



ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

**KNOWLEDGE AND PRACTICE OF STANDARD
PRECAUTION AMONG MEDICAL INTERNS AT SPHMMC,
ADDIS ABABA, ETHIOPIA**

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Acronyms

AAU- Addis Ababa University

AIDS- Acquired Immune Deficiency Syndrome

CDC- Center for Disease Control and Prevention

CI- Confidence Interval

COR- Crude Odds Ratio

HAI- Hospital Acquired Infection

HBV- Hepatitis B Virus

HCV- Hepatitis C Virus

HIV- Human Immunodeficiency Virus

IP- Infection Prevention

MOH- Ministry of Health

NaSH- National Surveillance System for Health Care Workers

NGOs- Non-Governmental Organizations

OR- Odds Ratio

OPD- Out Patient Department

PEP- Post Exposure Prophylaxis

PPE- Personal Protective Equipment

SD- Standard Deviation

SIGN- Safe Injection Global Network

SPHMMC- St. Paul's Hospital Millennium Medical College

SPSS- Statistical Package for Social Science

TASH- Tikur Anbessa specialized hospital

VCT- Voluntary Counseling and Testing

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Abstract

Background:-Health care workers (HCWs) are at risk of various occupational hazards in the hospital, including exposure to blood-borne infections, such as, HIV and hepatitis B and C virus (HBV and HCV), infection from sharps injuries and contact with body fluids. Standard or universal precautions are a set of measures formulated to prevent transmission of blood-borne pathogens when providing health care. Compliance with standard precautions has been shown to reduce the risk of exposure to blood and body fluids. Therefore, the main aim of this study was to assess the knowledge and practice of standard precaution and identify possible factors affecting the practice among SPHMMC medical interns, Addis Ababa, Ethiopia.

Methods:-An institution based descriptive cross sectional study was conducted to execute this study. The study period was from June 11, 2017 – July 1, 2017. In this study all medical interns who were not included in the pre-test were included (120). Information on socio-demographic characteristics and standard precaution was collected using a self-administered structured questionnaire. Data obtained from the questionnaire was analyzed using IBM SPSS 20 and presented using tables and graphs accordingly.

Results:- The total knowledge score showed the level that 84(70%) had fair knowledge, 9(7.5%) has good knowledge and 27(22.5%) had poor knowledge. The overall practice score showed that 41(34.2%) had fair practice, while 4(3.3%) had good practice and 75(62.5%) had poor practice. An association was found between knowledge and practice ($p=0.015$) using chi-square test.

Conclusion:- According to the study medical interns had a good Knowledge towards standard precaution, but medical interns' practices toward standard precaution in SPHMMC were not sufficient, favorable and safe enough to the expected standard. According to the findings in this research its recommended to Strengthen and integrate standard precaution with the routine services through providing training for all medical interns; provide sustainable supplies, which include all types of personal protective equipment's, water supply, washing utensils, and other related materials that are mandatory to correct the unsafe practice. In addition the necessity of standard precaution in prevention of disease in patients must be emphasized and facilities should be improved.

Key words:- Standard precaution, medical interns, knowledge & practice.

1. Introduction

1.1. Background

Standard precautions are meant to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources. They are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients (1). Standard precautions are based on the principle that all blood, body fluids & secretions, excretions (except sweat), non-intact skin, and mucous membranes may contain transmissible infectious agents. The term “standard precautions” is replacing ‘universal precaution’ as it expands the coverage of universal precautions by recognizing that any body fluid may contain contagious and harmful microorganisms. Standard precautions include hand hygiene, use of appropriate personal protective equipment (PPE), use of aseptic technique to reduce patient exposure to microorganisms and management of sharps, blood spills, linen, and waste to maintain a safe environment (2) (3).

Hand hygiene is a major component of standard precautions and one of the most effective methods to prevent transmission of pathogens associated with health care. In addition to hand hygiene, the use of personal protective equipment should be guided by risk assessment and the extent of contact anticipated with blood and body fluids, or pathogens. In addition to practices carried out by health workers when providing care, all individuals (including patients and visitors) should comply with infection control practices in health-care settings (1). The control of spread of pathogens from the source is key to avoid transmission. Among source control measures, respiratory hygiene/cough etiquette, developed during the severe acute respiratory syndrome (SARS) outbreak, is now considered as part of standard precautions. Worldwide escalation of the use of standard precautions would reduce unnecessary risks associated with health care. Promotion of an institutional safety climate helps to improve conformity with recommended measures and thus subsequent risk reduction. Provision of adequate staff and supplies, together with leadership and education of health workers, patients, and visitors, is critical for an enhanced safety climate in health-care settings (4).

Infections in health care services represent a global problem and constitute one of the main causes of morbidity and mortality associated with clinical, diagnostic and therapeutic procedures. Besides their range for patients, the problem is equally important for health care workers (HCWs), who are continuously subject to occupational risks and presents a major risk for the transmission of infection such as Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV) (5) (6).

Globally it is estimated that about 40% of HBV and HCV infections and 2.5% of HIV infections in HCWs are attributable to occupational sharps exposures. As exposure is a constant premise for professionals, intervention measures have been proposed to minimize this situation, with the implementation of standard precautions as one of the strategies. The use of standard precautions is recommended for all patients, regardless of suspected or confirmed infection status. It is applied in any setting in which health care is delivered based on the principle that all blood, body fluids, secretions, excretions except sweat, non-intact skin, and mucous membranes may contain transmissible infectious agents. So these procedures advise HCWs to practice regular personal hygiene, use protective barriers depending on the anticipated exposure and safe injection practices. It also include disposal of sharps, body fluids, and other clinical wastes properly (5) (7) (8).

1.2. Statement of the problem

In Ethiopia, there is dramatic increase in the development of health facilities. Despite, Ethiopian Federal Ministry Health have clearly defined policies and procedures to implement universal precautions/standard precautions, less emphasis is given at the facility level for the preventive strategies in reducing occupational injuries and increasing conformity with standard precautions. Still the problem is important and different study were recommending infection control teams and researchers need to consider the reasons for non-compliance and provide a supportive environment that is conducive to the routine, long-term application of standard precautions; very few studies were conducted in Ethiopia to assess the status of standard precautions practice among HCWs and factors inhibiting the practice (9). There are only few studies conducted in Ethiopia to address this problem even though the burden of the problem is high. There is therefore a need for adequate measures to ensure compliance to standard precautions and reduce the risk of infection among HCWs.

Hence this research deals with the knowledge and practice of standard precaution among medical interns in SPHMMC, as they are one of the front line physicians to examine every patient, have greater exposure and are at higher risk to acquire nosocomial infections.

1.3. Significance of the study

Even though medical interns are practicing in clinical setting, there is no sufficient study conducted towards Knowledge and Practice of medical interns concerning standard precautions. This study provides baseline information on knowledge level and practice on prevention of nosocomial infection of medical interns. It will provide strong body of scientific knowledge which will ensure the highest standards of medical care and practice.

Again, future researchers will benefit from this study that, it will provide them the baseline facts needed to compare their study results as necessary though studies have been conducted

2. Literature review

2.1. Overview of standard precaution practice

Health care workers should have the right to be able to protect themselves against infection, whether it is HIV, Hepatitis or anything else (8). Clients have also the right to get safe service. The following universal infection control precautions are advised by the World Health Organization to help protect health care workers and clients from blood-borne infections including HIV: Washing hands with soap and water before and after procedures; Using protective barriers such as gloves, gowns, aprons, masks, goggles for direct contact with blood and other body fluids; Disinfecting instruments and other contaminated equipment; Handling properly soiled linen. Gloves and leak proof bags should be used if necessary. Cleaning should occur outside patient areas, using detergent and hot water; using a new, auto disable syringe (AD) or single-use disposable injection equipment for all injections is highly recommended. Sterilizable injection should only be considered if single use Equipment is not available and if the sterility can be documented with Time, Steam and Temperature (TST) indicators; Discarding contaminated sharps immediately and without recapping in puncture and liquid proof containers that are closed, sealed and destroyed before completely full. Document the quality of the sterilization for all medical equipment used for percutaneous procedures (6).

Health care workers are increasingly at risk of becoming infected with serious blood borne viruses such as HBV, HCV, HIV and many other multiple drug resistance bacterial infections. The greatest risk is for staff that performs or assists with surgical procedures (physicians, medical students, nurses and midwives); process surgical instruments and equipment; and performs housekeeping and waste management tasks, including disposal of infectious waste items. Believing that safety injection and hand hygiene compliance can show the desired 10 outcome of universal precaution in the study area this survey was addressed these two major components (8) (10).

A study done to assess Compliance with Standard Precautions of Students in Clinical Practice in Cumhuriyet University, Turkey; the students showed high level of compliance with standard precautions such as wearing gloves, hand washing, and protection against penetrating injuries. However, the levels of compliance with wearing mask, using goggles, and wearing protective gowns were low. Students at advanced ages and those in their senior years displayed higher compliance with the standard precautions. Particularly

when they start clinical practicum, the students should be informed and educated about how they can protect themselves from blood-borne infections (11).

A study done on the knowledge, attitude, and practice of physicians and medical students of Rafsanjan University of Medical Sciences, Iran, regarding standard precautions showed that the response rate in this study was 95%. The results showed that the knowledge score was desirable, but the attitude and practice scores were not desirable (12). Thus, educational programs with the foundation of blood-borne infections, infection control, safety recommendations, and different aspects of standard precautions are recommended (13).

On a study done “Awareness and practice of standard precautions among Kerala state health service personnel in Neyyatinkar, Taluk, India” awareness and practice of standard precautions are much deficient among the study population and came to a conclusion that trainings and availability of resources have some positive effect in practice. Training coverage and Hepatitis B vaccination coverage were deficient. The needs for extensive trainings and for making the resources available were suggested (14).

On another study done on “The knowledge and practice of standard precautions among health care workers in public secondary health facilities in Abuja, Nigeria”. A quantitative descriptive survey was conducted with 83 doctors and 194 nurses using a structured questionnaire. Findings show suboptimal knowledge and practice of the standard precautions among the health care workers. Knowledge of post-exposure prophylaxis for HIV was low as well as hepatitis B immunization among the respondents. A lack or irregular supply of essential materials, such as personal protective equipment, was the main reason the respondents did not comply to the precautions. This report recommends the development and implementation of a comprehensive infection prevention and control program in health facilities in order to ensure compliance to the standard precautions by health care workers (15).

There are limited number of studies done on knowledge and practice of standard precaution in Ethiopia. Of this one of them is a study done Northern Ethiopia on Standard Precautions Practice among Health Care Workers in Public Health Facilities of Mekelle Special Zone showed that Of all 483 health care workers 207 (42.9%) of them had good practice of standard precautions. Young health care workers had a good practice when comparing with those older age. The presence of written guideline and training given for the health care workers were also predictors of standard precautions practice. And came to a conclusion that

there is suboptimal and inconsistent practice of standard precautions in the health care setting that put patients and health care workers at significant risk of acquiring infections. Therefore, the health authorities need to give comprehensive continues and quality in-service training for the HCWs and provision of the necessary infection prevention supplies to maintain optimal practice in the health care setting (5).

A study on Knowledge, Attitude and Practice towards Infection Control Measures among Mizan-Aman General Hospital Workers, South West Ethiopia showed that Majority of health care workers' knowledge, attitude and practice toward standard precaution were not sufficient, favorable and safe enough to the expected standard. Strengthening and integrating universal

precaution with routine services through provision of training and introducing health care workers infection prevention standard of practice, protocol, rules, and regulation are recommended (2).

In another study done at TASH, in 2014 on KAP of standard precaution among 4th, 5th& 6th year medical students and came to a conclusion that medical students had a better Knowledge and acceptable level of attitude towards standard precaution but Medical students had poor knowledge and practice towards hand hygiene, overall they had poor practice to all components Strengthen and integrate standard precaution with the routine services through providing training for medical students in the Hospitals and health centers they are attached (9).

3. Objectives

3.1. General objectives

- To assess the knowledge and practice of standard precaution among medical interns in SPHMMC, Addis Ababa.

3.2. Specific objectives

- To determine the level of medical interns knowledge towards standard precaution
- To estimate the practice of standard basic precautionary measures among medical interns.

4. Methods & materials

4.1. Study Design

Institution based descriptive cross-sectional study design was conducted to execute the study.

4.2. Study Area

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), AA has a total population of 3,384,569 and lies at an altitude of 7,546 feet (2,300 meters). The City has surface area of about 530.14 km². The city possesses a complex mix of highland Climate zones.

The study was conducted in SPHMMC; it is the second largest central referral hospital in Ethiopia that provides service for patients referred from all over the country. The Hospital was built by Emperor Haileselesie I in 1969 G.C as a source of medical care for underserved populations was named St Paul General specialized Hospital till 2008 and a medical college was formed in 2007. The college has undergraduate programs in medicine, emergency nursing & ICU care. The postgraduate programs were launched in 2012 with departments of OBS & GYN and IESO (Integrated Emergency Surgery and Obstetrics). The college has already started the postgraduate program in departments of internal medicine, pediatrics and surgery. It currently has 392 beds, has 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, most recently launched its new hem dialysis unit and transplant center.

4.3. Source Population

All medical interns working at SPHMMC were the source population.

4.4. Study Population

All medical interns working at SPHMMC during the study period who had fulfilled the inclusion criteria as the study population.

4.4.1. Inclusion criteria

- ✓ The respondents for the study must be individuals working as medical intern at SPHMMC.

4.4.2. Exclusion criteria

- ✓ Medical interns who are sick during the study period

4.5. Sample size determination

To determine the required data, representative sample size was determined using formula for a single population proportion based on the following assumptions;

Prevalence for fair practice (having a score of 60-80%) of a research done on KAP of medical students on standard precaution in TASH, Addis Ababa, Ethiopia which is 56.8%. (9) Confidence level of 95%, Contingency for non-response rate 10% and margin of error 5%

$$n_0 = \frac{Z_{\alpha/2}^2 p(1-p)}{d^2}$$

$$n_0 = (1.96)^2 \times 0.568(1-0.568)/(0.05)^2 = 377$$

Since the actual number of interns working at SPHMMC is much less than 10,000, the correction formula to get my actual sample size.

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

$$n = n_0 \times \text{non-response rate } 10\% + n_0$$

$$n = 377 / (1 + 377/126) \quad n = (94 \times 0.1) + 94 = 103$$

Where; N- Total number of medical interns in SPHMMC; n- Sample size; n₀- Is the sample from population; p- Prevalence of fair practice; z- The value of the standard variable at confidence level of 95% confidence interval and d- Margin of error.

But as sample size has benefit of increasing the precision of the research, all medical interns were included.

4.6. Variables of the study

4.6.1. Dependent variables

- Knowledge of standard precaution
- Practice of interns towards standard precaution

4.6.2. Independent variables

- The socio demographic characteristics: Age, days of clinical attachment, year of study, encounter religion, ethnicity, number of patients.
- Supply of personal protective devices, water supply and availability of antiseptics.
- Infection prevention Policy.
- Perceived risk of infection for self and others.
- Training on infection prevention.
- Hand washing
- Safety box use
- Post exposure preventive measures
- Use of PPE

4.7. Operational definitions & definition of terms

- Standard precaution; a set of measures designed to prevent infection.
- Perception; is one's feeling towards a subject or an issue.
- Hand hygiene care - A general term that applies to hand washing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis. (1)
- Medical interns- those health workers (doctors), who on the final year of their medical study working under supervision of senior physician.
- Good knowledge; having knowledge score > 80%. (9)
- Fair knowledge; having knowledge score 60-80 %. (9)
- Poor knowledge; having knowledge score < 60%. (9)
- Good practice; having score of > 80%. (9)
- Fair practice; having score of 60-80%. (9)
- Poor practice; having score less than 60%. (9)

4.8. Data collection procedure

The data were collected using structured self-administered questionnaire, which was adopted from previous study done on this topic at Tikur Anbessa Hospital Addis Ababa, Ethiopia, on KAP of standard precaution among 4th, 5th& 6th year medical students and modify it to suit the study, which the participants responded as we dictated them.

4.9. Data quality control

The questionnaire was pre-tested (on 5% interns working at SPHMMC), which were not primarily selected for the study and the findings were excluded from main study. The necessary amendments were made upon identification of ambiguities of the tools in the wording, logic and skipping order. Measurements and responses were crosschecked for missed, irregularities, inconsistencies, and unlikely response based on which corrective measures were taken as required. To maintain the quality of the data and avoid any problem or suspicious data, the researcher and the supervisors will crosscheck by recollection data from 5% of the study population.

4.10. Data processing and analysis

A number of statistical analysis methods were used ranging from frequency count of each variable to estimation of relative frequency, cross-tabulation between variables and descriptive statistical tests including estimation of mean and standard deviation.

Determination of statistical significance using chi-square test was performed by Statistical Package for Social Sciences (SPSS) for windows 20. Statistical significance was assessed at 95% confidence interval and p-value of less than 0.05 will be considered statistically significant and was used to draw conclusions. Paragraphs, tables, graphs, charts were used to illustrate these findings.

4.11. Ethical considerations

Permission was obtained from St. Paul's Hospital Millennium Medical College Public Health department. I also got permission from SPHMMC to carry out our research. The purpose of the study was explained to responsible intern selected before handing out questionnaire. Informed verbal consent was obtained from the participant interns. Regarding some areas, which require confidentiality, the confidentiality& anonymity of the subjects, is strictly protected.

4.12. Dissemination of results

After the research work is completed the results and recommendations I obtained will be presented to the department of public health and I hope my research will aid in further studies done in similar study area.

5. Results

5.1. Socio-demographic background of the medical interns

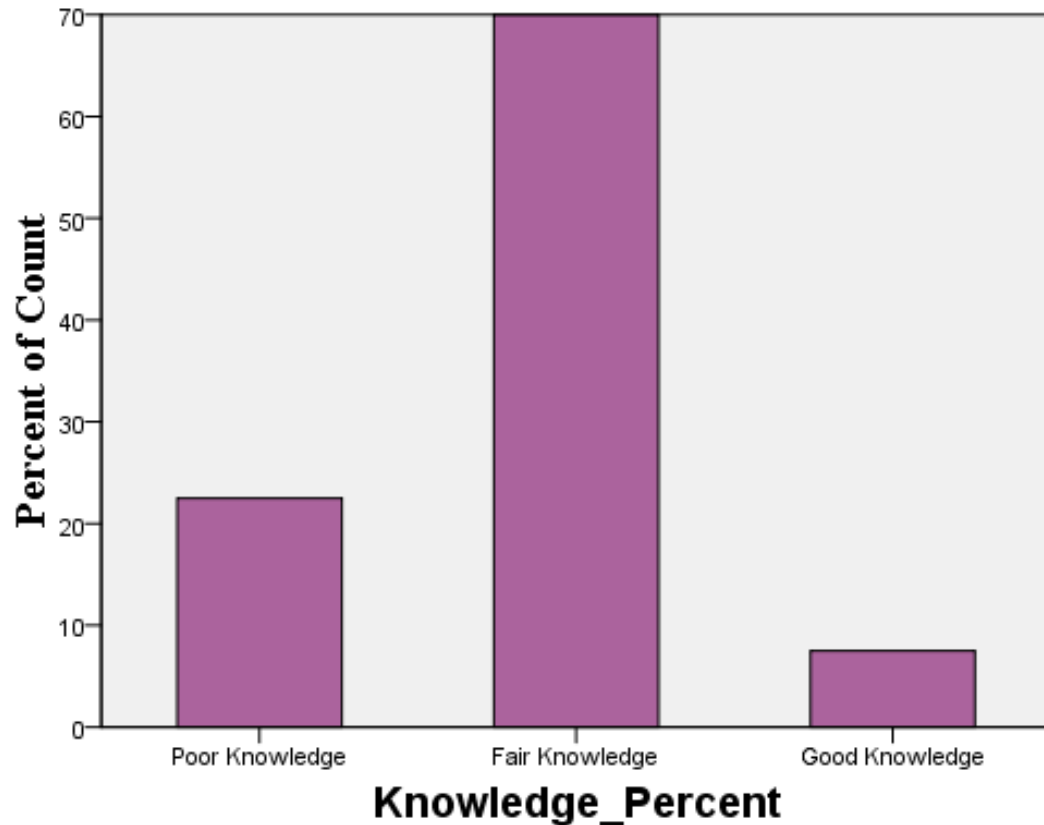
A total of 120 medical interns with a response rate of 94 % were found valid and included in the analysis. The age of the respondents ranges from 23 to 33 years with a mean age of 26.5 and the median age was 25year. The number of patients encountered during last month of their attachment showed 84(70%) encountered up to 100 patients on average, 28(23.3%) encountered 101-200 patients on average and 8(6.7%) encountered more than 200 patients. Of the total respondents 31(25.8%), 25(20.8%), 26(21.7%), 25(20.8%), 13(10.8%) were attaching in internal medicine, surgery, Gyn/Obs, pediatrics & emergency medicine respectively during the time of data collection. The socio demographic characteristics of the health care workers are described in table 1.

Table1. Selected socio demographic characteristics of respondent medical interns in SPHMMC, Addis Ababa, 2017

Characteristics	Frequency	No (%)
Sex		
Male	72	60 %
Female	48	40 %
Age		
20-25	107	89.2 %
26-30	12	10 %
31 And above	1	0.8 %
Ethnicity		
Amhara	51	42.5 %
Oromo	24	20.0 %
Tigray	7	5.8 %
Guraghe	15	12.5 %
Afar	2	1.7 %
Somali	8	6.6 %
Gamo	2	1.7 %
Shinasha	2	1.7 %
Wolayta	2	1.7 %
SNNPR	1	.8 %
Other(didn't specify)	6	5 %
Religion		
Orthodox	69	57.5 %
Muslim	25	20.8 %
Protestant	23	19.2 %
Catholic	1	.8 %
Adventist	1	.8 %
Pagan	1	.8 %

5.2. The level of Knowledge about standard precaution

The total knowledge score showed the level that 84(70%) had fair knowledge, 9(7.5%) has good knowledge and 27(22.5%) had poor knowledge. Total knowledge score of respondents range from 5 to 19 out of 20 the mean knowledge score 12.934 with sd of ± 2.674 . Majority, 100(83.33%) of the respondents scored greater than half and the highest result great majority 28(23.3%) scored 13.



Graph-1:- The total knowledge score of respondent medical interns in SPHMMC, Addis Ababa, 2017.

Coming to particularly the knowledge level on standard precaution 22(18.3%) had good knowledge, 62(51.7%) fair and 36(30%) poor knowledge. 102(85%) of the students respond hand washing between the same patient between procedures and tasks is necessary 18(15%) respond not necessary. Perceived risk of infection associated with increased likelihood of colonization of hands with harmful germs 17(14.2%) knows all of them i.e. wearing jewelry, damaged skin, artificial finger nails and regular use of hand cream, 28(23.3%) knows three, 15(12.5%) knows two, 59(49.2%) knows one and 1(8%) knows none of them. Among the students 107(89.2%) knows about standard precaution 13(10.8%) don't know about it. concerning the components of standard precaution 55(45.8%) know the four components, 24(20%) know the three component, 14(11.7%) know two components, 14(11.7%) know one component only and 13(10.8%) know nothing at all.

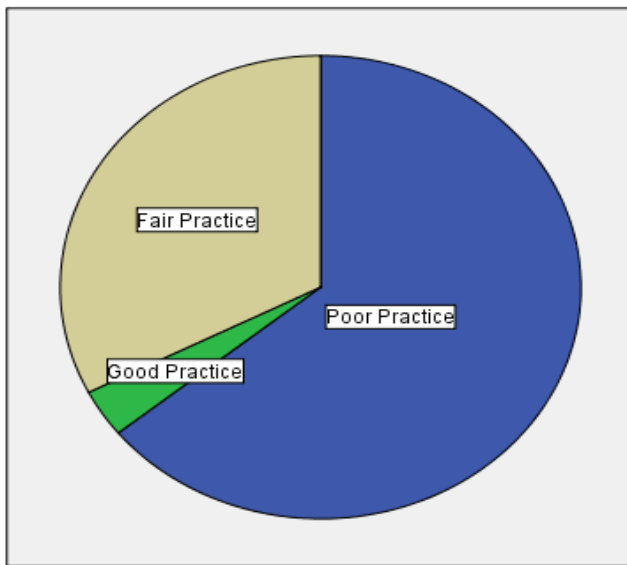
Among the respondents 24(20%) medical students had participated in any training program dedicated to infection prevention 96(80%) hadn't have any training program. Hepatitis b vaccination status of the interns shows that 35(29.2%) have vaccinated and 85(70.8%) have not vaccinated. The reasons not to be vaccinated are 12(14.11%) due to lack of availability, 37(43.53%) due to being costly and 36(42.36%) due to other reasons such as negligence, lack of time and without reasons. 2(1.7%) respondents know that dirty needles and sharp materials could transmit all of the disease mentioned. 22 (18.23%) knows five of the disease, 76(63.3%) knows four, 20 (16.7%) knows three.

Concerning perceived risk of infection 77(64.2%) of the respondents answered correctly patients considered as source of infection prior to their diagnosis & 43(35.8%) respond incorrectly. Concerning when suction catheter disposed 66(55%) responded correctly and 54 (45%) responded incorrectly concerning time suction catheter should be disposed.

5.3. Practice score of students towards hand hygiene and standard precaution

The overall practice score showed that 41(34.2%) had fair practice while 4(3.3%) had good practice and 75(62.5%) had poor practice. Total practice score of the respondents showed that 61(50.83%) score more than half and the score ranges between 5-20. The mean score of practice showed 10.76 with sd ± 2.25 and the highest result great majority 27(22.5%) scored 12.

Graph-2:- The total practice score of respondent medical interns in SPHMMC, Addis Ababa, 2017.



Hand hygiene practice showed that 15.8% had good practice while 51.7% fair and 32.5% poor practice. The conditions that respondents wash their hands showed that 117(97.5%) washed their hands at least for a single condition among listed four i.e. even gloves are worn, between every patient encounter, thinking of hand washing affects clinical outcome and hand

washing do not take too much time, 52(43.3%) wash at single moment, 26(21.7%) wash at two moments, 20(16.7%) wash their hand in all four conditions but 3(2.5%) don't wash even at single moment.

Practice score standard precaution showed that 108(90%) had poor and 12(10%) fair practice. Among respondents who ever worn personal protective devices, 27 (22.5%) used apron, 77 (64.2%) worn utility glove, 18(15%) head cover, 9 (7.5%) boots or shoes which cover toes, 6 (5%) eye protectors, 52(43.3%) mask, 116 (96.7%) examination glove and 120 (100%) gown. All 120(100%) of respondents know one instrument that should be disposed to safety box i.e. needles, lancet and other contaminated sharps. 25(20.8%) know three of them, 62(51.7%) know two and 27(22.5%) know one.

The availability of water resources 78(65%) respond yes, whereas 42(35%) responded no. Concerning disinfectant alcohol 88(73.3%) respond yes while 32(26.7%) respond not available. 62(51.7%) of the respondents had blood or body fluid splash. Among these only 4(3.3%) had got appropriate services including wash with soap and water, use antiseptics, visiting VCT, seek PEP and report to the head person, 44(70.9%) only washed with water and kept silent. 55(45.8%) of the respondents had needle stick or sharp related injury. Among these 21(38.18%) sustained during recapping, 12(21.82%) sustained during collection of sharp instruments in OR and other procedure rooms, 16(29.09%) sustained at movement of the patient during different procedures and 6(10.91%) during suturing wounds.

All 120 (100%) of the respondent had ever wore at least one type of personal protective device. 23(19.2%) wore gown and glove; 49(40.8%) wore gown, glove and mask; 23(19.2%) wore gown, glove, mask and goggle and 17(14.2%) wore five of the components. Concerning glove use 116(96.7%) respond correctly when glove should be used i.e. for all people when needed and procedures need glove but 4(3.3%) respond incorrectly i.e. only for HIV patients for procedures which need glove. Of the respondents 29(24.2%) wash their hand always after touching environment surface near to the patient, 47(39.2%) wash often, 43(35.8%) wash sometimes and 1(0.8%) never at all. 70(58.3%) of the respondents use plain soap and water to clean their hands, 95(79.2%) use alcohol hand rub, 43(35.8%) use antimicrobial based solution and 28(23.3%) use all of them together.

Chi-square association was taken to see the association between dependent variable, practice score and covariates of sex, training on Infection prevention, department attached and knowledge score. Association hasn't been seen among practice and covariates such as sex, age, ethnicity, religion, infection prevention training, which department the respondent was attached during period of data collection and average number of patients encountered in the last 30 days. Association was found between knowledge and practice (P-value=0.015). There were no correlations between episode of sharp injuries and knowledge. The results are shown here under in table 2.

			Practice level			Total	P-value
			Poor practice	Fair practice	Good practice		
Sex	Male	Count	44	25	3	72	0.800
		% within Sex	61.1%	34.7%	4.2%	100.0%	
		% within Practice level	58.7%	61.0%	75.0%	60.0%	
		% of Total	36.7%	20.8%	2.5%	60.0%	
	Female	Count	31	16	1	48	
		% within Sex	64.6%	33.3%	2.1%	100.0%	
		% within Practice level	41.3%	39.0%	25.0%	40.0%	
		% of Total	25.8	13.3%	0.8%	40.0%	
Age	20-25	Count	65	38	4	107	0.355
		% within Age	60.7%	35.5%	3.7%	100.0%	
		% within Practice level	86.7%	92.7%	100.0%	89.2%	
		% of Total	54.2%	31.7%	3.3%	89.2%	
	26-30	Count	10	2	0	12	
		% within Age	83.3%	16.7%	0.0%	100.0%	
		% within Practice level	13.3%	4.9%	0.0%	10.0%	
		% of Total	8.3%	1.7%	0.0%	10.0%	
	31 & above	Count	0	1	0	1	
		% within Age	0.0%	100.0%	0.0%	100.0%	
		% within Practice level	0.0%	2.4%	0.0%	0.8%	
		% of Total	0.0%	0.8%	0.0%	0.8%	
Training on infection prevention	Yes	Count	14	8	2	24	0.310
		% within Infection prevention	58.3%	33.3%	8.3%	100.0%	
		% within Practice level	18.7%	19.5%	50.0%	20.0%	
		% of Total	11.7%	6.7%	1.7%	20.0%	
	No	Count	61	33	2	96	
		% within Infection prevention	63.5%	34.4%	2.1%	100.0%	
		% within Practice level	81.3%	80.5%	50.0%	80.0%	
		% of Total	50.8%	27.5%	1.7%	80.0%	
Knowledge score	Poor knowledge	Count	17	10	0	27	0.015
		% within Knowledge score	63.0%	37.0%	0.0%	100.0%	
		% within Practice level	22.7%	24.4%	0.0%	22.5%	
		% of Total	14.2%	8.3%	0.0%	22.5%	
	Fair knowledge	Count	52	30	2	84	
		% within Knowledge score	61.9%	35.7%	2.4%	100.0%	
		% within Practice level	69.3%	73.2%	50.0%	70.0%	
		% of Total	43.3%	25.0%	1.7%	70.0%	

		Count	6	1	2	9	
	Good knowledge	% within Knowledge score	66.7%	11.1%	22.2%	100.0%	
		% within Practice level	8.0%	2.4%	50.0%	7.5%	
		% of Total	5.0%	0.8%	1.7%	7.5%	

Table-2:- Chi-square association of covariates with standard precaution, SPHMMC, 2017

6. Discussion

Employing standard precautions and hand hygiene practice means taking precautions with everybody. If precautions are taken with everyone, medical students do not have to make assumptions about people's lifestyles and risk of infection. Medical students should have the right to be able to protect themselves against infection. The study assessed the knowledge and practice of standard precaution among medical interns of SPHMMC, AA, Ethiopia.

Knowledge of standard precaution was good which was about 70% of the medical interns had fair knowledge. Even though this statistics is lower than a study done in AAU, TASH in 2014 in which 87.5% of the respondents had fair knowledge, it has shown to be better than the studies done in AAU, school of health science in 2015 and Kerala, India which was 53.7% & 11.38%.

Coming to particularly the knowledge level on standard precaution 22(18.3%) had good knowledge, 62(51.7%) fair and 36(30%) poor knowledge. This result is comparable to the study conducted in Nigeria among HCW's towards KAP on universal precaution, one third (37%) of the respondents had fair knowledge of universal precautions while 13% had good knowledge. The study done in AAU, TASH on which knowledge level on standard precaution 61.1% had good knowledge, 11.6% fair and 29.6% poor knowledge showed better than the finding here.

Training and education have been found to be of paramount importance to developing awareness among health care workers, as well as improving adherence to good clinical practice (3). But significant correlation was not seen between training and knowledge on standard precaution. The level of knowledge in this study is moderately acceptable even though small number of students don't know about it at all.

Concerning perceived risk of infection 77(64.2%) of the respondents answered correctly patients considered as source of infection prior to their diagnosis, which is higher than the study done in TASH where 44% don't consider patients as source of infection prior to their diagnosis it is slightly higher than a study conducted in Nepal only 41.8% recognized all patients are sources of infection.

Practice of standard precaution is poor. It is consistent with A study conducted in Iran revealed that was poor. The practice score which is 10.76 out of 20 is similar with other studies. This figure is lower than a study conducted in Ethiopia among HCWK's where practice score was 9 out of 11 and in AAU where practice score is 8.96 out of 14. This difference might be due to medical students have less experience than HCWK's who are frequently exposed to practice. The disparity between knowledge and practice could be due to high patient load per HCW, limited knowledge of risks, inadequate personal protective equipment (PPE), inconvenient place of work over crowded of patients and ignorance (16) (7) (17). This finding indicates medical interns are providing poor medical service that will promote nosocomial infection.

Practice score standard precaution showed that 41(34.2%) had fair practice while 4(3.3%) had good practice and 75(62.5%) had poor practice which is lower than a study done in AAU which showed that 125(56.8%) had fair 69(32.6%) poor and 23(10.6%) good practice. A study conducted in Ghana assessing KAP of medical residents to wards universal precaution showed that Forty-two (88%) of respondents indicated that they wore gloves routinely when performing invasive procedures on patients but 8 (16%) did not. The prevalence of sharp and needle stick injury which is 55(45.8%) of the respondents is high when compared to 24.5% out of the respondents in A study conducted in TASH and A study conducted in America which showed (18)that (30%) reported needle stick injuries. Related injury among these almost half 22(44.9%) sustained during recapping 11(22.4%) sustained during collection of sharp instruments. (18)

Hepatitis b vaccination status of the interns that 35(29.2%) have vaccinated higher than A study done in TASH which is 49(22.7%) have vaccinated. This is very low than Malaysians which is 93%.this is due to the reasons that, 12(14.11%) due to lack of availability, 37(43.53%) due to being costly and 36(42.36%) due to other reasons such as negligence, lack of time and without reasons. Over all Hand hygiene Practice was poor. But it was better i.e. (15.8.9%) had good practice than A study conducted in Srilanka which showed 5.3 %. (4)

Findings observed in our study shows that 15.8% had good practice while 51.7% fair and 32.5% poor practice which is better than both a study done in TASH which showed that 12.9% had good practice while 21% fair and 66.1% poor practice and A study conducted in Srilanka concerning hand hygiene practice 5.3% had good practices, while 26.9% had moderate practices and the majority (67%) had poor hand hygiene practices (4), This study examined the factors that influence medical students compliance with Standard Precautions in order to avoid occupational exposure to microorganisms; Several factors may contribute to these poor practices of hand hygiene and compliance to PPE such as breach of infection prevention guidelines, limited availability of basic supplies and infection control materials, poor supply of water, lack of facility , shortage of time and reasons PPE were not convenient and considering not always necessary.

In this study it was found that there is a relationship between the practice of standard precaution and knowledge of standard precaution which was similar to other studies done at AAU, TASH and Kerala, India where there was relationship found between these factors in the studies.

7. Limitation of the study

- ✓ The questionnaire is not standardized.
- ✓ Some of the questions in the questionnaire are not clearly defined, therefore, had to rely on their subjective self-assessment. Therefore their response might have accurately reflected the true practice and the reported level of practice might have been higher than the real level.

8. Conclusion

This study was conducted to determine knowledge and practice of medical interns on standard precaution, infection prevention and hand hygiene. Based on the finding, the study concludes the following:-

- Medical interns had a good Knowledge towards standard precaution.
- Medical interns had poor knowledge and practice towards hand hygiene.
- Medical interns didn't consistently use personal protective equipment.
- Medical interns' practices toward standard precaution in SPHMMC were not sufficient, favorable and safe enough to the expected standard.
- Having knowledge alone doesn't guarantee practice.
- Vaccination status for HBV was low.
- Medical interns are at high risk for sharps injuries and blood borne pathogen exposure
- Number of trained medical interns on standard precaution is low.

9. Recommendations

According to study findings the following recommendations have been made to SPHMMC:-

- Strengthen and integrate standard precaution with the routine services through providing training for all medical interns.
- Provide sustainable supplies, which include all types of personal protective equipment's, water supply, washing utensils, and other related materials are mandatory to correct the unsafe practice.
- Introduce close supportive supervision, monitoring and evaluation of universal precaution and infection prevention as one of the health services activities.
- Prepare vaccination campaigns which are accessible for medical interns
- Further survey should be done to identify predictors which determine Knowledge and Practice of medical interns.

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Annexes

Annex 1: Declaration

The undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the research and publication directorate or /and department of public health of St. Paul's Hospital Millennium Medical College.

Name of the student:- _____

Date:- _____

Signature:- _____

Approval of advisor(s)

Advisors	Signature	Date
Name 1:- _____	_____	_____
2:- _____	_____	_____

Annex 2: Informed consent

How are you, I am _____. This is a questionnaire to be filled by you for a study that is being conducted by me, an intern at SPHMMC as a partial fulfillment of requirements for the degree of doctor in medicine. I would like to ask you to fill this questionnaire and your willingness in the study. This study is prepared to obtain relevant information about the Knowledge and Practice of medical interns towards standard precautions at SPHMMC. Your participation in the study is very important in reducing nosocomial infection, work related sharp injuries, morbidity and mortality rate, which is caused by improper use of standard precautions.

Your name & address will not be written in this form and will never be used in connection with any information you tell us. All the information given by you will be kept strictly confidential and only used for this study. Your participation is voluntary and you are not obligated to answer any question which you do not wish to answer. If you feel discomfort to respond to any of the question, please feel free to drop it any time you wish to do so. Thank you in advance for your participation in the study.

I have read all the process and the objective of the study and I have understood the same as written. I understood that the research imposes no risk and no compensation would be provided to me.

Could I have your permission to continue?

1. Yes
2. No I won't fill the questionnaire

Annex 3: Questionnaire

Number _____

Direction: Put (√) mark on the boxes in front of options provided.

PART ONE. SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Sex A. Male B. Female

Male	
Female	

2. Age _____ (in years)

3. Ethnicity

Amhara	
Tigray	
Oromo	
Gurage	
Other (specify)	

4. Religion A. Orthodox C. Muslim B. Protestant D. Catholic Other (s) ____

Orthodox	
Muslim	
Protestant	
Catholic	
Other (specify)	

5. Which department you have been attached currently?

Emergency department	
Surgery	
Gyne/Obs	
Pediatrics	
Internal medicine	

6. Average numbers of patients exposed in the last 30 days, figure out _____

**PART TWO. KNOWLEDGE OF MEDICAL INTERNS TOWARDS
NOSOCOMIAL INFECTION, STANDARD PRECAUTION AND HAND
HYGIENE**

7. Do you know nosocomial infection?

Yes	
No	

8. Do you know standard precautions?

Yes	
No	

9. If yes, which components do you know?

Use of barriers (gloves, gown, cap and mask)	
Care with devices, equipment and clothing used during care	
Environmental control (surface processing protocols and health service waste handling); adequate discarding of sharp instruments	
Patient's accommodation in accordance to requirement levels as an infection transmission source	

10. Have you taken training on infection prevention?

Yes	
No	

11. Have you taken hepatitis b vaccination?

Yes	
No	

12. If no, what is the reason not to be vaccinated? -----

13. If vaccinated what is your immunization status?

Completed 3 doses	
Not completed 3 doses	

14. All patients are sources of infection regardless of their diagnoses?

True	
False	

15. Hand washing is indicated between tasks and procedures on the same patient?

True	
False	

16. Which of the following disease can be transmitted through dirty needles and sharps? (**Tick yes, no or don't know for each item**)

Type of disease	Yes	No	Don't know

Hepatitis (HBV)			
Hepatitis (HCV)			
HIV (AIDS)			
Tetanus (Clostridium tetani)			
Malaria (Plasmodium Species)			
Tuberculosis (Mycobacterium tuberculosis)			
Other (specify)			

17. When it is required to dispose a suction catheter?

Immediately after one single use	
Can be cleaned and used twice	
Can be used without being cleaned	
I don't know	

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

Wearing jewelry	
Damaged skin	
Artificial fingernails	
Regular use of hand cream	

PART THREE: Practice of medical interns towards standard precaution, infection prevention and hand hygiene

19. When do you wash your hands?

	Yes	No
Hand washing between every patient encounter		
Before every patient encounter		
After gloves are worn off		
Touching every part of hospital environment		
Other (specify)		

20. What disposed in to the safety box?

Needles	
Lancet	
Empty vials	
Cotton pads	
Dressing materials	
Latex gloves	
Other contaminate sharps	

21. Is there persistent water source in the health facility?

Yes	
No	

22. Is there alcohol swab in the room always?

Yes	
No	

23. Have you ever had blood or body fluid splash to your eye, mouth and/or nose?

Yes	
No	
I don't know	

24. If you exposed to blood or body fluid what measure did you take?

Washing with soap and water Wash with alcohol, iodine, chlorine	
Applying pressure to stop bleeding	
Dress the wound Squeezing to extract more blood	
Take TAT	
Visiting VCT	
Seek PEP	
Report to the head person	
Other (specify)	

25. Have you ever had needle stick /sharp injury?

Yes	
No	
I don't know	

26. How did you sustain the injury?

During recapping	
By sudden movement of the patient	
During sharp collection	
Other (specify)	

27. Do you wear personal protective equipment?

Apron	
Utility glove/ double glove	
Head cover	
Boots/ shoe	
Eye protectors / goggle	
Mask	
Examination glove	
Gown	
Other (specify)	

28. When did you use glove?

	Yes	No	Don't always
For all people when needed			
For only HIV Suspected cases			
For only HIV Positive cases For procedures which needs glove			
Other (specify)			

29. If you answer is No for Q.28, Why?

Difficult to work with	
Not always necessary	
Uncomfortable	
Out of stock	
Other (specify)	

30. How often do you clean your hands after touching an environment surface near to the patient (for example, table wall or bed) ?

Always	
Often	
Sometimes	
Never	

31. Which method do you use to clean your hands at work?

	Yes	No
Plain soap and water		
Anti-microbial		
Alcohol based hand rub		
Other (specify)		

Thank you for your cooperation!!!!