection of HIV among health workers in sub-Saharan Africa. Anesthesia practice is not an exception, and exposure to such hazards will affect the quality of health service delivery.

With the continuing advancement in anesthetic and surgical techniques and the emergence of modern equipment and newer drugs, the duties and responsibilities of anesthetists have also significantly increased in the past few years (Bajwa *et al.*, 2012). The ever-increasing professional duties and social burden both demanded at the workplace greatly affect the health of anesthetists. Anesthesiology is associated with risk because an anesthetist is required to provide safe and smooth anesthesia not only in the operating theatre and intensive care units but also in other places such as the pain clinic and radiotherapy centers (Kim *et al.*, 2018) where there is continuous exposure to noise pollution, chemical fumes, high physical and psychological stress exposure. The rise in healthcare demands has exposed anesthetists to risk factors affecting their mental and physical wellbeing. Anesthetists are exposed daily to these hazards because occupational health and safety hazards exist at institutions where healthcare services are provided (Gestal, 1987).

Morbidity and mortality rates are high among exposed workers; hence the necessary attention should be given to occupational health and safety. An estimated 100,000 people die from an occupational illness, while about 400,000 new cases are diagnosed yearly (Ajayi, 2006). This affects workers in various occupations with varying degrees of exposure. However, health workers, including anesthetists, are exposed to the highest risk, especially those at the hospital (Gestal, 1987). Even though these hazards may be avoided or reduced, healthcare workers are suffering from an increasing number of occupational accidents and diseases, and their rates are among the highest (Bell *et al.*, 2013). This causes physical, economic and psychological damages to these individuals and their dependents or immediate families. These injuries significantly impair their health and quality of life. Over the last decade, the number of occupational injuries among health-care professionals has increased. Agriculture and construction, on the other hand, are both safer today than they were a decade ago (NIOSH, 2006).

Employers are required to provide up-to-date information for employees to safeguard themselves regarding all identified hazards and their prevention or control (Hryhorczuk *et al.*, 2004). Workers are not educated enough on occupational health and safety issues (MOH/GHS, 2010) and work under dangerous conditions to their health. Ghana's healthcare reform is now focusing on the Ghana Health Services/Ministry of

Health's core objectives, and all health workers are essential to attaining these objectives. Therefore, the accomplishment of healthy work environments is vital to worker safety, recruitment, and retention; thus, methods to improve their workplaces necessary. Diverse health and safety-related issues abound in health care institutions. It's a public health concern because of the highest degree of accident recorded compared to other public sectors (SOSCO, 2008). Much priority is not given to occupational health and safety in developing countries because of other challenging health issues (Kumar *et al.*, 2000). Laws and policies required to regulate the workplace are inadequate and sometimes lacking in developing countries such as Ghana; workers are therefore exposed to life-threatening hazards. According to (Ahasan & Partanen, 2001; LaDou, 2003). It is critical to identify factors related to occupational hazards among healthcare workers in order to develop occupational health and safety policies and procedures that will improve healthcare workers' productivity and general well-being (Obono *et al.*, 2019). Health workers in some health facilities are exposed to so many occupational hazards that some of them are not aware of and are vulnerable to occupational injuries and illnesses. According to (Partwary *et al.*, 2011), compliance to safety initiatives is a major contributory factor to occupational hazards among health workers. There are limited studies on occupational health and safety and under reporting of occupational hazards and the required expertness and resources to manage them in third world countries (Ahasan & Partanen, 2001).

The work of an anesthetist primarily involves regular contacts with patients, use of specific procedures and equipment which exposed them to occupational diseases and injuries. These exposures do not only affect the quality of service being delivered but also the mental and physical wellbeing of anesthetist. Occupational vulnerability threatens the quality of anesthesia delivery in developing countries. Effective knowledge and practice of health and safety among anesthetists are necessary to prevent hazards in hospitals. Provision of essential protective equipment for anesthetist and adequate regular training will reduce incidences of occupational injuries and illnesses, increasing productivity and impacting positively on the economy. The study performed an assessment on occupational health and safety among certified registered anesthetists. Therefore, their knowledge, compliance level and perception about occupational health and safety at the hospital were assessed.

MATERIALS AND METHODS

The study was conducted in the central business district of Tamale Metropolis which is also the capital town of the Northern Region in Ghana (Figure 1). It is in the central part of the Region and shares boundaries with the Sagnarigu District to the North-West, Mion District to the East, East Gonja to the South and Central Gonja to the South West.



Figure 1 Map of Northern Region showing Tamale Metropolis in red color where Tamale Teaching Hospital is situated.

The was characterized as a cross-sectional study designed dominated using quantitative analysis to assess occupational health and safety among certified nurse anesthetists in Tamale Teaching Hospital. The study population was 42 permanent nurse anesthetists in the Tamale Teaching Hospital from which a simple random sampling method was used to select 38 nurse anesthetists according to (Barlett *et al*, 2001). Data was collected using structured questionnaires with closed-ended questions. The questionnaire contained pre-determined answers to questions from which the participants selected the answers that best expressed their views in terms of the hospital occupational health and safety. The questionnaire consisted of three sections. Section A consisted of four (4) questions on demographic characteristics of the participant. Section B consisted of six (6) questions on knowledge of occupational health and safety, Section C consisted of six (6) questions to determine the compliance level of Certified Anesthetist in occupational health and Section D consisted of six (6) questions on perception of occupational health and safety among nurse anesthetist.

Questionnaires were pre-tested among 10 health workers at Tamale Teaching Hospital to eliminate ambiguity and difficult in answering questions. Following pre-testing, some questions were revisited and revised since the pretest revealed that some questions were ambiguous, undefined, or vague. The completed data collection tool was checked for accuracy as well as completeness. This data was then coded, tabulated and analyzed using Microsoft excel, version 2016 and statistical package for social science (SPSS) version 25.0. The researcher ensured consistency and legitimacy of data by a peer reviewed carried out by a senior anesthetist and the academic supervisor of the study. Pretesting was carried out to avoid any errors. The data collection sheets were also numbered and coded to avoid multiple entries during processing. The data was also backed up in a pen-drive and a hard copy under safe lock.

RESULTS

Data analysis was based on the feedback from the respondents henceforth anesthetists. The feedback was received in four major areas which included; demographics, knowledge,

compliance level and perception on occupational health and safety. Information gathered on demographics (Table 1) included anesthetists age, gender, education and work experience. A total of 36 respondents participated in the study comprising 80.6% males and 19.4% females. Age distribution of the respondents revealed a mean age of 35.06 ± 3.89 years. The minimum age of the respondents was 30 years and the maximum age was 48 years. The modal age was between 30-35 years. In the education front, 5.6% were students, 11.0% had diploma, 80.6% had bachelor's degree and 2.8% had master's degree in the profession. Excepting the students, it was also shown that majority of the respondents (63.9%) had 0-5 years' work experience while 36.1% had already worked above 6 years.

Table 1 Demographics on Anesthetists

Variable	Frequency	Percent
Age		
30-35	22	(61.1%)
36-40	11	(30.6%)
41+	3	(8.3%)
Sex		
Male	29	(80.6%)
Female	7	(19.4%)
Education		
Student	2	(5.6%)
Diploma	4	(11.0%)
Bachelors	29	(80.6%)
Master's	1	(2.8%)
Work experience		
0-5 years	23	(63.9%)
6 years and above	13	(36.1%)

Assessment on Knowledge

On occupational health and safety (Tables 2 and Table 3), only a few anesthetists (8.4%) indicated that it was the welfare of the employer, 22.2% indicated that it was the welfare of employee and while the majority (69.4%) indicated that occupational health and safety was the welfare of both employee and employer. 5.6% of respondents did not consider noise as an occupational hazard. Likewise, 94.4% of them did not consider early arrival at work, as the profession demands, as an occupational health issue. However, most anesthetists (77.1%) acknowledged that contact with patient blood and body fluid is the most likely source of occupational infection in the department. While body contact was indicated by 14.3% of anesthetists as the most likely source of infection and 8.6% of them indicated that airborne was the most likely source of infection.

Table 2 Knowledge on occupational health and safety

Variable	Frequency	Percent
What is occupational health and safety?		
Welfare of employer	3	8.4
Welfare of employee	8	22.2
Welfare of both employee & employer	25	69.4
Which of the following is not an occupational hazard in the department?		
Noise	2	5.6
Early arrival at work	34	94.4

Table 3 Knowledge on occupational health and safety

	Frequency	Percentage
What is the most likely source of occupational infection in the department?		
Air-borne	3	8.6
Body contact	5	14.3
Blood and body fluid	27	77.1

Assessment on Hand Washing Practices

Table 4 shows that majority of the respondents had very good knowledge on hand washing practices (97.2%) hence they viewed and affirmed hand washing as a good way of preventing infections.

Table 4 Hand washing to prevent occupational infection

Variable	Frequency	Percent
Yes	35	97.2
No	1	2.8
Total	36	100.0

Assessment on Activities Likely to Cause Needle Stick Injuries

According to the findings presented in Figure 1, majority of the respondents (80 %) indicated that recapping was one of the activities that caused needle stick injury among anesthetists. (14%) and (6%) further supported with additional views as they indicated that transporting of needle sticks to the sharp safety box and handling equipment after use were responsible for needle stick injury among anesthetists respectively.

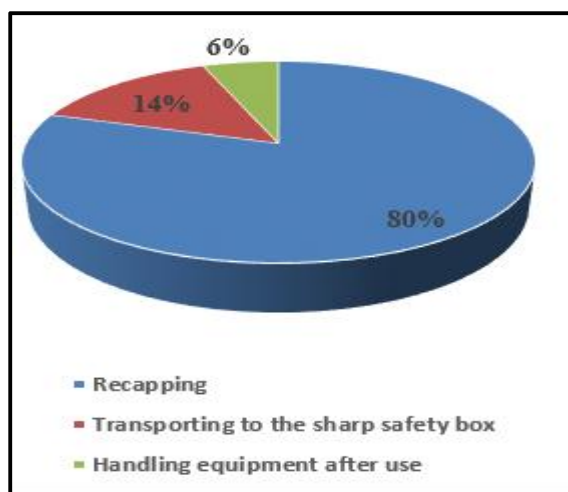


Figure 1 Activities likely to cause needle stick injuries

Assessment on Occupational Hazards

According to Figure 2, few of the respondents (9%) acknowledged mechanical hazards as hazardous to their health. Physical and chemical hazards were equally perceived as being hazardous (34%).

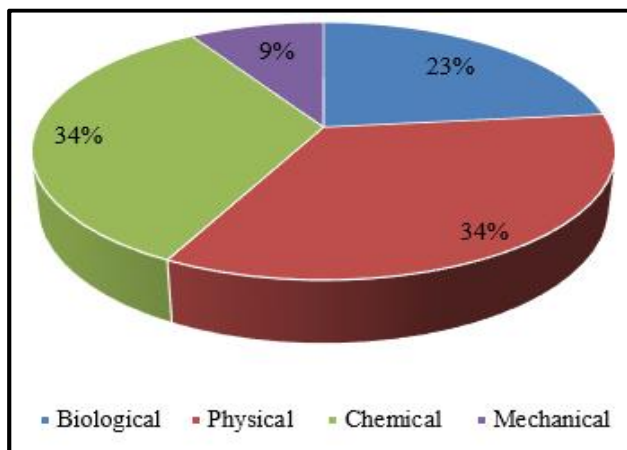


Figure 2 Occupational hazards grouped into biological, physical chemical and mechanical

Relationship between Demographics and Knowledge

Based on the findings presented in Table 5, it was found that age of the respondents was not associated with respondent's knowledge on occupational health and safety ($\chi^2 = 4.61$, $p = 0.130$, $\alpha = 0.05$).

Table 5 Relationship between respondent's demographics and their level of knowledge on occupational health and safety

Variable	Occupational health			Chi square (χ^2)	P value
	Employer	Employee	Both		
Age				4.61	0.130
30-35	5 (13.9%)	7 (19.4%)	10 (27.8%)		
36-40	2 (5.6%)	3 (8.3%)	6 (16.7%)		

However, as shown in Table 6, findings on educational status and work experience of respondents showed association with respondent's knowledge on occupational health and safety ($\chi^2 = 12.30$, $p = 0.002$, $\alpha = 0.05$) and ($\chi^2 = 11.90$, $p = 0.002$, $\alpha = 0.05$) respectively.

Table 6 Relationship between educational status and work experience and their level of knowledge on occupational health and safety

Variable	Occupational health			Chi square (χ^2)	P value
	Employer	Employee	Both		
Education				12.30	0.002
Student	0 (0.0%)	1 (2.8%)	1 (2.8%)		
Diploma	0 (0.0%)	2 (5.6%)	2 (5.6%)		
Bachelors	3 (8.3%)	7 (19.4%)	19 (52.8%)		
Master's	0 (0.0%)	0 (0.0%)	1 (2.8%)		
Work experience				11.90	0.002
0-5 years	6 (16.7%)	5 (13.9%)	12 (33.3%)		
6 years and above	2 (5.6%)	4 (11.1%)	7 (19.4%)		

Compliance Level on Occupational Health and Safety Practices

The compliance level of nurse anesthetist in occupational health and safety was examined and the findings presented below. Table 7, showed that majority of the respondents (77.8%) indicated that they always used gloves during venous access. Hand washing was averagely accepted (52.8%) to prevent infections while recapping to needles after use was not a common practice among anesthetist.

Table 7 Compliance of respondents on health and safety

Variable	Always	Very often	Often	Sometimes	Never
Use gloves during venous access	28 (77.8%)	5 (13.9%)	3 (8.3%)	0 (0.0%)	0 (0.0%)
Perform hand washing	19 (52.8%)	11 (30.6%)	3 (8.3%)	3 (8.3%)	0 (0.0%)
Recap needle after use	9 (25.0%)	4 (11.1%)	6 (16.7%)	13 (36.1%)	4 (11.1%)

Compliance Level with Safety Precautions

Based on the findings presented in Figure 3, it was found that, majority of the respondents (64%) indicated that they complied with safety precautions always while 36% sometimes did the same.

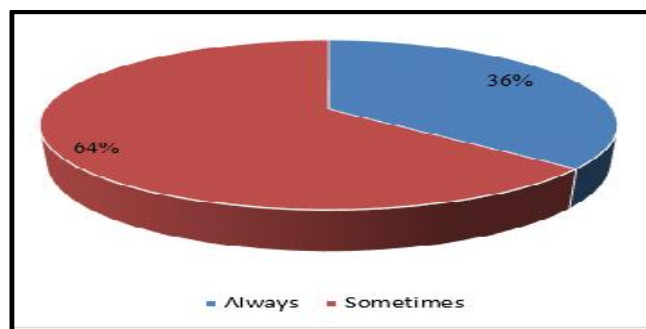


Figure 3 Respondents compliance with safety precautions

Reasons for Non-Compliance with Safety Precautions

Based on the findings presented in Figure 4, it was found that an average of the respondents (52%) revealed that the reason for non-compliance with safety precaution was because they saw it as waste of time. The remaining of the respondents (48%) said their non-compliance with safety precautions practices was due to the unavailability of safety kits.

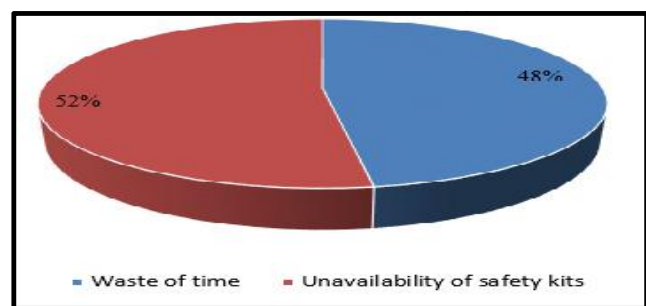


Figure 4 Reasons for non-compliance with safety precautions

Awareness on Health and Safety Precautions

Based on the findings presented in Table 8, it was found that all the respondents (100%) indicated that they were aware of handwashing with bacterial agent as a precautionary measure. Barrier method was indicated as a safety precautionary measure by most respondents (88.9%).

Table 8 Awareness on health and safety precautions among respondents

Variables	Aware		Not aware	
	Freq.	Perc.	Freq.	Perc.
1. Hand washing with bactericidal agent	36	100	0	0.0
Barrier methods	32	88.9	4	11.1
Gloves	36	100	0	0.0
Gowns (apron)	33	91.7	3	8.3
Caps	34	94.4	2	5.6
Masks (goggles)	33	91.7	3	8.3
Environmental control e.g., effective waste handling	35	97.2	1	2.8
Safe disposal of sharps	36	100	0	0.0
Complete immunization against Hepatitis B	35	97.2	1	2.8
Tetanus	32	88.9	4	11.1
Prophylactic treatment	32	88.9	4	11.1
Correct body posture during procedures	33	91.7	3	8.3

All respondents indicated wearing of gloves as a safety precaution. Likewise, all respondents were aware that the safe disposal of sharps was imperative. 91.7% were aware of mask wearing as a safety precautionary measure, 97.2% were acknowledged the need for environmental control such as effective waste handling, 94.4% were aware of caps as a safety precautionary measure, 97.2% were aware of Hepatitis B

immunization as a safety precautionary measure and 91.7% were aware of correct body posture during surgical procedure as a safety precautionary measure.

Adherence to Precautions among Respondents

Table 9 revealed that, hand washing with bactericidal agents was a common practice among 91.7% of respondents. The findings further showed that 61.1% of the respondents practiced correct body posture during procedures. Downing of gloves was practiced by all respondents and 88.9% practiced barrier methods. 97.2% of the anesthetists practiced safe disposal of sharps and on immunization most respondents (83.3%) were immunized against Hepatitis B while tetanus and prophylactic treatment were not common practices (< 20%).

Table 9 Adherence to precautions among respondents

Variables	Practice		Not practice	
	Freq.	Perc.	Freq.	Perc.
2. Hand washing with bactericidal agent	33	91.7	3	8.3
Barrier methods	32	88.9	4	11.1
Gloves	36	100	0	0.0
Gowns (apron)	24	66.7	12	33.3
Caps	31	86.1	5	13.9
Masks (goggles)	24	66.7	12	33.3
Environmental control e.g., effective waste handling	25	69.4	11	30.6
Safe disposal of sharps	35	97.2	1	2.8
Complete immunization against Hepatitis B	30	83.3	6	16.7
Tetanus	16	44.4	20	55.6
Prophylactic treatment	18	50.0	18	50.0
Correct body posture during procedures	22	61.1	14	38.9

Perception about Occupational Health and Safety

Table 10 shows (94.4%) of respondents were at risk of occupational hazards at the workplace while (5.6%) indicated they were not at risk.

Table 10 Risk of occupational hazards and safety

Variable	Frequency	Percent
Yes	34	94.4
No	2	5.6
Total	36	100.0

Degree of occupational hazard

Based on the findings presented in figure 4, (50%) perceived their vulnerability to occupational hazards as high, while 44% and 6% considered their exposure risk as medium and low respectively.

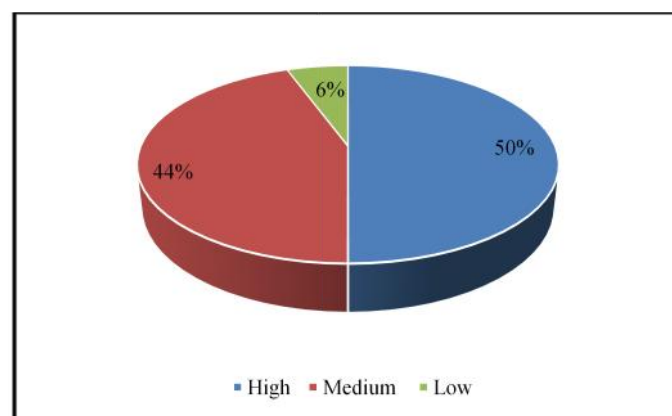


Figure 5 Degree of occupational hazard

Perceived occupational hazards among respondents

From the findings presented in Table 11, majority of the respondents (97.2%) considered needle prick injury as an occupational hazard, similarly (91.7%) perceived susceptibility to radiation and anesthesia gases at the work place, (88.9%) of the respondents perceived direct contact with patient's body fluid as an occupational hazard. Colleague assault as a hazard was acknowledged by (72.2%) of respondents, (86.1%) of respondents saw needle recapping as a hazard. Body contact with retroviral positive patients (61.1%) and weekly night shifts 9(25.0%) were the least perceived occupational hazard at the workplace respectively.

Table 11 Occupational hazards among respondents

Variable	Yes		No	
	Freq	Perc	Freq	Perc
Needle prick	35	97.2	1	2.8
Body contact with retroviral positive patients	22	61.1	14	38.9
Exposure to radiation/ anesthesia gases	33	91.7	3	8.3
Assault from patient	31	86.1	5	13.9
Direct contact with patient's body fluid	32	88.9	4	11.1
Assault from co-workers	26	72.2	10	27.8
Recapping of needle after use	31	86.1	5	13.9
Weekly night shifts	9	25.0	27	75.0

Person responsible for health and safety of staff

Based on the findings presented in Figure 6, more than two-thirds of respondents (70%) indicated that they were responsible for their own health, while the hospital head was responsible for (14%) of respondents, (8%) indicated their supervisor was responsible for their health and safety, (5%) of the polled respondents indicated the environmental health unit was responsible for their health and safety and (3%) of the respondents were not sure.

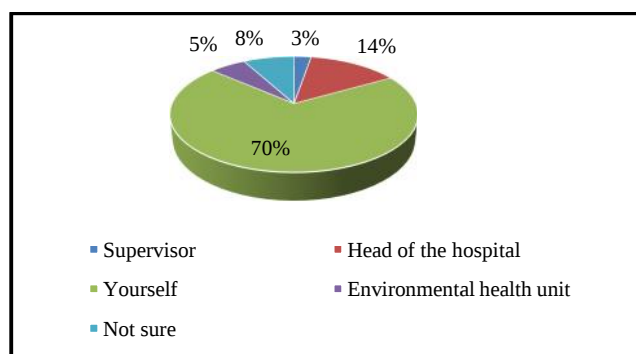


Figure 6 Person responsible for health and safety of staff

Respondents Satisfaction of occupational health and safety

From table 12 more than two-thirds of respondents (69.4%) were not satisfied with occupational health and safety measures in the hospital whilst 11(20.6%) were satisfied with the hospital's occupational and safety measures.

Table 12 Satisfaction of occupational health and safety

Variable	Frequency	Percent
Yes	11	30.6
No	25	69.4
Total	36	100.0

Assessment of respondents' occupational health and safety

Based on the findings presented in Table 13, 16(44.4%) of the respondents rated their level of occupational health and safety as good, 9(24%) very good, 8(22.2%) fair and 3(8.4%) poor.

Table 13 Assessment of occupational health and safety

Variable	Frequency	Percent
Very good	9	24.0
Good	16	44.4
Fair	8	22.2
Poor	3	8.4

DISCUSSIONS

Socio-Demographic Characteristics

In this study were 36 respondents and over 80% were male anesthetists. This is in consonance with previous findings by Lindsay (2007) were, the autonomic, lucrative and technical nature of anesthesia is believed to be the reason why there is the influx of men than women in the practice of nurse anesthesia. The distribution of age ranged from 30 and 48 falls within the working age in Ghana. Most respondents' in this study had between 0-5years working experience. Similarly, the work experience in a previous study by Ford and Tetrick (2011) was less than 5years for most respondents. Their responses could be relied on for this study because majority of respondents (80.6%) had bachelor's degree and may not necessarily need to be on the job for long to be able to assess occupational health and safety.

Knowledge on Occupational Health and Safety

According to the data in Figure 1, majority of respondents could identify some categories of occupational hazards. Mechanical hazards were known by only 9% of respondents and it doesn't seem to be well recognized by respondents in this study. In contrast to a study by Aluko *et al* (2016) where 63.8% of the respondent knew about mechanical hazard, only 9% of respondents in this study were able to recognized mechanical hazard. This is supported in a study by (Bajwa, 2012) where he stated that mechanical hazards are uncommon in the practice of anesthesia, though they can be a source of damage and harm to anesthesiologists on the job. According to a research published in 1990 by Kristensen *et al*, accidents involving blood and other bodily fluids are the most reported experience. As indicated in Table 2, a substantial majority of respondents (77.1%) knew contact with patient's blood and body fluid could be a potential cause of infection. Similarly, an overwhelming majority of respondents (80%) believed that needle recapping is a risky activity, in agreement with findings by Obono *et al* (2019). where needle stick injuries were common during recapping in a tertiary facility in Lagos among healthcare workers. Over 95% of respondents knew hand washing was an effective way to avoid cross infection in clinical practice.

Majority of the respondents (69.4%) knew occupational hazards were both they and their employers' responsibilities. Based on our findings in table 4, age of the respondents was found not to be associated with respondent's knowledge on occupational health and safety. The findings rather showed that, the educational level of the respondents was associated with respondent knowledge on occupational health and safety.

These findings agree with Tziaferi *et al* (2011) where it was concluded that the level of education influences the level of knowledge.

Compliance Level among Respondents on Occupational Health and Safety

Gloves usage is a widely recognized practice during venous access in clinical settings. The adherence to wearing gloves by respondents in this study was practiced by (77.8%) always, (13.9%) very often while an improvement is sought for (8.3%) that practiced gloves usage often. In the administration of healthcare, hand washing is a commonly accepted method of reducing cross infection. Based on our findings, respondent's compliance to hand washing was average with (52.8%) doing it always, 30.6 % attending to it very often and the remaining few respondents (8.3%) performing hand washing often and sometimes. This finding is supported by Kim *et al* 2018 where he demonstrated a controversial behavior between gloves usage and hand hygiene among anesthesiologist. Only 64% of the respondent followed the preventive safety precautions recommended in standard operating procedures and task aids on a consistent basis. The reason provided by the defaulting 36% of respondents who did not always follow standard operating procedures was a lack of or insufficiency of safety equipment (52%) and (48%) believed that it was a waste of time respectively. This observation is in tandem with the publication of Aluko *et al* (2016) where noncompliance to safety precautions were attributed to inadequate safety kits, time compliance and associated discomfort. Evidence from this study, all respondents were aware of hand washing using bactericidal as a preventive coping strategy. This awareness could also be attributed to the outbreak of COVID 19 virus. However, 8.3% of people did not comply or wash their hands with bactericidal agents. In addition, all respondents properly disposed of sharps (97.2%). The majority of respondents (97.2%) were aware of Hepatitis B immunization at the time of this survey, with the exception of 1 (2.8%), and 83.3% of respondents were inoculated at the time of this study, in agreement with findings by Aluko *et al* (2016) in Nigeria where more than two thirds of respondents (62.4%) have been immunized against Hepatitis B. The effects of posture in anesthesia delivery cannot be over emphasizes. In table 7, (91.7%) of respondents affirmed awareness of correct body posture during procedures with 61% compliance and 38% non-compliance rate during procedures respectively. Furthermore, following safety precautions against occupational hazards can be cumbersome and time-consuming, despite the fact, respondents believe that wearing aprons, caps, and masks is highly necessary before clinical operations to avoid occupational hazards.

Perception of Respondents on Occupational Health and Safety

The perceived risk of exposure was high in this study since most respondents (94.4%) believe they were at risk of exposure to occupational hazard and (50%) perceived the risk of exposure as high. This was in consonance with findings of previous studies by Kim *et al* (2018), Aluko *et al* (2016), and Orji *et al* (2002). Needle prick (97.2%), direct contact with patient body fluid (88.9%) and exposure to radiation of anesthetic gases (91.7%) were the three most perceived occupational hazard among respondents while body contact

with retroviral positive patients and weekly night shifts were considered least. This agree with previous findings by Orji *et al* 2000 were needle prick injuries (94.5%) and direct contact with patients' bodily fluids (92.4%) were the most reported occupational exposures among respondents. Needle pricking was rated as a high-risk infection by (97.2%) of respondents. This is in line with findings by Prüss-Üstün *et al* (2003), where occupational infections with Hepatitis B and C accounted for around 37% and 39% of all Hepatitis B and Hepatitis C infections among healthcare workers, respectively, all of which were caused by occupational exposures to contaminated sharps. Diseases like hepatitis B and C can be prevented by avoiding needle stick injuries, which is especially crucial in high-prevalence areas (Niu, 2010). Based on this study majority of respondents (70%) took responsibility of their health and safety. This is vital in ensuring their own safety and that of their patients. Majority of respondents (69.4%) were not satisfied with the occupational health and safety initiatives by management. Management would have to engage these workers to create a better way of improving safety and health. The study also discovered that (44%) of respondents rated themselves as good, (22%) as fair, and (24%) as very good. This indicated that respondents are concerned about workplace health and safety, albeit this has more to do with the fact that 8.4 % of respondents rated themselves as poor.

CONCLUSION

The study discovered certified registered anesthetics of the Tamale Teaching Hospital have adequate knowledge about occupational hazards in general. However, the study also identified a knowledge gap among certified registered anesthetics about the various forms of occupational hazards. Prominent among the least known occupational hazard was mechanical hazard followed by biological hazards. This inadequacy of knowledge has a higher implication on the safety of the health of certified registered anesthetics and could inhibit the delivery of quality health service. The challenges identified by this study have far-reaching implications for the health of certified registered anesthetics, thereby influencing the quality of healthcare delivered to patients. Although a significant number of respondents were complaint to preventive safety precautions recommended in standard operating procedures and task aids. The study discovered that an average number of the certified registered anesthetics were very selective in the adherence to universal safety precautions. They were very selective in the use of safety tools when they were available. Respondent also made excuse of time restrictions and inadequate safety kits for violation of compliance procedures. It was interesting to discover that almost all respondent agrees to been expose to occupational hazards and half of them perceive the risk of exposure was high. Needle prick, direct contacts with patients' body fluid and exposure to radiations/ anesthetic gases were most perceived occupational hazards among respondent. The study discovered that majority of respondent were not satisfied with managerial initiatives to ensure occupational health and safety of certified registered anesthetics

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