



**St. Paul's Hospital
Millennium Medical College**
የቅዱስ ዳዎሎስ ሆስፒታል ሚሌኒየም ሕክምና ኮሌጅ

OPERATING TEAM MEMBERS KNOWLEDGE, ATTITUDE AND PRACTICE OF
PERSONAL PROTECTIVE EQUIPMENT AT SPHMMC ADDIS ABABA ETHIOPIA, 2023.

GROUP MEMBER ID NO

- | | |
|-------------------|---------|
| 1. ABEBE MESERET | 4173/12 |
| 2. MARSHET TESFA | 4180/12 |
| 3. SAMRAWIT FIKRU | 4184/12 |

RESEARCH PAPER SUBMITTED TO SPHMMC OF HEALTH, SCHOOL OF NURSING IN
PARTIAL FULLFILLMENT OF BACHELOR SCIENCE DEGREE IN **OPERATING
THEATRE NURSING** ADDIS ABABA ETHIOPIA, 2023.

January, 2023

ADDIS ABEBA ETHIOPIA

OPERATING TEAM MEMBERS KNOWLEDGE, ATTITUDE AND PRACTICE OF
PERSONAL PROTECTIVE EQUIPMENT AT SPHMMC.ADDIS ABABA ETHIOPIA , 2023.

PRAPERED BY:

1. ABEBE MESERET
2. MARSHET TESFA
3. SAMRAWIT FIKRU

ADVISORS:

1. TSEDAY YESHITILA (BSc. OTN MSc HSE Department of OTN)
2. SEADA ADEM (BSc. OTN, MSc Medical Education)

GANUARY, 2023

ADDIS ABABA ETHIOPIA,

Acknowledgement

We would like to extend our heartfelt gratitude and admiration to our advisor TsedayYeshitila (BSc, MSc. HSE Department of OTN) and Seada Adem (BSc, MSc. Medical Education), for their guidance, giving us valuable suggestions and moral support in the process of preparing this research. We would like to extend our deepest gratitude and thanks to SPHMMC department of Nursing for giving us this opportunity to do this research to develop skills in conducting research, lastly but not least we would like to thank our friends and family's who are helping us for doing this research.

Table of Contents

Acknowledgement	I
List of table and List of figure	V
Abbreviation and Acronyms	iii
ABSTRACT-----	vi
1. INTRODUCTION	1
1.1 Background.....	1
1.2 STATEMENT OF THE PROBLEM	2
1.3 SIGNIFICANT OF THE STUDY	3
2. LITERATURE REVIEW	4
2.1. Personal protective equipment.....	4
2.2 Knowledge, attitude & practice of PPE	5
3. OBJECTIVES	9
3.1 General objective	10
3.2 Specific objectives	10
4. METHODS AND MATERIALS.....	11
4.1 Study Area-----	11
4.2 Study period-----	11
4.4 <i>Population</i>	11
4.5 Inclusion and Exclusion Criteria.....	11
4.6 Sample size and sampling procedures	12
4.7 Operational definition	12
4.8 Study Variables.....	12
4.9 Data management.....	20
4.10 Dissemination of the result	12

5: Result	12	Error! Bookmark not defined.
5.1. Socio demographic characteristics-----	14	
5.2 .Knowledge assessment-----	16	
5.3. Attitude of health care workers at Saint Paul's hospital in operating room-----	17	
5.4. Practices of health care workers Saint Paul's hospital in operating room-----	19	
6. DISCUSSION-----	20	
7. Strength and Limitation of the study-----	21	
8. Conclusion -----	22	
9. Recommendation-----	23	
10. REFERENCES-----	24	
11. ANNEX I	28	

List of table and List of figure

Table 1: Distribution of Socio-demographic characteristics of the health care workers in, operating room at SPHMMC, in Addis Ababa, Ethiopia/ 2023.

Table 2: Knowledge of the health care workers in, operating room Attitude of health care workers in Saint Paul's hospital in operating room in Addis Ababa, Ethiopia/ 2023.

Table 3: Attitude of health care workers in Saint Paul's hospital in operating room in Addis Ababa, Ethiopia/2023.

Table 4: Practices of health care workers in Saint Paul's hospital in operating room in Addis Ababa, Ethiopia/ 2023.

Abbreviation and Acronyms

CDC	Center for Disease Control and Prevention
HAIS	Health care Associated Infection
HCP	Health Care Providers
HCWS	Health care Workers
ILO	International Labor Organization
KAP	Knowledge, Attitudes, and Practices
OR	Operation Room
PPE	Personal Protective Equipment
SPHMMC	Saint Paul's Hospital Millennium Medical College
WHO	World Health Organization
SARS	Severe Acute Respiratory Syndrome
IPC	Infection prevention Control

ABSTRACT

BACKGROUND

Personal protective equipment (PPE) provide a physical barrier between the user and micro-organisms by preventing micro-organisms from contaminating the mucous membranes, airways, skin, clothing, hair and shoes of health care workers. Personal protective equipment (PPE) limits the health care workers contact with all secretions or biological products. This study is planned to find gaps between uses of PPE among the health care provider (HCPs).

The study aims: to assess the KAP on PPE use among SPHMMC operation room working health workers.

OBJECTIVES: The objective of this study was to assess knowledge, attitude and practices on personal protective equipment in operation room at SPHMMC.

Materials and Methods: - Hospital based cross-sectional prospective study design was used to collect data from 260 healthcare working in public hospitals in Addis Ababa from October 2022 up to December /2022. The data were collect using purposive sampling method for self-administered questioner health care worker were used to collect the data to determine the knowledge, attitude and practices of operation room on PPE at St, paul's hospitals, Addis Ababa Ethiopia. Data were analyzed by using MS-Excel 2010 (SPSS V26) and presenting the data in the form of percentage using tables, pie chart and bar chart.

Result: - A total of 260 health care worker with response rate of 248 (95.3%) were participated in this study. 49(19.8%) has poor knowledge, 199 (80.2%) were good knowledgeable, Based on quantitative finding 227 (91.5%) of respondents have favorable attitude for health care workers whereas the 21(8.5%) has unfavorable attitude and Based on practice of heath care worker 198(79.8%) were correct practice and 50(20.2%) were incorrect practice.

CONCLUSION: The study showed inappropriate use and lack of adequate knowledge on infection control practices emphasizing that periodic re-training is needed. PPE use is vital in safeguarding the HCWs and reduces spread of infection. Increasing the awareness of health care workers about the importance of adherence to usage of PPE is very important and will help in

reducing transmission of infection to them. Protection of health care workers from acquisition of infectious diseases can be achieved by compliance to established infection control.

Recommendation: Periodic reinforcement and training programs are needed for all level of health care workers for adherence with appropriate use of personal care equipment.

Key wards: Knowledge, Attitude and Practice, personal protective equipment operating room
And health care workers

1. INTRODUCTION

1.1 Background

Personal protective equipment (PPE) is equipment worn to minimize exposure to a variety of hazards, includes such items as gloves, foot Cover and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits (Safety and Health Program Management Guidelines...33). They are considered as a very important part of Standard Precaution. (Karen et al., 2015)

In the developing countries, the health care workers particularly, operation room working providers are at greater risk due to sub-optimal infection control practices like lack of equipment, training, compliance with universal precautions (Sagoe-Moses et al., 2001). The world health organization (WHO) estimates that among 35 million HCWs worldwide, three million experience occupational blood exposure each year. As a result of these exposures, 150,000 HCWs get infected to HCV, 70,000 to HBV, and 500 to HIV per year. More than 90 % of these infections occur in developing countries, particularly in sub-Saharan Africa (CDC 2020). African countries showed that the lifetime and one-year blood exposure were 5.7 % and 48 %, respectively (Auta A, Adewuyi EO).

PPE is considered a very important part of Standard Precaution. (Karen et, al., 2015) World Health Organization (WHO) has recommended health care professionals conduct a routine appraisal of their danger of exposure to blood and other body fluids before the provision of any health care services and utilize the proper PPE for protection.

The Ethiopian federal ministry of health has tried to reform hospitals throughout the country following the Ethiopian hospitals reform implementation guideline and infection prevention and patient safety strategy with the prime aim of reducing occupational blood exposure and associated healthcare-acquired infections FMOH2010. Despite the efforts, the prevalence of one-year and lifetime needle stick injuries among the Ethiopian HCWs is as high as 55.1 % and 63.6 %, respectively (T Yazie TD, Chufa KA,) the provision of protective equipment, safety trainings and the number of healthcare workforce are indicated to have significant implications for occupational exposures(O. Yasin J, Fisseha R, Mekonnen F) on top of that, there is poor

compliance to infection prevention practices among HCWs (Sahiledengle B, Tekalegn Y, Woldeyohannes D).

Compliance with the use of PPE and recommended infection control precautions is critical to prevent the transmission of the pathogens one study. The finding that physicians wore aprons, eye protection significantly higher than nurses can be explained by the fact that surgeons are especially at higher risk as shown from the results of a prospective study which conducted to determine the incidence of blood splashes to the masks and goggles of surgeons. The study observed that the rate of blood splashes was 62.5% on surgeons' masks, 63.2% on surgeons' goggles, 11.1% on scrub nurses' masks and 16% on scrub nurses' goggles (Aisien and Ujah, 2006)

However, knowledge, attitude & practice of PPE level health care providers (HCP) will be considered as proven way of addressing the problem as stated by WHO (2015) rational model of health promotion believed high knowledge will translate to a positive attitude and subsequently good behavior. Indeed, protection of HCPs and their working environment are relevant aspects in pandemic responses. one study in Kenya Hospital reveals

Therefore the study aims to identify and describe the level of knowledge, attitude and practice among OR working teams regarding PPE in St. Paul's specialized Hospital through conducting KAP survey among operation room working teams and provide baseline evidence for further research requirement in the areas.

1.2 STATEMENT OF THE PROBLEM

Operation room working providers are bearing the highest vulnerability of exposure to microorganism. Evidence shows in 2011, Loftus and colleagues sampled the hands of anesthesia providers before the start of intra operative care, they found that approximately 66% of provider hands were contaminated with at least 1 major pathogen. . HCAIs pose a real and serious threat to both the patients and healthcare workers. (5. S. A. Khan). An estimated 10% of hospitalized patients in developed countries and 25% in developing countries develop HCAIs and subsequently result in adverse healthcare outcomes as increased hospital stay, economic burden, significant morbidity, and mortality (J. D. Stanaway, A. D. Flaxman, M. Naghavi et

al.)However, a largepercentage of HAI are preventable through effective infection prevention and control (IPC) measures (WHO 2017.).

Even though PPE is the essential part of universal standard percussion, low health care resourcing countries like, Ethiopia still lag reveal high prevalent of KAP 82.35% in OR room providers, as compared to Indian OR room 100%(ArchanaLakshmi PA et al). With this respect St. Paul'sspecialize Hospital where the largest number of operation procedure undergone, and it will likely to magnifying the burden.

The most common problems associated with using PPE kits will excessive sweating (100%), fogging of goggles, spectacles, or face shields (88%), suffocation (83%), breathlessness (61%), fatigue (75%), headache due to prolonged use (28%), and pressure marks on the skin at one or more areas on repeated use (19%). Occasional problems reported were skin allergy/dermatitis caused by the synthetic material of the PPE kit, face shield impinging onto the neck during intubation, and nasal pain, pain at the root of the pine, and slipperiness of shoe covers. Various ways and means have been employed by the HCWs to actively address and solve these problems.

1.3 SIGNIFICANT OF THE STUDY

IT helps describe an understanding of the knowledge , attitude & practice of PPE as well as assess the ability to properly wear and use of PPE during HCP performing their work requiring the use of PPE. It also address universal infection control precautions advised by the World Health Organization (WHO) to protect operation room workers and clients from blood-borne infections including HIV and ensure the greatest possible protection for employees in the workplace and maintaining a safe and healthful work environment in line with Ministry of Health Ethiopia approval and endorsement National IPC Policy, strategy and roadmap which will be implemented during the period of 2021/22-2025/26. As well as address national health policywhich intent is to establish and institutionalize high standards of IPC to reduce the risk of HAIs, improve the safety of patients, health care workers, and attain the highest quality of health care across all levels of the Ethiopian health care system.

2. LITERATURE REVIEW

2.1. Personal protective equipment

Personal protective equipment is designed to protect health care providers from serious workplace injuries or illnesses. 1 Personal protective equipment provides a physical barrier between microorganism and wearer. It offers protection by preventing microorganism from contaminating hands, eyes, clothing, hair and shoes. 2 A breach in infection control practices facilitates transmission of infection from patients to health care workers, other patients and attendants. Personal protective equipment (PPE) includes gloves, protective eye wear (goggles), mask, apron, gown, boots/shoe cover, hair cover. Standard Precautions assumes that all patients have potentially infectious blood and body fluids. In addition, Standard Precautions adds the focus on preventing Healthcare personnel from acting as vectors for Health care associated infections (HAI) pathogens

WHO Collaborating Centre for Occupational Health carried out a literature review of the values and preferences of health workers regarding the use of PPE in the context of Ebola and other infectious diseases, including hepatitis B virus, human immunodeficiency virus (HIV) infection and severe acute respiratory syndrome (SARS) and identified five main domains that affect the use and acceptability of PPE: (1) beliefs and values, such as risk perception and safety climate; (2) interference with work activities and impaired mobility; (3) comfort, such as weight of PPE and heat stress; (4) work factors, such as number of patient encounters; and (5) use and availability, including difficulty in dressing and undressing, and training. The study conducted in Egypt Hospital indicate that the perception of health works regarding PPE most of the considered their work environment as highly risky (50.7%). Although most of them agreed that usage of PPE can reduce the work hazards (45.7%), the highest percentage of them stated that they only (sometimes) used PPE (41.2%). Moreover, most of them disagreed that a hospital policy on PPE usage will increase adherence ,the the percentage of nurses was significantly higher than that of physicians to believe the following factors have strong influence: previous inoculation, past experience, peer or senior example, wearing PPE interferes with doing their work tasks, availability of PPE at work, urgent patient needs. While physicians found that hospital policy, not enough time, patient objection are factors with a significant strong influence on adherence to PPE usage.(Hakim SA et al.) hus, The use of PPEs is mandatory in all

interventions, including surgical interventions, intubation and extubation, regional anesthesia, cannulation and catheterization.¹² It is also essential for all staff, including nurses and surgeons, to receive the necessary training to prevent infection when wearing and removing PPEs.

2.2 Knowledge, attitude & practice of PPE

The concept of KAP can be reasonably assumed that good knowledge and a positive attitude regarding the use of personal protective measures should lead to the proper practice of IPC. Even though studies assessing KAP of HCP was limited particularly, in operation room, few evidence were identified in Indian Operation Theater, and reveals appropriate use of gloves, mask, apron, gown and hair cover was 100%. But the use of goggles and shoe cover was very low. The reasons for inappropriate use of PPE will non availability (78%) followed by not aware of the importance (11%) ArchanaLakshmi PA et al .

In Kenya the majority 49.3% (69) of participants had worked for 15 years and above followed by those who had worked for a period of 10 to 15 years 21.4% (30). Those with work experience between 5 to 10 years were 28 and accounted for 20.0%. Only a few had work experience between 1 to 5 years 9.3% (13).knowledge the majority 50.7% (69) reported that they were trained on infection control for a period of more than 3 years passed with about 13.9% (19) who had received training for a period between 1 to 6 months earlier given the time survey was carried out. Concerning the mode of training on infection control.

In study conducted in Ethiopia Jima referral hospital 14 (82.35%) of them has good knowledge while the rest of 3 (17.64%) have poor knowledge. Among 17,14 (82.35%) attitude score was > 15 and 3 (17.64%) score was below 15 (unfavorable)

2.2.1 Knowledge

Knowledge can be defined as the perception and cognition of oneself, the immediate surrounding or environment and the universe as a whole. Study in Bangladesh (99.5%)has good knowledge. According to WHO (2015), the rational model of health promotion believed high knowledge will translate to a positive attitude and subsequently good behavior. The Center for Disease Control and Prevention (CDC, 2020) recommends frequent training of HCWs on the standard and transmission-based precautions such as the correct procedure for donning and doffing PPE when caring for patients study In Kenya, Moyo (2013) stated that more than half of nurses (60%) had

attended formal training on infection prevention which includes the use of PPE, while the remaining 40% were not formally trained on the use of PPE. Even though 64% of the nurses were diploma holders, with less than 30% being first degree holders, there is no significant difference in their knowledge on the use of PPE and the study recommend need for training on the use of PPE.

Study conducted in the neonatal intensive care units in the Ministry of Health (MOH) hospitals in Gaza governorates clarifies that the practice of IPC is very low; while the attitude is high. The reasons of incompliance to IPC according to the HCWs perception were the absence of a training program and lack of knowledge and education (Awad, 2009).

On other study conducted in Egypt showed that PPE can reduce the work hazards (45.7%), the highest percentage of them stated that they only (sometimes) used PPE (41.2%) On studying the factors affecting adherence to usage of PPE among participants, the percentage of nurses was significantly higher than that of physicians to believe the following factors have strong influence: previous inoculation, past experience, peer or senior example, wearing PPE interferes with doing their work tasks, availability of PPE at work, urgent patient needs. While physicians found that hospital policy, not enough time, and patient objection are factors with a significant strong influence on adherence to PPE usage.

Knowledge is very important as far as KAP of PPE is concerned similar study reveals in Ethiopia bale Zone 145 (36.8%) of them were found to have self-reported good infection prevention practice. Good knowledge towards infection prevention availability of personal protective equipment, and water at workplace were found to have a statistically significant association with healthcare workers self-reported good infection prevention practices it could gained through training & education. Training and education is an important function of any organization as a method to develop the human resource and enrich their experience and knowledge. Training is an organized activity aimed at imparting information and/or instructions to improve recipient's performance or to help him to attain a required level of knowledge or skill (Business Dictionary, 2011b).

Another study argues that knowledge can be influence by educational level this study found 74.9%, 84.2% and 68.9% prevalence of adequate knowledge, positive attitude and good practice

respectively. Working in comprehensive specialized hospital. Having MSC degree, and training on COVID-19 were strongly associated with knowledge of health care workers.

2.2.2 Attitude

An attitude is a way of behaving towards something that indicates how you feel and consider it. Research has indicated that attitude is important towards the utilization of personal protective equipment by HCWs.

HCWs' KAP regarding PPE for the prevention in Bangladesh found out that 88.8% had a positive attitude regarding PPE. However, the proportion of HCWs having positive attitudes differed significantly between non-physician (76.5%) and physicians (93.9%). In preventive standards observance against COVID-19 was in moderate (55.3 ± 10.5) level and the level of compliance with the standards of using PPE by the surgical team was favorable (61.8 ± 8.1). There was a statistically significant relationship between the level of compliance with the standards of using PPE and the type of specialty. However, study conducted in Badgujar et al. (2021) argued investigating KAP regarding the use of PPE equipment during the COVID-19 pandemic among HCWs at a tertiary health care center revealed that the majority of HCWs had a positive attitude and appropriate practice regarding the use of PPE, underlining the importance of positive attitude concerning the practice of donning and doffing PPE.

2.2.3 Practice

The practices of health workers are (51.7%) has good practice equally important in preventing infections. Since it is not always possible to identify patients with asymptomatic infection, because early symptoms are nonspecific. For this reason, it is important that health workers use standard precautions consistently with all patients, regardless of their diagnosis. Rigorous adherence to these precautions is crucial, it helps to the healthcare workers to reduce and minimize their occupational exposure. However PPE practice level had shown the greater variation depending on the health care resource. More providers in LIC/L-MICs felt unsafe performing their clinical duties than in UMIC (35.5% vs 6.8% (Nichole Starr, MD, MPH). Study conducted on the basis of practical experience Canada and Nepal A total of 79.5% of participants had satisfactory knowledge while 75.6% had satisfactory practice scores regarding donning and doffing of PPE.

Study report in Malaysia report of More than 90% of the healthcare workers followed infection prevention and control practices recommendations regardless of whether they have been exposed to occupational risk for COVID-19 (Nor Azila Muhammad Azami¹, Nor Azian Abdul Murad).

Study conducted assess practice level of health workers in Ethiopia bale 36.8%, of them were found to have self-reported good infection prevention practice. Good knowledge towards infection prevention & availability of personal protective equipment major factors for practicing.

Study conducted in Ethiopia Debre-Markose Hospital which is (89.8%), 387 (94.4%), and 326 (79.5%) HCPs had adequate knowledge, positive attitude, and good prevention practice, Factors significantly associated infection, having < 5 years of working experience similar study seen in southern Ethiopia SULTE hospital Studies conducted in southern Ethiopia Sulte Zone focusing infection prevention in health care but, indicates 74.9%, 84.2% and 68.9% prevalence of adequate knowledge, positive attitude and good practice respectively not specific to personal protective equipment.

In contrast to this In one study, health care workers cited various reasons for not using the personal protective equipment (PPE) and emergencies were the reason cited by most of them (91.43%) for not using the PPE, busy schedule (37.14%), risk of offending the patient (27.14%), discomfort (24.29%) and difficulty in carrying out the job (18.57%) (Med et al., 2011. Factors such as the profession of the participants their workplace provision of PPE at workplace, and availability of designated space at workplace for methodical were major contributor donning and doffing of PPE,

Type of health facilities, level of education (master degree), training on PPE, work experience, type of source of information were significantly associated with knowledge, attitude and practice of health care workers. However Issue in different still raising argue mental ideas on the bases of application standard percussions, which is mostly associated to perception and believe HCP literature In one study, 87.5% of respondents believed that use of appropriate PPE would confer adequate protection for health care workers. Half of respondents reported that PPE use was inconvenient, while 21.2% believed that PPE use would interfere with patient care, with no difference observed between physicians and nurses (Hakim SA, Abouelezz NF and El Okda EM)

Conceptual Frame Work KAP on PPE

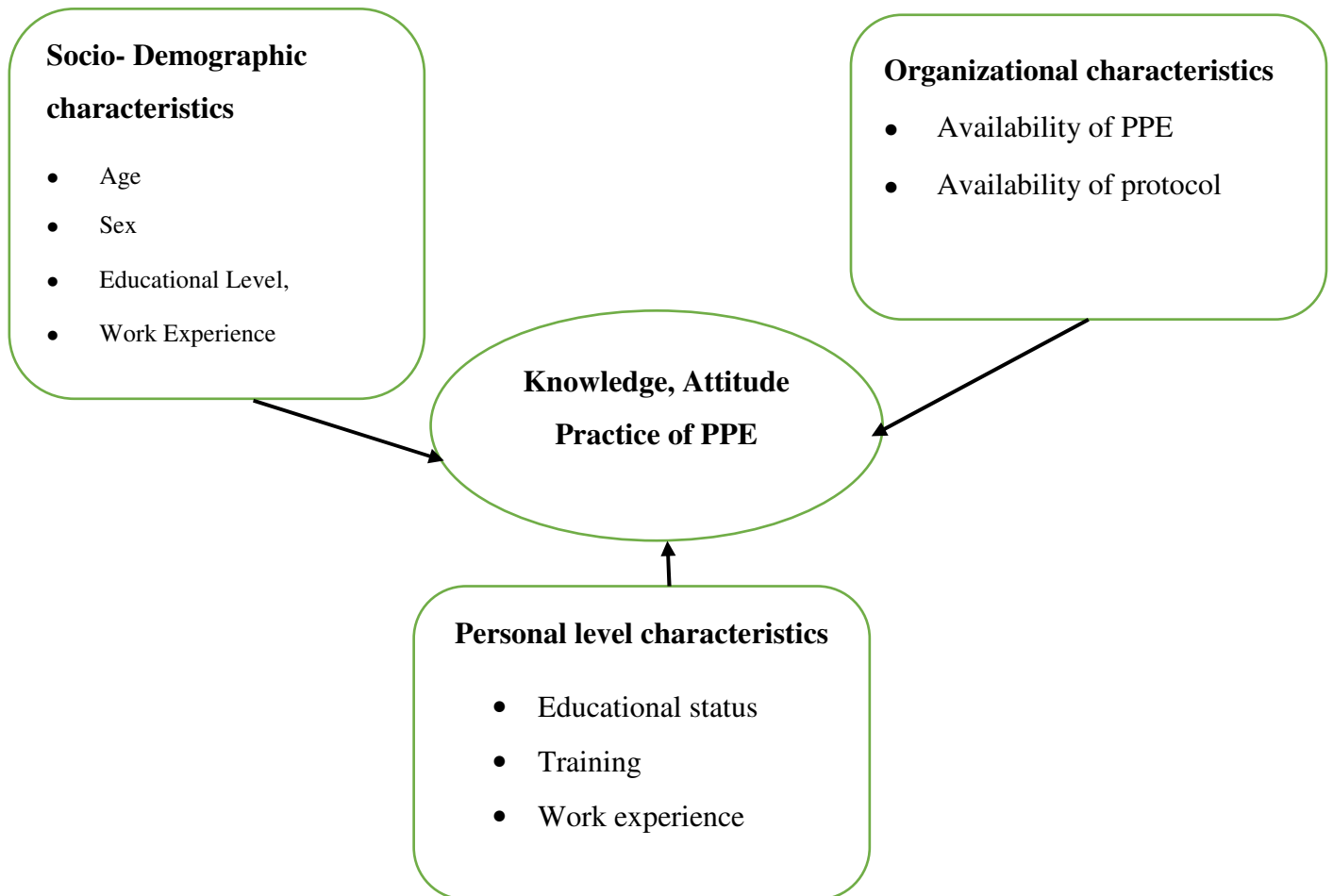


Figure 1. Schematic representation of Knowledge, Attitude Practice of PPE

3. OBJECTIVES

3.1. General objective

- ❖ To assess operating room team members' knowledge, Attitudes and Practice regarding personal protective equipment in SPHMMC, Addis Ababa Ethiopia, 2022

3.2. Specific objectives

- ❖ To determine operating room health care providers knowledge regarding PPE in SPHMMC
- ❖ To describe the attitude of operation room health care providers regarding PPE in SPHMMC
- ❖ To identify operating room health care providers practice regarding PPE in SPHMMC.

4. METHODS AND MATERIALS

4.1. Study Area

St. Paul's hospital millennium medical college was established in 1968 by the late Emperor Haile Selassie. It was found in the capital city of Ethiopia and it is the second largest hospital in the country. The hospital more than 700 beds totally. Averages of 598864 clients are served annually, and have more than 5 million populations. The Hospital has 5598 clinical and non-clinical staffs. Multi discipline workers of which 122 operation room working nurses, 57 anesthetics professional and 81 physicians were working in operation room.

4.2. Study Period

- ❖ The data was be collected from November 1, to December 30, 2023

4.3. Study design

- ❖ An institutional based Cross sectional quantitative study design.

4.4. Population

4.5.1. Source population

- ❖ All health care workers work at St. Paul's Hospital from November 1, to December 30, 2023.

4.5.2. Study population

- ❖ All health care workers work at St. Paul's Hospital in operation room from November 1, to December 30, 2023.

4.6. Inclusion and Exclusion Criteria

4.6.1. Inclusion criteria

- ✓ Health care workers works in operation room available during the data collection period were included in the study.

4.6.2. Exclusion criteria

- ❖ Free service worker health care workers were excluded.
- ❖ All cleaners' workers were excluded.

4.7. Sample size and Sampling Technique

4.7.1. Sample size

The sample size for quantitative study and the study population at St. Paul's hospital Surgeon = 81, Nurse =122, and anesthesia =57 total health care workers are 260 .To get sample from the total population we used total population for sample size. Accordingly, the sample sizes required for this study were 260; and there is no adding 10% for non-response rate the total sample size required were 260.

4.7.2. Sampling Technique

St, Paul's Hospitals was purposively for the study and we study participants by using purposive sampling method.

4.8. Data collection tools

Self-administered per-tested structured questionnaire was used to collect the data.

4.9. Operational definition

Knowledge: Defined as participant, from total knowledge related question, correctly respond less than 60% categorized as having poor knowledge and >60 categorized as as having good knowledge.

Attitude: Ways of thinking of the study subject about infection prevention. The result will be graded according to Likert scale from 1-5. For response to positive statements, strongly agree score 5 & strongly disagree score 1. For responses to negative statements strongly disagree score 5 & strongly agree score 1. Based on this score > 60% considered as favorable attitude while <61% considered as unfavorable attitude, which also include neutral response.

Practice: Experience or way of doing of the study subject regarding to prevent any sort of infection. Those who have no risk practice considered as safe practice. Those who had at least one risk practice considered as unsafe practice; practicing without personal protective equipment uses.

4.10. Study Variables

4.10.1. Dependent variables

- ❖ KAP on PPE

4.10.2. Independent variables

- ❖ **Socio demographic variable** – Age, Sex
- ❖ **Personal level characteristics** - Educational Level, Work Experience
- ❖ **Organizational characteristics** - Availability of Personal Protective Equipment, Availability Of Protocols

4.11. Data management

Data were conducted using English version standard questionnaire, Information response was Self-administer questionnaire containing close ended questions was used to collect data. The question focused on operation room health care providers' knowledge, attitude and practice of PPE. And it was arranged & organized with summary table to illustrate clear information. Final result displayed by graph & was interpreted using descriptive statistical measurement rate & proportion.

4.12. Data Quality Control

Orientation was given for two diploma data collector nurses about where to collect, how to collect and the aim of the study, close supervision was undertaken coding on variable was used to organize data,

4.13. Data Processing and Analysis

The data was cleaned, coded, and entered into SPSS software, where it was checked for completeness and consistency and analysis, the raw data was handled carefully from losing of valuable data by using computer password. The data was cleaned by checking the frequency of each variable for accuracy, inconsistency, and missing values. To make data analysis easier, variables were compiled before they are analyzed.

All variables related to the study's objective was provided descriptive statistics such as frequency, bar chart.

4.14. Ethical Clearance

Ethical clearance approval was gained from St Paulo’s college of medicine research ethics board and initially permission letter was obtained from Hospital administration before the data collection start. The objectives of the study was clarified and consent sign was be signed by individual health care providers, confidentiality was kept the question format does not include personal identifying name or code was not be included and the data which is collected from the health worker was strictly confidential.

4.15. Dissemination of the result

The finding of this study was disseminated to SPHMMC and reported to department of Nursing in Saint Paul’s millennium medical college.

5. Result

5.1. Socio demographic characteristics:

A total of 260 health care workers with response rate of 248 (95.3%) were participated in this study. From all respondents 116 (46.8%) were male, 132(53.2%) were femal, 33(13.3%) were 18-25 years old, 141(56.8%) were 26-35 years old,69(27.8%) were 36- 45 years old,5(2.0%) were >46 year old, 95(38.3%) were having 0 to 5years of work experience 97(39.1%) were 6-10 years, 53(221.3%) were 10-15 years, 3(1.2%) were >15 years, 27(10.8%) were Diploma, 89(35.8%) were first degree holders and 61(24.5%) were Master’s Degree and 71(28.6%) were PHD.

Table 1. Distribution of Socio-demographic characteristics of operating team members knowledge, attitude and practice of PPE at SPHMMC Addis Ababa Ethiopia, 2023 (N=248)

Variables		Frequency	Percent
1. Sex	Male	116	46.8
	Female	132	53.2
	Total	248	100.0

2.Age category	18-25	33	13.3
	26-35	141	56.9
	36-45	69	27.8
	>46	5	2.0
	Total	248	100.0
3.Marital status	Married	140	56.5
	Single	104	41.9
	Widowed	2	.8
	Separated	2	.8
	Total	248	100.0
4.Educational level	Diploma	27	10.9
	Degree	89	35.9
	Masters	61	24.6
	PHD	71	28.6
	Total	248	100.0
5.Work experience	0-5 years	95	38.3
	6-10 years	97	39.1
	11-15 years	53	21.4
	Above 15 years	3	1.2
	Total	248	100.0

5.2. Knowledge assessment:

A total of 260 health care workers with response rate of 248 (95.3%) were participated in this study. Among study participants 49(19.8%) has poor knowledge, and 199 (80.2%) were good knowledgeable.

Table 2: Operating team members knowledge of PPE at SPHMMC Addis Ababa Ethiopia, 2023 (N=248)

S.no	Variable	Correct		Incorrect	
		No	%	No	%
1	Have you been trained in infection control	153	61.7	95	33%
2	When did you receive your last training on infection control	180	72.6	68	27.4
3	How were you trained on infection control	180	72.6	68	27.4
4	Choose the correct series of donning PPE	208	83.9	41	16.1
5	Choose the correct series of removing PPE	174	70.2	74	29.8
6	Choose the correct order of donning gloves	186	75.0	62	25%
7	Choose the correct order of removing gloves	188	75.8	60	24.2%
8	Choose the correct order of donning Gown	167	67.3	81	32.7%
9	Choose the correct order of removing Gown	176	71.0	72	29%
10	Choose the correct order of donning Mask	166	66.9	82	33.1%
11	Choose the correct order of removing Mask	188	75.8	60	24.2%
12	After donning gloves, work should start from	226	91.1	22	8.9%

Knowledge Assessment:

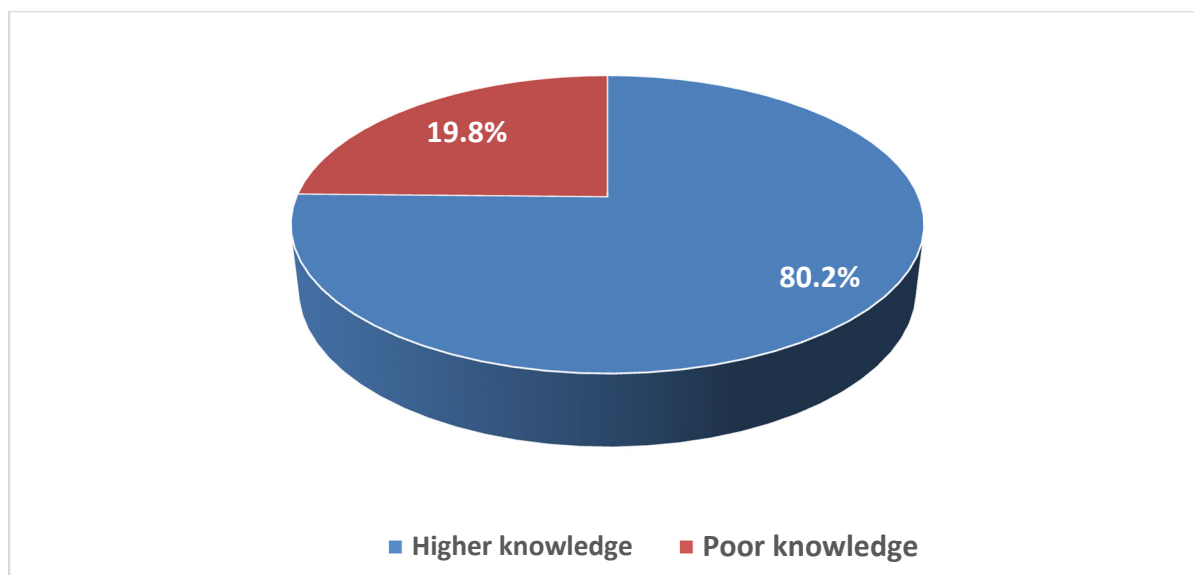


figure1: As figure below 49(19.8%) has poor knowledge, and 199 (80.2%) were good knowledgeable.

To knowledge on the use of PPE on a scale of 1 to 5 (1 = Complete Disagree, 2 = Disagree, 3 =Neutral, 4 = Agree, 5 = Complete Agree)

S. N O	Variable	Complete Disagree	Disagree	Neutral	Agree	Complete Agree
1	Use of Personal Protective Equipment (PPE) is part of infection control	4(1.6%)	15(6.0%)	2(0.8%)	23(9.3%)	204(82.3%)
2	Personal Protective Equipment (PPE) is an effective barrier to infection	2 (0.8%)	5(2.0%)	3(1.2%)	55(22.2%)	183(73.8%)
3	PPE should be used when there is a risk of exposure to fluids and secretions patient	12(4.8%)	8(3.2%)	13(5.2%)	170(68.5%)	45(18.1%)
4	I am confident that I understand the risks associated with infections when dealing with patients	3(1.2%)	4(1.6%)	52(21.0%)	123(49.6%)	66(26.6%)

5	I am confident that I understand how to protect myself and my patients from infections	6(2.4%)	1(0.4%)	26(10.5%)	136(54.8%)	79(31.9%)
6	The use of correct PPE eliminates the need for hand hygiene	13(5.2%)	1(0.4%)	4(1.6%)	142(57.3%)	88(35.5%)

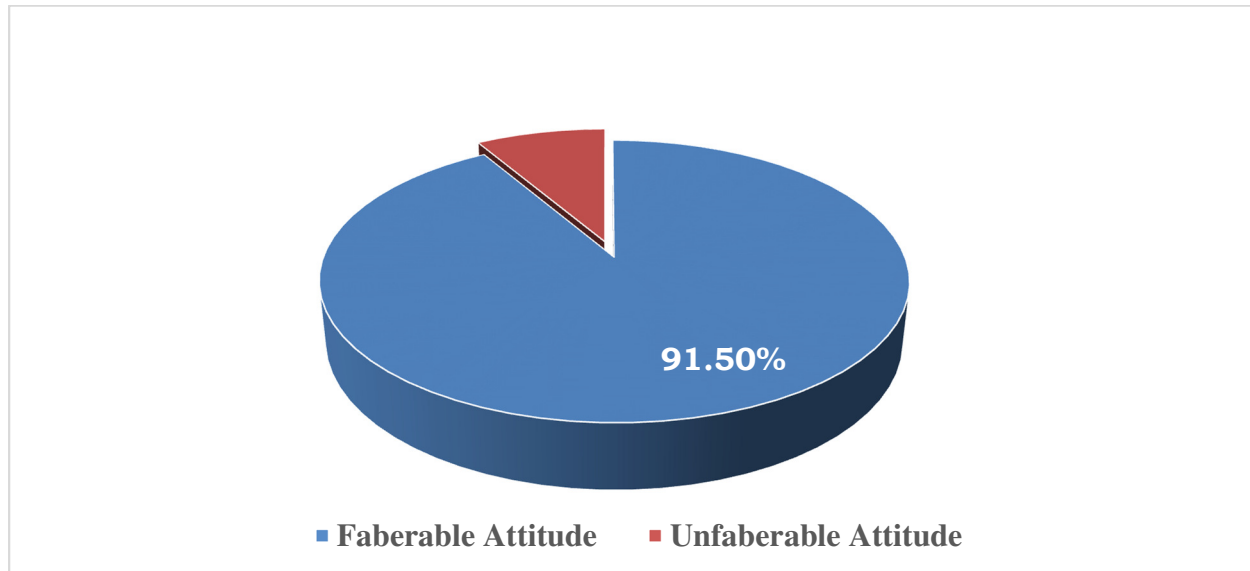
5.3. Attitude Assessment of health care workers at Saint Paul's hospital in operating room.

Based on quantitative finding 227 (91.5%) of respondents have favorable attitude for health care workers nursing 21 (8.5%) has unfavorable attitude.

Table 3: Attitude of health care workers in Saint Paul's hospital in operating room Addis Ababa, Ethiopia/ 2023.

S.no	Variable	Complete Disagree	Disagree	Neutral	Agree	Complete Agree
1	Do you Use of PPE keeps me from getting infections	6(2.4%)	4(1.6%)	4(1.6%)	112(45.2%)	122(49.2%)
2	Use of PPE will keep patients from getting Infections	2(0.8%)	4(1.6%)	14(5.6%)	143(57.7%)	85(34.3%)
3	It is inconvenient to use recommended PPE when taking care of patients	9(3.6%)	11(4.4%)	39(15.7%)	128(51.6%)	61(24.6%)
4	Use of recommended PPE interfere with patient treatment/care	12(4.8%)	4(1.6%)	52(21.0%)	103(41.5%)	77(31.0%)
5	Adherence to guidelines for the use of PPE is very essential	10(4.0%)	8(3.2%)	15(6.0%)	134(54.0%)	81(32.7%)
6	I am confident that I can improve PPE Compliance	19(7.7%)	38(15.3%)	15(6.0%)	126(50.8%)	50(20.2%)

Attitude of health care workers



As figure below 227 (91.5%) of respondents have favorable attitude for health care workers whereas the rest 21 (8.5%) has unfavorable attitude .

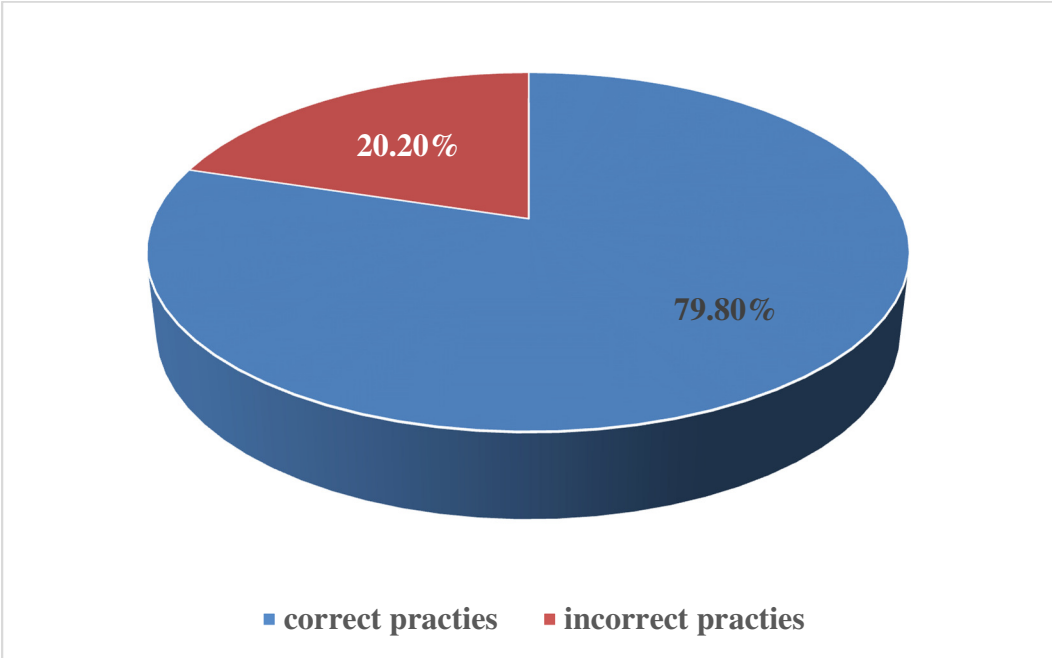
5.4. Practices of health care workers Saint Paul's hospital in operating room.

Table 4: Practices of health care workers in Saint Paul's hospital in operating room Addis Ababa, Ethiopia/ 2023.

s.no	Variable	Correct	In correct
1	Is always remove gloves first during the doffing procedure using glove-in-glove technique	218((87.9%)	30(12.1%)
2	Is remove the gown after removing the inner pair of gloves	196(79.0%)	52(21.0%)
3	Is move out from the doffing area after removal of gloves and N95 mask.	190(76.6%)	58(23.4%)
4	Personal protective equipment can protect employees from all workplace hazards	182(73.4%)	66(26.6%)
5	Will personal protective equipment protect a specific disease	176(71.0%)	72(29.0%)

6	Does every piece of PPE provide the same level of protection	198(79.8%)	50(20.2%)
7	PPE is designed to be used with other infection control practices such as hand-washing, using alcohol-based hand sanitizers and covering coughs and sneezes to minimize the spread of infection from one person to another.	228(91.9%)	20(8.1%)

Based on practice of health care worker 198(79.8%) were correct and 50(20.2%) were incorrect.



As figure below Practices of health care workers among Saint Paul's hospital in operating room .

5. Discussion

OR room among the highest vulnerable area to microorganism during resulting from direct contact to body fluids at the time of day to day procedures undergoing. PPE ultimate safety of both patients and providers under the WHO recommendation. there for study conducted on the knowledge, attitude, and practice of health worker can provide evidence based practice to the currently growing infection prevention programs and policy strategies this study was found that most of participant HCW who working in operation room had having favorable attitude (91.5%), good knowledge (76.9%) and practice (78.8%) This study had shown almost nearly similar

evidence regarding knowledge and attitude of HCW in operation room 76.8% and 91% respectively, with similar study performed in Jima hospital result showed that 82.35% had good knowledge and favorable attitude, the difference seen may be considered as the characteristics of study participant, and the gap in the study period ;anesthesia provider,2015 respectively. on the other hand the practicing practice level the study was show considerable variation depending on the nature of setting and participant characteristics .the practice level of this study regarding specific concepts like, remove gloves first during the doffing procedure using glove-in-glove technique(87.7%), remove the gown after removing the inner pair of gloves was 79.0%, move out from the doffing area after removal of gloves and N95 mask was (76.6%),

Our result indicates lower practical level of PPE as compared to similar study performed in INDIA about knowledge, attitude and practice and result showed that 99%, 98%, 99% respectively, The difference may result because of the lower level of knowledge seen in our setting (76.6%) HCW knowledge lower associated with lower accessing training (33%).

We found that 73.8% of the participants had good knowledge regarding PPE and other study conducted in Bangladeshi showed that the participants of good knowledge result showed that 99.5%. This variation is may be due to lack of training, educational level, and availability of PPE

This study demonstrated that 73.8% of the participants had a good knowledge towards PPE. But the proportion of HCWs having a positive attitude differed significantly between non-physician (76.5%) and physician (93.9%). similarly the study had identified over all donning and removing of PPE 83,9,70,2% respectively Our study showed that 79.8% of the participants had good practice of donning PPE, and the study has larger result than the study conducted in keniya in 2021 the result showed that 65% of nurses had been correctly and 44.3 % them had been correctly removing PPE. the difference may related to the study subject in Kenya was specific to Nurse providers. Regarding attitude of participants on this study on the level of getting risk of infection without PPE was agreed accounting 45.2% & 39.2% ware accounting completely agreed, the result indicate almost similar with the study conducted in Egypt Cairo teaching Hospital,2016, 38.5%, 50%,which had shown, the participant HCW believes level as medium, highest respectively of getting Environmental related risk while not using PPE. The existing discrepancy may result from the greater account of receiving training of participant as compared

to this study. However, this study could bring the health care planner, particularly SPHMMC programmers focus on frequent training and HCWs KAP development,

6. Strength and Limitation of the study

This study discovered some crucial information about knowledge, attitude and practice towards PPE in operating room team members. The check list was modified and data collected from primary data which is from health care worker, the dual data entering, cleaning was employed to increase data quality.

However, this study is not without limitations, Given that it could not identify the relationship between socio demographic characteristic of participant and their KAP level.

The study did not emphasize on organizational factor such as the relation between availability of PPF and KAP Of participant

7. Conclusions

The analysis of individual and work environment factors that influence the use of Personal Protective Equipment by health care workers was meant to understand the factors that can be used to explain the decision of HCWS regarding utilization of PPE to protect them from hazards and risks of acquiring infections while dealing with patients in the hospital. This information is important to the management of hospitals and other interested stakeholders in the development of strategies for addressing sub-optimal utilization of PPE among HCWS in hospitals.

This study found that 73.8% of the participant has good knowledge, 91.5% has positive attitude, and 79.8% of participants has good practice towards PPE.

The study concludes that utilization of PPE among is suboptimal hence leaving them exposed to a variety of hazards and risks, some of which could easily have been controlled or greatly reduced if all the recommended PPE was utilized.

The study further concludes that knowledge about PPE is a vital component in the entire process of utilizing recommended PPE among HCWS. Having the requisite knowledge will raise the level of risk awareness among HCWS.

The study further concludes that attitude towards the use of recommended PPE is very important on the overall utilization of PPE among HCWS. In line with this, a positive attitude among HCWS concerning PPE would enhance the utilization of the same.

Lastly, the study concludes that health facility-related factors are important to the overall utilization of PPE. This is true because HCWS could have the knowledge and positive attitude but still fail to use them due to hospital-related and behavioral factors.

8. Recommendations

Increasing the awareness of health care workers about the importance of adherence to usage of PPE is very important and will help in reducing transmission of infection to them. Protection of health care workers from acquisition of infectious diseases can be achieved by compliance to established infection control. Guidelines including rigorous infection control practices, perspective instructions for the use of PPE and post exposure antiviral prophylaxis

9.1. Recommendations for Hospital Management

The findings of the study Healthcare-acquired infections can be significantly reduced or avoided through good and consistent utilization of recommended PPE when dealing with patients in hospitals.

The findings of the study provide real-world implications for the management of hospitals. For managers of hospitals, this study has demonstrated that knowledge about PPE is important to the overall use of PPE. Thus, the management should ensure that HCWS are well trained by planning for periodical training, and when doing so, to utilize experts. For hospitals, aiming to reduce or avoid healthcare-acquired infections, the management should invest more to develop ways of enhancing positive attitudes among HCWS. More attention should be paid to the importance of utilizing PPE and the consequences for doing the contrary. Besides, the management of hospitals should ensure that, at all times, recommended PPE is available and accessible.

9.2. Recommendations for Government

The County governments should ensure that quality PPE is available to hospitals. This would ensure that recommended PPE is available for use by HCWS while attending to patients.

The ministry of health should develop strategies for training and delivering safety and health education information to hospitals to raise awareness on the use of PPE and other protective measures. Training of HCWS would increase their perception of risks and enhance their perceptions of the benefits of PPE in offering protection from work related hazards.

REFERENCES

1. WHO guide line Personal protective equipment for use in a filovirus disease outbreak:2016
2. E. Kamunge, T. Cahill, G. Zipp, and R. Parasher, “Knowledge, attitudes and practices of registered nurses regarding the spread of nosocomial infections and the impact of organizational support,” *Antimicrobial Resistance and Infection Control*, vol. 4, no. S1, pp. S1–60, 2015.
3. KebebeHailemariam Gezie¹, Emebet Leta², Fikrte Admasu², Sisay.Gedamu^{1*}, Abebe Dires¹ and DebrneshGoshiyeHealth care workers knowledge,attitude and practice towards hospitalacquired infection prevention at Dessie referral hospital, Northeast Ethiopia:2019
4. .B*, Tefera T, Jisha H: Knowledge, Attitude and Practices of Infection Prevention among Anesthesia Professional at Jimma University Teaching Hospital; Oromia Region, South West Ethiopia, May 2015
- 5 ..Chia SE, Koh D, Fones C, Qian F, Ng V, Tan BH, et al. Appropriate use of personal protective equipment among healthcare workers in public sector hospitals and primary healthcare polyclinicsduring the SARS outbreak in Singapore.*Occup Environ Med.* 2005;62:473–7.
6. S. A. Khan, “Nosocomial infection: general principles and the consequences, importance of its control and an outline of the control policy-a review article,” *Bangladesh Medical Journal*, vol. 38, no. 2, pp. 60–64, 1970
7. J. D. Stanaway, A. D. Flaxman, M. Naghavi et al., “(e global burden of viral hepatitis from 1990 to 2013: findings from the Global Burden of Disease Study 2013,” *Ae Lancet*, vol. 388,no. 10049, pp. 1081–1088, 2016
- 8 .Sagoe-Moses C, Pearson RD, Perry J et al (2001): Risks to health care workers in developing countries.*EnglJMed*;345:538-41
9. Hakim SA, Abouelezz NF and El Okda EM. USE OF PERSONAL PROTECTIVE DEVICES AMONG HEALTH CARE WORKERS IN A TEACHING HOSPITAL IN CAIRO, EGYPT; *Egyptian Journal of OccupationalMedicine*, 016; 40 (2) : 287-300
10. JehadNasriElmadhoun Assessment of Infection Prevention and Control Practices at Operating Rooms in Nongovernmental Organizations Hospitals - Gaza Governorates

11. Mohammad Ali Hossain¹, MdUtba Bin Rashid², Md Abdullah Saeed Khan³, Sabrina Sayeed⁴, Md Abdul Kader⁵, Mohammad Delwer Hossain¹, Hawlader Healthcare Workers' Knowledge, Attitude, and Practice Regarding Personal Protective Equipment for the Prevention of COVID-19
12. Wassachew Ashebir^{1*}, Belete Yimer², Atsede Alle¹, Muluken Teshome¹, Yohannes Teka¹, Awwarar Wolde. Knowledge, attitude, practice, and factors associated with prevention practice towards COVID-19 among healthcare providers in Amhara region, northern Ethiopia:2022
13. Sagar Pandey¹, Sujan Poudel¹, ID Ashok Gaire¹, Ritu Poudel¹, Prabin Subedi¹, ID Jyoti Gurung¹, ID Rituraj Sharma¹, Jeevan Thapa¹ Knowledge, attitude and reported practice regarding donning and doffing of personal protective equipment among frontline healthcare workers against COVID-19 :Nepal:2021
13. Tadesse S, Israel D. Occupational injuries among building construction workers in Addis Ababa. Ethiopia J Occup Med Toxicol. 2016;
14. Mojgan Lotfi^a, Zahra Sheikhalipour^b, Vahid Zamanzadeh^c, Ahmad Mirza Aghazadeh^d, Omid Zadi Akhuleh^e Observance of preventive standards against COVID-19 transmission in operating rooms: A cross-sectional study: Iran, 2021
15. Nor Azila Muhammad Azami¹, Nor Azian Abdul Murad exposure assessment and prevention practices among healthcare workers at a teaching hospital
16. Demisu Zenbaba¹, Biniyam Sahiledengle², and Daniel Bogale Practices of Healthcare Workers regarding Infection Prevention in Bale Zone Hospitals, Southeast Ethiopia:2020
17. A Yesse M, Muze M, Kedir S, Argaw B, Dengo M, Nesre T, et al. Assessment of knowledge, attitude and practice toward COVID-19 and associated factors among health care workers in Silte Zone, Southern Ethiopia(2021)
18. Nichole Starr, MD, MPH Perioperative Provider Safety in Low- and Middle-income Countries During the COVID-19 Pandemic
19. Bikis Liyew: Magnitude and Determinants of Needle stick and Sharp Injuries among Nurses Working in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia :2020
20. World Health Organization, 2017. Healthcare-associated infections: fact sheet;2014.

21. Bratzler DW, Dellinger EP, Olsen KM, et al. (2013) Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Surg infect* 14: 73-156
22. Dr. ArchanaLakshmi P. A. personal protective equipment use among health care providers, Tamil Nadu .India
- 23 CDC: Centers for Disease Control and Prevention, Division of Health care Quality Promotion. Surveillance of Healthcare Personnel with HIV/AIDS.. 2020.
24. Auta A, Adewuyi EO, Tor-Anyiin A, Aziz D, Ogbole E, Ogbonna BO, Adelaye D: Health-care workers' occupational exposures to body fluids in 21 countries in Africa: systematic review and meta-analysis. *Bulletin of the World Health Organization* 2017, 95(12):831
- 25 AddisuGetie Adam WondmienehGetachewTefaw
26. Yazie TD, Chufa KA, Tebeje MG: Prevalence of needlestick injury among healthcare workers in Ethiopia: a systematic review and meta-analysis. *Environmental health and preventive medicine* 2019, 24(1):1-10
27. FMOH: 'Ethiopian Federal Ministry of Health, Hospital Reform Implementation Guidelines', 2010; 1(2), pp. 1–400. 2010
28. Yasin J, Fisseha R, Mekonnen F, Yirdaw K: Occupational exposure to blood and body fluids and associated factors among health care workers at the University of Gondar Hospital, Northwest Ethiopia. *Environmental health and preventive medicine* 2019, 24(1):1-9.
29. Sahiledengle B, Tekalegn Y, Woldeyohannes D: The critical role of infection prevention overlooked in Ethiopia, only one-half of health-care workers had safe practice: A systematic review and meta-analysis. *PloS one* 2021, 16(1): 0245469
30. Centers for Disease Control (CDC) (1985) Recommendations for preventing transmission of infection with human T-lymphotropic virus type III/ lymphadenopathy-associated virus in the workplace. *MMWR* 34(45): 6810.
- 31 Aisien AO and Ujah LA (2006): Risk of blood splashes to masks and goggles during cesarean section. *Med SciMonit*; 12(2): 94-7

32. WHO. Personalprotective equipment for use in a failovers disease outbreakRapid advice guideline 33.National Institute of Occupational Health and Safety. State of the Sector: Healthcare and Social Assistance; Centers for Disease Control and Prevention: Atlanta, GA, USA, 2009.

11.ANNEX

ANNEX 1. CONSENT FORM

Greetings!

Dear respondents our name are _____. We are a post graduate student at St. Paulo's millennium medical college department of operating theater nurses. We are conducting a research to assess the knowledge, attitude and practice (KAP) of health care worker at Saint Paul's hospital. We would like to ask you some questions about knowledge, attitude and practice (KAP) of health care worker at Saint Paul's hospital, Addis Ababa, Ethiopia, 2022. Please be assured that the information will be confidential and your name does not need to be written in any page of the questionnaires, and you may choose to stop your participation at any time.

Refrain from any question. Only the researcher had the information and uses it for the study purpose only you have a full right not to participate in this study. Are you willing to participate?

Yes ----- No-----

Data collectors' name _____

Signature _____ Date _____

Thanks for your cooperation

Part 1. Socio-demographic characteristics

1. Sex: A. Male B. Female
2. Age: A. 18-25 B. 26 – 35 C. 36-45 D. 46 and above

Part 2. Personal level characteristics

4. How long have you worked as health care worker? A. 0- 5yrs B. 6 - 10yrs C. 11 - 15yrs D. Above15yrs
5. Level of education A. Diploma B. Degree C. Masters D. PhD

Part 3. Knowledge on Personal Protective Equipment

6. Have you been trained in infection control? A. Yes B. No
7. When did you receive your last training on infection control?
A. 1 – 6 months ago B. 7 – 12 months
C. 1 - 3 years D. More than 3 years
8. How were you trained on infection control?
A. During orientation and induction B. on the job training
Short course C. In-service training

9. Choose the correct series of donning PPE

- A. Apron/Gown ► Particulate Respirator/Mask ► face shields/Goggles
► Gloves
- B. Gown ► Gloves ► Mask/Respirator ► Goggles/face shields
- C. Mask/Respirator ► Gloves ► Goggles/face shields ► Gown
- D. Gloves ► Mask/Respirator ► Goggles/face shields ► Gown

10. Choose the correct series of removing PPE

- A. Mask/Respirator ► Gown ► Goggles/face shields ► Gloves
- B. Goggles/face shields ► Gloves ► Mask/Respirator ► Gown
- C. Gloves ► Goggles/face shields ► Gown ► Mask/Respirator
- D. Gown ► Goggles/face shields ► Gloves ► Mask/Respirator

11. Choose the correct order of donning gloves

- A. If in use) ► Keep the gloved hand away from the face ► Avoid touching any other PPE ► Remove glove if it is torn ► Ensure hand hygiene before donning a new set of gloves
- B. Select correct type and size ► Extend over isolation gown cuff (i.e. if in use)

▶ Insert hand into glove ▶ Avoid touching other PPE ▶ Perform hand hygiene before donning new gloves ▶ Keep gloved hand away from face

▶ Remove glove if it is torn

C. Ensure hand hygiene before donning new gloves ▶ Select the correct type and size

▶ Insert hand into glove ▶ Extend over isolation gown cuff ▶ Keep gloved hand away from face ▶ Avoid touching another PPE ▶ Remove glove if torn

D. Select correct type and size ▶ Insert hand into glove ▶ Extend over isolation gown cuff ▶ Remove glove if torn ▶ Perform hand hygiene before donning new gloves

▶ Avoid touching other PPE ▶ Keep gloved hand away from the face.

12. Choose the correct order of removing gloves

A. Grasp outside edge near wrist ▶ Peel away from hand turning the glove inside out

▶ Hold in opposite gloved hand ▶ Slide ungloved finger under the wrist of the remaining glove ▶ Peel off from inside creating a bag for both gloves ▶ Discard the gloves ▶ Wash hand

B. Peel away from hand turning the glove inside out ▶ Slide ungloved finger under the wrist of the remaining glove ▶ Hold in opposite gloved hand

▶ Grasp outside edge near wrist ▶ Peel off from inside creating a bag for both gloves ▶ Wash hand ▶ Discard the gloves

C. Slide ungloved finger under the wrist of the remaining glove ▶ Peel away from hand turning the glove inside out ▶ Grasp outside edge near wrist

▶ Hold in opposite gloved hand ▶ Peel off from inside creating a bag for both gloves ▶ Discard the gloves ▶ Wash hand

D. Peel away from hand turning the glove inside out ▶ Grasp outside edge near wrist

▶ Hold in opposite gloved hand ▶ Slide ungloved finger under the wrist of the remaining glove ▶ Peel off from inside creating a bag for both gloves ▶ Discard the gloves ▶ Wash hand

13. Choose the correct order of donning Gown/Apron

A. Select appropriate type and size ▶ Opening is in the back ▶ Secure at the neck, then waist ▶ If a gown is too small, use two ▶ Tie the first one in front, and the second one in back

B. Select appropriate type and size ► Secure at the neck, then waist ► If a gown is too small, use two ► Tie the first one in back, and the second one in front ► Opening is in the front

C. Select appropriate type and size ► If a gown is too small, use two ► Tie the first one in back, and the second one in front ► Opening is in the front

► Secure at the neck, then waist

D. If a gown is too small, use two ► Tie the first one in back, and the second one in front

► Select appropriate type and size ► Opening is in the front

► Secure at the neck, then waist

14. Choose the correct order of removing Gown/Apron

A. Unfasten ties ► Peel away from neck and shoulder ► Turn contaminated area outside towards the inside ► Fold or roll gown ► Discard

B. Peel away from neck and shoulder ► Unfasten ties ► Turn contaminated area outside towards the inside ► Fold or roll gown ► Discard

C. Turn contaminated area outside towards the inside ► Peel away from neck and shoulder ► Unfasten ties ► Discard ► Fold or roll gown

D. Peel away from neck and shoulder ► Turn contaminated area outside towards the inside ► Unfasten ties ► Discard ► Fold or roll gown

15. Choose the correct order of donning Mask

A. Place mask over nose, mouth, and chin ► Fit flexible nose-piece over nose

B. bridge ► Secure the head with ties or elastic ► Adjust to fit

C. Place mask over nose, mouth and chin ► Secure the head with ties or elastic ► Adjust to fit

D. Fit flexible nose-piece over nose-bridge

E. Fit flexible nose-piece over nose-bridge ► Place mask over nose, mouth, and chin ► Adjust to fit ► Secure on the head with ties or elastic

F. Secure on the head with ties or elastic ► Fit flexible nose-piece over nose Bridge ► Place mask over nose, mouth, and chin ► Adjust to fit

16. Choose the correct order of removing Mask

A. Untie the bottom, then the top tie ► Remove from face ► Discard

B. Remove from face ► Discard ► Untie the top, then the top bottom

- C. Untie the top ► then the bottom ► Remove from face ► Discard
- D. Remove from face ► Untie the top Discard ► Untie the bottom

17. Choose the correct order of removing Particulate Respirator

- A. First, lift the bottom elastic overhead ► Lift the top elastic and remove respirator
► Discard
- B. First, lift the top elastic overhead ► Lift the bottom elastic and remove respirator
► Discard
- C. Remove respirator ► Lift the bottom elastic then lift the top elastic overhead
► Discard
- D. Lift the bottom elastic then lift the top elastic overhead ► Discard
► Remove respirator

18. Choose the correct order of donning Goggle/Face shield

- A. Select the appropriate type and size ► Position the goggle over the eyes and secure to the head ► using earpiece or headband ► Position face-shield over face and secure to the head using earpiece or headband ► Adjust to fit comfortably
- B. Position the goggle over the eyes and secure to the head using earpiece or headband
► Position face-shield over face and secure to the head using earpiece or headband
► Adjust to fit comfortably ► Select the appropriate type and size
- C. Select the appropriate type and size ► Adjust to fit comfortably ► Position the goggle over the eyes and secure to the head ► using an earpiece or headband □ Position face-shield over face and secure to the head using earpiece or headband ► Select the appropriate type and size ► Adjust to fit comfortably
- D. Position the goggle over the eyes and secure to the head ► using an earpiece or headband ► Adjust to fit comfortably

19. Choose the correct order of removing Goggle/Face shield

- A. Grasp ear or head-piece with ungloved hands ► Lift away from face ► Place in the designated receptacle for reprocessing or disposal
- B. Lift away from face ► Place in the designated receptacle for reprocessing or disposal
► Grasp ear or head-piece with ungloved hands
- C. Grasp ear or head-piece with ungloved hands ► Place in the designated receptacle for reprocessing or disposal ► Lift away from the face

- D. Lift away from face ► Place in the designated receptacle for reprocessing or disposal
 ► Grasp ear or head-piece with ungloved hands

20. After donning gloves, work should start from?

- A. Dirty to clean area B. Clean to dirty area C. Anywhere D. None of above

21. Please indicate your level of agreement with regard TO KNOWLEDGE ON THE USE OF PPE on a scale of 1 to 5 (1 = Complete Disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Complete Agree)

S.no_	KNOWLEDGE	1	2	3	4	5
1	Use of Personal Protective Equipment (PPE) is part of infection control					
2	Personal Protective Equipment (PPE) is an effective barrier to infection					
3	PPE should be used when there is a risk of exposure to fluids and secretions patient					
4	I am confident that I understand the risks associated with infections when dealing with patients					
5	I am confident that I understand how to protect myself and my patients from infections					
6	The use of correct PPE eliminates the need for hand hygiene					

Part C. Attitude

22. Please indicate your level of agreement with regard to following statements on a scale of 1 to 5 (1 = Complete Disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Complete Agree)

S/n	Attitude	1	2	3	4	5
1	Do you Use of PPE keeps me from getting infections					
2	Use of PPE will keep patients from getting Infections					

3	It is inconvenient to use recommended PPE when taking care of patients					
4	Use of recommended PPE interfere with patient treatment/care					
5	Adherence to guidelines for the use of PPE is very essential					
6	I am confident that I can improve PPE Compliance					

Practice

- 1) Is always remove gloves first during the doffing procedure using glove-in-glove technique
1. Yes 2) NO
- 2) Is remove the gown after removing the inner pair of gloves.1). Yes2). NO
- 3) Is turn the gown inside-out during removal to get the infected side packed inside of the gown.
1). Yes 2). No
- 4) Is move out from the doffing area after removal of gloves and N95 mask.1). Yes2). NO
- 5. Personal protective equipment can protect employees from all workplace hazards:
A. Yes B. No
- 8. Will personal protective equipment protect a specific disease A.Yes B. NO
- 18. Does every piece of PPE provide the same level of protection? A. Yes B . NO
- 19. PPE is designed to be used with other infection control practices such as hand-washing, using alcohol-based hand sanitizers and covering coughs and sneezes to minimize the spread of infection from one person to another. A. NO B. Yes

Thank you for your cooperation!

ANNEX III ASSURANCE OF INVESTIGATOR

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 or /and Department of operating theater nurses of St Paul's Hospital Millennium Medical College.

Name of Student_____ Date_____ Signature_____

Name of student_____ Date_____ Signature_____

Name of student_____ Date_____ Signature_____

Approval of advisor

:Name of the adviser :1.TSEDAY YESHITILA

:2.SEADA ADEM