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ORIGINAL ARTICLE

Barriers to infection prevention and control practice among Amhara region teaching hospitals in Ethiopia: qualitative study

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Abstract

Healthcare workers have good perception towards infection prevention, but there has been a poor practice towards it. Therefore, the aim of this study was to explore barriers to practice of infection prevention and control practice in teaching hospitals in Amhara region. A phenomenological approach used to explore the lived experience of healthcare workers and management staff towards infection prevention practice and control. The data were collected from ten in-depth interviews and 23 focus group discussion participants, by face to face interview using open ended interview performed in safe and quiet places. Data were managed using OpenCode software version 4.03 and contents were analyzed thematically. In total ten different barriers were identified, such as availability of facilities, shortage of material supply, lack of maintenance of facilities and equipment, high patient flow, experience, emergency situation, healthcare worker behaviour and healthcare workers' information about infection prevention, low awareness of patients and visitors and overflow of families and visitors to the hospital. For effective infection prevention practice implementation, barriers should be considered from the perspectives of the organization, HCWs, and patients and visitors.

Keywords: Infection control, barriers, healthcare workers, teaching hospitals, Ethiopia

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Introduction

Healthcare-associated infections (HAI) are one of the major public health problem worldwide with an impact on morbidity, mortality and quality of life.[1] According to a World Health Organization report, out of every 100 patients, seven in developed and 15 in developing countries acquired at least one HAI in acute care hospitals.[2] In Ethiopia, the prevalence of HAI in teaching hospitals was 14.9 percent.[3]

Healthcare-associated infections affect patients, visitors, family members and healthcare workers (HCWs). Patients are more vulnerable to infection because of invasive procedures.[4] Implementation of infection prevention and control (IPC) practices leads to significant reductions in HAI. Effective IPC programs lead to more than 30% reduction in HAI rates.[5] However, HCWs have good perception towards infection prevention,[6] but there is still a high prevalence of needle stick injury and exposure of blood and body fluids.[7,8] This may be due to poor infection prevention practices, or HCWs may be unable to practice appropriate standard precautions.[9] Healthcare worker behavior,[10,11] environmental and organizational characteristerics,[12] occurrence of emergency situations,[13,14] lack of available material,[15] shortage of time,[16] and poor communication between patients and HCWs,[17] were some of the barriers to infection prevention practice.

Despite the availability of studies abroad, evidences to barriers of IPC to control HAI were limited and not explored in the study area. The findings of this study helps policy and decision makers to intervene about the problem in similar health institutions in resource limited settings. Therefore, the aim of this study was to explore barriers to practice proper IPC in teaching hospitals in Amhara region.

Methods

Design

A phenomenological approach to understand the experiences of IPC practices of HCWs and management staff working in two teaching hospitals was assessed. These hospitals were founded in Amhara regional state of Ethiopia and serve as a referral and teaching hospital in the region. University of Gondar and Felege-Hiwot Hospital have 498 and 378 inpatient beds respectively. University of Gondar is the first public health college hospital in Ethiopia.[18] The barriers and challenges to the implementation of IPC practice to prevent HAI were explored.

HCWs were purposefully selected for interview based on their experience and sufficient knowledge regarding the hospital management set up and their willingness to participate.

Data collection

A face to face interview was conducted from each ward; surgical, medical, paediatrics, obstetrics and gynaecology and ophthalmology and one with the environmental hygiene officer. Focus group discussions with similar health professionals were also conducted. Both the face to face interviews and the focus group discussions were facilitated by the principal investigator. One additional note taker was used for the focus group discussion. Discussions started after all participants agreed following an explanation on the purpose of the research. Confidentiality of the information was assured. All interviews and discussion voices were tape-recorded for full transcription.

The semi structured interview guide was used for both in-depth-interview and focus group discussion. The interview guide was developed based on previous literature on barriers and challenges to the implementation of infection prevention and control practice. Interview guide was tested and checked before the actual data collection. Interview guide questions had simple definition terms of the broader contextual definitions to interlink the ideas. For both focus group discussion and in-depth interview, the following questions were asked during the discussion:

1. What does hospital acquired infection mean?
2. What are the basic components of infection prevention?
3. Do you know how important is infection prevention practice to the community such as, patient, healthcare worker, for the general community?
4. What are the basic activities conducted in the hospital to protect infection prevention activities?

5. What are some of the sources of the problem to conduct infection prevention activities?
6. Are there institutional factors for practicing infection prevention?
7. What are the management factors that contribute to the infection prevention activities?
8. What are the healthcare workers factors that contribute to the infection prevention activities?
9. What kind of measurement is relevant for the prevention and control of infection prevention practice?

A total of 33 HCWs and management staff participated in this qualitative study. Ten participants to in-depth interview and 23 to focus group discussion were selected purposively as those who have direct involvement with patients in the wards. Healthcare providers and management staff, knowledgeable to the respective department and ward, were part of the discussion for the study. The interviews were conducted from March to April 2015. For each focus group discussion an average of six participants was included. Participation was voluntary. The interviews were conducted in a safe and quiet place to prevent disturbances during discussion. The team was composed of one public health and one microbiologist from a non-medical profession, and one medical doctor. None of the research team members was related with any of the study participants.

An average of 67 minutes for each group discussion and 38 minutes for an in-depth interview was used to collect the data for discussion. Level of saturation was used to determine adequacy of data for each concept and to go to the next discussion topic. Debriefing was conducted after each interview (both focus group discussion and in-depth interview) using field notes to see the presence of new ideas and concepts and to formulate the next interview.

Ethical considerations

Ethical approval was obtained from the Addis Ababa University College of Health Science Institutional Review Board. The School of Public Health and advisors approved the protocol. Data were collected after written consent from each participant with a brief description about the importance of the study.

Analysis

Data were gathered in the form of audio recordings and notes from the in-depth interview and focus group discussion. The text was analyzed thematically. Prior to analysis, all the collected data were transcribed into English. The field notes were checked for accuracy and completeness. The transcribed data were read more than three times to understand the context. Audio recorded data were transcribed to text files, then imported to OpenCode software (University of Umea, Sweden). Data analysis was conducted with OpenCode software version 4.03 and the contents were analyzed thematically. Coding was conducted carefully, reading line by line several times by two research investigators. A coding tree was constructed to understand the relationship of ideas and look for links between themes. The codes were grouped into categories and then analyzed thematically.

Result

Characteristics of the respondent

A total of 33 HCWs and management staff participated in the discussion, 17 from Felege-Hiwot and 16 from University of Gondar teaching hospitals. One HCW did not agree to participate. Among the participants 20 were males and the remaining 13 were females. Of the total participants, 16 were nurses, seven physicians, four environmental health officers, two laboratory technologists and one occupational health and safety officer. The age range of the respondents was from 23 to 48 years.

Understanding the problem

All participants in this discussion had adequate information regarding HAIs and infection prevention practice. The majority of the participants agreed that there were activities related to IPC in their hospital. However, most of them believed that these activities were not enough to prevent HAIs. Activities related to infection prevention were; infection prevention monthly report and discussion, quality team works on death audit and needle stick injury survey, hepatitis B vaccination for HCWs (for those who had sharp

and needle stick injury) report, surgical site infection audit, supplies check and balance system, and health education for patients.

Even if there were adequate information and activities conducted in their hospital, all participants admitted that non-compliance to standard precautions and challenges and barriers to IPC practice were common in their ward.

Barriers to infection prevention and control practice

The major themes that emerged in the analysis were organizational, and HCW, patient and visitor barriers to practice infection prevention. The sub themes were:

1. Availability of facilities

The majority of the participants described shortage of facilities in the wards as the main barrier to IPC practice. Thus, facilities are relevant for patients, HCWs and family caregivers. Some of the important facilities discussed by participants were toilets, hand washing facilities and shower. In some wards, even though there were facilities there was no water, or they were not functional at all. The problem was also paramount and witnessed by a physician. *"I have not seen a single patient washed their body for the last 8 months in the ward, because even if there is installed pipe, but there was no water"*

2. Shortage of material supply

Reusing materials and equipment in resource limited countries is common. Before reusing equipment and materials, they should be free from micro-organisms. The materials should have passed the standard recommended sterility techniques. In this discussion, the majority of the participants raised the issue of material shortage to apply infection prevention practices in some procedures. A physician in the gynaecology and an obstetrics ward shared his experience: *"In our ward, some instruments are very few in number. For example, manual vacuum aspiration materials are limited in number in our ward, we have only four manual vacuum aspiration tools. Hence, we are forced to re-use without proper sterility procedure. Sometimes in one night, more than four abortion cases came at a time and to sterilize the material, it takes three to four hours, including cooling time. Due to this reason, sometimes we are forced to use the material without appropriate sterility technique, to save the life of the mother."*

3. Lack of maintenance

Regular inspection of materials and maintenance are very important phenomena to approve the quality of the material. It helps determine if the equipment is working properly or not. In particular, highly sensitive procedures and materials should need such inspection, like central supply and others. Such activities were discussed by participants in most of the wards. The problem was considered an obstacle to perform activities in infection prevention.

Maintenance problems were reflected by most participants. In addition, buildings and infrastructure (like latrine, rooms, drainages and hand washing basins) were challenges to IPC practice. The idea was highly reflected on the age of the building that affects the activities of infection prevention due to lack of maintenance of buildings and latrines.

4. High patient flow

All participants agree that patient flow in hospitals was high and a barrier to IPC practice. A female nurse said: *"There are not sufficient nurses in our ward, sometimes one nurse is assigned to 24 patients"* another female nurse expressed *"…. Sometimes I was assigned for 30 beds in one night, besides this there were also emergency and our focus was on saving the life of the patient rather than the long impact of hospital acquired infection. …. at that time, I was not conscious to do here and there, so I do not consider in my mind infection prevention activities."* This leads nurses to loss of intention of improper practice of universal precaution. The problem arises only when there are emergency situations.

5. Experience

Those HCWs who were working for more than five years were considered as experienced and below five years non-experienced. Some groups of participants agreed that low experience had poor IPC practice. This was observed in students. Poor IPC practice was also observed in highly experienced HCWs. The majority of the discussants observed that such experienced HCWs did not follow appropriate standard precautions procedures. In addition to this it was agreed that there

was not any communication or exchange of ideas between senior and junior team members regarding IPC practice.

6. Emergency situations

Sometimes physicians and nurses may be in a hurry to save a patient's life in an emergency condition. Application of normal procedures for standard precaution may not be performed. Most of the participants agreed that when there was an emergency condition they were unable to follow the normal procedure. In addition, the emergency situation creates shortage of time to perform appropriate standard precautions. A male nurse in the surgery ward explained that *"…… Shortage of time forced me to accept that there is no risk without visible fluids and wounds in the patient."*

7. Behaviour of healthcare workers

Professional variation between nurses and physicians were one of the variations in utilization of standard precautions. The majority of the discussants said that nurses practiced properly compared to physicians in certain standard precautions. A physician expressed that there were also some challenges for the utilization of hand rub "…… *believe that alcohol provided to this hospital is not Vaseline based, so they assumed that it will dry their hands and causes skin breakage"*

8. Healthcare workes information

Understanding of HAI and IPC practice is crucial to all HCWs in the hospital. But this was the issue raised by some participants and there was information gap, especially in cleaners or janitors regarding IPC practices.

9. Low awareness of patients and visitors.

HCWs are expected to give information to patients that should be taken as a measure to prevent HAI. This information was provided to patients and also to their families or caregivers. Though the community expects that hospital environment was safe and clean, there are risks of infection in healthcare environment. The majority of the discussants observed that there were challenges to IPC practice in patients and families or caregiver's side. A portion of patients and their visitors have poor perception towards the hospital environment. Sometimes health education may not suffice to bring the appropriate IPC practice to patients and their visitors.

10. Overflow of families and visitors

This was one of the major obstacles for HCWs to perform their activities in the two hospital wards. All participants agree that overflow of families and visitors have an impact to IPC practice.

Discussion

It is important to understand the cause of HAI and barriers to perform IPC practice. To minimize infection to patients, HCWs, families and visitors, IPC practices are important. This research identifies barriers in infection prevention into three themes: organizational or institutional barriers were the first theme and included availability of facilities, shortage of material supply, lack of maintenance of facilities and equipment's and high patient flow; the second theme was healthcare worker related barriers including experience, emergency situation, healthcare worker behaviour and healthcare workers information about infection prevention; patients' and visitors' barriers were the third and included low awareness of patients and visitors and overflow of families and visitors to the hospital.

Barriers and challenges identified in this study were highly influential for IPC practice. The findings are transferable to other similar setups for the improvement of IPC activities. Availability of toilet, shower, hand-washing material and other facilities are very important to practice infection prevention for HCWs, patients and families or visitors in the hospital. The unavailability of facilities was considered as the barrier for proper IPC practice in this study. This was also supported by a similar study conducted in Cyprus on nurses that were non-compliant with standard precautions.[15] A similar questionnaire-based study also supported this finding for practice of infection prevention practice.[14]

Shortage of material supply and equipment, and their regular maintenance, were other important identified barriers to infection prevention practice. It was mentioned by the majority of the participants that they were forced to practice inappropriate procedures and steps. The problem was also explained by healthcare workers working in hospitals in the USA and The Netherlands.[14,16]

High patient flow in the hospital leads to shortage of time for HCWs to practice their activities including infection prevention practices.[15,16] In our finding the high burden of patients in the two hospital leads HCWs to unintentionally have improper practices of standard precaution. A similar research reported that lack of time was a barrier to practice infection prevention in the work environment.[14,19]

Healthcare worker related barriers

Experience of HCWs was one of the barriers to IPC practice in this study. Some of the discussants agreed that experienced HCWs did not follow appropriate standard precautions procedures. This observation was supported by a questionnaire survey conducted on HCWs, when experience increases the risk of needle stick injury and exposure of blood and body fluids increase.[7,8] On the contrary, in our study it was observed that the risk for sharp and needle stick injury in medical students was higher than that of experienced staff. This may be because experienced HCWs develop skill regarding this issue.[15] Students may be overloaded with many tasks and they may be too focused only to pass their exams.

Activities in the hospital may prioritized to saving a patient's life in an emergency condition. In this study this was seen as a barrier to practice IPC activities. Participants discussed that sometimes in emergency condition they were unable to follow the normal procedure of their institution. Similar findings were reported in other studies, in that during emergency situations HCWs were unable to wear gloves and follow appropriate procedures.[14–16]

Many studies have indicated that there was a professional difference between physicians and nurses. Some researchers concluded that nurses are more compliant with appropriate standard precautions when compared to physicians.[16] In this study the majority of respondents agreed that nurses were better than physicians in some practice of infection prevention. In spite of this, previous research indicate that physicians have good knowledge regarding standard precaution of hand hygiene[19] and physicians utilize more alcohol hand rub compared to nurses.[20] This difference may be due to the fact that this study was conducted in teaching hospitals and physicians were more experienced and have confidence to perform their activities.[15] The other reason that may inhibit physicians to practice hand hygiene may be soreness and dryness of hands following use of alcohol rubs.[16] In line with this study, other research showed that the behaviour of HCWs was a barrier to infection prevention practice in hospitals.[10,21]

Knowledge of HCWs is fundamental to practice infection prevention activities in the hospital. In this research, some participants discussed that there were no standard understanding of IPC practice in all HCWs in their ward. This knowledge gap was observed especially in cleaners or janitors. This type of gap was also observed in a similar research conducted by Ider *et al*.[21]

Patients are at greater risk than non-patients to acquire HAI in a hospital environment. Healthcare workers are expected to give information to patients on how to care for themselves to prevent infections. Studies showed that patients had poor communication with HCWs regarding infection prevention.[17] A questionnaire-based study conducted in different parts of the world about patients' knowledge and practice of infection prevention in the hospital found that it was poor.[17,22–24] In this study the majority of the participants reported that there was poor infection prevention practice amongst patients, families or caregivers. Therefore due to their poor perception, families, care givers or visitors increase their number in the hospital work environment unnecessarily, making the HCWs unable to perform their task and creates a challenge to practice infection prevention practice.

This study had some limitations. The discussion includes mainly HCWs, physicians, nurses, environmental health, occupational health, laboratory and other management staff. Other allied health professionals like pharmacy professionals were not included. Drug resistance patterns of common hospital acquired micro-organisms were not explored well in this study. This study focused only on self-reported, lived experiences of HCWs' behaviours and did not include patients' views of their perception and challenges to infection prevention practice. This limits the triangulation of information to increase the validity of information in addition to HCWs and management staff.

Even if it is not possible to generalize to all teaching hospitals, it is possible that these findings can be extrapolated to other similar settings. To assure this, the study team tried to discuss in depth until data saturation of ideas, and purposefully included different types of health professionals in the wards. Thus, exploratory findings try to observe some of the challenges of IPC practice in teaching hospitals, and this observation should be promoted to healthcare managers, HCWs, patients and family caregivers.

Conclusion

The majority of the participants had good information about IPC practices. However, understanding the practices does not guarantee these activities will be practiced. Three themes with ten barrier sub-themes were identified that described barriers to IPC practice in teaching hospitals in Amhara region. Thus, barriers should be addressed via identifying effective implementation of interventions targeted specifically towards the organization, HCW and patients and visitors.

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