

ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE



ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE ON HAND HYGIENE AMONG NURSES WORKING IN SPHMMC

BY; DR.DESSALEGN ADEBA (MEDICAL INTERN)

**RESEARCH TO BE SUBMITTED TO THE DEPARTMENT OF PUBLIC
HEALTH, SPHMMC IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE DEGREE OF DOCTOR OF MEDICINE**

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Acronyms and Abbreviations

A.A: Addis Ababa

CI: Confidence interval

SPHMMC: Saint Paul Hospital Millennium Medical College

SPSS: Statistical Package for Social Sciences

SD: Standard deviation

WHO: World Health Organization

SRS; systematic random sampling

HCW; healthcare workers

HH; Hand Hygiene

HCRI; Health care related infection

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1. ABSTRACT

Background: Effective hand hygiene is essential for reducing healthcare associated infections. However, compliance of healthcare workers to hand hygiene guidelines are reportedly poor. It is important therefore to instill adequate knowledge and good attitudes and practices at the time of primary training of the healthcare workers.

Objective: - This paper aims to assess knowledge, attitudes and practices of nurses working in SPHMMC and to improve existing training programs and enhance good practices and working ethics in the future.

Methods: - This research was based in Saint Paul Hospital Millennium Medical College (SPHMMC), Ethiopia and it was a self-administered questionnaire based cross sectional study was done. The data was collected from nurses working in SPHMMC by a self-administered questionnaire. The data was then filled on SPSS 21.0. Appropriate analysis of different socio demographic characteristics was done. The results were presented using graphs and tables.

Results: - A total of 254 nurses were sampled and from these 161 were females and 93 were males making F: M ratio 1.73:1. The mean age of the individuals is 25.98 and the median age is 26 years. The minimum and the maximum ages are 18 and 42 respectively. Of these 97 were married and 157 were single and percentage of married and single being 38.2 % and 61.8 % respectively.

The results showed that the participants had a good knowledge 56.7% of the nurses regarding the hand hygiene and majority of the respondents had moderate attitude 74%. Regarding practice 61% (155 out of 254) had poor practice and 20.1% (51 out of 254) had good practice and remaining 18.9%(48 out of 254) had moderate practice on hand hygiene

Conclusion: - The results of the current study showed that there was a further need to focus on the practices of hand hygiene by continuous education and training for nurses in the country.

2. INTRODUCTION

2.1 BACKGROUND

Health care related infection (HCRI) in hospitals has resulted in many negative impacts on patients, families and healthcare workers worldwide [1]. It represents a major burden around the world and affects the safety and quality of care for patients [2]. WHO ranks HCRI as one of the top ten causes of hospital deaths each year [3].

Patients, health care workers, and the environment are major reservoirs of health care related infection [1, 4]. The transmission of infection from patient to patient mainly occurs at the hand of health care workers [5, 6]. Patients' skin, mucous and any discharge can be colonized by many organisms, which will be transferred to surrounding surfaces and contaminate the environment in the hospital [7]. The hands of the health care workers will be contaminated through daily caring for patient or his environment, despite wearing gloves [8]. Therefore, hand hygiene (HH) is considered the most effective way to prevent cross-transmission of HCRI [6, 9]. Health care related infection is estimated to affect 10% of patients in developed countries, and 25% in developing countries [10]. Consequently, this will have a high impact on the quality of care, reflected in increased morbidity and mortality rates.

WHO, in 2005 issued guidelines regarding specific steps and procedures to be followed during hand washing. The spread of infections in developing countries remains a serious problem, especially in high-risk settings such as health care facilities due to lack of awareness in health care workers and compounded by “omo syndrome” (a belief that they are super clean and sterile)[12,13].

Implementation and adherence to hand hygiene practices in a healthcare facility can prevent health care-associated infections (HAI) and limit the transmission of microorganisms, including multidrug resistant pathogens [11]. Hand hygiene is considered one of the most simple but important ways to break the chain of infection [12]. Proper hand hygiene before and after each contact with any patient is an important measure to prevent HCRI [9, 11]. Hand hygiene generally refers to hand washing with water and soap, or by using antiseptic solution or alcohol-based hand rubs [9].

In Ethiopia where the healthcare service is largely covered by low and midlevel health professionals assessing the necessary knowledge, attitude and practice or the skill on infection prevention and factors in health care facilities as early as possible can give way to manage the limited resource available in the sector for health providers and Customers [14, 15].

Nurses constitute the largest percentage of the health care workers (HCW) and they are the “nucleus of the health care system”. Because they spend more time with patients than any other HCWs, their compliance with hand washing guidelines seems to be more vital in preventing the disease transmission among patients [16, 17].

2.2 STATEMENT OF THE PROBLEM

Hand washing is critical in the prevention of hospital acquired infections. It is a very simple procedure and work well in the prevention of diseases as people are the carriers of pathogenic microbes. The practice is however unacceptably low among health workers.

Hand hygiene compliance rates in different developed countries rarely exceed 50%. For instance, figures show that in the USA it is 50%, in Switzerland 42% and in the UK 32%. Hence, poor compliance has resulted in high morbidity and mortality. Hand hygiene practice among HCWs is considered to be the single most clinical and cost effective measure to prevent HAI. (WHO) strongly emphasis the essential need for hand hygiene during healthcare delivery, to avoid possible infection and subsequent complications; hence, the 'Clean Care is Safe Care' program, launched by WHO in 2005 as part of the 'First Global Patient Safety Challenge'. This program offers new guidelines on hand hygiene training, observation and performance reporting in healthcare settings. Out of every 100 hospitalized patients, at least 7 in high-income and 10 in low-/middle-income countries will acquire a healthcare-associated infection. Among critically ill and vulnerable patients in intensive care units, that figure rises to around 30 per 100[1, 5, 9].

SIGNIFICANCE OF THE STUDY

This study was done at Saint Paul hospital millennium medical college. The generalizations made based on the obtained result through this study and the study will be done to contribute to the scientific community about the current knowledge, attitude and practice of nurses in our country.

Hand washing is considered the most important single and simple practice for preventing hospital acquired infection. An intricate problem may be caused by a number of factors if there is failure to practice effective hand washing. Therefore, this research has great deal of importance in minimizing the community burden and health consequences of patients, HCW and staff.

As there are no enough studies done on knowledge, attitude and practice of hand hygiene among nurses working in Addis Ababa, this study is aiming at contributing KAP of hand hygiene among nurses .As a result, recommendations will be made on the current knowledge, attitude and practice level of hand hygiene in our set up.

3. LITRETURE REVIEW

Hand hygiene practice among HCWs is considered to be the single most clinical and cost effective measure to prevent HAI, a view recognized globally. Despite the relative simplicity of this procedure, adherence to hand washing recommendations is unacceptably low, usually well below 50% (10, 11). Most nosocomial infections are thought to be transmitted by the hands of health care workers. Patients, health care workers, and the environment are major reservoirs of health care related infection (1, 4). The transmission of infection from patient to patient mainly occurs at the hand of health care workers (5, 6).

Patients' skin, mucous and any discharge can be colonized by many organisms, which will be transferred to surrounding surfaces and contaminate the environment in the hospital. In the US, hospital patients contract two million infections per year, approximately one infection for every 25 patients (11). These infections can be life-threatening and difficult to treat.

It has long been known that hand hygiene among health care workers plays a central role in preventing the transmission of infectious agents. Hand-washing (HW) is the most effective way of preventing the spread of infectious diseases But despite a Joint Commission requirement that Centers for Disease Control and Prevention hand hygiene guidelines be implemented in hospitals, compliance among health care workers remains low(3,10).

The reasons for low compliance to hand hygiene have not been defined in developing countries probably due to limited studies on hand hygiene. Factors that contribute to noncompliance to HW among health care workers are: lack of awareness and knowledge among health care workers as regard the importance, techniques, methods and quality of hand hygiene (18).

Nurses' hands come into close contact with patients and are frequently contaminated during routine patient care: e.g. auscultation and palpation or while touching contaminated surfaces, devices or materials such as changing of dressing. The NMC'S Code of Standards and Conduct requires nurses and midwives to provide a high standard of practical care all the time (19, 20).

Furthermore, study indicates that nurses often fail to practice hand hygiene because they are busy and they feel hand hygiene takes up precious time (3, 13). In addition, nurses often perceive that gloves can be used as an alternative to hand hygiene. They usually tend to remove the gloves without washing their hands or use the same gloves to deliver intended care to multiple patients. Even when they remove their gloves, only 20% of nurses actually clean their hands (23) and they avoid hand hygiene because they are frightened that skin problems such as dermatitis could develop, especially with alcohol hand-rubs (8).

Compliance on the part of Healthcare workers (HCWs) including nursing and medical students with standard precautions has been recognized as being an efficient means to prevent and control

Health care- associated infections. Such measures not only protect the patient, but also the HCWs and the environment. Among the standard precautions advocated, hand hygiene is considered, in itself, the most important one (3, 4). Another important measure is the adequate use of gloves, whose purpose is to protect the HCWs, as well as the patient.

Nurses tend to wash their hands more often than doctors and among non-health care workers, females tend to wash their hands more often than males. Although increased compliance with hand washing protocols has been shown to decrease infection rates, hand washing compliance remains poor, particularly among some professional groups.

Studies of hand washing frequency have recorded hand washing rates following patient contact ranging from 10.6% to 61%, and significant differences have long been noted in hand washing frequency between professional groups such as nurses and doctors (22).

4. RESEARCH OBJECTIVES

4.1 GENERAL OBJECTIVE

To determine knowledge, attitude and hand washing practices among nurses working In SPHMMC.

4.2 SPECIFIC OBJECTIVES

To assess the level of knowledge

To assess the level of attitude

To assess the level of practice of nurses on hand hygiene

5. RESEARCH METHODS

5.1 STUDY SETTING

Addis Ababa is the capital and largest city of Ethiopia. It has the population of 3,384,569 according to 2007 census, with annual growth rate of 3.8%. The study was carried in SPHMMC one of the largest hospitals of the country. St. Paul's Hospital was built in 1969 (was named St Paul General Specialized Hospital until 2008) by Emperor Haile Selassie II in collaboration with the German Evangelical Church, as a source of medical care for underserved populations. The medical school, the millennium medical college was opened in 2007 G.C. to commemorate the new millennium era of Ethiopian calendar. The school was established by the Ethiopian FMOH with Professor Gordon Williams of the department of urology at London University.

It currently has above 390 beds, with an annual average of 200,000 patients and a catchment population of more than 5 million. Approximately 75% of the patients receive medical services free of charge. There are over 1300 clinical and non-clinical staff in over 13 departments. There are currently 751 Nurses, 700 medical students, 110 Interns and 499 residents at SPHMMC.

5.2 STUDY DESIGN

This study is a cross-sectional study method designed to assess the knowledge, attitude and practices of nurses working in SPHMMC towards hand hygiene.

SOURCE POPULATION

All nurses of SPHMMC included in this study.

STUDY POPULATION

SPHMMC nurses available during data collection.

INCLUSION AND EXCLUSION CRITERIA

INCLUSION CRITERIA

Staff Nurses

- . Staff nurses who willing to participate in the study.
- . Staff nurses who are available during the period of data collection.

Exclusion Criteria

- . Who were not in the study area during data collection.

Sample size determination

The sample size was calculated using a single population proportion formula, $[n = (Z \alpha/2)^2 p (1-p) / w^2]$, was employed. From research done at Mizanman General Hospital Workers, South West Ethiopia the prevalence of practice was (68.7%). calculating sample size by taking

Margin of error 5% (0.05), Confidence level 95%, were used. Hence, the sample size was calculated as; $n_0 = (Z_{\alpha/2})^2 p (1-p) / d^2$

$$= (1.96)^2(0.69) (0.31)/ (0.05)^2=352$$

Considering 10 % non- response rate, the final sample size obtained will be =387, since there are total of 751 participants, so $n_0 = n / 1 + 1/N (n)$; $N_0 = 387 / 1 + 1/751(387) = 254$ yielding the maximum sample size. So the sample size taken was 254.

5.3. SAMPLING TECHNIQUE

Random sampling technique was used to recruit the participants

5.4. DATA COLLECTION

The data was collected by Self-administered questioner, prepared in English language consisting of four sections including socio-demographic character, knowledge, attitude and practice parts adapted from standard WHO research questionnaire on hand hygiene. The data was collected from all departments by assigning one investigator for each department after training the data collectors. Pretest was undertaken in 10%, which is not included in the study. In the case of the concurrence of incompleteness and inconsistency, data collectors went back to respondent's site to refill the questionnaire.

5.5. STUDY VARIABLES

INDEPENDENT VARIABLES:

- Socio demographic information
 - Age
 - Sex
 - Religion
 - Marital status
 - Educational level
 - Work Experience

5.6. OPERATIONAL DEFINITION

Hand Hygiene: Hand washing is the process of cleaning one's hands with or without the use of water or another liquid, or with the use of soap for the purpose of removing soil, dirt, and/or microorganisms and is simple, easy implemented and good practice can reduces the risk of cross infection

Nurse; Professional personnel working in clinical setting of a health facility and involved in patient care.

Knowledge was assessed using WHO hand hygiene questionnaire for health care workers and Attitude and practice were assessed using another self-structured questionnaire.

A score of more than 75% was considered good, 50–74% moderate, and less than 50% was taken as poor.

5.7. DATA PROCESSING AND MANAGEMENT

The collected data was manually checked for completeness, accuracy and clarity. Those which were incomplete were left out of the analysis. Then it was managed by proper entry into the computer statistical package program SPSS by the researcher.

5.8. DATA ANALYSIS

The data collected using a data collection form was analyzed using the statistical package SPSS 21.0. Different statistical analysis were used including descriptive statistics with frequencies of variables

5.9. ETHICAL CONSIDERATIONS

Before collecting data a permission letter from public health office of St Paul's Hospital Millennium Medical College was obtained and after getting ethical clearance, Verbal consent was obtained from each individual respondent during data collection and after a through explanation of the purpose of the study and assuring them of their privacy and confidentiality data was collected.

5.10. DISSEMINATION OF FINDINGS

After the completion of this research, the findings was submitted to St Paul's Hospital Millennium Medical College public health department and will be uploaded on the internet so that it will serve all researchers who are interested in the subject matter

6. RESULTS

Socio demographic characteristics

A total of 254 nurses were sampled yielding the response rate of 100%. From the total respondents proportions of females were 161(63.4%) and 93(36.6%) were males making F: M 1.73:1. The mean age of the individuals is 25.98 and the median age is 26 years. The minimum and the maximum ages are 18 and 42 respectively. Out of 254 individuals 157(61.8%) were single and 97(38.2%) were married. Most of the participants are Orthodox Christian in religion 154(60.6%) followed by Muslim 45 (17.7%) and Protestant 45 (17.75%).

From total of 254 samples majority of them 213 (83.9%) are degree followed by diploma 32 (12.6%) and 9 (3.5%) of them master's degree and above. Regarding work experience about half of them 133 (52.4%) worked for ≤ 2 years, 56 (22%) for 3 to 4 years and the rest 65(25.6%) for 5 years and above. See the table below.

Table 1; Socio demographic information of the patients

Variables		frequency	Percent
Sex	Male	93	36.6
	Female	161	63.4
Marital status	Married	97	38.2
	Single	157	61.8
Religion	Orthodox	154	60.6
	Muslim	45	17.7
	Protestant	45	17.7
	Other	10	3.9
Educational level	Diploma	32	12.6
	Degree	213	83.9
	Master's degree and above	9	3.5
Work Experience	≤ 2 years	133	52.4
	3 to 4 years	56	22.0
	5 years & above	65	25.6

Other's-catholic,

Knowledge on Hand Hygiene

From the total more than half of the sample 158(62.2%) reported that they had received training about hand hygiene, compared with 96(37.8%) who did not get any training

When asked about main route of transmission of potentially harmful germs between patients; 145(57.1%) answered health care worker's hands when not clean, 26(10.2%) answered air circulating in hospital, 68(26.8%) answered patient's exposure to colonized surfaces, and the remaining 15(5.9%) of them answered sharing noninvasive objects. For this knowledge question 145(57.1%) nurses answered correctly and remaining 109(42.9%) answered incorrectly.

For the knowledge question, the most frequent source of germs responsible for health care associated infection? the majority 150(59.1%) said germs already present on or within the patient, followed by 86(33.9%) the hospital environment (surfaces), 13 said the hospitals water system, 5 said the hospital air. For this question 150(59.1%) nurses answered correctly and 104(39.9%) did not answer correctly.

For the knowledge assessment question, HH action before touching patient prevents transmission of germs to the patient? Most of them 237(93.3%) said yes and the rest 17(6.7%) said no. For this question 237(93.3%) answered correctly

For the question HH action immediately after a risk of body fluid exposure prevents transmission of germs to the patient? 148(58.3%) answered correctly & 106(41.7%) answered incorrectly.

For the question HH action after exposure to immediate surroundings of a patient prevents transmission of germs to the patient? 93 answered No and 161 answered Yes. For this question 93 nurses answered correctly with response percent of 36.6%.

For the question, HH action immediately before clean or aseptic procedure prevents transmission of germs to the patient? From out of 254 samples 231 answered correctly with response percent of 90.9 and 23 answered incorrectly.

For asked question, HH action after touching patient prevents transmission of germs to the health care workers? 240 individuals answered correctly and 14 did not answered correctly with 94.5% and 5.5% respectively. For the question HH action immediately after a risk of body fluid exposure prevents transmission of germs to HCW? 240 answered correctly and remaining 14 answered incorrectly with 94.5% and 5.5% respectively. For the question HH action after exposure to the immediate surroundings of the patient prevents transmission of germs to HCW? From out of 254 samples 246 answered correctly and remaining 8 answered incorrectly with response percent 96.9% and 3.1% respectively.

For the knowledge question, wearing jewelry should be avoided as associated with increased likelihood of colonization of hands with germs? Majority of them 189(74.4%) answered correctly and 65(25.6%) did not answer correctly. For the question damaged skin should be avoided as associated with increased likelihood of colonization of hands with germs? 251 answered correctly and 3 did not answer correctly.

For the question artificial fingernails should be avoided as associated with increased likelihood of colonization of hands with germs? Most of them 239(94.1%) answered correctly and 15(5.9%) did not answer correctly.

For the knowledge assessment question the minimal time needed for alcohol based hand rub to kill most germs on your hands? From 254 individuals; 140(55.1%) answered 20 seconds, 59(23.2%) answered 10 seconds, 43(16.9%) answered 01 minute, and remaining 12(4.7%) answered 03 seconds. For this question 140(55.1%) answered correctly and 114(44.9%) did not answer correctly.

The knowledge on hand hygiene was good (144 out of 254) among 56.7% of the total study population and 42.9% (109 out of 254) had moderate knowledge. Only 0.4% (1 out of 254) had poor knowledge.

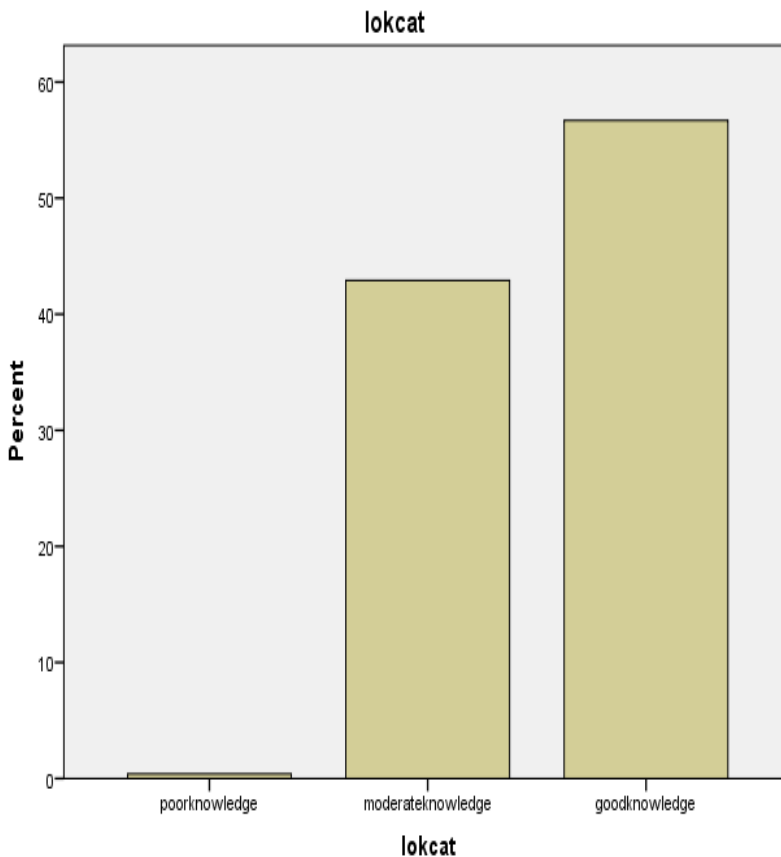


Fig 1: Level of knowledge on hand hygiene

Attitude towards hand hygiene

From total sample of 254 nurses majority of them 228(89.7%) adhere to correct HH practices at all times i.e. 88 (34.6%) strongly agree, 140 (55.1%) agree and 228(89.8%) of them have sufficient knowledge about hand hygiene, 64(25.2%) strongly agree&164(64.6%) agree.

For the attitude assessment question Sometimes I have more important things to do than HH, 13(5.1%) strongly agree, 80(31.5%) agree, 7(2.8%) neutral, 124(48.8%) disagree, 3(11.8%) strongly disagree. From total individuals for the question Emergencies & other priorities make hygiene more difficult at times, 24(9.4%) strongly agree, 154(60.6%) agree, 9(3.5%) neutral, 53(20.9%) disagree, 14(5.5%) strongly disagree. From out of 254, 87(34.3%) agree that wearing gloves reduces the need for hand hygiene, 29(11.4%) are neutral, 103(40.6%) disagree& 35(13.8%) strongly disagree. About 157(61.8%) believe that adhering to HH practices is easy in the current setup and 25(9.8%) of them are neutral, and the remaining are disagree & strongly disagree. See table; 2 below.

Majority of the respondents had moderate attitude 74% (188 out of 254) and 16.9% (43 Out of 254) had good attitude and the remaining 9.1%(23 out of 254) had poor attitude.

Table; 2 responses for attitude assessment questions

Variables	Strongly agree		agree		neutral		Disagree		Strongly disagree	
	freq	%	Freq	%	Freq	%	Freq	%	Freq	%
I adhere to correct HH practices at all times	88	34.6	140	55.1	7	2.8	19	7.5	---	---
I have sufficient knowledge about hand hygiene	64	25.2	164	64.6	14	5.5	12	4.7	---	---
Sometimes I have more important things to do than HH	13	5.1	80	31.5	7	2.8	124	48.8	30	11.8
Emergencies & other priorities make hygiene more difficult at times	24	9.4	154	60.6	9	3.5	53	20.9	14	5.5
Wearing gloves reduces the need for hand hygiene	17	6.7	70	27.6	29	11.4	103	40.6	35	13.8
I feel guilty if I omit hand hygiene	32	12.6	117	46.1	19	7.5	80	31.5	6	2.4
I am reluctant to ask others to engage in HH	21	8.3	128	50.4	36	14.2	67	26.4	2	0.8
Adhering to HH practices is easy in the current setup	30	11.8	127	50	25	9.8	70	27.6	2	0.8

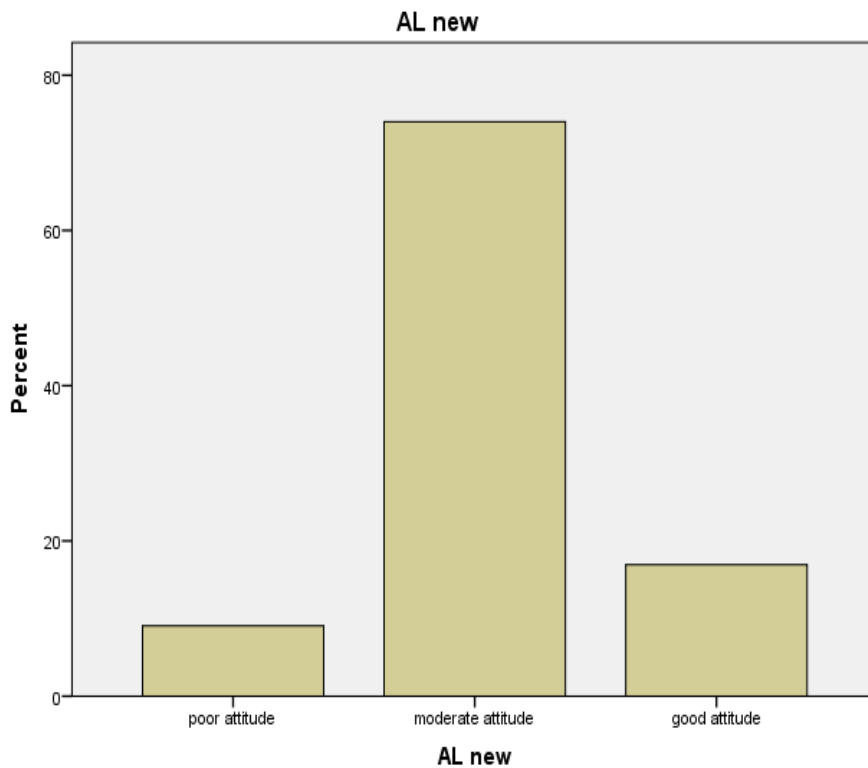


Fig.2 attitude level on hand hygiene

Practice on Hand Hygiene

From total sample majority of them, 182 (71.7%) Sometimes miss out HH simply b/s they forget it and vast majority of nurses 241 (94.9%) in role hand hygiene as essential part of their role but the remaining 13 (5.1%) did not in role hand hygiene as essential part of their role.

For the practice assessment question, Frequency of HH required makes it difficult for me to carry out as often as necessary 162(63.8%) answered yes and 92(36.2%) no.

About 131(51.6%) of nurses suggest that Infection prevention notice boards remind them to do HH. And the majority of them 168(66.1%) use alcoholic hand rubs as alternative if their hands are not visibly soiled.

From the total sample 106 (41.7%) of the individuals wash their hands between patient contacts and the other 148(58.3%) do not wash their hands between patient contacts. And 40(15.7%) only use water for hand washing and remaining not. See table; 3 below

Table; 3 responses for practice assessment questions

Variables	YES		NO	
	Frequency	%	frequency	%
Sometimes I miss out HH simply b/s I forget it	182	71.7	72	28.3
HH is essential part of my role	241	94.9	13	5.1
Frequency of HH required makes it difficult for me to carry out as often as necessary	162	63.8	92	36.2
It is difficult for me to attend HH courses due to time pressure	142	55.9	112	44.1
Infection prevention notice boards remind me to do HH	131	51.6	123	48.4
I use alcoholic hand rubs as alternative if my hands are not visibly soiled	168	66.1	86	33.9
I wash my hands between patient contacts	106	41.7	148	58.3
I only use water for hand washing	40	15.7	214	84.3

Regarding practice about 155 out of 254 (61%) had poor practice and 20.1% (51 out of 254) had good practice on hand hygiene the rest 18.9% (48 out of 254) had moderate practice on hand hygiene. See figure 3 below.

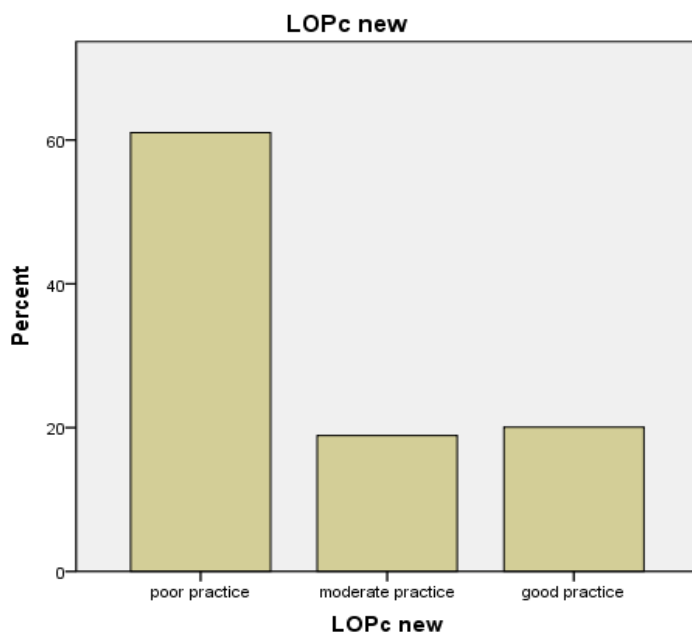


Fig. 3 level of practice on hand hygiene

7. DISCUSSION

Hand hygiene is one of the most important measures to prevent HCRI. It is easy, simple and quick to implement, but it has an immense impact on HCRI. Compliance of health care workers to adhere to correct hand hygiene are reported to be poor (25, 26). However hand hygiene is a single most effective preventive measure against hospital acquired infections, and can contribute to shorter hospital stay, reduction in patient morbidity and health care costs (1, 24). It is important to carry out training programs on hand hygiene regularly for health care workers as it has been associated with increased compliance to hand hygiene practices and reduction of infection (16, 17). Our study group consisted of nurses working in SPHMMC. In the current study, the sample has good knowledge score and moderate attitude on hand hygiene and had poor practice regarding practice on hand hygiene.

As described in the present study the knowledge on hand hygiene was good among majority 56.7%(144 out of 254) of the study population which was a positive finding; only 0.4%% of participants had poor knowledge and rest 42.9% (109 out of 254) had moderate knowledge and the majority had moderate attitude 74% (188 out of 254), 16.9%(43 out of 254) had good attitude and the remaining 9.1% (23 from 254) had poor attitude. Regarding practice 61% (155from 254) had poor practice, 18.9% (48 out of 254) had moderate practice and the remaining 20.1% (51 out of 254) had good practice. This finding on knowledge and attitude is better than Study done on KAP on hand hygiene among final year medical and nursing students at the University of Sri Jayewardenepura, Participants had moderate knowledge (77%) and Only 9% of participants (26 of 289) had good knowledge regarding hand hygiene. but attitudes, practices and satisfaction of facilities of all the participants was overall poor (<50%). However the nursing students had better knowledge, attitudes, practices and satisfaction of facilities compared with the medical students.

A study by Nair *et al.* at a tertiary health care center of Raichur, Karnataka, India among medical and nursing students revealed that both study groups had moderate knowledge on hand hygiene and nursing students knowledge were significantly better than medical students.

In another earlier study from Riyadh, Saudi Arabia by Basurrah *et al.*; among health care workers (HCWs), adherence to hand hygiene was seen among 70% among medical students, 69.2% among interns, 18.8% among nurses, 12.5% among residents and 9.1% among consultants [15].

A study done on KAP of nursing students regarding hand hygiene in Western region of Nepal revealed that the knowledge on hand hygiene was moderate (84%) among the total study population and a total of 90% of the participants had positive attitude towards hand-hygiene and 56% of the participants exhibited good practice regarding hand hygiene. Moderate knowledge among majority of the nursing students reflected upon their positive attitude and practice regarding hand hygiene among them. Essentially, most of the nursing students considered hand hygiene as an essential part of their role.

In addition, study done on Assessment of Knowledge, Attitude and Practice of Health Care Workers on Infection Prevention in Health Institution Bahir Dar City Administration overall knowledge score of respondents were 84.5% and about 55.6% had positive attitude and 54.2% of respondents' had safe infection prevention practice.

Other study done at Palestine on Hand Hygiene Knowledge, Practices and Attitudes among Nurses and Physicians the sample has a moderate knowledge and practice of HH. In general, the sample has a better score on attitude (a mean of 82.5 ± 8.8) compared to knowledge and practice (a mean score of 62 ± 7) of HH.

Study done on Knowledge, Attitude and Practice towards Infection Control Measures among Mizan-Aman General Hospital Workers, South West Ethiopia. Out of 135 respondents, 57 (42.2%) of HCWs think that they apply standard precaution always. About two-third (65.6%) of them had ever participated in training program. All of the respondents know that dirty needle and sharp materials could transmit disease causing agents. Majority of health care workers' knowledge, attitude and practice toward standard precaution were not sufficient, favorable and safe enough to the expected standard.

8. STRENGTH AND LIMITATIONS

Strength

Adequate sample size was applied according to single population proportion formula
Data collators were health professionals and medical students who were trained.

Limitations

It was self-administered questionnaire so personal bias possible

The questionnaire was written in English

It is better if factors that contribute to poor hand washing compliance were assessed.

9. CONCLUSION

In conclusion, HH is very important to health care workers to control HCRI. It is important for both physicians and nurses and other healthcare workers to stick to and improve their practice, attitude and knowledge about this issue, which will play an important role in decreasing the cost of care for the patients and hospitals, contributing to shorter hospital stay, reducing mortality and morbidity rates and improving quality of care and of life for patients.

This study shows that nurses have good knowledge and moderate attitude regarding HH which is a positive finding that must be encouraged. Despite this finding surprisingly their practice on hand hygiene was poor. The study shows the need for further improvement of the existing hand hygiene training programs to address the gaps in knowledge, attitudes and practices

10. RECOMMENDATIONS

Increasing emphasis on hand hygiene in the undergraduate curriculum might improve student 's knowledge, beliefs and practices about hand hygiene and hand hygiene training sessions for nurses as well as other HCW's need to be conducted with continuous monitoring and performance feedback to encourage them to follow correct hand hygiene practices.

In order for the HCW's to develop good practices regarding hand hygiene, it is important to make proper hand hygiene facilities available and increasing the supplies necessary for hand washing and institutional support is essential in combating substandard practices in hand hygiene.

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ANNEX I; Questionnaire

Section I; Socio-Demographics characteristics:

1	Age(in complete years)	-----
2	Sex	1.Male 2.Female
3	Marital Status	1. Married 2. Single 3. .Divorced 4. Widowed
4	Religion	1 Orthodox 2. Muslim 3. Protestant 4. Catholic 5 .Other (specify).....
5	Educational level	1. Certificate 2.Diploma 3. Degree 4. Master's degree and above
6	Work Experience	1) <=2 years 2) 3-4 years 3) 5 years and above

Section II; Knowledge Assessment Question

1. Did you receive formal training in hand hygiene?

☐ YES

☐ NO

3. Which of the following is the main route of transmission of potentially harmful germs between patients? (Select one)

- A) Health-care workers' hands when not clean
 - B) Air circulating in the hospital
 - C) Patients' exposure to colonized surfaces (i.e., beds, chairs, tables, floors)
 - D) Sharing non-invasive objects (i.e., stethoscopes, pressure cuffs, etc.) between patients
4. What is the most frequent source of germs responsible for health care associated infections?
- A) The hospital's water system
 - B) The hospital air
 - C) Germs already present on or within the patient
 - D) The hospital environment (surfaces)

Which of the following hand hygiene actions prevents transmission of germs to the patient?

- | | | |
|--|--------|-------|
| 5. Before touching a patient | A) YES | B) NO |
| 6. Immediately after a risk of body fluid exposure | A) YES | B) NO |
| 7. After exposure to the immediate surroundings of a patient | A) YES | B) NO |
| 8. Immediately before a clean/aseptic procedure | A) YES | B) NO |

Which of the following hand hygiene actions prevents transmission of germs to the health-care worker?

- | | | |
|-----------------------------|--------|-------|
| 9. After touching a patient | A) YES | B) NO |
|-----------------------------|--------|-------|

10. Immediately after a risk of body fluid exposure A) YES B) NO

11. After exposure to the immediate surroundings of a patient A) YES B) NO

Which of the following should be avoided, as associated with increased likelihood of colonization of hands with harmful germs?

12. Wearing jewellery A) YES B) NO

13. Damaged skin A) YES B) NO

14. Artificial fingernails A) YES B) NO

15. What is the minimal time needed for alcohol-based hand rub to kill most germs on your hands?

A) 20 seconds B) 03 seconds C) 1 minute D) 10 seconds

SECTION 2; Attitude Assessment Questions

	(put (X) mark on the following accordingly)	Strongly agree	agree	neutral	Disagree	Strongly Disagree
1	I adhere to correct hand hygiene practices at all times					
2	I have sufficient knowledge about hand hygiene					
3	Sometimes I have more important things to do than hand hygiene					
4	Emergencies and other priorities make hygiene more difficult at times					
5	Wearing gloves reduces the need for hand hygiene					
6	I feel guilty if I omit hand hygiene					
7	I am reluctant to ask others to engage in hand hygiene					
8	Adhering to hand hygiene practices is easy in the current setup					

SECTION; 3 Practice Questions

(put (X) mark on the following accordingly)	YES	NO
1. Sometimes I miss out hand hygiene simply because I forget it		
2. Hand hygiene is an essential part of my role		
3. The frequency of hand hygiene required makes it difficult for me to carry it out as often as necessary		
4. It is difficult for me to attend hand hygiene courses due to time Pressure		
5. Infection prevention notice boards remind me to do hand hygiene		
6. I use alcoholic hand rubs as an alternative if my hands are not visibly soiled		
7. I wash my hands between patient contacts		
8. I only use water for hand washing		

ANNEX; II

My name is Dessalegn Adeba, I am a medical Intern at SPHMMC and I am conducting a research for partial fulfillment of requirement for the degree of doctor of medicine on assessment of knowledge, attitude and practice of hand hygiene among nurses working in SPHMMC 2018.

Therefore, your honest and genuine participation by responding to the questions prepared is highly appreciated and helpful to attain the objective of the study.

Your name will not be written on this form and no individual response will be reported to anybody. Hence, your answers are completely confidential. You do not have to answer any question that you don't want to answer and you may refuse to answer all of the questions. Please, if you cooperate by responding to the questions it means that you have your own contribution to the success of this study.

Do you agree to participate on the interview?

☐Yes ☐No