JIMMA UNIVERSITY

INSTITUTE OF HEALTH

FACULTY OF MEDICAL SCIENCE

DEPARTMENT OF PEDIATRICS AND CHILD HEALTH

ASSESSMENT OF PRACTICE OF STANDARD PRECAUTIONS AND ASSOCIATED FACTORS AMONG HEALTHCARE PROFESSIONALS WORKING AT PEDIATRICS WARD OF JIMMA UNIVERSITY MEDICAL CENTER, SOUTH WEST ETHIOPIA, 2022.

INVESTIGATOR:

GEZAHEGN DIRIBA (YEAR III PEDIATRIC RESIDENT)

THESIS TO BE SUBMITTED TO THE DEPARTMENT OF PEDIATRICS AND CHILD HEALTH, FACULTY OF MEDICAL SCIENCES, INSTITUTE OF HEALTH, JIMMA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR SPECIALTY CERTIFICATE IN PEDIATRICS AND CHILD HEALTH.

DECEMBER, 2022

JIMMA, ETHIOPIA

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ADVISORS:

1. **Dr. Habtamu Sime (Assistant professor, consultant Pediatric intensivist)**
2. **Mr. Beshea Gelana (MSc, MPH, PhD candidate)**

DECEMBER, 2022

JIMMA, ETHIOPIA

DECLARATION

ASSURANCE OF PRINCIPAL 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 faculty of Medical Science in effect at the time of grant is forwarded as the result of this application.

Name of the investigator: _____

Date: _____ Signature: _____

APPROVAL OF THE ADVISORS

Name of the advisor: _____

Date: _____ Signature: _____

Name of the advisor: _____

Date: _____ Signature: _____

Abstract

Background: Standard precautions are means of reducing the risk of transmission of blood borne and other pathogens from both recognized and unrecognized sources. Despite differences in knowledge, attitude, practice, and institutional factors, healthcare professionals practice standard precautions in a variety of settings.

Objective: The aim of this study was to assess the practices of standard precautions of health care professionals working at the pediatric wards of Jimma University Medical Center.

Method: Facility-based cross-sectional study design was used. A survey of total of 205 healthcare professionals working in pediatrics department was included and 20 healthcare professionals were selected by stratified random sampling for hand hygiene observation. Data was collected via a structured self-administered questionnaire developed after reviewing literatures on practice of standard precautions and observation was undertaken for hand hygiene.

Results: Overall, 49.8% (n=102) of respondents had reported good practice on safety precaution while 35.7% for observed practice on Hand hygiene. Odds of good practice on safety precaution were 5.5 times higher among age 36 and above compared to those 25 and below [AOR=5.5, 95% CI: 1.24-24.1 p=.025]. The odds of good practice on safety precaution was 3.3 times higher among nurses compared to pediatricians [AOR=3.35, 95%CI: 1.16-9.69, p=0.026]**.** Those health workers who had work experience over five years were likely to practice good on safety precaution compared to health worker who had served for two years and below [AOR=1.9,95% CI: (0.01-9.01), p=0.033].

Conclusions: Based on the study results, it was found that the practices of healthcare professionals with respect to standard precaution were poor/unsatisfactory. These gaps in pediatrics department should be addressed through training, and strict implementation of national guidelines of infection prevention and control policy and institutional infection prevention standard

Keywords: Infection prevention, Standard precautions, Knowledge, Attitude, practice Healthcare professionals, Jimma, Hand hygiene

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Lists of acronyms

AMR	antimicrobial resistance
CASH	clean and safe health
CR-BSI	Catheter related blood stream infection
CRUTI	Catheter related urinary tract infection
ECDC	European Centre for Disease Prevention and Control
EHAQ	Ethiopian hospitals alliance for quality
EHRIG	Ethiopia hospitals reform implementation guidelines
EPHI	Ethiopian Public Health Institute
HAIs	Hospital acquired infection
HCAI	Health care associated infection
HCPs	Health care professionals
HH	Hand hygiene
HICPAC	Healthcare Infection Control Practices Advisory Committee
ICU	Intensive care unit
JUMC	Jimma University Medical Center
KAP	Knowledge, attitude and practice
SPs	Standard Precautions
UTI	Urinary tract infection
VAP	Ventilator associated pneumonia
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1.**Background**

Standard Precautions represent the minimum infection prevention measures that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where healthcare is delivered. It is based on the assumption that every person is infected or colonized with an organism that could be transmitted in the healthcare setting and thus health care workers need to apply infection control practices during the delivery of health care(1).

According to WHO, SPs are set of activities designed to prevent the transmission of organisms between patients/staff for the prevention of health care-associated infection. They must be applied to all patients who require health care, by all health workers in all health settings(2). Standard Precautions include: hand hygiene, use of personal protective equipment (e.g., gloves, gowns, facemasks) depending on the anticipated exposure, respiratory hygiene and cough etiquette, safe injection practices, and safe handling of contaminate equipment or surfaces in the patient environment(3). These are designed to both protect healthcare personnel and prevent the spread of infections among patients and among visitors as well(3).

A study done in the southeast Ethiopia among 648 healthcare workers 53.7% of the respondents were assessed as knowledgeable(4). A research in Addis Ababa employed 629 healthcare workers from 30 governmental healthcare facilities, 335(55.4%) HCWs had good knowledge of infection prevention measures(5). Institution based study conducted on 217 students from Addis Ababa university medical college showed that only 71/217(32.9%) of students had a 'good' knowledge score(6). A study conducted in Wogdie district Northern part of Ethiopia among 171 healthcare providers about 70.8 % of healthcare providers had adequate knowledge (7). A research done in Debre Markos referral hospital among 150 participants showed more than two thirds (84.7%) of healthcare workers were found to be knowledgeable(8). Institutional based cross-sectional in selected public hospitals of Amhara region, in 2017, 74.3% of the healthcare workers had good knowledge towards standard precautions(9). A research conducted at Gondar University referral hospital in 2018 among 282 study participants showed

81.6% had adequate knowledge(10). A study conducted at a government tertiary hospital among 196 nurses in Zambia, 83.21% of them had good knowledge in infection prevention and control (11). A study conducted in Nigeria among HCW in two tertiary hospitals showed overall median knowledge scores toward standard precautions were above 90%(12). A survey including 73 medical students in Qatar showed 85.48% had sufficient knowledge about SPs(13). A cross sectional study involving doctors, nurses, lab workers from 10 primary healthcare (PHC) centers in in Makkah, during in 2021 involving 200 participants showed knowledge regarding standard precautions of infection control was (55.0%) (14). A study among 300 HCWs from three regional hospitals in Trinidad and Tobago about only 20.3% respondents were knowledgeable(15) .Overall knowledge of HCPs on SPs is not satisfactory including our country, much is to be done to increase awareness of HCPs toward SPs to fill this gap.

A facility based study in Addis Ababa among 629 healthcare workers from 30 governmental healthcare facilities revealed 83.3% of HCWs had positive attitude towards infection prevention practices(4). Institution based study conducted on 217 students from Addis Ababa university medical college showed 83% of the respondents had favorable attitude on SPs(6). A research conducted at Gondar University referral hospital in 2018 among 282 study participants showed 64.2% had favorable attitude(9) . A study conducted at a government tertiary hospital among 196 nurses in Zambia, attitude towards infection prevention and control was good with the mean score of 81.37(10) . A study conducted in Nigeria among HCW in two tertiary hospitals showed overall median attitude scores toward standard precautions were above 90%(12). A study among 300 HCWs from three regional hospitals in Trinidad and Tobago about 46.7% had good attitude (15).

A facility-based cross-sectional study in the southeast, Ethiopia from 30 randomly selected healthcare facilities, among 648 healthcare workers 36.3% of the respondents reported safe infection prevention practices(4). According to a facility based cross-sectional study conducted in 2016, in Addis Ababa among 629 healthcare workers from 30 governmental healthcare facilities, 400(66.1%) HCWs had good infection prevention practices(5). Institution based descriptive cross sectional study on 217 students from Addis Ababa university medical college showed the overall practice score was 53.9% had fair practice while 15(6.9%) had good practice

and 85(39.2%) had poor practice(6). Institution based cross-sectional study conducted in Wogdie district Northern part of Ethiopia among 171 healthcare providers and about 55.0% of healthcare providers had adequate safe practice of infection prevention(7). A Hospital-based cross-sectional study was conducted in Debre Markos referral hospital among 150 participants only 86 (57.3%) of respondents demonstrated a good practice on infection prevention(8). An institution based cross sectional study conducted in 2016 among 17 health institutions found in Dawuro zone on 250 health care workers. Out of which 162(65.0%) of respondents had complied with standard precaution practices (16).

According to the literatures, major reported factors that affect compliance with standard precautions include but not limited to lack of understanding and knowledge among healthcare workers on SPs shortage of time to implement the precautions (work overload), limited resources, lack of proper training, uncomfortable equipment, skin irritation, forgetfulness, distance from the necessary facilities, and insufficient support from management in creating a facilitating work environment. Moreover, certain sociodemographic variables such as age, sex, job category, marital status, working site in the hospital and work experience were found to be associated with compliance with standard precautions. So doing this research may give insight to hospital administrators, IPC committee and concerned bodies to give emphasis on tackling problems with regard to practice of HCP professionals toward SP that will help the setting an ideal place where patients are managed and improved, attendants and HCP stay safe.

Adequate knowledge is a pre-requisite for implementing SPs in healthcare facilities. Inadequate knowledge about SPs among HCWs is the most common responsible reason for poor adherence in implementing SPs in various healthcare facilities. Hence, this study will try to determine the level of practice of standard precautions among HCWs working in pediatric wards of Jimma University Medical Center towards SPs.

1.2. Statement of the problem

Of every 100 hospitalized patients at any given time, seven in developed and 15 in developing countries will acquire at least one HAI. The endemic burden of HAI is also significantly (at least 2-3 times) higher in low- and middle-income countries (LMICs) than in high-income nations, particularly in patients admitted to intensive care units, and neonatal intensive care units (17). Data from 2016–2017, the European Centre for Disease Prevention and Control (ECDC) showed that 4.5 million episodes of HAIs occurred every year in patients admitted to hospitals in European Economic Area (EEA) countries(17). The USCDC estimates that, on any given day, 1 in 31 hospital patients and 1 in 43 nursing home residents has a health care-associated infection. Similarly, the CDC estimated that, on any given day, one in every 43 nursing home residents has a HAIs (18).

According to the World Health Organization (WHO) 2019 HCAI fact sheet report, a hundred million patients were affected each year globally. This report added that the point prevalence of HCAI was estimated in the ranges between 3.5–12% and 5.7–19.1% in developed and low- and middle-income countries, respectively (19).

In order to improve the wellbeing of patients, visitors, attendants, supportive staff, health care workers and general community in healthcare facilities; WHO developed different initiatives such as “Clean Care is Safer Care” as main focus to promote hand hygiene practices globally at all level of healthcare as initial step in ensuring high level of infection prevention practices and control (20).

Different primary studies in Ethiopia showed the burden of nosocomial infection across geographical setting and variant period. According to a systematic review and meta-analysis done in 2020, including a total of 18 studies with 13,821 patients participated in the overall prevalence estimation. The pooled prevalence of healthcare-associated infection was 16.96% (21). Federal ministry of health (FMOH) has developed a number of guidelines in hospitals for infection prevention practices and control as effective quality measures. Additionally, the ministry obligates hospital administration to have strong infection prevention committee and environmental health officers from 2004 on. Hence in order to improve compliance with standard precautions (SPs) among HCWs; In Ethiopia different strategic intervention have been

performing till now (4,18). However, in most of the hospitals of Ethiopia there are guidelines, and policies of IPC, such as hand hygiene, personal protective equipment (PPEs), disinfection and sterilization, injection safety and proper waste management. All components of standard SPs are challenged by accessibility and availability of infrastructures, under staffing, shortage of basic PPEs, workload, inadequate structural organization and lack of awareness and on infection prevention practices and control guidelines.

In 2010 EHRIG and 2014 clean and safe health (CASH) initiatives had been launched in line with Ethiopian hospitals alliance for quality (EHAQ) which has the same aim on SPs. In Ethiopia, efforts have been made to improve the quality healthcare service provision to citizens. Among initiatives currently underway, the protection of patients and healthcare workers from infections and reducing antimicrobial resistance in health facilities has been given particular attention by the Federal Ministry of Health. It is known that infection prevention and control (IPC) is a critical component of quality health services and with this regard FMOH has updated IPC guideline in 2012 to be implemented to decrease healthcare burden, cost and AMR in healthcare settings. So that the main aim was to make hospitals clean, comfortable and safe environment for patient, attendants, visitors, staff and number of general public and to increase patient confidence and organizational commitment to assure patient safety and good health outcomes (22).

To our knowledge in the study setting, there is no such a comprehensive research that show the practice of SPs among HCPs and doing this research can alert administrators, IPC committee and the health institution in general to give emphasis to IPC measures and monitoring parameters and allows budgeting more on SPs related issues; identify determinant factors, and to explore the barriers for the prevention and control of infection prevention activities in pediatric department at JUMC.

1.3. Significance of the study

Strict compliance to Standard Precautions ensures occupational safety of healthcare workers. Alleviates the burden of HAI and decrease transmission of antimicrobial resistant microorganisms and reduce health care costs by decreasing hospital stay, reducing workload on hospital staffs that creates vicious cycle of poor compliance to SPs especially in resource limited areas. It alerts administrators to review their IPC guideline implementations as per standard and supervise professionals implemented IPC to strengthen adherence to Standard safety Precautions. Helps as baseline data for the setting for further comprehensive study. Therefore, this study tries to identify gaps in Practice of Standard Precautions among healthcare workers in pediatrics department.

CHAPTER TWO: LITERATURE REVIEW

Over the last decade, major outbreaks like coronavirus (MERS-COV) pandemic have incontestable however epidemic-prone pathogens will unfold quickly through health care settings. These events have exposed the gaps in infection prevention and control (IPC) programmes that exist no matter the resources accessible or the national level of financial gain. what is more, alternative less-visible health emergencies are a compelling reason to deal with gaps in IPC, like the silent endemic burden of health care-associated infections (HAIs) and antimicrobial resistance (AMR), that damage patients a day across all health care systems (17) .

Knowledge of HCPs on standard precautions

A facility-based cross-sectional study in the southeast, Ethiopia. A total of 648 healthcare workers participated in this study. Of these, 53.7% and 36.3% of the respondents were assessed as knowledgeable and reported safe infection prevention practices respectively(4). For this reason preservice and/or on job coaching ought to given and IPC tips shall be accessible at work place. A facility based cross-sectional study in Addis Ababa employed 629 healthcare workers from 30 governmental healthcare facilities, among the total HCWs, 335(55.4%) HCWs had good knowledge of infection prevention measures. HCWs who had good knowledge regarding infection prevention measures were 1.5 times more likely to have good infection prevention practices compared to their counterpart(5)and this shows however providing coaching, supervision on SPs, support from directors facilitate HCPs to follow SPs. Institution based study was conducted on 217 students from Addis Ababa university medical college. The results showed that only 71/217(32.9%) of students had a 'good' knowledge score. While 27/217(12.5%) had poor knowledge(6). This study showed that medical students had poor follow to all or any parts of SP that supports however integration of SPs to curriculum of graduate school alleviate the matter associated with poor follow of SPs. Institution based cross-sectional study conducted in Wogdie district Northern part of Ethiopia among 171 healthcare providers and about 55.0% of healthcare providers had adequate safe practice of infection prevention(7) majority of HCWs had acceptable information however majority have unsafe follow of infection interference which suggests follow of SPs wants perspective amendment, government commitment to enforce applications of IPC guideline and provision of materials for HCPs to follow safe tending. A Hospital-based cross-sectional study was conducted in Debre Markos

referral hospital among one hundred fifty participants. More than two thirds (84.7%) of employees were found to be knowledgeable however solely eighty six (57.3%) of respondents incontestable an honest follow on infection interference(8) this discrepancy between information and follow can be as a result of less administrative body support and inconsistent superintendence and non purposeful IPC committee further.

Institutional based cross-sectional in selected public hospitals of Amhara region, in 2017, Three-fourth (74.3%) of the healthcare workers had good knowledge towards standard precautions(9) . Majority of employees had smart information of ordinary precautions. However, variation in information was detected across employees by hospital kind and ward/units. This suggests even though troublesome to deal with most issues at a time prioritizing the establishments can facilitate tackle the poor follow of SPs. An institution based study was conducted at Gondar University referral hospital in 2018. Among 282 study participants, 230 (81.6%) had adequate knowledge(10). Compliance with customary precautions among the employees is low. Coaching of employees on customary precautions and consistent management support are suggested.

A quantitative descriptive study was conducted at a government tertiary hospitals in 2017 in Zambia, 196 nurses were involved. The majority of participants had good knowledge in infection prevention and control with the mean score of 83.21(11). A cross-sectional study in 2011/2012 among HCW in two tertiary hospitals in Nigeria. Overall median knowledge and attitude scores toward standard precautions were above 90%, but median practice score was 50.8%(12) it absolutely was terminated that continuous provision of IPC materials would possibly decrease the poor adherence to SPs. A cross-sectional, interview-based survey enclosed seventy three medical students from Kurt Weill Cornell Medical School, Qatar. Students completed a form regarding awareness, knowledge, and perspective relating to IPC practices and 85.48% had adequate information regarding SPs(13) coaching programs got to target freshly graduated medical practitioners and shall be enclosed within the graduate medical curriculum to change IPC tips. A cross sectional study registered HCWs (doctors, nurses, work workers) from ten primary tending (PHC) centers in in Makkah, throughout the April to June, 2021, Our total participants were 200. information relating to customary precautions of infection management study results show the bulk of participant had average data were(55.0%) whereas weak information were twenty one percent (14) and terminated that provision of coaching for HCWs

can be helpful in up their information of ordinary infection management precautions and is additionally expected to facilitate positive perspective and practice. A cross-sectional study was conducted among 300 HCWs from April to June 2016 from three regional hospitals in Trinidad and Tobago about their knowledge, attitude, and practice towards infection prevention in the country. In this study only 20.3% respondents were knowledgeable, 46.7% had good attitude and 44% had good practices toward infection prevention, suggesting less than satisfactory scores in this study (15) strict policies and IPC measures should be put in place to ensure regular adherence of HCW to SPs.

Attitude of HCP toward Standard precautions

A facility based cross-sectional study in 2016, among 629 healthcare workers in Addis Ababa from 30 governmental healthcare facilities showed total HCWs, 504(83.3%) HCWs had positive attitude towards infection prevention practices (4) for this reason creating an environment enabling HCPs to have positive attitude may change practice in addition to strict IPC measure enforcements. Institution based cross sectional study among 217 students from Addis Ababa university medical college, overall attitude score of the respondents showed that 180(83%) scored above half (6) medical students had a better Knowledge and acceptable level of attitude towards PPE but poor attitude towards hand hygiene which should be improved by availing sanitary equipment in patient surrounding for immediate use and continuous availability of tap water. A cross-sectional study conducted at Gondar University referral hospital in 2018, among 282 study participants181 (64.2%) had favorable attitude(9) a lot of things to be done to increase attitude of HCPs toward SPSs. A descriptive study was conducted at a government tertiary hospital in Zambia among 196 nurses, attitude towards infection prevention and control was good with the mean score of 81.37 (10) which supports managerial support of HCP to develop positive attitude which is a base for change. A cross-sectional study was undertaken in 2011/2012 among total of 290 HCW in two tertiary hospitals in Nigeria. Overall median knowledge and attitude scores toward standard precautions were above 90% (11) . A cross-sectional study among 300 HCWs in 2016 from three regional hospitals in Trinidad and Tobago, about 46.7% had good attitude and 44% had good practices toward infection prevention (14).

Practice of HCP toward Standard precautions

A facility-based cross-sectional study employed in the southeast, Ethiopia. A total of 648 healthcare workers participated in the study, 36.3% of the respondents reported safe infection prevention practices(4) According to a facility based cross-sectional study conducted from February to March 2016, in Addis Ababa among 629 healthcare workers from 30 governmental healthcare facilities, among the total HCWs, 400(66.1%) HCWs had good infection prevention practices. It was concluded that Two-third of the healthcare workers had good infection prevention practices. Good awareness on infection prevention measures, having positive attitude towards infection prevention practices, having awareness on availability of standard operating procedures and presence of continuous water supply were predictors of good infection prevention practices. To sustain good practices, pre-service and in-service training should be in place to equip and update health care workers about infection prevention precautions. The need for continuous supervision should be implemented to strengthen adherence for infection prevention practices among workers along with sustainable and reliable water supply is crucial(5). Institution based cross sectional study on 217 students from Addis Ababa university medical college showed overall practice score showed that 117(53.9%) had fair practice while 15(6.9%) had good practice and 85(39.2%) had poor practice(6) and strengthening and integration of standard precaution with the routine services and provide training for medical students in the institutions they are attached is recommended.

Institution based cross-sectional study was conducted from February to May in Wogdie district Northern part of Ethiopia among 171 healthcare providers who were selected by a simple random sampling technique and about 55.0% of healthcare providers had adequate safe practice of infection prevention (7).A Hospital-based cross-sectional study was conducted in Debre Markos referral hospital among 150 participants. Only 86 (57.3%) of respondents demonstrated a good practice on infection prevention (8) which shows poor practice of HCW on SPs that needs administrative commitment on this issue. An institution based cross sectional study in 2016 in 17 health institutions found in Dawuro zone. Data were collected on 250 health care workers selected by simple random sampling technique. Out of the total respondents, 162(65.0%) of respondents had complied with standard precaution practices (16) it was recommended that strategies should be set to continuously supply equipment used for its application including gloves, sustainable tap water supply with soap etc..

An institutional based cross-sectional study was conducted at Hawassa comprehensive specialized hospital, in 2020 and the overall compliance with standard safety precaution among healthcare workers were only 56.5%. Being female, accessibility of safety box, availability of running tape water, training and supportive supervision were independent predictors of compliance with standard safety precaution. Thus ensuring availability and accessibility of safety precaution materials and regular observing and supervising healthcare workers' practices are highly recommended (23).

As it was mentioned in literatures, there is significant gap that was reported with regard to knowledge, attitude and practice of HCP professionals toward SP which indirectly affect patient outcome as well as compromise patient safety and increase burden on health system both financially and wok overload on health institution. So doing this research may give insight to hospital administrators, IPC committee and concerned bodies to give emphasis on tackling problems with regard to knowledge, attitude and practice of HCP professionals toward SP that will help the setting an ideal place where patients are managed and improved, attendants and HCP stay safe. Lack of awareness about SPs among HCWs is the most common responsible reason for low adherence in implementing SPs in various healthcare facilities. Hence, this study will try to determine the level of Practice of standard precautions among HCWs working in pediatric wards of Jimma University Medical Center towards SPs.

Most of the literatures were based on the reported practice only but this work tries to observe the practice part of SPs which probably differs from previous works which is the most critical part of standard precautions that has direct impact on patient outcome, healthcare cost that clearly shows how HCPs of Jimma University pediatrics department are practicing and it tries to show where the gap is on SPS. On the other hand, except for some few studies on compliance of hand hygiene, limited evidences are available with regard to the level of compliance of healthcare workers with standard precautions and its associated factors in Jimma particularly.

1.2. **Conceptual framework**

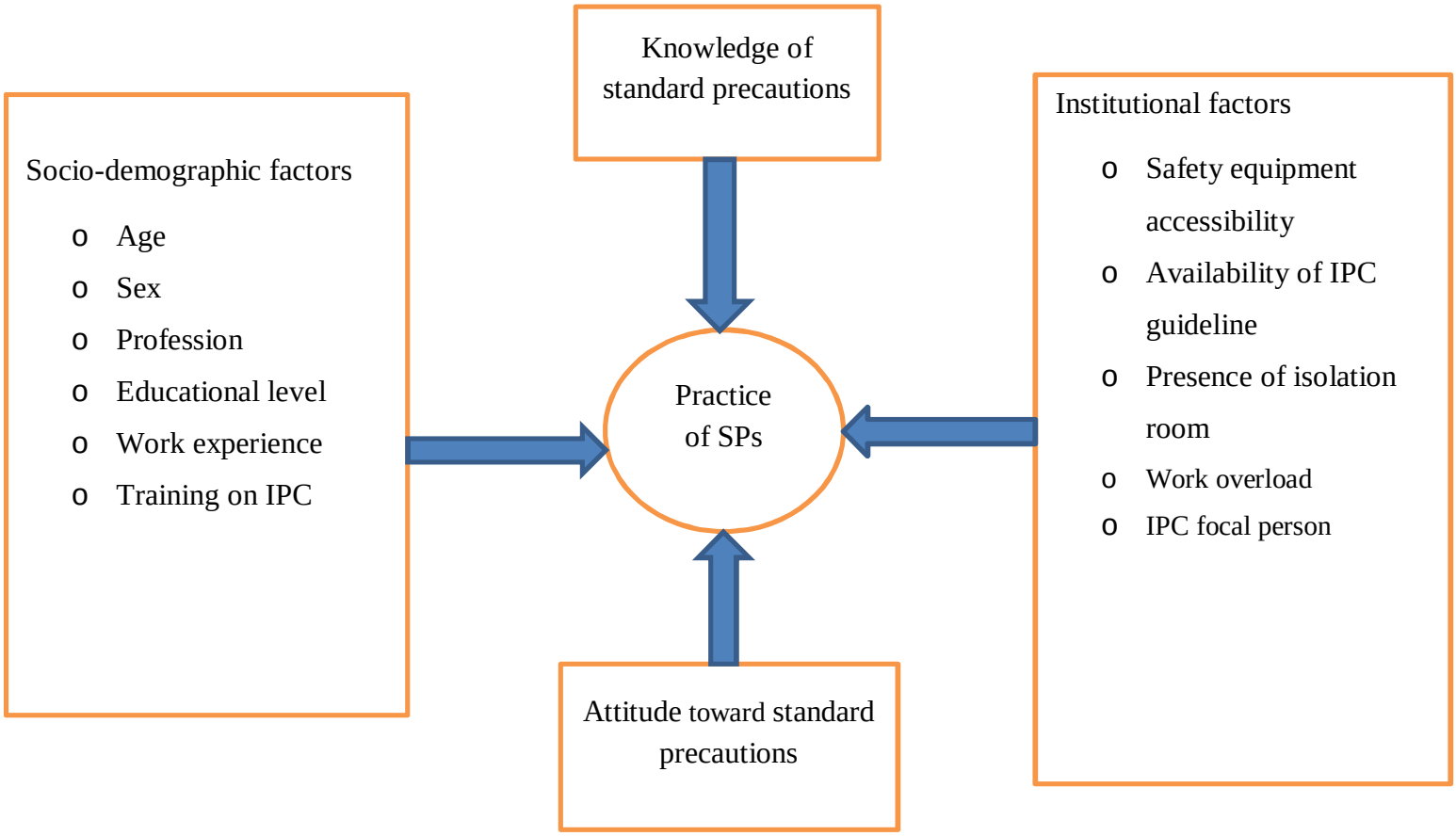

Figure 1. Conceptual framework

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CHAPTER THREE: OBJECTIVES

3.1. General Objectives

To assess practice of standard precautions and associated factors among healthcare professionals working at pediatric wards of Jimma university medical center, Southwest Ethiopia.

3.2. Specific Objectives

To assess practice of standard precautions among healthcare professionals in the pediatric wards of Jimma University Medical Center, 2022

To identify factors associated with practices of standard precautions among healthcare professionals in the pediatric wards of Jimma University Medical Center.

CHAPTER FOUR: METHODS

4.1. Study area and period

The study was conducted in Jimma University Medical Center (JUMC) pediatric wards. JUMC is one of the oldest public hospitals in the country located in Jimma Town of Oromia Regional State, Ethiopia. The center has a total of 694 beds with a total HCP of 1053 (105 senior physicians, 268 residents, 50 general practitioners, 320 nurses/midwifes/laboratory technicians, and 310 medical interns). The pediatrics department has 134 beds and 238 current HCP, including 13 seniors, 2 pediatric oncology fellows, 42 residents, 110 nurses, and 74 medical interns. There is one focal person on IPC in the department. There was functional IPC committee during study period. There are 3 isolation rooms available at the department. The study was conducted from August 1, to August 30, 2022

4.2. Study design

Cross sectional study design was employed.

4.3. Population

4.3.1 Source population

All of healthcare professionals working in pediatric department during study period included

4.3.2 Study population

All selected healthcare professionals working in pediatric department during study period who fulfill the inclusion criteria

4.4. Inclusion and exclusion criteria

4.4.1 Inclusion criteria

All healthcare professionals working in pediatrics department during study period who gave consent to take part on the study.

4.4.2 Exclusion criteria

Healthcare professionals who declined consent to take part in the study.

4.5 Sampling

4.5.1 Sample size determination

The sample size will be calculated by sample size determination formula for a single population

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

Sample size was calculated with the following assumption:

- n = minimum sample size,
- $Z_{1-\alpha/2}$ = significance level at $\alpha = 0.05$
- d= margin of error (5%)
- P= prevalence of 56.5%

Hence: $No = \frac{(1.96)^2 0.56(0.44)}{(0.05)^2}$ $No = 378$

Total number of HCP is 238, which is less than 10,000 by using correction formula

$$Nf = \frac{No}{1 + \{(No-1)/N\}}$$

No = Initial sample size (378)

Nf = final sample size

N = 238

NR = Non response Rate

Hence, $Nf = \frac{378}{1 + \{(378-1)/238\}}$ Nf= 147

By taking 10% nonresponse rate total sample size become 162. But total HCPs in the department is manageable and we surveyed all HCPs

.

4.5.2 Sampling method

Survey was undertaken to involve all HCPs of pediatrics department for structured questionnaire. Observation was undertaken in 10% of total population selected by stratified random sampling on hand hygiene. Strata were made by profession (seniors, residents, nurses and medical interns) and participants were selected from each stratum by lottery method.

4.6 Study Variables

4.6.1 Dependent variable

Standard precaution practice

4.6.2 Independent variables

Sociodemographic factors

Institutional factors

Knowledge of standard precaution

Attitude toward standard precaution

4.7. Operational, and definition of terms

- **Standard Precautions: -** represent the minimum infection prevention measures that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where healthcare is delivered.
- **Good knowledge: -** subjects answer above mean score of knowledge assessment questions.
- **Poor knowledge:** - subjects answer mean and below score of knowledge assessment questions
- **Favorable attitude:** - subjects answer above mean score of attitude assessment questions
- **Unfavorable attitude:** - subjects answer mean and below score of attitude assessment questions
- **Good practice:** –subjects answer above mean score of reported practice assessment questions and compliance rate more than 50%.
- **Poor practice:** - subjects answer mean and below score of self-reported practice assessment questions and compliance rate less than or equal to 50%.

4.8 Data Processing and Analysis

Data was entered into Epidata version 3.1 and then it was exported to SPSS Version 20.0 for statistical analysis. The univariate analysis such as percentages, frequency distributions and appropriate graphic presentations was used describing data. Continuous variables were expressed as frequency, mean, percentages. Bivariate analyses were done and all covariates which had association with the outcome variables at p-value of <0.25 was selected for multivariable analyses. Then multivariate logistic regression was carried out to identify an independent effect of the predictors that showed significant association with dependent variable. To evaluate the association between dependent and independent variables, both crude odds ratio (COR) and adjusted odds ratio (AOR) with 95% confidence interval was reported.

4.9 Data collection tool and technique

The questionnaire was developed in English by reviewing available literatures and guidelines. Pretested structured self-administered questionnaire developed from different literatures and Ethiopia IPC guidelines were used to collect data on self-reported practice by two trained Bsc Nurses. Data collection tool included sociodemographic data, facility related, knowledge, attitude and practice questions. Knowledge was measured by a set of 10 questions. For every correct response, 1 point was given and 0 was given for an incorrect answer. Attitude was measured by a set of 10 attitude questions using Likert's scale with responses including '1. Strongly disagree', '2. Disagree' '3. Neutral', '4. Agree' and '5. Strongly agree'. Value of '1' is given for 'agree' and 'strongly agree' and '0' for 'strongly disagree' and 'disagree' and 'neutral'. Practice questions were seven. Additionally observation was undertaken using WHO hand hygiene observation checklist.

4.10 Data quality Assurance

To assure the data quality, data collection instruments were pre-tested on 5% of the sample on HCPs working at pediatric OPD to check the consistency of the questions and reliability test was done with Cronbach's Alpha value of 0.664. Two-day training was given for the data collectors at each ward. The data collection was supervised by principal investigator. Every day the filled questionnaires was reviewed and checked for completeness, clarity and accuracy of data by principal investigator and the necessary feedback was offered to data collectors.

4.11 Ethical consideration

The study was reviewed and approved by the Institutional Review Board (IRB) of Institute of Health, Jimma University with ref.no JUIRB/59/22. Permission letter was obtained from department of Pediatrics and Child Health. Confidentiality of information collected from each study participant was maintained. Study participants were informed about the purpose and importance of the study through written informed consent before the data collection process. Written informed consent was taken before start of survey. Participation in this study is completely voluntary whenever the participant wants to withdraw from the study; they have full right to leave at any time.

4.12 Utilization and dissemination of results

The result of the study will be presented to department of pediatrics and child health, Jimma University. The final result from the study will be submitted to the postgraduate coordinator office of Jimma University. Study findings will be presented for concerned bodies. Also, the results will be submitted to a peer reviewed journal for publication.

CHAPER FIVE: RESULTS

5.1. Socio-demographic characteristics

A total of 205 HCPs were surveyed with 100% response rate. Among 205 participants, 118 (57.6%) were male and the age was ranged from 21 to 55 years mean age of participant was 28.75 years. Regarding their profession, 84(41%) of the participants were nurse followed by medical intern which accounted 36.1 % of respondents. With regard to education 113(55.1%) of the respondents were first degree holder. About 47% of the respondents have less than two years of work experience.

Table 1:-Socio-demographic related characteristics for assessment of standard precautions pediatrics ward of JUMC, Southwest Ethiopia, 2022.

Variables	Categories	Frequency	Percent (%)
Age(in years)	25 and below	52	25.4
	26-30	103	50.2
	31-35	35	17.1
	36 and above	15	7.3
Sex	Male	118	57.6
	Female	87	42.4
Marital status	Single	115	56.1
	Married	89	43.4
	Other[1*]	1	.5
Job category/ Profession	Nurse	84	41.0
	Medical intern	74	36.1
	Resident	41	20.0
	Pediatrician	6	2.9
Work experience (in years)	2 and below	96	46.8
	3-4	47	22.9
	5 and above	62	30.2
Educational level	1st degree	113	55.1
	2nd degree and above	18	8.8
	Medical intern	74	35.6

	Other[2*]	1	.5

Key:[1*] divorced, widowed, separated Other2*: diploma

5.2. Health care related characteristics

This study result revealed that, three –fourth of (78.5%) participants did not take trainings on IPC. 42.9% (88) of them reported experiencing needle stick injury during the work 117(57.1%) participants experienced at least one occupational hazard most of which is needle stick injury 88(42.9%). Of all participants, 125(61%) participants stated PPE equipment's were not available at their ward and 38% of the respondents reported that PPE equipment's are sometimes accessible at patient side.

Table 2:- Health facility related characteristics for assessment of standard precautions pediatrics ward of JUMC, Southwest Ethiopia, 2022.

Variables	Categories	Frequency	Percent (%)
Is PPE equipment available at your ward	Yes	73	35.6
	No	125	61.0
	I don't know	7	3.4
Is PPE equipment accessible at patient side	Always	12	5.9
	Sometimes	78	38.0
	Rarely	57	27.8
	Not at all	58	28.3
Is IPC guideline available at your workplace	Yes	42	20.5
	no	114	55.6
	I don't know	49	23.9
Is there isolation room at your unit	YES	90	43.9
	no	115	56.1
Have you ever taken training on IPC	Yes	44	21.5
	No	161	78.5
Have you ever experienced occupational hazard at your work site	Yes	117	57.1
	No	88	42.9
Type of hazard you experienced	Needle stick injury	88	42.9

	Airborne disease	21	10.2
	Blood born disease	8	3.9
For how many patients you are responsible per your shift	<5	77	37.6
	5-10	66	32.2
	>10	62	30.2
Does your department have IPC focal person	Yes	44	21.5
	No	64	31.2
	I don't know	97	47.3
Are sinks with running water and soap available at your unit	Yes	89	43.4
	No	116	56.6
How often are they available?	Always	12	5.9
	Sometimes	50	24.4
	Rarely	27	13.2

5.3. Knowledge of study participants

Total mean score of knowledge is 4.44. According to the mean value overall, 42.9% (n=88) of respondents had good knowledge. About 180(87.8%) of respondents are aware of risk of their working environment, while 107(52.2%) of HCPs correctly answered 72 hour is the maximum delay to start HIV post-exposure prophylaxis.

Table 3:-knowledge of health professional related characteristics for assessment of standard precautions pediatrics ward of JUMC, Southwest Ethiopia, 2022

Variables	Categories	Frequency	Percent (%)
Are healthcare workers responsible for occupational health and safety	Yes	178	86.8
	No	11	5.4
	I don’t know	16	7.8
How far apart should patients be to prevent transmission of respiratory infection	1 meter	67	32.7
	2 meters	124	60.5
	3 meters	14	6.8

Are you aware of the risks of your working environment	Yes	180	87.8
	No	7	3.4
	I don't know	18	8.8
Do you know about color coding segregation of healthcare wastes	Yes	173	84.4
	No	32	15.6
which color is used for an infectious waste disposal	Yellow	59	28.8
	Black	26	12.7
	Red	88	42.9
How maximum full should be the safety box containing sharp medical supplies	1/2 full	43	21.0
	3/4 full	107	52.2
	Full	29	14.1
	I don't know	26	12.7
What is the maximum delay to start HIV post-exposure prophylaxis	24 hours	12	5.9
	48 hours	23	11.2
	72 hours	163	79.5
	I don't know	7	3.4
Which item is difficult to sterilize with autoclaves	Metal	54	26.3
	Plastic	132	64.4
	Linen	19	9.3
Does wearing personal protective equipment reduce the risk of infection	Yes	187	91.2
	No	18	8.8
The minimum time needed for hand washing	< 40 sec	69	33.7
	40- 60 sec	91	44.3
	More than 1 minute	45	22.0

5.4. Attitude of study participants

The overall mean score of the Likert scale that consists of five items was 4.0. About two third of the respondents (67%), had favorable attitude towards safety precaution. One hundred thirty eight (67.3%) study participants strongly agreed that safety precaution is important for healthcare organizations. Similarly, 67.8% of respondents strongly agreed up on Occupational health and safety training is important for healthcare workers.

Table 4-attitude related characteristics of health professionals for assessment of standard precautions in pediatric ward of JUMC, Southwest Ethiopia, 2022

Variables	**SD** **n (%)**	**D** **n (%)**	**N** **n (%)**	**A** **n (%)**	**SA** **n (%)**
Safety precaution is important for healthcare organizations	11 (5.4)	3 (1.5)	7 (3.4)	46 (22.4)	138 (67.3)
Occupational health and safety training are important for healthcare workers	8 (3.9)	3 (1.5)	6 (2.9)	49 (23.9)	139 (67.8)
Your healthcare environment may expose you to occupational hazards	8 (3.9)	7 (3.4)	9 (4.4)	57 (27.8)	124 (60.5)
Health care workers are at high risk of infection	7 (3.4)	3 (1.5)	9 (4.4)	51 (24.9)	135 (65.9)
All personal protective equipment should be accessible in the working	16 (7.8)	11(5.4)	11 (5.4)	52 (25.4)	115(56.1)
Risk assessment is important for occupational health and safety	6 (2.9)	6 (2.9)	6 (2.9)	63 (30.7)	124 (60.5)
Sharp materials should be discarded in a safety box	10 (4.9)	5 (2.4)	3 (1.5)	52 (25.4)	135 (65.9)
Needles should not be recapped after	48 (23.4)	13 (6.3)	9 (4.4)	38 (18.5)	97 (47.3)
Wearing facemask and eye goggles during procedures with aerosol	8 (3.9)	6 (2.9)	8 (3.9)	68 (33.2)	115 (56.1)
Vaccination for healthcare professionals is mandatory	6 (2.9)	4 (2.0)	9 (4.4)	51 (24.9)	135 (65.9)

Key: SD= strongly disagree D=Disagree N= Neutral A= agree SA= strongly agree N=frequency %=percentage

5.5. Self-reported practice of study participants

The mean scores for the practice were 3.47**.** One hundred three (50.2%) of the respondents had poor practice to safety precaution. One hundred thirty eight (67.3%) of study participants wear gloves before touching mucous membranes, before touching blood and body fluids, before performing sterile procedures. 99(48.3%) of study participants always use sanitizer/alcohol during patient care when other means of hand hygiene is not available. 149(72.7%) discard healthcare wastes by segregation. 128(62.4%) of study participants contact PEP focal person, clean with water and soap and examine patient for retroviral infections when exposed to blood and injured by needle.

Table 5: Self- reported practice related characteristics of the health care professionals working in pediatric ward of JUMC, Jimma, southwest Ethiopia, 2022.

Variables	Categories	Frequency	Percent (%)
How often you use gloves	Before touching mucous membranes	12	5.8
	Before touching blood and body fluids	26	12.7
	Before performing aseptic procedure	29	14
	During all above procedures	138	67.3
How often you wash your hands in patient care	Before touching patient	7	3.4
	Before aseptic technique	31	15.1
	After contact with patient	4	2.0
	After body fluid exposure	33	16
	During all above	149	72.6
How often you use sanitizer/alcohol during patient care when other means of	Always	99	48.3
	Sometimes	89	43.4
	Rarely	13	6.3
	Never	4	2.0

How do you discard healthcare wastes	Patient side	13	6.3
	On the floor/corridor	6	2.9
	By segregation	149	72.7
	In my convenience elsewhere	37	18.0
Do you check expiry date before injecting medications	Yes	125	61
	No	80	39
What measure do you take if you are exposed to blood or fluids, needle stick	Contact PEP focal person	13	6.3
	Clean with water and soap	18	8.8
	Examine patient for retroviral i	46	22.4
	I take all actions	128	62.4
What do you do if you have respiratory symptoms while caring for patient?	Strict use of facemask	47	23
	Frequent hand hygiene	58	28.3
	Both 1 and 2	93	45.3
	Do nothing than usual	7	3.4

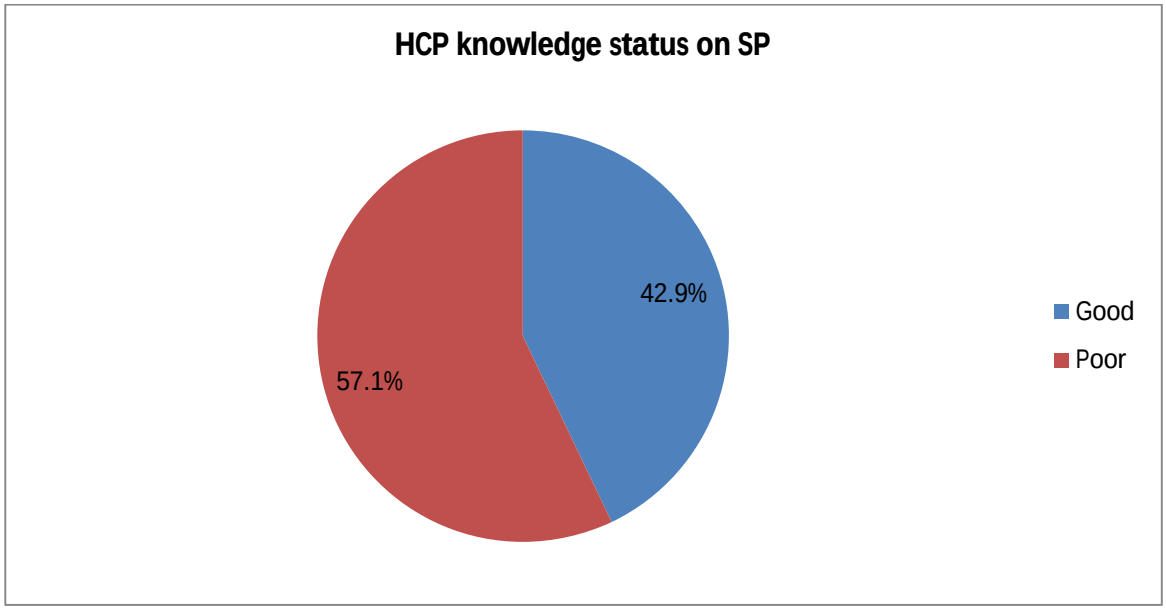

Figure 2: Level of knowledge of health professionals working in pediatric ward towards standard precautions at Jimma medical center, southwest Ethiopia, 2022.

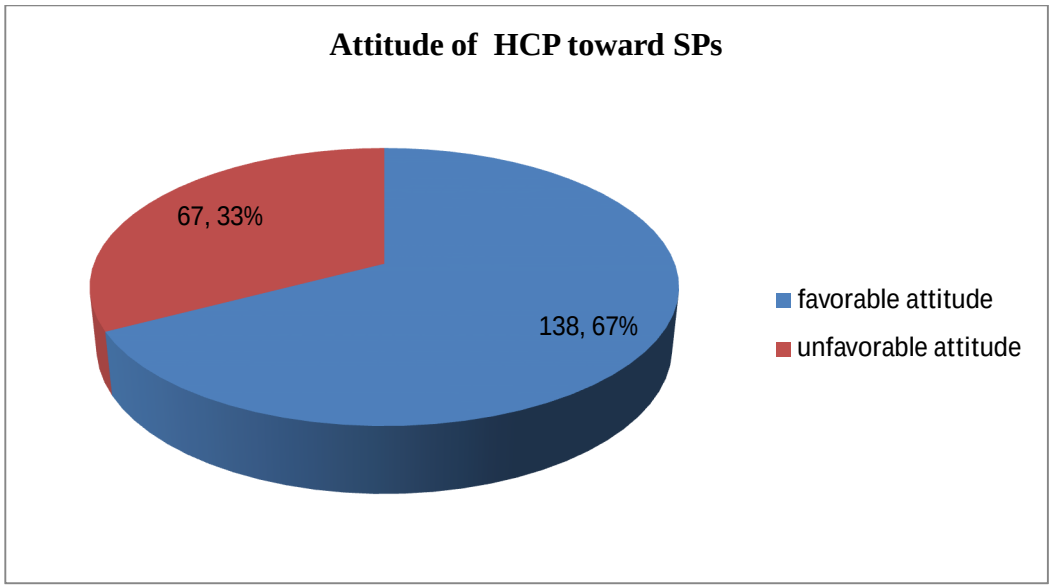

Figure 3: Level of attitudes of health professionals working in pediatric ward towards standard precautions at Jimma medical center, southwest Ethiopia, 2022

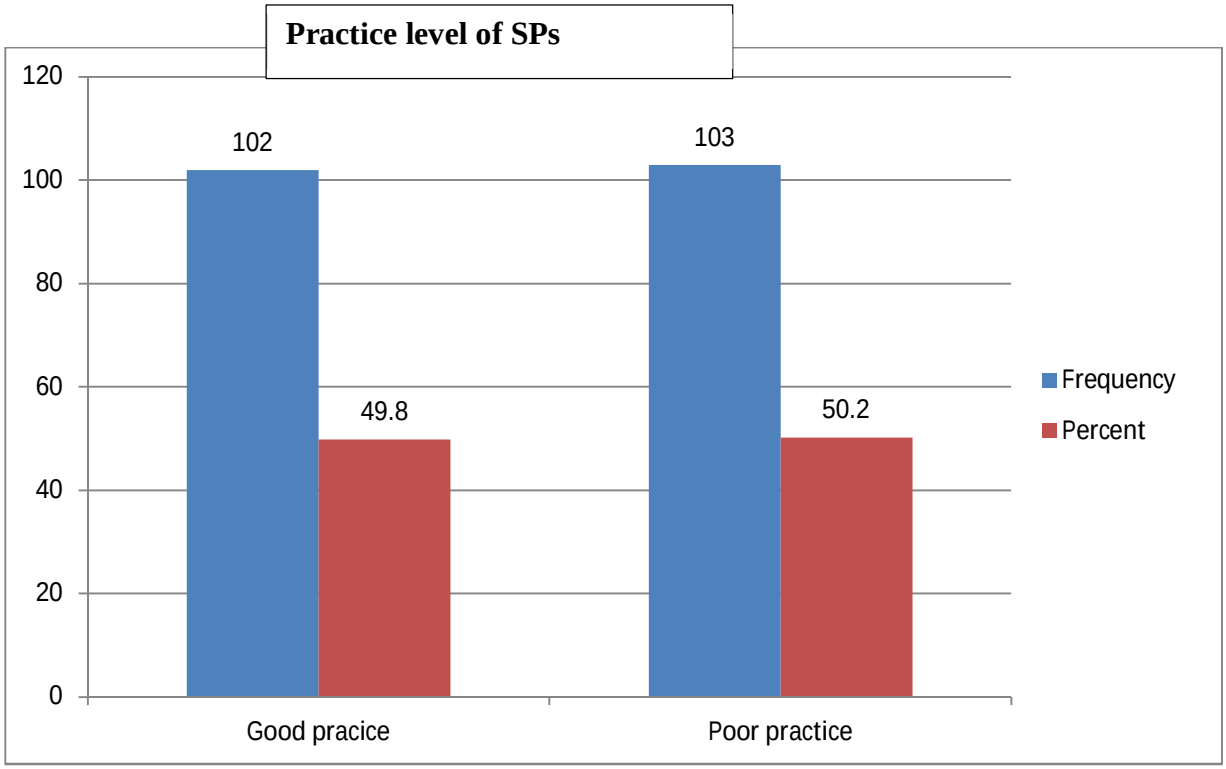

Figure 4:- Level of practice of health professionals working in pediatric ward towards standard precautions at jimma medical center, southwest Ethiopia, 2022

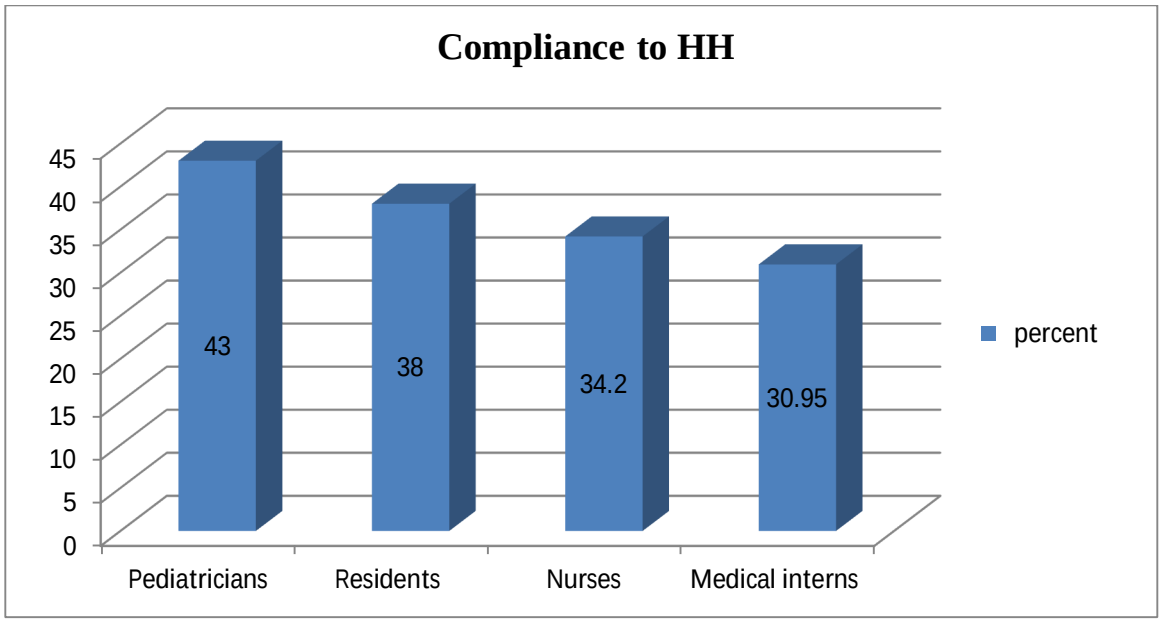

Figure 5:- Level of compliance to HH by job category of pediatrics ward HCPs at Jimma medical center, southwest Ethiopia, 2022.

5.6. Factors affecting reported practice of standard precaution among health care professionals

To assess the association between different characteristics of the respondents, bivariate logistic regression was conducted to identify a candidate variable. During the selection of these variables P-value<0.25 was used as a criterion (Table 6).

In the bivariate analysis factors which were significantly associated with practice of SPs was: sex, age, work experience, profession. Males were two (COR= 2.018, 95%, CI [(1.133, 3.597)] times likely to have good practice of standard precautions as compared to female participants. Regarding age, those age 36 yr and above are six times likely to have good practice of standard precautions (COR= 6.3, 95%, CI [(1.67-23.7)] than those below 25 counterparts. With regard to profession nurses have four (COR= 4.5, 95%, CI [(0.509-40.587)] times likely to have good practice of standard safety precautions than pediatricians. Regarding work experience, those who have work experience 5 and above have 1.9 (COR= 1.903 95%, CI [(0.98, 3.693)] times likely to have good practice of standard precautions than those having work experience of 2 yr and below.

In multivariate logistic regression analysis, age, work experience and profession, was found to be significantly associated with practice of standard precautions. In respect to the age of healthcare professionals, with the age 36 and beyond were about five times (AOR = 5.5, 95%, CI = [(1.24-24.1)]) more likely to have good practice standard precaution activities than those 25 yr and below study subjects. Regarding profession nurses have three times (AOR=3.3**,** 95%, CI = [(0.309-10.258)]) to have good practice of standard precautions than pediatricians. Regarding work experience those having five year and above practice standard precautions nearly two (AOR=1.9**,** 95%, CI = [0.54-1.93]) times than those having 2 year and below work experience.

Table 6: Bivariate logistic regression analysis of Practice of healthcare professionals working in pediatric ward towards standard precautions characteristics at Jimma Medical Center, Jimma, Ethiopia, 2022

Variables	**Category**	**Practice of SP**		**COR (95% CI)**	**P V**
		Good	Poor		
Sex	M	70	48	**2.018 (1.133, 3.597)**	**0.017***
	F	42	45	1	1
Age(in years)	25 and below	25	27	1	1
	26-30	40	63	3.7(0.93-14.7)	0.26
	31-35	12	23	2.1(0.49-8.85)	0.37
	36 and above	12	3	**6.3(1.67-23.7)**	**0.023***
Profession	Nurse	45	40	**4.545(0.509-40.587)**	**0.175***
	Medical inter	30	44	2.255(.249-20.406)	0.469
	Resident	13	28	1.833(.192-17.489)	0.598
	Pediatrician	3	3	1	1

Work experience(in years)	2 and below	32	46	1	1
	3-4	21	26	1.327 (0.63, 2.871)	.473
	>5 and above	50	30	**1.903 (0.98, 3.693)**	**0.057***

*variables significant at Pv <0.25, and candidate for multivariate logistic regression

Table 7: - Multivariable analysis results of selected variables associated with practice of standard precautions in Jimma medical center, Jimma, Ethiopia, 2022

Variables	**Category**	**Practice of SP**		**COR**(95% CI)	**AOR**(95% CI)	**PV**
		Good	**Poor**			
Profession	Nurse	45	40	4.545(0.509-40.587)	**3.3(1.16-9.9)**	**.026****
	Medical intern	30	44	2.255(.249-20.406)	0.42(0.04-4.4)	0.464
	Resident	13	28	1.833(.192-17.489)	0.56(0.23-0.13)	0.192
	Pediatrician	3	3	1	1	
Age(in years)	25 and below	25	27	1	1	
	26-30	40	63	3.7(0.93-14.7)	2.6(0.5-13.3)	0.26
	31-35	12	23	2.1(0.49-8.85)	2.0(0.44-9.236)	0.37
	36 and above	12	3	6.3(1.67-23.7)	**5.5(1.24-24.1)**	**.025****
Work experience(in years)	Under 2	32	46	1	1	
	3-4	21	26	0.76(0.35-1.62)	0.711(0.45-1.73)	0.592
	>=5	50	30	1.02(.54-1.93)	**1.9(0.01-9.01)**	**0.033***

** Variables significant at PV<0.05

CHAPTER SIX: DISCUSSION

Proper practice of standard safety precaution is one of critical aspect in healthcare setting. This study assessed practice of standard safety precaution of HCPs of pediatrics department. The study revealed nearly half (49.8%) of healthcare professionals had good overall self- reported practice on standard precaution and 42.9% of participants were found to have good knowledge about standard precautions and about 67% had favorable attitude.

This finding indicated that majority of the healthcare professionals in the department had poor/inadequate knowledge on standard precautions, poor practice but favorable attitude toward standard precaution. Low level of knowledge can be explained with absence of pre-service and on service training in which only about 21% of participants were trained. Regarding practice, it is poor because majority of units do not have available PPE at patient side and at point of care (61%) and in wards where PPE is available (38%) it is on occasional basis.

Regarding knowledge, good knowledge which is found to be 42.9% in this study This finding is bit higher than study in Bale zone hospitals,36%((27), Trinidad and Tobago,20%(15) difference could be from difference of cut off mean score, study setting, and study population but lower than study in Shenan Gibe hospital 82.97 %((28), Dessie Referral Hospital, 87.5%(29), Nigeria, 90%(12). The difference observed could be from difference in sample size, cut off mean score, study setting, and study population.

This study reveals attitude toward SPs was 67%, which in lines with Gondar University, 66 %(10) in which the staffs of both hospitals trained were less than 50% of the participants. On other hand lower compared to studies done in Addis Ababa, 83.3%(5), Tikur Anbessa,83%(6), Zambia, 81.3%(11). This difference can be explained with difference in study setting, population of study and training status.

The proportion of healthcare workers who have good self-reported practice of standard precautions activities was 49.8%. This in lines with studies done in Jordan 49.15%((30), Gaza, 49.5%(31), Trinidad and Tobago, 44%(15), Nigeria, 50.8%(12) similarities can be explained with similarities in socioeconomic status and methodology. It is bit lower than studies undertaken at Gondar University, 57.4%(10), Debre Markos, 54.3%(8), Addis Ababa, 66.1%(5)

and Hawassa, 56.5%(23). These differences can explained with difference in socio-demographic, study setting, sample size and study population

Lower self-reported practice level (49.8%) in this study could be explained with that around one third of study participants were junior healthcare professionals (medical interns). This study revealed that healthcare workers with age thirty six and above years were 5.5 (AOR = 5.5, 95%, CI [1.24-24.1]) times likely to have god practice compared to those who were below or equal to 25. This might be attributed to the fact that as age advances; year of service increased which in turn improves their practice through time and get chance to be trained on standard precautions.

Regarding observed practice, among 140 HH moments observed, overall observed compliance rate was 33.5%. Compliance rate was found to be 10.4% after patient contact, 10% after body fluid exposure, 9.2% before patient contact and 2.4% before aseptic technique. Sixty percent of HH was performed using ABHR. From profession point of view compliance to HH was 43% among pediatricians, 38% among residents, 34.2% among nurses, 30.95% among medical interns. As it is seen in this study, the observed and self-reported practice are quietly different possibly causes of observed practice can be multifactorial than reported practice.

In regard to profession, nurses have three (AOR = 3.3, 95%, CI [1.16-9.9]) times good practice compared to pediatricians. This can be explained with low representation of pediatricians as compared to rest of participants, and nurses are only assigned for limited number of patients while the other healthcare professionals are responsible for many patients (even whole ward) at a time and nurses are involved in nursing care tasks like wound care, bladder and bowel care which need strict compliance to HH. In addition, this study revealed that working experience is another factor significantly associated with the practice of infection prevention activities.

From the study finding, there is need to support existing IPC committees and come up with new strategy to tackle low practice level of SPs and related health issues. Therefore, the department of pediatrics and the hospital has to make up-to-date on practice of health care professionals regarding standard precaution activities with pre-service training especially among junior healthcare professionals or in-service training and continuous mentorship/supervision to improve HCPs adherence to standard safety precaution is recommended.

6.1. STRENGTH AND LIMITATIONS

6.1.1. STRENGTH

100% response rate.

Adequate sample size.

In addition to reported practice, it includes observational practice of selected participants.

6.1.2. LIMITATIONS

Study includes only pediatrics department which makes the study result difficult to generalize to other wards and other settings.

Small number of observed participants.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1. CONCLUSION

The study has demonstrated that majority of health care professionals had poor knowledge about standard precaution and more than half of healthcare providers had poor practice but about two third had favorable attitude.

Year of service/work experience, and job category/profession were significantly associated with practice of standard precautions.

7.2. RECOMMENDATIONS

Strict policies and IPC measures should be put in place to ensure regular adherence of HCPs to SPs.

Hospital administrators should strengthen IPC committee and reform if necessary

Hospital and department should reconsider retention mechanisms of senior health staffs.

Therefore, the department and hospital should start mandatory pre-service training especially among junior healthcare professionals (medical interns) or in-service training and provision of continuous mentorship/supervision to improve HCPs adherence to standard safety precaution.

Since this study is single center data, large, comprehensive and representative study should be conducted for assessment of practice of standard precautions because practice assessment is a prerequisite for initiating and implementing a successful infection prevention and control (IPAC) strategy in any health facility.

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Annexes

Information sheet and Consent form

Good morning? / Good afternoon? My name is_____. I am here to collect data for a study being done to assess Knowledge, Attitude and Practice of Standard Precautions of HCPs at JUMC department of pediatrics. The questionnaire requires a maximum of 10 minutes to complete. Your participation is entirely voluntarily, and you can leave the study any time you want. Personal information will completely be kept confidential and will not be disclosed to any third person other than the people conducting this study.

Do you agree to participate in the study?

Yes ☐ No ☐

If yes, continue interviewing

I certify that I have read the above consent to participate.

Signature: _____

Questionnaire

Part I: Socio-Demographic related characteristics

Code	Question	Answer options
11	Sex	1.Male 2. Female
12	Age	(in years)…….
13	Marital status	1. Single 2. Married 3. Others……..
14	Profession	1. Nurse 2.Medical intern 3. Resident (year) …… 4. Pediatrician
15	Educational level	1. 1st degree 2. 2nd degree 3. Medical intern 4. Other (specify)……..
16	Work experience	(in years)……

Part II: Health care facility related characteristics

Code	Questions	Answer options and code
21	Is PPE equipment available at your ward?	1.Yes 2. No 3. I don't know
22	Is PPE equipment accessible at patient side?	1. Always 2. Sometimes 3. Rarely 4. Not at all
23	Is IPC guideline available at your workplace?	1. Yes 2. No 3.I don't know
24	Is there isolation room at your unit?	1.Yes 2.No 3.I don't know
25	Have you ever taken training on IPC?	1. Yes 2. No
26	Have you ever experienced occupational hazard at your work site?	1. Yes 2. No
27	If yes for q26 which type	1. Needle stick injury 2. Airborne disease 3. Blood born disease 4. Other (specify)……

28	For how many patients you are responsible per your shift?	……
29	Does your department has IPC focal person?	1.Yes 2.No 3.I don't know
210	Are sinks with running water and soap available at your unit?	1. Yes 2. No
211	If yes, for Q29 how often?	1. Always 2. Sometimes 3. Rarely 4. Never

Part III: Knowledge questions

Code	Questions	Answer options and codes
31	Are healthcare workers responsible for occupational health and safety?	1**.Yes** 2.No 3. I don't know
32	How far apart should patients be to prevent transmission of respiratory infections in common waiting areas?(In meters)	**1. 1 meter** 2. 2 meters 3. 3 meters
33	Are you aware of the risks of your working environment?	1**.Yes** 2.No 3.I don't know
34	How do you handle used needles and sharps?	**1. Put in safety box immediately after use** 2. Leave at patient side 3. Discard on floor 4. Other specify…….
35	Do you know about color coding segregation of healthcare wastes?	1**.Yes** 2.No
36	If yes for Q.306 which color is used for an infectious waste disposal	1**.Yellow** 2.Black 3.Red
37	How maximum full should be the safety box containing sharp medical supplies?	1. 1/2 full 2. **3/4 full** 3. Full 4. I don't know
38	What is the maximum delay to start HIV post-exposure prophylaxis?(in hours)	1. 24 hours 2. 48 hours 3. **72 hours** 4.I don't know
39	Which item is difficult to sterilize with autoclaves?	1. Metallic materials 2**. plastic materials** 3.linen

310	Does wearing personal protective equipment reduce the risk of infection?	1.**Yes** 2.No
311	The minimum time needed for hand washing is	1.< 40 sec **2.40- 60 sec** 3.More than 1 minute

Part IV: Attitude questions

Code	Questions	Answer options and codes
41	Safety precaution is important for healthcare organizations	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
42	Occupational health and safety training is important for healthcare workers	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
43	Your healthcare environment may expose you to occupational hazards	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
44	Health care workers are at high risk of infection	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
45	All personal protective equipment should be accessible in the working department/ section of the healthcare facility.	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
46	Risk assessment is important for occupational health and safety.	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
47	Sharp materials should be discarded in a safety box	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
8	Needles should be recapped after use	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
49	Wearing facemask and eye goggles during procedures with aerosol production is mandatory	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree
410	Vaccination for healthcare professionals is mandatory	1.Strongly disagree 2.Disagree 3.Neutral 4.Agree 5.Strongly agree

Part V: Practice questions

Code	**Questions**	**Answer options**
51	When should you use gloves?	1. before touching mucous membranes only 2. before touching blood and body fluids 3. before performing invasive procedures 4. **during all above procedures**
52	When should you wash your hands in patient care?	1. Before touching patient 2. before aseptic technique 3.after contact with patient 4.After body fluid exposure 5. **during all above**
53	How often you use sanitizer/alcohol during patient care? When others means of hand hygiene is not available	**1.Always** 2.Sometimes 3.Rarely 4.Never
54	How do you discard healthcare wastes?	1. Patient side 2. On the floor/corridor 3. **By segregation** 4. In my convenience elsewhere
55	Do you check expiry date before injecting medications?	1. **Yes** 2. No
56	What measure do you take if you are exposed to blood or fluids, needle stick injury?	1. Contact PEP focal person 2. Only clean with water and soap or alcohol 3. Examine patient for retroviral infection **4. I take all actions**
57	What do you do if you have respiratory symptoms while caring for patient? More than one answer possible	1. Strict use of facemask 2. Frequent hand hygiene **3. Both 1 and 2** 4. Do nothing than usual

VI. WHO five moments of HH Observation format

Prof.cat			Prof.cat			Prof.cat			Prof.cat		
Code			Code			Code			Code		
N°			N°			N°			N°		
Opp.	Indication	HH Action	Opp.	Indication	HH Action	Opp.	Indication	HH Action	Opp.	Indication	HH Action
1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	1	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves
2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	2	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves
3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves	3	☐ bef-pat. ☐ bef-asept. ☐ aft-b.f. ☐ aft-pat. ☐ aft.p.surr.	☐ HR ☐ HW O missed O gloves

	Facility:						Period:			Setting:					
	Before touching a patient			Before clean/ aseptic procedure			After body fluid exposure risk			After touching a patient			After touching patient surroundings		
Session N°	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)	Indic (n)	HW (n)	HR (n)
1															
2															
3															
4															
5															
6															
7															
8															
9															

15														
16														
17														
18														
19														
20														
Total														
Calculation	Act (n) = Opp (n) =			Act (n) = Opp (n) =			Act (n) = Opp (n) =			Act (n) = Opp (n) =			Act (n) = Opp (n) =		
Compliance														

Compliance (%) = $\frac{\text{Actions}}{\text{Opportunities}}$ x 100

nstructions for use