

## Hand Hygiene Compliance/Practice and Knowledge among Healthcare Staff in Intensive Care Unit of Aabet Hospital, Addis Ababa, Ethiopia

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### Abstract

**Introduction:** Hospital-acquired infections are a major threat to patients. It is estimated about 50% of health care associated infection occurs due to hand of health care providers (HCPs). Therefore, good hand hygiene compliance is the simplest and the most valuable method of infection control in hospital. The importance of this simple procedure is not sufficiently recognized by health-care workers (HCWs) and poor compliance has been documented repeatedly. Notable factors for poor compliance include hand irritation, inaccessibility or shortage of hand-washing equipment, dense working conditions and poor knowledge. The objective of this study was to assess the knowledge and practice of hand hygiene among health care workers in ICU.

**Method:** A cross-sectional study with convenient sampling of all ICU staff who were giving service. All ICU staff were included in the study (n = 38) who were working in 2018 at the time of data collection. A survey was done by filling a close ended validated questionnaire and tried to maintain its anonymous. The data was entered and analysed using SPSS version 21. Descriptive statistics like frequencies and percentile was performed.

**Result:** A total of 38 study participants were interviewed with self-administered questionnaire. The majority 89.5% of the respondents were knowledgeable on Hand hygiene compliance [HHC]. Fourteen of the respondents (38.9%) had been trained for HHP. Regarding knowledge on the presence of infection prevention [IP] committees, about fourteen (37.8%) of the respondents knew the presence IP committees. The majority of the respondents i.e. nineteen (51.4%) didn't always practice hand hygiene. Most of the respondents (52.9%) reasoned out that facility was not conveniently placed followed by lack of convenient sink.

**Conclusion:** The findings of this study showed that the majority of respondents had adequate knowledge about hand hygiene practice, but didn't have compliance to HH and the result of the study was low. A limited number of staff had been trained for HHP and there was also low availability of facilities needed for HPP. These findings are crucial as it reveal strong gaps in the facility in terms of provision of suitable facilities which contribute and improve hand hygiene compliance. Therefore, it calls for enhancement of facilities at the ICU and strengthening training of staff in order to improve the hand hygiene compliance.

**Keywords:** Hand Hygiene; Hand Hygiene Compliance; Hospital-Acquired Infections; Infection Prevention

### Abbreviation

HH: Hand Hygiene; HHP: Hand Hygiene Practice; HHC: Hand Hygiene Compliance; HCAIs: Health Care Associated Infections; HCPs: Health Care Providers; HHC: Hand Hygiene Compliance; ICU: Intensive Care Unit

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## **Introduction**

“Hand hygiene (HH) is a compliance of cleansing hands using soap and water or using antiseptic hand rub for removal of transient microorganism from hands and in the way of keeping the skin condition” [1]. Any action of hand cleaning is referred to as hand hygiene [1]. Hand hygiene, either by hand washing or hand disinfection, remains the single most important measure to prevent nosocomial infections and the spread of antimicrobial-resistant pathogens and subsequent nosocomial infections [2,3].

Hospital-acquired infections are a major threat to patients. It is estimated that annually about hundreds of millions of patients suffer from health care associated infections (HCAIs) worldwide [1,4]. Globally, 5% - 10% of patients acquire nosocomial infections, with prevalence rates of 20% - 30% for patients admitted at the intensive care unit (ICU). This leads to a considerable burden of disease and mortality [1], prolonged hospital stay, high amount of economical cost of drugs [1,4,5].

Hand hygiene is the simplest and effective measure to prevent infections [4,6-8]. However, about 50% of health care associated infection occurs due to hand of health care providers (HCPs) [5]. Therefore, good hand hygiene compliance is the simplest and the most valuable method of infection control in hospital [1,4,8]. Hospital acquired infection through the hands of health care workers is mostly due to poor hand hygiene of the health care providers [1,2,4]. Hand hygiene compliance is the way of minimizing transmitting microorganism which may be multi drug resistant for those patients who have been infected and admitted in the hospital due to their cause and has got other infection by contaminated health care provider’s hands [1,3,9].

Hand hygiene, either by hand washing or hand disinfection, remains the single most important measure to prevent nosocomial infections [2]. The importance of this simple procedure is not sufficiently recognized by health-care workers (HCWs) [2] and poor compliance has been documented repeatedly [2,4]. Notable factors for poor compliance include hand irritation [4], inaccessibility or shortage of hand-washing equipment [4,10], dense working conditions [4,8,11] and poor knowledge [4,8].

## **Aim of the Study**

This study aims to provide a useful insight into the prevailing practices of hand-hygiene and to points out major gaps or obstacles of the current practice in ICU of Aabet. This kind of study has not been done at Aabet hospital. Therefore, this study was assessing the knowledge and practice of hand hygiene among health care workers in ICU. Addressing this will help us to identify the root cause of the problem and influencing factors which can play a crucial role in tackling high burden of HAI and improve HH practice.

## **Method**

### **Study Area/setting**

St Paul millennium hospital is a teaching hospital that provide care to the residents of Addis Ababa and all over Ethiopia. The study was conducted at Aabet Hospital for 1 week in 2018. This hospital is one of the trauma and burn centers in Ethiopia. It was established in 2015 as part of St. Paul millennium medical college. It is located in Addis Ababa, the capital city of Ethiopia. The hospital has over 2,000 staff, serving a population of approximately more than 5 million. Aabet currently provide health care service in several specialties namely: orthopedics, neurosurgery, plastic and reconstructive surgery and emergency and critical care. Aabet hospital has approximately 20 - 30,000 total visit to the hospital and provides a variety of outpatient services, including emergency service and provides elective and emergency surgeries of the respective departments. The hospital has 2 ICUS with 18 bed capacity. Both ICUs have conveniently located hand washing facilities.

### **Study design and period**

This was a cross-sectional study with convenient sampling of all ICU staff (health care members namely; clinicians, nurses, physician and other staff was taken as sample size who were giving service. All ICU staff were included in the study (n = 38) who were working

at 2018. Adherence to hand washing and knowledge was assessed using pre tested questionnaire Survey. The study population was all health care providers who are working at ICU at the time of the data collection.

## **Variables**

### **Independent variables**

Age, sex, religion, profession, educational level, marital status, year of experience.

### **Dependent variables**

- Hand hygiene practice compliance.
- Knowledge of hand Hygiene in AaBET.

### **Inclusion criteria**

All ICU staff were included in the study (n = 38) who were working at 2018.

### **Exclusion criteria**

No exclusion criteria.

### **Data collection and statistical analysis**

A survey was done by filling a close ended validated questionnaire and tried to maintain it anonymous. The questionnaire was pertaining to intentions of adherence to and hygiene, perception and knowledge, accessibility of sanitary material. It also involved the facts about difficulty of adhering to hand hygiene and the reason for not adhering.

Each completed questionnaire was checked visually for completeness before fed to computer. The data was entered and analysed using SPSS version 21. Descriptive statistics like frequencies and percentile was performed. Ethical clearance was obtained from academic and research unit. The purpose of study was well explained to the study participants and informed consent was obtained. Confidentiality was maintained at all levels of the study by avoiding use of name and other identifiers. Participants' involvement in the study was on voluntary basis; participants who were unwilling to participate in the study and were informed to do so without any restriction.

### **General objective**

- To assess the knowledge and practice of hand hygiene among health care workers in ICU in AaBET hospital Addis Ababa, Ethiopia.

### **Specific objective**

- To describe the Socio-demographic characteristic of the health care providers in ICU of Abet Hospital, Ethiopia, demographic characteristics of road traffic injuries.
- To describe variables related to hand hygiene practice compliance and assess hygiene practice compliance in ICU of Aabet Hospital, Addis Ababa, Ethiopia.
- To assess knowledge and training of hand hygiene practice in ICU of Aabet Hospital, Addis Ababa, Ethiopia.

### **Research questions**

It is stated above that the magnitude of the problem needs to be critically evaluated. This study concentrated on the listed research questions:

1. What is the evidence on knowledge and training of hand hygiene practice of ICU staff in Aabet hospital, Addis Ababa?;
2. What is the hand hygiene practice compliance rate of ICU staff in Aabet hospital?;
3. What is the reason for not complying hand hygiene practice of ICU staff in Aabet hospital;
4. How the situation can be improved?

## Results

This study was across-sectional study conducted among health care providers of Aabet Hospital to assess the knowledge and practice of hand washing. The findings of the study are presented in this section.

A total of 38 study participants were interviewed using a self-administered questionnaire. The mean age ( $\pm$ SD) of respondents was  $26.62 \pm 3.5$  years. The majority of the respondents (65.8%) were Orthodox Christians. Out of 38 participant's majority were nurses (71.1%), (23.7%) of the respondents were physicians and the remaining (5.3%) were interns. Thirty (78.9%) reported to be single. The year of experience of the respondents were 28.9%, 44.7% and 26.3% for 1 year, 1 - 4 year and above 4 years respectively (Table 1).

The majority 94.7% of the respondents were knowledgeable on Hand hygiene compliance [HHC]. The overall hand hygiene compliance was 89.5%. Fourteen of the respondents (38.9%) had been trained for HHP. Out of those trained staff about 8 (100.0%) were physician. While nurses and interns were 24 (96.3%) and 2 (50.0%) respectively (See table 1-3). Twenty-nine of the participants (76.3%) assured the presence of Alcohol Based Hand Rub [ABHR]. Seven of the participants (18.4%) reported that the presence of individual towel or tissue paper for drying in their working area. Regarding knowledge on the presence of infection prevention [IP] committees, about fourteen (37.8%) of the respondents knew the presence IP committees (Table 3). The staff was asked if they practicing hand hygiene always by self-administered questionnaires. The majority of the respondents i.e. nineteen (51.4%) didn't always practice it. Out of the respondents who practice hand hygiene always nine (100.0%), twenty-six (96.3%) and two (100%) were physician, nurses and interns. Most of the respondents (52.9%) reason out that facility was not conveniently placed followed by lack of convenient sink (See figure 1).

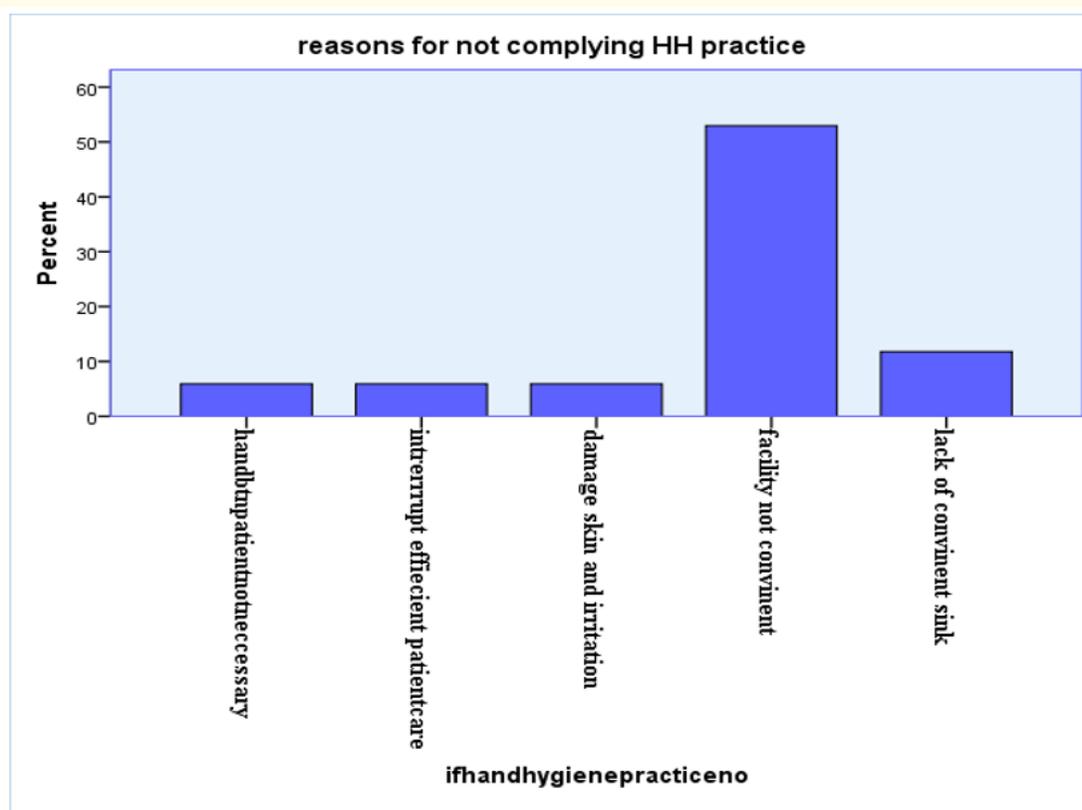


Figure 1: Respondents' reasons for not practicing hand hygiene in Aabet Hospital, Addis Ababa, Ethiopia, 2018.

Variables		Frequency	Percent (%)
Age	18 - 24	8	27.6
	25 - 34	19	65.5
	≥ 35	5.3	6.9
Sex	Male	10	26.3
	Female	28	73.7
Religion	Orthodox	25	65.8
	Muslim	8	21.1
	Protestant	5	13.2
	Others		
Profession	Physician	9	23.7
	Nurses	27	71.1
	Interns	2	5.3
Educational level	Diploma	9	23.7
	BSC (1 <sup>st</sup> degree)	21	55.3
	2 <sup>nd</sup> degree and above	6	15.3
Marital status	Married	8	21.1
	Single	30	78.9
Year of experience	< 1year	11	28.9
	1 - 4 year	17	44.7
	> 4 year	10	26.3

**Table 1:** Socio-demographic characteristic of the health care providers in ICU of Abet Hospital, Ethiopia, 2018 (n = 38).

Variable		Frequency	Percent
Hand hygiene practice before touching patient	Yes	23	60.5
	No	15	39.5
Hand hygiene after touching patient	Yes	30	78.9
	No	8	21.1
Hand hygiene practice after exposure to body fluids	Yes	36	94.7
	No	2	5.3
Hand hygiene before aseptic and clean procedure	Yes	24	64.9
	No	13	35.1
Hand hygiene practice after touching patient surrounding	Yes	26	74.3
	No	9	25.7
Practice hand hygiene always	Yes	18	48.6
	No	22	61.1

**Table 2:** Variables related to hand hygiene practice compliance in ICU of Aabet Hospital, Addis Ababa, Ethiopia, 2018 (n = 38).

Hand hygiene compliance		Number
Overall	89.5%	34
HHC of physician	88.9%	8
HHC of Nurses	88.9%	24
HHC of interns	100.0%	2

**Table 3:** Hand hygiene practice compliance in ICU of Aabet Hospital, Addis Ababa, Ethiopia, 2018 (n = 38).

Variable		Frequency	Percent
	No	9	25.7
Knowledge on WHO indication on hand hygiene	Yes	28	73.7
	No	10	26.3
Training on HH	Yes	14	38.9
	No	22	61.1

**Table 4:** Related to knowledge of hand hygiene practice in ICU of Aabet Hospital, Addis Ababa, Ethiopia, 2018 (n = 38).

Variable		Frequency	Percent
Hospital promoting the importance of HHP	Yes	18	47.4
	No	20	52.6
Availability of soap and water in working area	Yes	27	71.1
	No	11	28.9
Availability of sink in working area	Yes	25	67.6
	No	12	32.4
Availability of towel/tissue paper	Yes	7	18.4
	No	31	81.6
Availability of alcohol based hand rub in the area	Yes	29	76.3
	No	9	23.7
Availability of glove in the area	Yes	31	83.8
	No	6	16.2
Do you know availability of IP committee	Yes	14	37.8
	No	23	62.2

**Table 5:** Variables related to conducive facility for HHP in ICU of Aabet Hospital, Addis Ababa, Ethiopia, 2018 (n = 38).

Training on Hand hygiene		Number
Physician	100.0%	8
Nurses	96.3%	24
Interns	50.0%	2

**Table 6:** Frequency distribution of hand washing training of the participants in ICU of Aabet Hospital, 2018.

Hand hygiene practice always		Number
Physician	100.0%	9
Nurses	96.3%	26
Interns	100.0%	2

**Table 7:** Frequency distribution of hand washing compliance of the participants in ICU of Aabet Hospital, 2018.

Knowledge of hand washing	Frequency	Percent
Adequate	36	94.7

**Table 8:** Frequency distribution of knowledge of hand Hygiene in Aabet hospital, 2018.

## Discussion

The finding from this study illustrates 94.7% of all staffs had adequate knowledge (Table 8). This result was comparable but slightly higher than the study finding done in 2015 at Shenan Gibe Hospital, Staff on hand washing practice in which case 82.9% of the staff had adequate knowledge [12].

In response to the questionnaire, about 73.7% claimed to have knowledge about WHO indication on hand hygiene and its recommendations. When asked whether they were practicing HH always according to recommendations, about 51.4% didn't have compliance to HH and the result obtained from the study was low. This shows that most of respondents perceived HH as useful measure to prevent hospital-acquired infections yet the knowledge was not converted to actions. Studies has shown that good hand hygiene compliance is the simplest and the most valuable method of infection control in hospital [1,4,8]. Most of the respondents gave the reason for not complying with HH as the facility not being conveniently followed by lack of convenient sink and interrupting patient care. Furthermore, About 81% of the respondents said there was no available towel/tissue paper in ICU for staffs. Other study done in (2012) Australia showed that the presence of hand drier will improve HHC [13]. These findings are crucial as they reveal strong gaps in the facility in terms of providing suitable environment which can contribute and improve HH compliance of preparing suitable environment.

A few of the staff (38.9%) had been trained on HH. Out of this about 100.0% physician, 96.3% nurses and 50.0% interns took training on HH. The finding shows the training gap for staff. Since interns have the highest burden and responsibility it is mandatory to create opportunity at this environment as they are at early stage of their career. Even for physician and nurses even if trained already but they still need refresher training. This is because other studies done in India, UK and China which showed that training had positive relationship with HH compliance in all medical staffs [14,15].

Only 37.8% of the staff knew the presence of IP committees in the hospital. It is important to create awareness of the existence IP committee in the hospital for staff. Other studies has shown that presence of IP committees will result in the reduction of HCAs [16]. Furthermore, IP committee may provides supervision on the HH compliance of the health care providers, and audit of HH compliance and may providers to the hospital to address the gap, and possible the IP committees may give feedback to staff at the point of care. It further helps the staff to get access to necessary material for HHP through IP committee.

## Limitation of the Study

The study was conducted with a certain limitation due to the cross-sectional nature of this study temporal relationship couldn't be established between the explanatory and outcome variable. Furthermore, practical observation wasn't included in this study and solely rely

on the administered questionnaire which might overestimate the real situation in ICU. The small sample size and self-reporting through questionnaire are the limitation as they can be source of biased and could affect the result.

### **Conclusion**

The finding of this study showed that majority of respondents have adequate knowledge about hand hygiene practice. Furthermore, most participants claimed to have knowledge about WHO indication on hand hygiene and its recommendations. But didn't have compliance to HH and the result obtained from the study was low. The reason why they not complying to HH practice were facility was not conveniently placed followed by lack of convenient sink and interrupt with patient care. In addition, other factors like no available of towel/ tissue paper in ICU for staffs and low awareness of availability of IP committee aggravate the existing situation. Limited number of staff had been trained for HHP. These findings are crucial as it gives strong gap in the facility in terms of preparing suitable facility which contribute and improve the hand hygiene compliance. Therefore this calls for enhancement of facilities in the ICU and strengthen training to staff in order to improve the hand hygiene compliance.

### **Recommendation**

- Training for ICU staffs on key hand hygiene skills/practice and benefits.
- To enhance training specifically to practicing students(interns).
- To enhance ongoing refresher training on hand hygiene practice for health professionals.
- To strengthen the infection prevention committee.
- To enhance the supervision of hand hygiene practice of ICU staffs.
- To enhance the facility and utility that facilitate the hand hygiene practice.
- To build a reward system for those who have good hand hygiene compliance.

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### **Availability of Data and Materials**

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

### **Competing Interests**

The authors declare that they have no competing interests.

### **Ethics and Consent**

Ethical clearance was obtained from research and publication unit of Aabet hospital. The purpose of study was well explained to the study participants and informed consent was obtained. Confidentiality was maintained at all levels of the study by avoiding use of name and other identifiers. Participants' involvement in the study was on voluntary basis; participants who were unwilling to participate in the study and were informed to do so without any restriction.

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