

Experiences of infection prevention and control in clinical practice of nursing students in the Greater Accra Region, Ghana: An exploratory qualitative study

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Abstract

Introduction: Globally, infections acquired from hospitals pose a major obstacle to patients' safety. Health care workers, especially, nursing students are at high risk for Hospital Acquired Infections (HAIs) as they are always in contact with clients. Therefore, this study aims to explore experiences of infection prevention and control in the clinical practice of nursing students in the Greater Accra Region, Ghana.

Methods: The study utilized a qualitative exploratory design to interview 42 participants (7 focus groups, comprising of 6 members each). A purposive sampling technique was employed to select the participants, who were engaged in 50–90 min' focus group discussions. Data collection lasted for 3 months and was analyzed using content analysis. NVivo version 12 Software was used to identify recurrent themes from the transcribed data

Results: The results revealed two main themes: preventive practices against hospital-acquired infections and barriers toward infection prevention practices. The subthemes under the preventive practices were as follows: views on HAIs preventive practices, barrier nursing, hand washing and use of sanitizers, aseptic techniques, and sterilization. Increased workload, lack of superior support, and inadequate resources emerged under the barriers toward infection prevention practices.

Conclusion: It was concluded from the study that most of the student nurses had adequate information about HAIs and wish to adhere to the Infection prevention protocols. However, the participants observed poor infection prevention practices among the staff they were learning from. It is therefore recommended that more attention is focused on infection prevention and control in clinical practice among nurses.

Keywords

Infection, prevention, practices, nursing students, intra-semester, clinical placement

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Introduction

Millions of hospitalized patients contract infections while on admission each year, worldwide.^{1–3} Infections acquired from hospitals pose a major obstacle to patients' safety.^{4,5} Due to this, the prevention and control of infections in hospitals have gained a significant concern. It is estimated that, in less than a decade there were a total of 1.7 million hospital-acquired infections and nearly 99,000 deaths were associated with hospital-acquired infections (HAIs), making hospital-acquired infections the sixth leading cause of death in the

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United States and Europe alone.^{2,6} However, studies have shown that approximately one-third or more of hospital-acquired infections are preventable.^{7,8}

The Centers for Disease Control and Prevention (CDC) reported that every year, 2 million patients suffer from HAIs and about 100,000 of them die. HAIs result in higher health-care costs of up to US\$4.5 billion per year.^{9,10} Hospital-acquired infections add to the patient's functional disability and emotional stress and may lead to disabling conditions that decrease the quality of life in some cases. The cost of nosocomial infections is enormous causing financial burden and human suffering.^{11,12}

Worldwide studies have revealed that health care workers especially nurses are the main transporters of HAIs as they are always in contact with clients and especially through the use of mobile phones on the ward.¹³ This infection was also found to be transmitted via the attire used by health professionals while discharging their duties.¹⁴ This was attributed to the poor knowledge regarding HAIs among some nurses.¹⁵ It is, therefore, necessary to improve the knowledge of standard precautions, develop programs for HAI control, and hold training courses based on successful educational models.

In West Africa, it was discovered that some Hospitals and health care facilities had ineffective HAIs prevention and control approaches.¹⁶ For instance, in Ethiopia, Algeria, Burkina Faso, Senegal, and the United Republic of Tanzania, the total occurrences of hospital-acquired infections in surgical wards ranged from 5.7% to 45.8%.¹⁷ The high prevalence of HAIs among these African countries was attributed to economic challenges, weak healthcare systems, overcrowding, and insufficient staff in hospitals.

In Ghana, a report about HAIs at Ghana's Volta Regional Hospital estimated that out of 20.7 million people, the incidence rate of HAIs in Ghana is about 152,000.¹⁸ In 2014, a study found that many health care workers in Ghana have knowledge and understanding of preventive practices of HAIs including; hand washing with soap (50.7%) and observing patients' safety rules.¹⁹ However, the researchers indicated that despite the awareness of the preventive measures, compliance with these practices was weak. Other reasons for non-compliance to Infection Prevention and Control (IPC) policy in some Ghanaian health facilities include the insufficiency of resources/equipment needed for training per the guidelines.²⁰

In Ghana, the Health Service emphasizes the importance of IPC through campaigns on water, sanitation, and hygiene. A study done at KBTH in Ghana identified wound infection as the most common among infections acquired from the hospital, followed by skin, urinary tract infections, and lower respiratory infections.²¹ The same survey suggested that surgical site infections accounted for 39.3% of all HAIs. Another recent survey about abdominal surgery at Tamale Teaching Hospital showed that 11.25% of all cases developed surgical site infections.²² Healthcare-associated infections remain the highest concern to all stakeholders in the country, like

patients, nurses, government, and regulatory bodies, since they all have a part to play in HAIs prevention.²³ Moreover, several studies have addressed infection prevention practices and knowledge among health care workers in Ghana including the Greater Accra Region, where the study was conducted. However, literature about infection prevention practices among nursing students in Ghana is scarce. In addition, no study was found on infection prevention practices among student nurses during their clinical placement in this setting. The few studies found were among health workers in some hospitals located in the Greater Accra Region, such as Korle-Bu Teaching Hospital and Greater Accra Regional Hospital.¹⁹ Therefore, this study aims to assess infection prevention practices among students during their clinical placement to help improve their interest and practices and to protect them from acquiring infections during their clinical placement especially in this era of Covid-19.

Methods

A research design is an overall plan for addressing a research question, including requirements to establish the study integrity.²⁴ A qualitative exploratory design was employed for this study. It helped the researchers to make sense of and interpret the phenomena to make it more meaningful to improve the understanding regarding the phenomena.²⁵ This allowed the researchers to explore the student nurses' experiences with infection prevention practices during the clinical placement. This was done using focused group discussion (FGDs). FGDs have carefully planned discussions with a specific set of participants gathered to gain ideas on particular areas of interest in a permissive, non-threatening environment and led through an open discussion by a skilled moderator.²⁶

The setting for this study was the Greater Accra Region which is the capital of Ghana and the second most populated Region following the Ashanti Region. The Greater Accra Region is bordered on the north by the Eastern Region, on the east by the Volta Region, on the south by the Gulf of Guinea, and on the west by the Central Region. There are many public and private hospitals in this region including Korle-Bu Teaching Hospital, Greater Accra Regional Hospital, and 37 Military Hospital which are the major referral centers. Others include Lapaz Community Hospital, University of Ghana Medical Center, Nyaho Medical Centre, among others. The Region also has several Universities and diploma awarding schools training nursing students including the University of Ghana, Valley View University, Ghana Christian University College, Wisconsin University, and Knutsford University College. Some studies were identified in some Hospitals in this setting addressing HAIs among Health care workers and patients in Ghana.^{19,21} These studies have revealed that knowledge on infection prevention practices was high among health care workers in the hospitals used while HAIs were found to be common

Table 1. Themes and subthemes.

Themes	Sub-themes	Codes
Preventive practices against hospital-acquired infections	1. Views on HAIs preventive practices 2. Barrier nursing 3. Hand washing and use of sanitizers 4. Aseptic techniques 5. Sterilization	Practice HAI
Barriers toward the prevention of hospital-acquired infection.	6. Increased workload 7. Lack of superior support 8. Inadequate resources	Bar HAI

among patients.^{19,21} However, no study was found to have been conducted among students having their intra-semester clinical in the hospitals found in this setting.

Participants were selected using the purposive sampling technique.²⁷ A purposive sampling technique was used in this study by the researcher to select participants who met the inclusion criteria and were willing to be interviewed for the study. This ensured that the richness of the data is achieved. The sample size was reached when data were saturated. Saturation is the point of data collection at which no new responses to ideas emerge from data. The sample size for the study was 42. All 7 focus groups were formed by the researchers with 6 members in each group comprising males and females. The study was carried out on both males and female nursing students in the Greater Accra Region of Ghana who has had at least one clinical placement since they might have had an experience with infection prevention practices. Participants who were considered eligible for the study were students from selected Universities in the Greater Accra Region of Ghana following their Intra-Semester clinical placement. These participants were students from levels 200–400 (second to fourth year students) from the selected Universities. Exempted from this study were first year (level 100) students, because they have not had any clinical placement and hence have no experience of HAIs prevention practices on the ward.

Approval was obtained from the Dodowa Health Center Institutional Review Board (DHC-IRB 81/07/20). Following the ethical clearance, ethical clearance letters were sent to the selected Universities in the Greater Accra Region in the country. Interview guide was pretested among four nursing students from one university aside the three universities selected in order to ensure credibility and dependability of the guide. Three (3) Universities offering Nursing in the Greater Accra Region of Ghana were used for the main data collection. Permission was obtained from the authorities of the various Universities to enable the researcher to gain access to the study participants. The researchers contacted students during classes' hours, and other gatherings to request students to voluntarily wait for a short discussion after their meetings. Some were also contacted in their various hostels. The purpose of the study was explained to them, and those eligible were recruited after their consents were

sought. Those recruited were informed that the discussion will be in groups and were assured of the measures taken to adhere to Covid-19 protocols which include the mask and social distancing during the discussion. The whole process was thereafter explained to the participants. They have then put in focus groups consisting of members from the same class. In all, 7 FGDs were formed (2 Focus groups from school A thus 12 (29%), 2 from school B 12 (29%), and the other 3 FGs from school C (42%). Meetings were scheduled with participants in their free time and at a private place on campus as suggested by participants where no one was present. Participants were told about the terms of the group discussions and were allowed to sign consent forms before the beginning of the interviews. The interview was conducted and moderated by all the researchers using a semi-structured interview guide. The discussion took about 50–90 min for each group. The structure for the interview followed the objectives of the study. The interviews were all conducted in the English language since all the participants were student nurses who could read and understand the Lingua Franca. The data were recorded, transcribed, and analyzed.

Data analysis refers to breaking up data into manageable themes, patterns, trends, and relationships.²⁸ The researchers employed content analysis. Content analysis is a method for systematically identifying, organizing, and offering insight into patterns of meaning across a dataset.²⁸ The collection and analysis of data were done simultaneously. The data collected were recorded with an audio recorder and transcribed verbatim manually. The data were typed and analyzed using thematic content analysis. The manual transcripts were checked and read over while listening to the audio-tape recording to ensure the accuracy of the data collected. The transcripts were read by the researcher to identify recurring themes. The themes were coded to differentiate them. The researcher correlated larger themes and their corresponding subthemes into a hierarchy. Data gathered were properly arranged per their codes and labeled with the use of NVivo version 12. See Table 1 for details of theme and subthemes.

Trustworthiness, also known as methodological Rigor was ensured in this study by maintaining credibility, transferability, dependability, and confirmability. The following were done rigorously to achieve quality results including evaluation design, the conceptualization of constructs,

measurement strategies, time frames, program integrity, and others.

Results

The sociodemographic characteristics of participants

Forty-two (42) participants from level 200–400 (second, third, and final year nursing students) who have had at least one clinical experience were recruited. The participants were selected from three Universities in the Greater Accra Region. The distribution was as follows: University *A* 12 (29%), University *B* 12 (29%), and University *C* 18 (42%). They were within the age range of 19 and 25 years. In all, 12 (29%) were selected from level 200, 12 (29%) were from level 300, and 18 (42%) were from level 400. All of them were nursing students and involved 25 females (60%) and 17 males (40%). In terms of religion, all the participants were from Christian denominations 40 (95%) with only one 2 (5%) being Muslims. The level 400s have had 3 years' clinical experience, level 200s have had 2 years' experience, and the 200s have had a year of clinical experience.

In all the FGs were 7 with 6 members each. Two themes emerged with 8 subthemes as discussed in the following. The themes were preventive practices against hospital-acquired infections and barriers toward infection prevention practices. The subthemes were views on HAIs preventive practices, barrier nursing, hand washing and use of sanitizers, aseptic wound dressing, sterilization, increased workload, lack of superior support, and inadequate resources.

Preventive practices against hospital-acquired infections. The following were shared by participants regarding infection prevention practices during their clinical placement: views on HAIs preventive practices, barrier nursing, hand washing and use of sanitizer, aseptic techniques, and sterilization.

Views on HAIs preventive practices. Participants recognized the need to engage in practices necessary for the prevention of HAIs. They emphasized the importance of preventing infections:

The importance of infection prevention practices cannot be over-emphasized as it goes a long way in controlling and preventing the spread of infection. (FG 7, R1)

Having had lessons on the need to practice infection prevention, I ensure that I protect myself prior to the performance of procedures, whether it involves getting into contact with fluids of patients or not; hence my regular practice of wearing PPEs before procedures. (FG 5, R4)

I observed with worry, how some nurses in their failed attempts to find the veins of patients, place needles removed from cannulas on the patient's mattress, only to use them again to

pierce the patient. Doing this, can introduce infections to the patient thereby causing them to spend extra days and money at the hospital. (FG 3, R6)

According to the data collected, these preventive methods can prevent other infections like Covid-19:

As for me, the fear of contracting Covid-19 alone motivated me to adhere to the safety protocols such as hand washing and mask-wearing. (FG 3, R6)

Barrier nursing. Barrier nursing was mentioned by participants as one of the modes that protect nurses and their patients from HAIs. The following statements portray the above statement:

When we go to the hospital we have our lab coats and aprons to protect ourselves, especially when doing wound dressing and other invasive procedures so that one does not get infections or transmit infections to patients; as such, the use of PPEs not only during these procedures, but at all times whilst working in the hospital must be encouraged to prevent other infections as well as Covid-19. (FG 2, R5)

However, the responses from the participants ascertained that the protective clothing that they were required to wear turned out to make one uncomfortable:

Even though PPEs are good, my colleagues and I have complained about how hot the lab coats can be, leaving them to sweat profusely, hence our dislike for it. The nose mask can also be so stuffy; making breathing difficult. I would rather suggest they are made with lighter and more comfortable materials, to solve these issues. (FG 3, R1)

Hand washing and use of sanitizers. Hand washing has been distinctly pointed out by participants of this study as the main measure to prevent HAIs:

One of the basic infection prevention methods is hand washing. As student nurses, we are expected to develop the habit of hand washing to avoid infections. As expected, we always wash our hands when we arrive at the ward and when we are leaving, right after each procedure before touching the next patient. In instances where we are far from water, we sanitize our hands severally whilst on the ward, being fully aware of the presence of Microbes. (FG 2, R6)

The results of the study also revealed that hand washing was mandatory because of Covid-19, and according to others, they practice it due to the fear of contracting Covid-19:

Before we were sent for clinical, our instructors advised us on the need to wash our hands anytime we get to the ward and as often as we can to avoid contracting Covid-19. At present, hand washing has become a prerequisite to enter the ward due to the pandemic. For me, I think it is a good practice to reduce nosocomial infections and Covid-19. (FG 7, R4)

Nevertheless, some students (participants) have wrong knowledge about infection control and perceived it to be tedious:

Actually for me, I do not practice it dutifully, because there are some procedures that make it difficult to wash your hand. Assuming you have 50 patients on the ward and you are to wash your wards after getting into contact with each patient, you will have to wash your hands at least 10 times before and after touching them. Honestly, this will be very tedious, so I mostly forego it, and sometimes only use the sanitizer. (FG 1, R6)

Aseptic techniques. According to the participants in this study, aseptic techniques, although a vital practice in nursing, was mostly breached by the nurses they observed while performing invasive procedures during their clinical placements:

I understand aseptic techniques to be the act of trying to reduce opportunistic organisms that may cause any form of infection. But I did not see this throughout our clinical placement period, especially among some doctors. (FG 3, R2).

Adding to what my colleague said, sometimes, the wounds are not even dressed in a sterile way. Some of the health workers use disposable gloves and unsterile cotton wool to dress the wounds. The environment the wounds are dressed is also not clean or sterile. This creates the enabling environment for bacteria to enter the wounds and cause additional harm. (FG 2, R4)

Few Participants Also Had the Wrong Perception About Aseptic Techniques in Infection Prevention:

I observed some nurses use disposable gloves when ermm . . . they were going to transfuse patient or pass an IV line for patients. When I inquire from them, they said they are aware they are supposed to use sterile gloves, but the sterile gloves was not sufficient. So the reason for using disposable gloves which can easily transfer infections to the patient. (FG 6, R6)

According to the data collected, some participants did not adhere to the aseptic techniques protocol while still learning:

There are times during our clinical some seniors delegate us to do invasive procedures like removal of the catheter, IV cannula removal and the like, but because we have not been taught about some of them they just tell us to withdraw the fluid from the catheter without guiding us step by step, how to maintain aseptic techniques. (FG 7, R2)

Sometimes too some senior nurses encourage us to adhere to the aseptic techniques and teach us about preventing infection, for example, sterile fields at the theater that only the scrub nurse should touch. However, these senior nurses sometimes shout at us, as oblivious us we as student nurses at the theater, and we get embarrassed and sad throughout our stay on the ward, but I think it is for the good of the patient and my own good. (FG 5, R5)

Sterilization. Few participants mentioned sterilization as a practice that could aid the prevention of HAIs; however, they expressed dissatisfaction about the sterilization process and regarded the items as not wholly sterilized:

Practically, one of the ways we can prevent these hospital-acquired infections is by sterilizing the instruments, but some of the district hospitals within which we had our clinical, did not have this machine. As such, they resorted sometimes to boiling the instrument after decontamination. I however, do not think it is 100% safe as it might still contain some sort of bacteria from a previous patient it was used on. It is therefore important that these instruments are sterilized after each use. Others also used it right after decontamination and washing which is wrong. (FG 1, R1)

Shortage of instruments at the various wards pushed the health workers to use the unsterilized instruments as stated by some participants:

As health workers, we know we have to use sterilized items all the time when performing some procedures. But the insufficiency of these instruments compel us to use the unsterilized spare ones we have in our wards, especially during emergencies. I think the hospital should provide enough sterilized materials and also conduct routine checks to ensure everyone uses sterilized items where necessary. (FG 2, R5)

The findings of the study reported that some participants expressed dissatisfaction concerning what she observed regarding the use of unsterilized instruments:

I remember observing at a hospital, how instruments we used to deliver a baby were washed in bleach and dried in the sluice room, only to be brought back within a short period to be used for another patient. Sometimes, these instruments are seen with blood stains from the previous patient. This can introduce organisms, especially where the woman has to undergo an episiotomy. (FG 2, R3)

Barriers toward the prevention of hospital-acquired infection. Participants in this study listed some factors that made it difficult for them to strictly adhere to the infection prevention practices. Three sub-themes derived from this theme were increased workload, lack of superior support, and inadequate resources.

Increased workload. Some participants stated that increased workloads in the hospital made it difficult to observe all the safety measures needed to prevent HAIs. This was evident in the following remarks:

Mainly, as the workload increases, it becomes difficult to protect yourself or the patients. For instance, in the hospital, you might have been asked to give IV medication to a patient. After opening the cork, and coming into contact with the fluid of that patient, you observe that another patient is twitching due to a

seizure attack. You may not even remember to remove your gloves or wash your hands since you are in a hurry to prevent the patient from falling. Unconsciously, you end up transmitting bacteria from one person to another. When you have a lot of patients to take care of, there are many things you are likely to omit. As a student at the ward, everyone calls you to do something for them, and you begin to omit certain vital infection prevention protocols. An increase in the numerical strength of nurses especially in middle-income countries like Ghana, will address this issue. (FG 2, R5)

Another participant also pointed out that emergency cases were also part of that workload that causes nurses to forget the safety precautions:

Emergency cases are such that everyone is required to do something to save a life within the limited time. So you may not have enough time to go through the normal infection prevention protocols while racing against time to save the life of a patient. Addressing the issue of insufficient staff on duty will prevent these problems. (FG 3, R5)

Lack of superior support. Support from superiors in the hospital serves as a great motivation to the health workers, in that it encourages them to practice safety precautions. However, some of the participants stated that the health superiors failed to support them in adhering to the safety protocols:

Well, I think most of the student nurses are afraid of their nurse in-charges. With the use of some materials such as gloves and nose masks, some of the in-charges will shout at you to create the impression that you are changing gloves or masks too often. This can go a long way to de-motivate us in adhering to infection prevention. To avoid being embarrassed, most people use the same item for more than one patient. (FG 3, R3)

I recall an instance when I was washing my hands. A senior nurse passing by asked me why I have wasted so long a time in the process and asked if I was washing my sins away. I laughed though, but deeply thinking about it, those are the petty things that discourage us from practicing interventions to help us prevent infections. (FG 1, R6)

According to the data collected, some protective equipments are given to specially selected people, leaving the rest to work without any protective clothing:

When there is a procedure which requires the use of an apron to be done, they give it to only the staff nurses leaving the nursing students to do the procedure with their bare uniforms. If there are microorganisms especially in this Covid-19 era, it will be easier for us to pick them up. (FG 2, R2)

Inadequate resources. Most participants revealed that the hospitals had inadequate resources such as gloves, nose masks, goggles, and aprons. They claim that it was difficult getting access to these resources all the time in the wards:

Sometimes, the things we need to use to protect ourselves are not available. You do not always have the materials such as liquid soap, tissues, and water. The water supply can completely be cut off, and you will have to resort to using alcohol all day which also makes our hands dry a lot, and I think that is not the best. (FG 1, R1)

With regard to gloves, sometimes only one box to be used for the whole day which sometimes finishes during one shift. The staff in the other shift will then have to go round looking for gloves and if they do not get any, will have to manage on the ward without any glove which exposes them to infections. (FG 3, R4)

Discussions

It was important to note the diverse views that participants had concerning the various measures of prevention against HAIs. Most of the participants emphasized the significance of cohering to the necessary practices since they believed that diligently committing to them is bound to prevent the spread of infections. They also mentioned that unsafe practices such as putting needles on the mattresses of patients and re-using them, not washing hands frequently, and not ensuring neatness in the various wards led to the promotion of microorganisms that can cause infections. The findings of this present study agree with a recent study done in 2021 which revealed a high level of infection prevention control among students.²⁹ The study discovered that the self-reported compliance with infection prevention was 83%, 81% of the students practiced personal protective equipment use, and 83% knew how to dispose of sharps correctly. However, observing staff nurses breaching the infection control practices may affect their views as well as practices of infection prevention in the future.

Other participants also revealed that they made conscious efforts to protect themselves, by wearing the necessary protective equipment before a procedure or using sterile instruments when performing wound dressing and washing their hands frequently. A similar result was identified among nurses in Saudi Arabia.³⁰ These nurses made sure that all the preventive protocols were practiced by all the health care workers in the hospital. However, in the same study, it was recognized that the medical doctors although aware of the importance of PPE as part of the infection control practices were of the view that its usage was necessary for the isolation wards and the intensive care units. The non-concerned attitude of some health care providers as listed by participants can contribute to the spread of HAIs including Covid-19 and prolong patients' stay on the ward. It was also recognized in this study that Covid-19 played a major role in ensuring that all the health workers practice measures meant to protect themselves against infections. Most of the participants were of the view that since they (health workers) were most vulnerable to infections, it was necessary not to neglect

their protection and engage in preventive practices, especially hand washing and wearing of the nose masks regularly. Nevertheless, a study in Ethiopia revealed that only a few of the health care workers practiced infection prevention even though the majority were aware of HAI prevention.³¹

Another significant finding identified by most participants of this study was that they practiced hand washing before entering and after leaving the hospitals, before and after every procedure, and after getting into contact with every patient. Concerns were expressed by the participants that each health worker and each patient must hold hand washing in high regard and fully commit to washing their hands as frequently as they could. Similarly, a positive observation was made among the participants where 79.5% of the respondents disclosed washing their hands between attending patients.³² It was, however, observed that 20.5% of these respondents stated that they do not wash their hands as often as was necessary. Since hand washing has become mandatory in the various facilities due to Covid-19, it is expected that the HAIs, as well as Covid-19 incidence, will keep decreasing which will, in turn, reduce deaths associated with HAIs, since an author found that hand hygiene helps to reduce Covid-19.³³

However, the finding revealed that few participants of this study shared wrong views regarding hand washing by stating hand washing should be done whenever a health care worker moves from one patient to the other to give care. This was a wrong view because according to CDC guidelines, hand hygiene is a general term that applies to either hand washing, antiseptic hand wash, antiseptic hand rub, or surgical handantiseptis.³⁴ When hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids, hand washing with either a non-antimicrobial soap and water or an antimicrobial soap and water is recommended. If hands are not visibly soiled, an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations is used.

Aseptic techniques describe techniques used to create a state of sterility and eliminate the presence of pathogenic organisms. Some participants gave similar definitions and identified that the aseptic procedures are usually done when performing invasive procedures for patients. They identified instances such as wound dressings and setting up intravenous fluids for a patient using aseptic techniques that would help reduce the chances of introducing microorganisms to the patient. Nevertheless, they reported that it was not fully adhered to due to various barriers. They further reported that some HCW was not strictly adhering to these protocols while performing invasive procedures. The finding supports a study in Ghana where it was identified that, even though gloves and other equipment were available on the various wards, it was not easily accessible to work with.³⁵ This was due to the reluctance of the ward sisters to issue enough materials at a time for the staff to use with the excuse of misuse of the materials by the nurses. However, a study reported

that adherence to the Aseptic technique among operating room nurses was high.³⁶

Some participants mentioned sterilization as one of the preventive methods that could prevent HAIs. However, they voiced out that even though the instruments were sent to be sterilized, they did not trust if the instruments were 100% sterilized. Other participants also stated that some of the health workers re-used some instruments right after decontaminating them without them being sterilized. This served as mediums for bacteria to be harbored and in the end, transmit infections from one patient to another. The participants, therefore, admonished the hospital to ensure that these instruments are sterilized before they are re-used. Other participants also noted that some of these instruments were not enough on the wards and as a result, led the health workers to use the unsterile instruments. A researcher claimed that all instruments must be sterilized in a standardized manner to be effective.³⁷ This could be through physical means such as autoclaving, dry thermal, or wet thermal, or through chemical means including gas sterilization with ethylene oxide.

The increased workload in the various health care settings was a barrier to many of the participants as they claimed that they find it difficult to protect themselves when the number of their patients' increases. They added that one is likely to omit the safety precautions when trying to attend to the needs of the patient during emergencies and in the end, transmit bacteria from one patient to another. Similar to this, 26% of participants in another study stated that IPC practices seemed to be an extra demand on them when attending to many patients on the ward.³⁸ This was found to negatively affect the level of compliance among the health workers in their study and the current study as well. In addition, increase workload and fatigue were discovered by other authors to serve as an obstacle toward infection prevention practices among nurses.³⁹

Superiors in the health care settings exerted a form of motivation to the health workers in encouraging them to adhere to the safety precautions. Participants noted that these superiors turn out to de-motivate the health workers by failing to support them when they (participants) want to commit to the safety protocols. Some participants commented that they received some scolding from some of the ward in-charges when they tried going for disposable gloves to use during procedures. Others are also accused of wasting resources such as soap, water, and paper towels. Due to this, they deem it better to go without washing their hands or using any protective clothing at all. Contrary to these findings, it was necessitated in an article that, it was the duty of the hospital administration to ensure that every nurse or health worker complies with the daily infection control practices to prevent infections or the transmission of infection.³⁹ In other words, every superior personnel in the ward is to ensure that each member receives adequate resources in making sure that he or she is fully protected and can protect the patients as well, without any form of hindrance.

Availability of resources was found to be a great determinant of the compliance level of participants to the preventive measures of HAIs. Few of the participants stated that resources such as soap, water, and hand towels were important resources that are required in hand washing. Without these resources, participants were forced to resort to the use of alcohol-based rubs that caused dryness of their hands to which they stated were not comfortable. It could be concluded that the low availability of infection prevention resources could be attributed to the lack of funds by the hospital. The participants, therefore, recommended that hospitals need to address this problem as inadequate resources posed a great threat in the adherence to IPC measures. It was pointed out that, the availability of soap was not constant as was appropriate, and this caused most of the nurses to skip the standard safety precautions.⁴⁰ This caused the reinforcement of the IPC precautions in the chain of infection transmission to break.

Strength and limitation

Using FGDs ensured retrieving diverse views, unlike face-to-face in-depth interview guide. Also, participants were selected from three different hospitals from the Greater Accra Region of Ghana. However, the number of participants recruited in each focus group was six, which makes it a limitation since it may affect the richness unlike using a larger group number. Nevertheless, the fewer number in the group made the discussion well moderated. Only data from students were obtained, and there was no evidence from staff that the students had actively participated in infection prevention and control during clinical placement.

Conclusion

It was concluded from the study that most of the student nurses had adequate information about HAIs and wish to adhere to the Infection prevention protocols. However, the study revealed that some of their superiors were not following the infection prevention protocols strictly and were also discouraging them from sticking to these protocols, and these were revealed to de-motivate the student nurses. Participants also disclosed some barriers that hinder the practices of infection prevention. It was concluded from the study that most of the student nurses had adequate information about HAIs and wish to adhere to the infection prevention protocols. However, the participants observed poor infection prevention practices among the staff they were learning from which could harm them. It is therefore recommended that more attention is focused on infection prevention and control in clinical practice among nurses.

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Availability of data and materials

The supplementary materials will be provided upon request by noticing the corresponding author via email

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.

Ethical approval and consent to participate

Ethical clearance was first obtained from the Dodowa Health Research Center Institutional Review Board with the reference number (DHC-IRB 81/07/20). Verbal and written consent was also obtained by seeking permission orally from the participants and allowing them to sign a consent form after the purpose and the process was explained to them.

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Informed consent

Written and verbal informed consent was obtained from all subjects before the study.

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Supplemental material

Supplemental material for this article is available online.

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