FACTORS AFFECTING COMPLIANCE TO INFECTION PREVENTION AND CONTROL STANDARD PRECAUTIONS AMONG HEALTHCARE WORKERS IN SONGWE REGION, TANZANIA

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Factors affecting compliance to infection prevention and control standard precautions among healthcare workers in Songwe Region Tanzania

BY

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CERTIFICATION

The undersigned certify that he has read and hereby recommend for examination by Muhimbili University of Health and Allied Sciences a dissertation entitled "Factors affecting compliance to infection prevention and control standard precautions among healthcare workers in Songwe Region Tanzania" in (partial) fulfilment of the requirements for the degree of the Master of Science in Applied Epidemiology of Muhimbili University of Health and Allied Sciences.

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DECLARATION

I, Radenta Paul, declare that this dissertation is my own original work and that it has not been presented to any other university for similar or any other degree award.

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DEDICATION

This dissertation is dedicated to my lovely family (Parents and young brothers and sisters) and my Director Dr Eliudi Eliakimu for being the source of inspiration, love, support and encouragement that has been a very useful tool all over the period of this academic endeavor.

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LIST OF ABBREVIATIONS

AMR	Antimicrobial Resistance
CDC	Centers for Disease Control and Prevention
COVID-19	Corona Virus Disease 2019
HAIs	Health care Associated Infections
HCPs	Health Care Providers
HCWs	Health Care workers
HIV	Human Immunodeficiency Virus
ICAN	Infection Control Africa Network
IPC	Infection Prevention and Control
LMICs	Lower- and Middle-Income Countries
MUHAS	Muhimbili University of Health and Allied Sciences
PHC	Primary Health Care
PPE	Personal Protective Equipment
SOPs	Standard Operating Procedures
SPs	Standard Precautions
TFELTP	Tanzania Field Epidemiology and Laboratory Training Program
UHC	Universal Health Coverage
USA	United States of America
WHO	World Health Organization

DEFINITIONS OF TERMS

Compliance conformity in fulfilling standards or requirements

Health care-associated infection is also referred to as "nosocomial" or "hospital" infection, is an infection occurring in a patient during the process of care in a hospital or other health care facility which was not present or incubating at the time of admission.

Health care worker is one who delivers care and services to the sick and ailing either directly as doctors and nurses or indirectly as aides, helpers, laboratory technicians, or even medical waste handlers

Infection is the invasion and multiplication of microorganisms such as bacteria, viruses or parasites that are not normally present within the body

Infection prevention and control (**IPC**) is a scientific approach and practical solution designed to prevent harm caused by infection to patients and health workers

Personal protective equipment is specialized clothing or other wearable gear that minimize one's exposure to source of illness or injury and inhibit the spread of infection to other

Standard operating procedure: Set of step-by-step instructions compiled by an organization to help workers carry out routine operations in the most effective manner.

Standards precautions A 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. They include: hand hygiene; use of personal protective equipment; handling and disposal of waste and sharps; handling and management of clean and used linen; environmental cleaning; and decontamination of equipment

ABSTRACT

Background: Compliance to infection prevention and control standards precautions (IPCSPs) remains a major challenge in Tanzania. This exposes health care workers (HCWs) and patients to high risk of developing healthcare associated infections (HAIs) and increasing of antimicrobial resistance (AMR). The study investigated compliance to IPCSPs and associated factors among HCWs in Songwe Region Tanzania from January to March 2021.

Methodology: A cross-sectional study was conducted in all districts of Songwe Region, Tanzania which involved 400 HCWs from all levels of public health facilities. Semi structured questionnaire and compliance with standard precautions scale (CSPS) tool was used. Descriptive and modified Poisson regression analysis were done. A p-value of less than 0.05 was used to compute statistical significance.

Results: Only 22.5% (90/400) of HCWs had high compliance (above 80%) to IPCSPS. Majority HCWs reported highest compliance on discarding used needles/sharp items into sharp containers (94%), the lowest IPCSP compliance was on spills management, taking shower after extensive splashing and re-use of disposable masks at 8%, 28.5% and 34% respectively. However, Clinician (ARR=0.61 [0.37-0.99] p=0.049), IPC training or seminar in the previous one year (ARR=2.97 [1.87-4.72] p<0.001), working experiences (ARR=2.08 [1.22-3.54] p=0.007), and experiences to needle stick injury (ARR=0.62 [0.40-0.95] p=0.028), were identified as predictors of the HCWs compliance to IPCSPs. Reported barriers for IPCSPs compliance were: inconvenient location of personal protective equipment (PPEs) (65.5%), inadequate knowledge (56.8%), overcrowding and patient demand (40.3%), time consuming (27.8%), reduce ability to work (21%), and no need of IPCSPS when infections are not anticipated (13.5%).

Conclusion: Majority of HCWs in Songwe region had low compliance to IPCSPs. The following factors were predictors of high compliance: IPC trainings, length of years of working, and IPC supportive supervision. Unavailability of PPEs in working units and

inadequate knowledge were reported barriers for high compliance. Hence, capacity building initiatives targeting HCWs should be emphasized and PPEs should regularly be supplied at health facilities.

CHAPTER 1

1.0 INTRODUCTION

1.1 Background

Exposure to blood-borne pathogens in the 1970s led to spread of Hepatitis infections among many Health care workers (HCWs) in Health care facilities (HFs). Infection prevention and control (IPC) initiative was as a result of CHWs increased risk of hepatitis B virus (HBV) and human immunodeficiency virus (HIV) (1). A set of activities designed to prevent the transmission of organisms between patients/staff for the prevention of health care-associated infection are known as Standards precaution (SPs). Infection Prevention and Control Standard Precautions (IPCSPs) was initially referred to universal precautions or body substance isolation. They must be applied to all patients who require health care, by all health workers in all health settings. In this era of emerging and re-emerging infectious diseases like Haemorrhagic fever such as Ebola Virus Diseases (EVD) and Coronavirus 2019 (COVID-19), HCWs are at increased risk of exposure unless IPCSPs are adhered properly from national level to facility level (1,2)

Implementation of IPC is a universally relevant component of all health systems and it affect the health and safety of both people who use health services and those who provide them (3). Improvements in IPC at the national and facility level are critical for the successful containment of antimicrobial resistance (AMR), prevention of Health care Associated Infections (HAIs) and break transmission cycle during outbreaks of highly transmissible emerging and re-emerging diseases through high quality care within the context of universal health coverage (UHC) (4).

In 1996, the United States Centers for Disease Control and Prevention (CDC) proposed IPCSPs for hospitals to prevent transmission of microorganisms among patients and healthcare providers by expanding universal precautions (5). Universal precautions were designed to

apply blood and body fluid precautions to all persons regardless of infectious status and also SPs aimed to reduce the risk of transmission via all blood, body fluids, non-intact skin, and mucous membranes that may have infectious agents (5,6). The SPs have been regarded as essential, and global enforcement is recommended. SPs are one of the procedures utilizing the fundamental standards of infection control (e.g. hand washing, use of appropriate protective equipment barriers, and safe handling of sharps) and protects patients and HCWs from the occurrence of HAIs (1,5,6)

HAIs are a major public health problem with a significant impact on morbidity, mortality, and quality of life, longer hospital stay, increasing extra costs on the healthcare system and increasing of AMR threat. The burden of HAIs has been reported worldwide, in both developed and developing countries. In low and middle-income countries (LMICs) patients suffer from at least one HAI at any given time and reported to contribute to mortality (1). However, large proportion of HAI are preventable through effective IPCSPs practices (4). Although the evidence related to the economic burden of HAI is limited, particularly in LMICs. In developed countries data available from the USA and Europe reported the overall annual direct medical costs of HAIs to hospitals in the USA alone ranges from US$ 35.7 to 45 billion(5), while the annual economic impact in Europe is as high as € 7 billion (5).

Infection Control Africa Network (ICAN), reported that there are issues related to practices by HCWs that continue to fuel transmission of HAIs in Africa; among them are attitude and behaviour (1,4,8). Although significant progress has been made to reduce HAIs in many parts of the world, a number of emerging diseases like EVD and COVID-19 have underlined the need to support countries in the development and strengthening of IPC with the objective of having resilient health systems, both at the national and facility level (12,13)

In sub–Saharan Africa countries the magnitude of HAIs is high as IPCSPs compliance is unacceptable below the standards. In Ghana only about half of the HCWs comply with standards precaution on protect themselves against blood and body fluids infections, not recap

needles after use and correctly wipe all blood spills. Also, majority of HCWs do not wear basic protective equipment. But also concerning the associated factors with IPC compliance few HCWs attained training although not regularly done, and few supervisors encourage training in IPCSPs at working units. In many countries HCWs have mentioned various barriers to compliance of safety precautions that sometimes PPEs are not available at HFs, complying emergency situations compromises their compliance, workload and high patient demand of care and lack of enough time due to shortage compromise their compliance to IPCSPs (9). Hence, the situation continuing to fuel the problem of HAIs, AMR and improper security during response to emerging and remerging diseases

In Tanzania guidelines to enhance IPC for HCWs in health care settings have been in existence since 2004. In July 2018 the guidelines were revised based on adoption of new updates and recommendations from World Health Organization (WHO). The revised national IPC documents are enablers to continue strengthening HCWs compliance to IPCSPs in order to break infection transmission cycle and protect HCWs, patient and community from (HAIs) which increases burden of AMR, hospital stay, cost and eventually death (8).

Compliance to IPCSPs has remained the major challenge and problem in most countries especially in developing countries including Tanzania(1,11). This lead to exposure of patients to high risk of developing HAIs which are mainly caused by contact with contaminated hands of HCWs, equipment (e.g. stethoscopes, blood pressure machines, thermometer), health care interventions (such as surgery, diagnostic testing or invasive devices), and environment (4,7,11).

In this era of emerging and re-emerging diseases HCWs are the pillar for fighting against any outbreak (12). Preventing HCWs from infection is a crucial and worldwide concern for maintaining a strong fighting force with high morale and energy for fighting (12). The WHO recommends for country investments in core IPC components from national to facility level in order to ensure HCWs and patients are well protected from woefully unprepared status (1).

1.2 Problem statement

In Tanzania, level of compliance to IPC is poor. It is below 80%, the cut-off points provided by the National Guidelines for Recognition of Implementation Status of Quality Improvement Initiatives in Health Facilities (15). The baseline IPC standards compliance in all facilities was 32% in 2010, improved to 53% in 2014, and dropped to 34% in 2017 (16). In star rating assessment compliance to IPC by Primary Health care (PHC) facilities has been reported to be 31% baseline assessment in 2015/16 and 57% in reassessment in 2017/18 (8). Songwe region scored 3% lowest compared to other regions in that star rating reassessment (8). Reasons for poor compliance was HCWs poor compliance to Guidelines, Standards and Standards Operating Procedures (SOPs) by HCWs, poor infrastructures and shortage of supplies (8). This compliance is still poor regardless of existence of National IPC guidelines, IPC Standards and SOPs in all health care settings in Tanzania since 2004 (8). Nevertheless, the training cascade mechanism from national to subnational level has been initiated to each region in Tanzania including Songwe since development of IPC guidelines.

In Tanzania there are limited studies done to explore factors for poor compliance to IPCSPs among HCWs. Hence it is important to know what are the factors affecting compliances to IPCSPs by HCWs in healthcare settings regardless of existence of IPC guidelines, standards, SOPs and training modalities.

Poor compliance to IPCSPs magnifies HAIs, AMR, financial burden and cost to the government, patients and families and eventually death. HAIs systematic review reported burden of HAIs in Tanzania to be 14.8%. Review reveals that its frequency is much higher than in developed countries (17). Hence, this posed a big challenge for epidemic control and health systems exhaustion in countries' health systems (12,15). Therefore, this study aimed to explore the level of compliance and factors associated with compliance to IPCSPs by healthcare workers in healthcare settings.

1.3 Conceptual framework

Ecological framework was used in formulating the conceptual framework in this study. This framework explaining the domains that have factors affecting the IPCSPs compliance implementation process. Framework explain how social demographic factors like type of profession, age, working years can associate with compliance to IPCSPs, Healthcare workers factors, Health facilities factors and Health system factors can associate with IPCSPs. In addition, the framework shows the possibility of existence of relationship between independent factors. Health system factors like availability of PPEs can relate with healthcare workers factors that, it can reduce the motivation of HCW to comply with IPCSPs regardless of working years of experiences. However, the use of Ecological framework in present study was mainly focus more on social demographic, HCWs and health facility factors toward dependent factor the compliance to IPCSPs which is dichotomous such as high compliance and low compliance

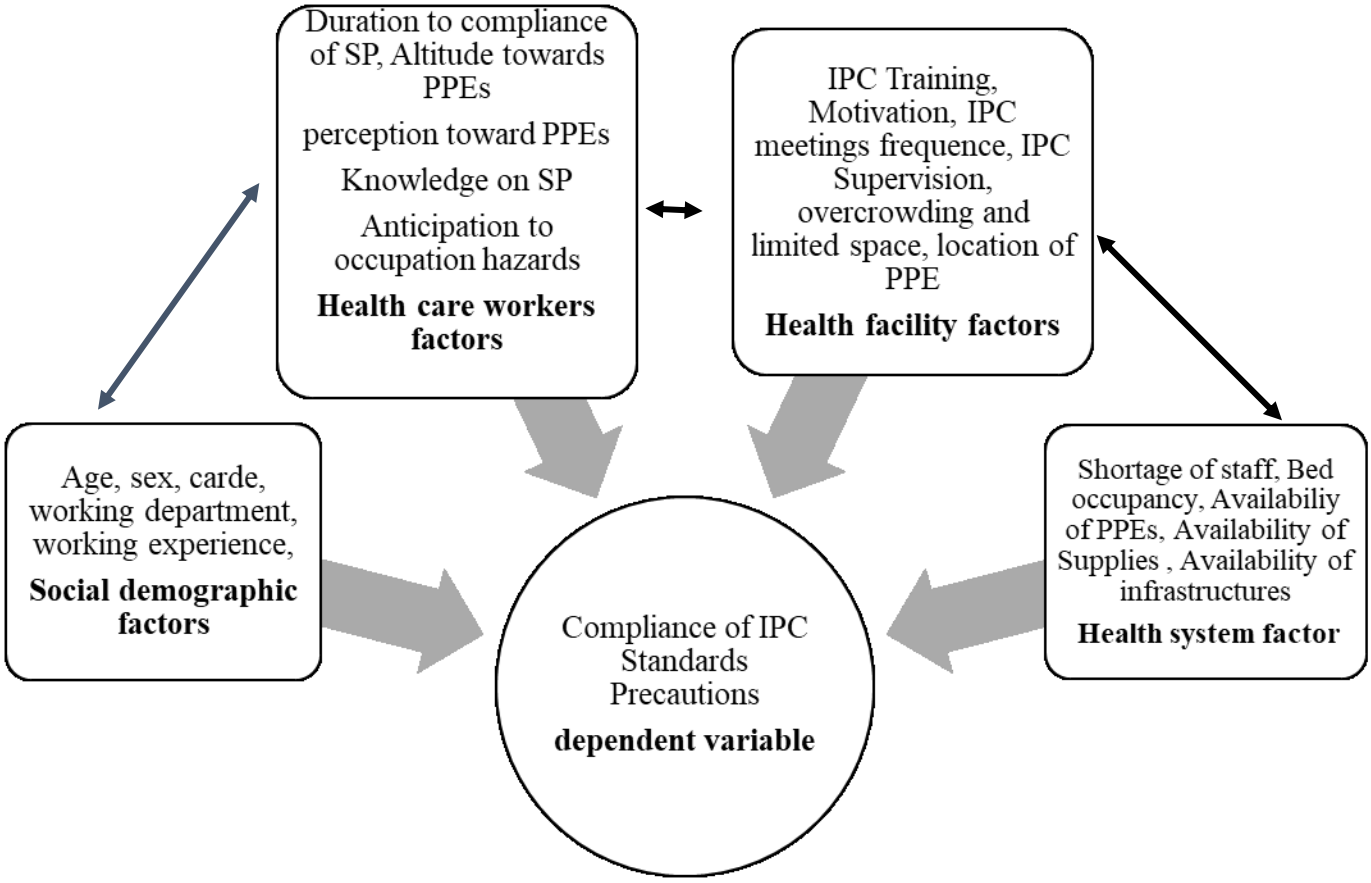


Figure 1: Conceptual framework on factors affecting compliance to IPCSPs (created by Author)

1.4 Rationale of the study

Considering that IPC practices have major role in reducing burden of HAIs, AMR and a way to protect HCWs, patients and community at this era of emerging and re-emerging diseases (1). This study will help to come up with best IPC approaches to be done to improve HCWs compliance IPCSPs in order to maximise safety of HCWs, patients, community during current COVID-19 pandemic. In addition, improvement of preparedness and response to future unexpected infectious diseases outbreaks. Also, the study will come with way forward and interventions on prevention of health care system exhaustion due to burden of HAIs, emerging and re-emerging diseases and AMR threat.

To add that, recommendations will help policy makers in health sector and other IPC stakeholders from national level to facility level to generate evidence and strategies that will guide to intervene HCWs poor compliance to IPCSPs at different health care settings. Finally, the knowledge gained will contribute to the body of science in improving IPC implementation at health care settings.

1.5 Research questions

Broad question

What is the level of compliance and its associated factors to infection prevention and control standards precautions among healthcare workers in Songwe region?

Specific questions

1. What is the level of compliance to infection prevention and control standards precautions (IPCSPs) among health care workers in Songwe region?

2. What are the factors affecting compliance to infection prevention and control standards precautions (IPCSPs) among health care workers in Songwe region?

3. What are the perceived barriers to compliance to infection prevention and control standards precautions (IPCSPs) among health care workers in Songwe region?

1.6 Objectives

1.6.1 Broad Objective

To determine level of compliance to IPC standards precautions and its associated factors among Health care workers in Songwe Region

1.6.2 Specific Objectives

1. To assess the level of compliance to IPC standards precautions among Health care workers in Songwe Region from January to March 2021
2. To ascertain factors associated with compliance to IPC standards precautions among health care workers in Songwe Region from January to March 2021
3. To describe perceived barriers to high compliance to IPC standards precautions among health care workers in Songwe Region from January to March 2021

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Level of compliance to IPC Standards Precautions

Globally, despite SPs being practices for more than a decade in healthcare settings, which has resulted in a considerable decline of HAIs, low compliance rates with SPs among HCWs remains a challenge (1,14). For example a study conducted among HCWs working in 11 units in five hospitals in the United States of America reported an in-adequate adherence to IPCSPs(6,7). Another study done on compliance with SPs during clinical training of nursing students in Saudi Arabia, A multi-university study reported the overall compliance rate to be low (6).

In Sub-Saharan Africa, study done in Zambia reported few HCWs always practice IPC at required standards, while half of them practice at some times and majority rarely implement Infection Prevention and Control according to standards(4). Another study conducted among HCWs in northwest Ethiopia reported also few HCWs always comply with SPs (6,15)

In Tanzania study done between February and April 2018 on IPC compliance assessment particularly on hand hygiene, glove use, disinfection of reusable equipment, and waste management in 220 health facilities (118 dispensaries, 66 health centers, and 36 hospitals) owned by Private for-Profit and Faith-Based Organisations in 18 Regions. The results indicated that compliance to these domains were "6·9% for hand hygiene, 74·8% for glove use, 4·8% for disinfection of reusable equipment, and 43·3% for waste management" (11) which indicate inadequate HCWs IPC compliance to IPCSPs, particularly for hand hygiene and disinfection (11).

In other articles published from star rating assessments (2015/16 and 2017/18) database results from eight (8) randomly selected regions across Tanzania reported median adherence to IPC principles increased from 31% to 57% after interventions. Privately-owned facilities had slightly higher adherence to IPC principles compared to public owned facilities during baseline and re assessment. On average, hospitals scored highest followed by health centers and then dispensaries during both assessments while in re assessment there was no significance difference between Hospital and health centres score(8).

2.2 Factors associated with compliance to IPC Standards Precautions

Globally, study done in Korea 2018 reported knowledge, attitude, and perceived safe environment as significant predictors for good IPCSPs compliance (3,5). Management support in hospitals and IPC departments which monitoring the performance of IPC practices and provision of periodic feedback show encouragement and motivation to HCWs compliance to IPCSPs (5).

Another study conducted in Jordan, showed that as age and clinical experience increases, the level of compliance to IPCSPs was also increased(3). In addition, knowledge and positive attitude were significant predictors of compliance to IPCSPs. In many studies IPC training or seminar in the last six months reported to exhibit better compliance to IPCSPs (3,5,6). Other research evidence suggested that adequate knowledge and education through training programs towards SPs modified HCWs behaviour and attitudes and hence influences compliance to IPCSPs (20).

Tanzania study done in 2018 on HCWs to IPC compliance assessment particularly on hand hygiene, glove use, disinfection of reusable equipment, and waste management in 220 Health facilities (118 dispensaries, 66 health centres, and 36 hospitals) owned by Private for-Profit and Faith-Based Organizations in 18 Regions noted that older health workers were less likely to use gloves correctly, female HCWs were better at hand hygiene, and nurses and midwives

performed substantially better than more qualified providers in most of the IPC domains. Also HCWs behaviours and attitude were factor which affecting IPC domain compliance (11)

2.3 Hindering factors to high Compliance to IPC Standards Precautions

Study done in Korea had reported the presence of individual barriers being associated with non-compliance to IPCSPs. Those were such as inadequate knowledge, inadequate human and material resources, and institutional management and nurses' perceptions of a safe environment made strong contributions to poor IPC compliance (5). Another study reported the discomfort of PPEs when worn as a barrier and this finding was consistent with findings from other studies example the study done on HCWs in India indicated that wearing PPEs led to uncomfortably during provision healthcare service (9). In addition, HCWs in Brazil considered PPEs uncomfortable as it makes them hot and induces sweating and itching although they acknowledged the benefits of PPEs for the prevention of infections (9). Nurses working in government hospitals in Cyprus complained that using gloves decreases dexterity when drawing blood (9).

In Sub Saharan Africa, other hindering factor to compliance of IPCSPs was the perception that wearing PPEs, such as (gloves, aprons, gowns and goggles) might cause patients to panic (63.0%) and complying with SP sometimes interferes with the ability to provide care (38.0%) this was a study done in Ghana HCWs. Also due to high demands of patient care, HCWs do not have enough time to comply with the rigors of SP (9) this is consistent with other study which reported nurses had experienced insufficient time to implement standard due to workload and also, they perceived their working environment to be safe (5).

A study done in Zambia reported shortage of staff, work load, inadequate finances, inadequate materials and equipment, inadequate knowledge, negative attitude of HCWs toward IPC overcrowding of patients and limited space, were the barriers affecting compliance to IPCSPs by HCWs (4). The study also reported female HCWs fail to comply with IPCSPs as the use of

PPEs make them uncomfortable and had argued that time factor especially on emergencies hinder the implementation of IPCSPs as per standards (6).

In general standards precaution compliance has been a challenge to many HCWs regardless of training and availability of guidelines and supplies. There are still unknown reasons to why majority of healthcare workers do not comply to IPCSPs to the standards required by WHO of compliance to IPCSPs near 100%. It is better to know whether the most challenging area is it for HCWs, HFs or Health system. This will be helpful to come with concrete information whether investment has to be done or change of HCWs behaviour should be insisted, in order to improve the compliance and assure the safety of HCWs and patients during health care provision at this era of AMR treats and emerging and re-emerging infections. Hence the study needed to assess more what area should the country invest to assure compliance to IPCSPs is improved and quality of healthcare services to all is achieved.

CHAPTER 3

3.0 MATERIALS AND METHODS

3.1 Study design

This was a cross-sectional study on assessing factors affecting compliance to IPCSPs among HCWs in Songwe Region Healthcare settings conducted between January and March 2021.

3.2 Study Area

The study was conducted in Songwe Region that involved HCWs working in Public Health facilities in each level of health care service delivery which included Hospitals, Health centres and Dispensaries at all districts. Songwe region is located in south western highlands part of Tanzania. The region covers 27,656 sq.km and it lies between latitude 7^0 and 9^0 36' south of the Equator and between longitude 32^0 and 33^0 41' east of Greenwich. The region has five districts mainly; Mbozi, Momba, Ileje, Tunduma and Songwe districts. The total estimated population in 2020 is about 1,278,850, where the main economic activities of inhabitants are agriculture, animal husbandly and fishing. Songwe region has 4 public hospitals, 12 public Health centres and 161 dispensaries, It has 1026 total number of HCWs working at public Health facilities where 374 working at hospitals, 212 health centres and 440 working at dispensaries. The Region scored lowest among all regions in Tanzania in IPC during national star rating reassessment in 2017/2018 which assessed the quality of healthcare services in all regions in Tanzania and categorize them in star levels.

3.3 Study Population

HCWs in Songwe Region from Hospitals, Health Centres and Dispensaries who met selection criteria from January to March 2021.

3.4 Sampling Procedure

Available HCWs number in Songwe Region is 1026, where 374 working in Hospitals, 212 working in Health centres and 440 working in Dispensaries. The number of HCWs included from each Health Facility level was obtained by stratified sampling technique where the proportion to size was considered. Total number of HCWs sampled at each facility were obtained by the following formula;

$$\text{HCWs to be sampled at HFs level} = \frac{\text{Number of HCWs present at HFs} * 418}{\text{Total number of HCWs in Songwe Region}}$$

Once the number of HCWs to be sampled at the facility level was obtained, Number of HCWs administered with the questionnaire done through simple random sampling. In each facility level, the list of names of HCWs was asked and assigned numbers. Electronic table of random number was used to identify the sampling unit.

3.5 Sample size estimation

From article published on star rating assessments 2017/18 database results from eight (8) randomly selected regions across Tanzania which reported median compliance to IPC principles as 57% (8). Hence from here sample size estimation was calculated by using sample size by proportion using Kish Leslie's formula for cross sectional studies at 95% confidence interval and marginal error of 5% with consideration of 10% non-respondent rate as follows

$N = (Z^2 * P * (1 - P))/e\text{^}2$

Where:

N= Sample size

Z= 95% confidence interval

P =proportion of compliance

e= marginal error

$N = (1.96^2 * 0.57 * (1 - 0.57))/0.05\text{^}2$

N=377

Non response rate (NRR) 10% of sample size

$$ASS = N \times \frac{1}{1 - NRR} = 377 \times \frac{1}{1 - 0.1} = 377 \times \frac{1}{0.9} = 418$$

The actual sample size for the study was to be 418.

3.5.1 Inclusion criteria

All HCWs regardless of their cadre at health care settings (clinicians, nurses, laboratory personnel's, pharmacists, medical attendants, physiotherapist, radiographers, mortuary attendants and cleaners)

3.5.2 Exclusion Criteria

Health care workers who were under supervisions (medical students, Interns or volunteers)

3.6 Data Collection tool and techniques

3.6.1 Data Collection

Questionnaires composed with Compliance with Standard Precautions Scale developed based on the SPs guidelines that were published by the World Health Organization was used in this study (CSPS) (5,13). The scale assessed the extent to which HCWs comply with SPs. The scale has 20 items, which were responded using a four point Likert scale (never, seldom, sometimes and always). Items 2, 4, 6, 15 and 20 were negatively stated. A score of 1 was given to an "always" response in positively worded statements and the "never" option in negatively worded statements, while 0 for the other responses, giving a total possible range score of 0 to 20. Higher scores above 16 signified better compliance with SPs. Compliance rates (CR) calculated as average compliance with the 20 items in percentage. Healthcare workers were expected to comply with National Guidelines for Recognition of Implementation Status of Quality Improvement Initiatives in Health Facilities and National IPC guidelines and standards fully; hence, a compliance rate of 80% was desired level of compliances and used as

dichotomous variable, compliance score of 80% and above categorized as high compliance and compliance score of below 80% as low compliance(15). This examined the adherence to PPE, disposal of sharps and waste products, decontamination and prevention of cross-infection between patients. And lastly assessment of factors affecting compliance to IPCSPs. Other parts of questionnaire were social demographic survey working experiences and factors affecting compliance to IPC standards precautions

Data collection was done by observation method to assess compliance to IPCSP and self-reporting for procedures of IPCSPs that were not happened at assessment time. In addition, interview methods and self-filling of questionnaire was used for other parts of questionnaire. This process was done by five (5) research assistance and principle investigator.

3.6.2 Validity and reliability of Questionnaire

The questionnaire was constructed by adapting Standard Precautions Scale developed based on the SPs guidelines that were published by the World Health Organization was used in this study (CSPS). Additionally, the final draft was given to experts to see if the questions have enough content validity. Furthermore, the questionnaire was administered to IPC program officers at Ministry of Health, Community Development, Gender, Elderly and Children, Tanzania to validate questions prior to the use in the study and modification were done accordingly after the completion of the pilot study. The reliability of the questionnaire was tested during data collection, whereby 10% of subjects were asked to fill in the same questionnaire during the main study and after two weeks the paired data were analysed to ascertain the degree of correlation.

3.6.3 Variables

Dependent variable: Compliance to IPCSPs such as; hand washing, waste management, decontamination and use of PPEs. Compliance of 80% and above was considered as desired level of IPC compliances(15). This is according to Tanzania standard based management and recognition for quality of services in Tanzania guidelines, hence compliance was considered as

dichotomous variable where by compliance score of 80% and above categorized as high compliance and compliance score of below 80% as low compliance

Independent variables: Factors affecting compliance of IPCSPs: social demographic factors, Healthcare workers factors, Health facility factors and Health system factors.

3.7 Data Management and Analysis

Data was collected by five research assistance, entered and checked daily by principle investigator for completeness and double entered in Epi info 7, and then exported to stata version 15 for analysis. Descriptive statistics done on the calculation of median, interquartile range and frequency for Continuous variables. Categorical variables were summarized in form of proportions, frequency tables and p-values computed for categorical variables using Chi-square test and Fisher's exact test depending on the size of the data set. Also, frequency distribution were compared using the Chi-square test where those with p value < 0.2 entered to bivariate modified Poisson regression model because the outcome for this study was common that means it was greater than 15%. Variables which showed significant association with the compliance to IPC standard precautions in bivariate modified Poisson regression analysis were added into the multivariate modified Poisson regression model using forward selection for further analysis. The factors included in the model were, profession, level of facility, working years' experience, IPC training in previous 1 year, needle stick injury experience, blood/body fluid splash, hepatitis B vaccination status and IPC supportive supervision. Bivariate and multivariate binary modified Poisson regression were used to identify factors associated significantly with high compliance to IPC standards precautions at p-value < 0.05 with their respective prevalence ratios and 95% confidence interval.

3.8 Ethical Consideration

Ethical clearance to conduct the study was obtained from Muhimbili University of Health and Allied Sciences (MUHAS - Director of Research and Publication) Ethical Review Committee. Upon reaching the Region, permission to conduct the study was requested from Songwe Regional Medical Officer and District Medical Officers of all five districts and medical officers in charges/managers of the respective health facilities. Informed consent was obtained from each study participant. Each participant was requested to sign informed consent form after agreeing to participate in the study. Confidentiality of study subjects was ensured through the use of ID codes to conceal their identity.

CHAPTER 4

4.0 RESULTS

4.1 Demographic characteristics of the study respondents

Table 1 presents the demographic characteristics of the respondents. Total number of respondents were 400 which equals to 96% respondent rate. Respondents had median age of 32 years with interquartile range (IQR) of 10 (29, 39). Majority of the respondents were females (64%), in addition to that, the largest percentage of the respondents were nurses (38.5%), and majority of all respondents attained Diploma level (35.3%). Furthermore, majority of respondent were from Hospital level (37.5%) and the largest percentage working at outpatient department (40.5%).

Table 1: Demographic characteristic of HCWs (N=400) in Songwe Region from January to March, 2021

Variable	Frequency (N=400)	Percent (%)
Age		
21 to 30	146	36.5
31 to 40	163	40.8
41 and above	91	22.7
Sex		
Female	256	64.0
Male	144	36.0
Professions		
Clinicians	110	27.5
Nurses	154	38.5
Medical Attendants	92	23.0
Others	44	11.0
Education level		

Degree and above	41	10.3
Diploma	141	35.3
Certificates	134	33.5
Secondary	55	13.7
Primary	29	7.2
Facility level		
Hospital	150	37.5
Health centre	109	27.3
Dispensary	141	35.2
Working department		
OPD	162	40.5
RCH	57	14.3
Labour ward	55	13.7
Others	44	11.0
Medical ward	29	7.2
Clinics	22	5.5
Surgical ward	17	4.3
Paediatric ward	14	3.5

4.2 Infection prevention and control experiences of the respondents

Table 2 show the respondents working experience where majority had been working in health care service delivery in less than 6 years (42.25%). In addition, majority of HCWs 46.3% and 71.3% had experienced needle stick injury and blood /body fluid splash respectively, while majority of HCWs 67.5% had not vaccinated against hepatitis B. On IPC experiences majority had not received IPC training for the past one year of working (79.25%), majority did not receive any motivation on IPC initiatives in their working unit (79.3%), and attendance to IPC meeting at their working unit majority (40.75%) did not attend any, furthermore, majority of HCWs (47%) did not receive any IPC supportive supervision.

Table 2: Experiences at work of HCWs (N=400) in Songwe region from January to March, 2021

Variable	Frequency (N=400)	Percent (%)
Working experience (years)		
less than 6	169	42.3
6 to 10	146	36.5
11 to 15	27	6.7
16 and above	58	14.5
Experience of needle stick injury		
Yes	185	46.3
No	215	53.7
Experience of blood/body fluid exposure		
Yes	285	71.3
No	115	28.7
Hepatitis B vaccination coverage		
Yes	130	32.5
No	270	67.5
IPC training < 1 year		
None	317	79.3
Once	69	17.2
Two and above	14	3.5
Motivation		
No motivation	322	80.5
Annually	25	6.3
Quarterly	25	6.2
Monthly	28	7.00
IPC meetings attended		
Never attended any	163	40.7

Monthly	91	22.7
Rarely	74	18.5
Weekly	32	8.0
Quarterly	31	7.8
Annually	9	2.3
Supportive supervision given		
No supervision done	188	47.0
Monthly	41	10.3
Annually	27	6.7
Quarterly	144	36.0

4.3. Compliance to infection prevention and control standards precaution

The overall average compliance of the HCWs to IPCSPs in Songwe Region was 66% where only 22.5% HCWs had high compliance to IPC standards precautions of greater than 80%. Majority HCWs (94%) reported the highest compliance on discarding used sharp articles into sharp boxes, while the IPCSPS which minority 8% comply with, correct management of spills of blood or body fluid on surface by cleaning first and followed by disinfection according to WHO and National standards. However, respondents reported suboptimal compliances to the following IPCSPS 71.5% of HCWs don't take shower after extensive splashing and 66% of HCWs re-use disposable masks at working areas, about 60% dispose safety box while full, 26.5% of HCWs still recap needles. For hand hygiene practices 24% HCWs don't wash their hands between each patient contacts while 41.5% HCWs don't use alcohol hand rub as alternative when hands are not visibly soiled, and 47% HCWs use only water for hand washing (Table 3)

Table 3: Compliance to IPC standards precaution of HCWs (N=400) in Songwe region from January to March, 2021

SP No.	IPC Standard precaution	Compliance (N=400)	Percentage (%)
5	I put used sharp articles into sharps boxes	376	94.0
19	I wear gloves to decontaminate used equipment with visible soils	373	93.0
9	I cover my wound(s) or lesion(s) with waterproof dressing before patient contacts	362	90.5
10	I wear gloves when I am exposed to body fluids, blood products, and any excretion of patients	361	90.0
17	Waste contaminated with blood, body fluids, secretion, and excretion are placed in red plastic bags irrespective of patient's infective status	353	88.0
18	I decontaminate surfaces and equipment after use	350	87.5
12	I decontaminate my hands immediately after removal of gloves	331	83
11	I change gloves between each patient contact	319	80
16	I wear a gown or apron when exposed to blood, body fluids, or any patient excretions	309	77.0
1	I wash my hands between patient contacts	303	76.0
4	I recap used needles after giving an injection*	292	73.5
14	My mouth and nose are covered when I wear a mask	293	73.0
7	I remove PPE in a designated area	256	64.0
2	I only use water for hand washing*	213	53.0
13	I wear a surgical mask alone or in combination with goggles, face shield, and apron whenever there is a possibility of a splash or splatter	184	46.0

3	I use alcohol hand rubs as an alternative if my hands are not visibly soiled	166	41.5
6	The sharps box is only disposed when it is full*	161	40.0
15	I reuse surgical mask or disposable PPE*	137	34.0
8	I take a shower in case of extensive splashing even after I have put on PPE	114	28.5
20	I clean up spillage of blood or other body fluid immediately with disinfectants*	32	8.0
	Overall mean compliance		66.0
	HIGH COMPLIANCE > 80%		22.5
	LOW COMPLIANCE <80%		77.5

Scale items were arranged from the highest to lowest compliance rate; * Reverse scored items.

4.3 Factors affecting compliance to IPC standards precautions

4.3.1 Demographic and working experience factors affecting compliance to infection prevention and control standard precautions

The findings of this study showed a statistically significant difference between respondent working in Dispensary, Health centre and Hospital in the compliance to IPC standards precautions (p=0.008). High proportion (33.03%) of HCWs at Health centres had a high compliance to IPC standards precaution compared to those working at Hospital and Dispensaries. Furthermore, compliance to IPC standards precaution was found statistically significant in working years of experiences (p=0.026); Working experience of 11 to 15 years had the highest proportion (44.44%) of high compliance to IPC standard precaution compared to those with less than 6 years of working experience (18.34%)

Additionally, there was a statistically significant difference between respondents who had IPC training in previous 1 Year (p<0.001). Respondents who had two and above number of IPC training in previous one year had a higher proportion (64.29%) in high compliance to IPC standards precaution, followed by those attain one training in previous year (39.13%).

Nevertheless, Findings showed statistically significant difference in needle stick injury exposures (p=0.005) where those with no exposure to needle stick injury had high proportion (27.91%) of high compliance to IPC standards precaution compare to those with needle stick injury exposure.

Furthermore, there was a statistically significant difference between respondents who received IPC supportive supervision at their working unit (p<0.001). Respondents who had at least one Supportive supervision per year on IPC had a higher proportion (44.4%) in high compliance to IPC standards precaution and those who did not received any IPC supportive supervision at their working unit (17.0%). Lastly findings showed no statistical difference in age, sex, professional cadres and IPC motivation in compliance to IPC standard precautions (Table 4).

Table 4: Compliance to IPC standard precautions and characteristics of respondents (N=400)

Variable	IPCSPs Compliance		Total	X2	P value
	Low N (%)	High N (%)			
Sex					
Female	195 (76.2)	61 (23.8)	256	0.46	0.396
Male	115 (79.9)	29 (20.1)	144		
Age					
21 to 30	115(78.8)	31(21.2)	146	0.29	0.867
31 to 40	126(77.3)	37(22.7)	163		
41 and above	69(75.8)	22(24.2)	91		
Profession					
Clinicians	94(85.4)	16(14.6)	110	0.61	0.085
Nurses	112(72.7)	42(27.3)	154		
Medical attendants	72(78.3)	20(21.7)	92		
Others	32(72.7)	12(27.3)	44		
Facility level					
Dispensary	116(82.3)	25(17.7)	141	9.63	0.008

Health center	73(67.0)	36(33.0)	109		
Hospital	121(80.7)	29(19.3)	150		
Working experience					
Less than 6	138(81.7)	31(18.3)	169	9.22	0.026
6 to 10	113(77.4)	33(22.6)	146		
11 to 15	15(55.6)	12(44.4)	27		
16 and above	44(75.9)	14(24.1)	58		
IPC training (in less than 1 year)					
None	263(83.0)	54(17.0)	317	30.39	<0.001
Once	42(60.9)	27(39.1)	69		
Two and Above	5(35.7)	9(64.3)	14		
Needle stick injury					
Yes	155(83.8)	30(16.2)	185	7.79	0.005
No	155(72.1)	60(27.9)	215		
Blood/body fluid Splash exposure					
Yes	226(79.3)	59(20.7)	285	1.84	0.175
No	84(73.0)	31(27.0)	115		
Hepatitis B Vaccination status					
Yes	93(71.5)	37(28.5)	130	3.92	0.048
No	217(80.4)	53(19.6)	270		
IPC Motivations					
Annually	19(76.0)	6(24.0)	25	1.27	0.736
Monthly	20(71.4)	8(28.6)	28		
No motivation	253(78.6)	69(21.4)	322		
Quarterly	18(72.0)	7(28.0)	25		
IPC Supportive supervision					
Annually	15(55.6)	12(44.4)	27	15.44	0.001
Monthly	26(63.4)	15(36.6)	41		
No any SS Done	156(83.0)	32(17.0)	188		
Quarterly	113(78.5)	31(21.5)	144		

4.3.2 Bivariate and multivariate modified Poisson regression of factors associated with compliance to infection and prevention control standard precautions

As displayed in **Table 5**; HCWs who are Clinicians were 0.61 times less likely to comply to IPCSPs at high level compared to nurses and it was statistically significant likewise, medical attendants were 0.87 times less likely to comply with IPCSPs at high level compared to nurses though it was not statistically significant and other profession were 0.84 times less likely to comply with IPCSPS to high level compare to nurses but was not statistically significant. Respondents who work in health centres were 1.86 times more likely to comply with IPC standards precautions at high level compared to those working at Hospitals and it was statistically significant while HCWs working at dispensaries were 1.23 times less higher likely to comply with IPC standards precaution compare to those working at hospitals though it was not statistically significant.

Likewise, respondents who had working experience of 11 to 15 years were two times more likely to comply with IPCSPs at high level compared to those who worked below six years and it was statistically significant while those who worked 16 years and above were 1.32 times more likely to comply to IPCSPs at higher level compared to those who worked for less than 6 years but it was not statistically significant. Lastly those with working experience of 6 to 10 years were 1.29 times more likely of comply to IPCSPs at high level though it was not statistically significant.

Respondents who had one (1) training on IPC in a previous one year were 1.88 times more likely to comply to IPCSPs at a high level compared to those who had no training in a previous one year (p=0.002); while those who had two and above training on IPC in a previous one year were 3 times more likely to comply with IPC standards precaution at high level compared to those with no training in a previous one year (p<0.001). However, HCWs who had exposure to needle stick injury were 0.62 times less likely to comply to IPCSPs at higher level compared to those with no history of exposure (p=0.028).

Respondents who received one supportive supervision in a year on IPC were two times more likely to comply to IPCSPs at a high level compared to those who did not received any supportive supervision (APR=2.09[1.25-3.50] p=0.005). There was no significant association

between other factors like blood/body fluid exposure history, Hepatitis B vaccination status and compliance to IPCSPS.

Table 5: Bivariate and Multivariate modified Poisson regression of factors associated with compliance to IPC standards precautions

Variable	Bivariate		Multivariate	
	CPR (95%CI)	P Value	APR (95%CI)	P Value
Profession				
Nurses	Ref		Ref	
Clinicians	0.53 (0.32-0.90)	0.018	0.61 (0.37-0.99)	0.049
Medical attendants	0.80 (0.50-1.27)	0.340	0.87 (0.55-1.38)	0.561
Other professions	1 (0.58-1.73)	1.000	0.84 (0.51-1.40)	0.509
Facility level				
Hospital	Ref		Ref	
Health centre	1.71 (1.12-2.61)	0.013	1.86 (1.23-2.80)	0.003
Dispensary	0.92 (0.51-1.49)	0.726	1.23 (0.73-2.04)	0.430
Years of Work experience				
less than 6	Ref		Ref	
6 to 10	1.23 (0.80-1.91)	0.350	1.29 (0.85-1.95)	0.240
11 to 15	2.42 (1.43-4.11)	0.001	2.08 (1.22-3.54)	0.007
16 and above	1.32 (0.75-2.30)	0.350	1.32 (0.80-2.18)	0.279
IPC training in previous 1 year				
None	Ref		Ref	
Once	2.30 (1.57-3.37)	<0.001	1.88 (1.26-2.82)	0.002
two and above	3.77 (2.38-5.98)	<0.001	2.97 (1.87-4.72)	<0.001
Needle stick injury				

No	Ref		Ref	
Yes	0.58 (0.39-0.86)	0.007	0.62 (0.40-0.95)	0.028
Blood/body fluid splash				
Yes	Ref		Ref	
No	1.30 (0.89-1.90)	0.170	1.02 (0.68-1.53)	0.91
Hep B Vaccination status				
No	Ref		Ref	
Yes	1.45 (1.01-2.09)	0.046	1.23 (0.84-1.79)	0.274
IPC Supportive supervision				
Never get any SS	Ref		Ref	
Annually	2.61 (1.54-4.92)	<0.001	2.09 (1.25-3.50)	0.005
Quarterly	1.26 (0.81-1.97)	0.300	1.13 (0.74-1.72)	0.581
Monthly	2.15 (1.29-3.59)	0.030	1.74 (1.05-2.87)	0.029

4.4 Perceived barriers to high compliance to IPC standards precautions among health care workers in Songwe region from January to March 2021

Figure 2: HCWs in Songwe reported inconvenient location of personal protective equipment (65.5%), inadequate knowledge (56.8%), overcrowding and patient demand (40.3%) and time consuming (27.8%) were the major barriers to comply with IPCSPs at standards level. Furthermore, PPE as source of patient/client to panic (25.5%), compliance to IPCSPs reduce ability to work (21%) and PPE reduce comfortability during work (17.3%) were also reported as barriers to compliance. finally, no need to comply with IPCSPS when risk to infections were not anticipated (13.5%) was reported to be a barrier for the compliance to IPCSPs at higher level.

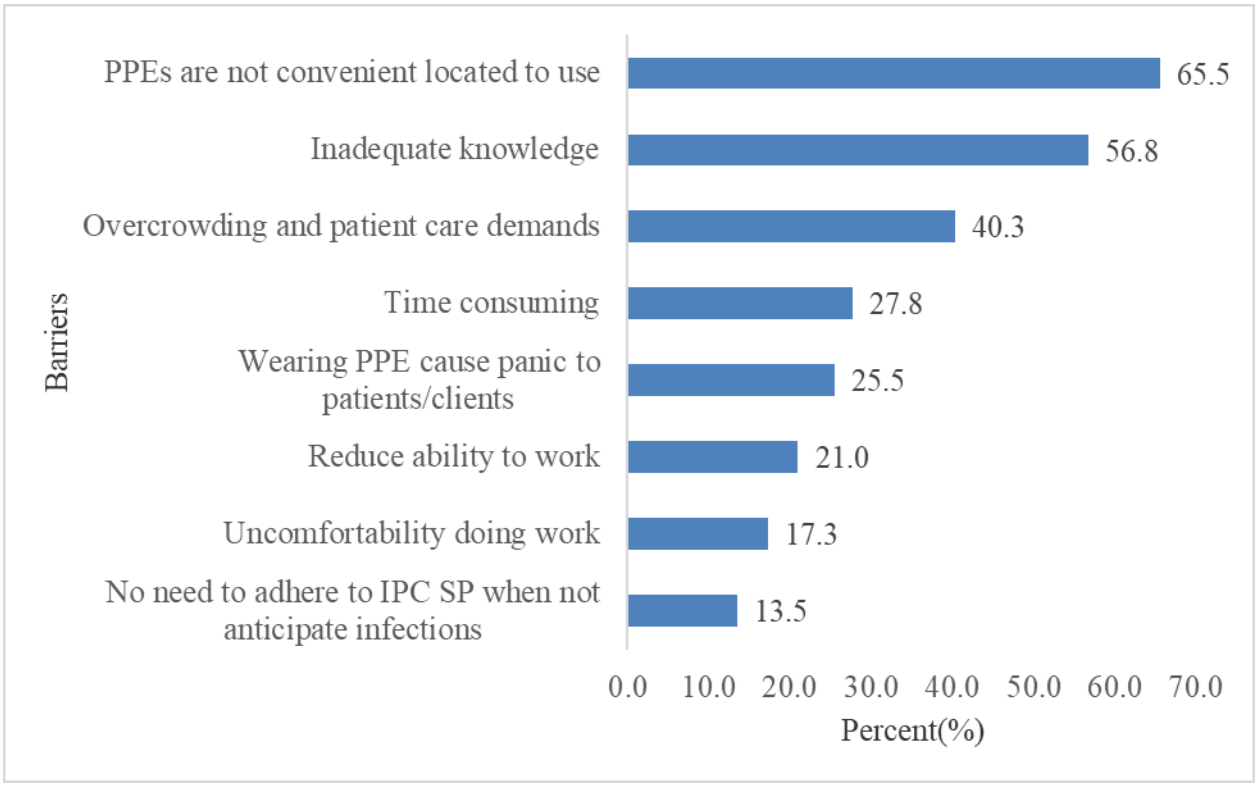


Figure 2: Perceived barriers to high compliance to IPC standard precautions by respondents

CHAPTER 5

5.0 DISCUSSION

5.1. Compliance to infection prevention and control standard precautions

This study demonstrated, low compliance to IPCSPs among HCWs at Songwe region as per National level standards. In addition, the study showed majority of HCWs do not always wear; surgical masks, eye protections, water proof aprons and they tend to re-use disposable masks. Furthermore, the study found nurses, IPC trainings, length of working years, IPC supportive supervision, facility level, lack of NSI exposure as associated factors to high compliance to IPCSPs. Hence, this low IPCSPs compliance challenge the patients and HCWs safety and quality of healthcare services in general.

The Low compliance to IPCSPs findings are congruent with other studies which showed that majority of HCWs were non-compliant(6,9). Based on previous studies, this is associated with negligence, attitude, inadequate motivation, inadequate knowledge on IPCSPs among HCWs, and inadequate equipment and supplies in HFs(21–24).However, study reported few of HCWs always wear surgical mask and do not reuse disposable surgical mask, eye protections and water proof aprons. This is congruent to study done in Ghana(9). This could be due to unavailability of these PPEs around the working unit and negligence to use them when available.

The study revealed about one-third of HCWs still recap needles, in contrast to the study conducted in Ghana that reported two-third of respondents recap needles after use(9). This unsafe practice seems to be improved in this current study which could be the impact of training, mentorship and supportive supervision done on proper handling sharps and safe injections. nevertheless, in this study hand hygiene practice between patients is high compare to the findings from study done previously in Tanzania, which reported low hand hygiene compliance(11)**.** This improvement in current study could be to output of ongoing awareness and sensitization and distribution of hand washing facilities on COVID-19 pandemic response interventions including hand hygiene.

5.2. Factors affecting compliance to infection prevention and control standards precautions

5.2.1 Healthcare profession

Study reported nurses were more likely to comply with IPCSPs at high level compared to clinicians, medical attendants and other professions. This is correlated with other study done in Jordan which showed Nurses scores to compliance was higher compared to clinicians(3) This could be due to presence of IPC clinical education in their curriculum at nursing school compared to other professions curriculum in which IPC is not included. Hence, it seems to have a positive effect on nurses' compliance towards IPCSPs at work.

5.2.2 Facility level

From this study, HF level was associated with compliance to IPCSPs at a high level. Interestingly, HCWs working at Health Centre are more likely to comply with IPCSPs at high level compared to those working at Hospitals. This finding is consistent with other study done previously in Tanzania, which reported HFs from higher service levels (Hospitals) had a relatively higher proportion of IPC scores at baseline. However, during reassessment, low-level facilities (Health Centres and Dispensaries) in Tanzania had higher improvement in scores compared to those from higher service level to the extent that there was no significant difference between low and high level facilities after the intervention(16). This could be due to training, supportive supervision and assessment modalities which are taking place to all facility levels.

5.2.3 Years of work experience

Years of work experience was associated with compliance to IPCSPs. HCWs who have been at work for 11 to 15 years were more likely to comply with IPCSPs compared to those who had worked for less than six years. This is consistent with other studies which reported length of clinical experience had positive impact on compliance to IPCSPs(3). This result may be

because of experiences obtained from many trainings, mentorship and supportive supervision on IPC at work as years go.

It is important that HCWs should be oriented on IPC when they are employed. Orientation of new employees may be effective approach to make all HCWs who are juniors to comply with IPC guidelines for their safety and client/patient safe as majority of HCWs are young.

5.2.4 Number of IPC training in previous one year

In this current study, Number of IPC trainings were also associated with compliance to IPCSPs at a high level, HCWs who received at least two trainings were more likely to comply with IPCSPs compared to those received one training and those who did not received any training in a previous one year. This is supported by multiple studies which reported IPC trainings as the factor that most affected IPC compliance(25–27). This can be explained by the fact that IPC training gives current evidenced updates on IPC for HCWs and patient safety from lessons learnt from outbreaks happened including Ebola and COVID-19 hence, contributing to higher compliance with IPCSPs.

5.2.5 IPC supportive supervision

SS was another factor associated factor with high compliance to IPCSPs. HCWs who did not receive any SS on IPC in a year had low compliance to IPCSPs compared to those received at least one in a year. This finding is congruent with a study done in Liberia which revealed the improvement of IPC compliance when comparing before and after SS(28). This could be due to the reason that SS provides onsite coaching, self-assessment and feedback on what is done correctly and incorrectly as WHO recommended on HCWs to obtain SS on IPC to improving their skills raise job motivation, satisfaction and improving their performance through technical advice provided on the spot(29),

5.2.6 Exposure to needle stick injury

From this study HCWs with no history of NSI exposure had higher compliance to IPCSPs compared to those exposed to NSI. This findings is similar to study done in China which showed exposure to NSI significant contributed to poor compliance to IPCSPs(5). This could be explained by improper behaviours and poor adherence to SOPs on handling sharps and safe injection which results to NSI(24).

5.3 Perceived barriers to high compliance to IPC standards precautions

In the current study, a number of barriers reported including; Inconvenient location of personal protective equipment, inadequate knowledge, overcrowding and patient demand, time consuming, Wearing PPE cause patient/client to panic, reduce ability to work, Wearing PPE cause uncomfortability during work and no need of IPCSPS when infections are not anticipated were reported as hindering factors or barriers to the compliance to IPC standards precautions to higher level. These findings are similar to many studies, first study done in Zambia reported that work load, inadequate materials and equipment, inadequate knowledge, overcrowding of patients and limited space were indicated as barriers to compliance with IPCSPs for HCWs (4). Another study reported that respondents who fail to comply with IPCSPs described the use of PPEs in SPs as uncomfortable(6). Inconvenient location of PPEs at working unit or insufficiency of basic PPEs such as masks, gloves and goggles have been reported as barriers to compliance with SPs (9,20,25). Also, a South Indian study reported that protective equipment are not readily available in working unit (30) and lastly, another study identified a major constraint to use of SPs identified by doctors and medical laboratory personnel was the non-availability of PPEs(31).

In another study many HCWs mentioned barriers to comply with IPCSPs such as unavailability of PPEs, inadequate time especially on emergency situations that places the patients at risk of adverse situations or death, workload and demands of patient care. Furthermore, wearing PPEs reported as might cause patients to panic, interferes with the

ability to provide care and reason of not anticipate any risk of exposure to infection were also reported as a barrier to comply with SP as barriers among HCWs(9).

This situation can be explained by existence of a fragile health systems in which majority of HFs succumb inadequate PPEs for health care delivery. This has also been determined by WHO assessment during COVID-19 pandemic that there is a critical shortage or complete lack of PPEs in many health care facilities and suggested temporary measures to be taken to mitigate the impact (32). Also, other reported barriers to compliance to IPC at higher level can be explained by inadequate knowledge, behaviour, attitude and low motivation among HCWs at working place.

5.3 Study limitations and mitigation

Some limitations should be acknowledged when using the findings from this study. These including Hawthorne effect whereby HCWs changed their health care delivery behaviors while observed for IPCSPs compliance. However, study methodology was likely to be more reliable than self-reports of behaviour because it involved observation in which after a long period of observation they tend to come with their normal practices. Another limitation is effect of availability of infrastructure and supplies to HFs on IPCSPs compliance as the study was not looking on them as factors but could be one of the reasons affecting compliance to IPCSPs by HCWs. As the study was mainly based on HCWs factors rather than healthcare system factors we recommend other studies to be conducted on health system factors how directly affect the compliance to IPCSPs among healthcare workers

CHAPTER 6

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The level of compliance to IPCSPs from this study is unacceptably below National level of acceptance to guarantee safety of HCWs and patients especially in this era of emerging and remerging infections including COVID-19 pandemic. Nurses, IPC trainings, length of working years, IPC supportive supervision, health centers, needle stick exposure were associated with high compliance to IPCSPs. Inconvenient location of PPEs and inadequate IPC knowledge were reported barriers for high compliance to IPCSPs among HCWs in Songwe Region.

6.2 Recommendations

6.2.1 To HCWs

Based on findings from the research, and analysed data. It is highly recommended that all HCWs regardless of cadre in Songwe Region should comply with all IPCSPs including hand hygiene, wearing PPEs, proper waste disposal and decontamination of surfaces as the practice at this time is low. Reminders for adherence to those IPCSPs should be available at all working units, also, HCWs need to read more on National IPC guidelines, standards and SOPs which were adapted from WHO and CDC in order to gain more knowledge and skills on IPC. Furthermore, HCWs should prepare scheduled and avail themselves for facility and unit IPC meetings and on job trainings, so that they continue enriching one another on IPC updates, to assure patients and HCWs safety and improve quality of services. To adhere with those recommendations sanctions and rewards system can be introduced to limit negative behaviour and reinforce positive attitudes towards IPCSPs compliance.

6.2.2 To Facility Management

All facilities are recommended to have IPC guidelines in each working unit, and being used in various working unit. Facility is required to prioritize the budget for PPEs and supplies to make them available at all working unit as this follow on baseline of hierarch of control to prevent work related health according to ILO and WHO(33). It is also supposed to encourage capacity building in IPC through workshops to all HCWs regardless of cadre; the pictures showed that large number never attended any workshop in the previous one year. Also, facility management need to intensify supportive supervision in different working units focusing on IPC compliance, and be able to help all HCWs fill in missing gaps for IPCSPs compliance.

6.2.3 To the MoHCDGEC

The Ministry of Health. Community Development, Gender, Elderly and Children (MoHCDGEC) – Health Department is congratulated for continuous efforts being made on measures to improve health services to the society, and recognize more and more the needs of healthcare providers. However, the MoHCDGEC should support and fund more research on implementation of IPC, to see whether there is improvement from interventions which are conducted countrywide through building capacity to HCWs especially on this ongoing COVID-19 pandemic by providing evidence-based information for decision making. Resource mobilization for continuity of availability of PPEs and Supplies at all health facilities, supportive supervision, mentorship and refresher training on IPC to all HCWs. Lastly, consideration of inclusion of IPC curriculum to all carders in which IPC is not part of their curriculum so that all HCWs are knowledgeable on importance of compliance to IPC practices especially in this era of emerging and re-emerging diseases.

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8.0 APPENDICES

8.1 Questionnaire

8.1.1 English version

PART A: SOCIAL DEMOGRAPHIC AND WORKING EXPERIENCES DATA	
SN	
1	Questionnaire Number……..
2	What is your age …….
3	Sex a) Male b) female
4	What is your professional a) Clinician(CA, CO, AMO, MO, Medical Specialist) b) Nurse (EN, ANO, NO) c) Health laboratory personnel(Lab attendant, Lab assistant, Lab technologist, Lab scientist) d) Pharmaceutical personnel (Pharmacist, pharmaceutical technicians, ass pha technician) e) Environmental Health (EHO, Assistant EHO) f) Medical attendant g) Other specify……..
5	What is your level of education? a) Masters b) Degree Level c) Diploma level d) Certificate level e) Ordinary level of secondary education (form four) f) Primary education
6	Which level of Health facility do you work a) Hospital b) Health center

	c) Dispensary
7	Which department/Section do you work a) OPD b) Medical ward c) Labor d) Surgical ward e) Pediatric ward f) RCH g) Clinic
8	How long (years/months) have you worked as per stated professional …….
9	Have you ever exposed to needle stick injury when providing healthcare services a) Yes b) No
10	Have you ever exposed with blood splash or any other body fluid when providing medical services a) Yes b) No
11	Have you completed three dosage of hepatitis B vaccine for your protection against biological hazards a) Yes b) No
12	How many IPC training have you attended for the last one year…….
13	How frequency do motivations are provided to IPCSPS best practices in your working department/section a) Weekly b) Monthly c) Quarterly d) Annually e) Rarely

	f) Never
14	How frequently do you attend IPC meeting in your working department/section a) Weekly b) Monthly c) Quarterly d) Annually e) Rarely f) Never attended any
15	How frequently do you get External or internal supportive supervision on IPCSPS a) Weekly b) Monthly c) Quarterly d) Annually e) Rarely f) Never (no supervision done)

PART B: COMPLIANCE WITH STANDARD PRECAUTIONS SCALE CHECKLIST

SN 16	**STANDARD PRECAUTION**	**LEVEL OF COMPLIANCE**				**Methodology**
		Never	**Seldom /rarely**	**sometime**	**always**	
I.	I wash my hands between patient contacts					Interview and observation
II.	I only use water for hand washing					Interview and observation
III.	I use alcohol hand rubs as an alternative if my hands are not visibly soiled					Observe presence of alcohol hand rub

IV.	I recap used needles after giving an injection					Interview and observation
V.	I put used sharp articles into sharps boxes					Interview and observation
VI.	The sharps box is only disposed when it is full					Interview and observation
VII.	I remove PPE in a designated area					Interview and observation
VIII.	I take a shower in case of extensive splashing even after I have put on PPE					Interview
IX.	I cover my wound(s) or lesion(s) with waterproof dressing before patient contacts					Interview and observation
X.	I wear gloves when I am exposed to body fluids, blood products, and any excretion of patients					Interview and observation
XI.	I change gloves between each patient contact					Interview and observation
XII.	I clean my hands immediately after removal of gloves					Interview and observation
XIII.	I wear a surgical mask alone or in combination with goggles, face shield, and apron whenever there is a possibility of a					Interview and observation

	splash or splatter					
XIV.	My mouth and nose are covered when I wear a mask					Interview and observation
XV.	I reuse surgical mask or disposable PPE					Interview and observation
XVI.	I wear a gown or apron when exposed to blood, body fluids, or any patient excretions					Interview and observation
XVII.	Waste contaminated with blood, body fluids, secretion, and excretion are placed in red plastic bags irrespective of patient's infective status					Interview and observation
VIII.	I decontaminate surfaces and equipment after use					Interview and observation
XIX.	I wear gloves to decontaminate used equipment with visible soils					Interview and observation
XX.	I clean up spillage of blood or other body fluid immediately with disinfectants					Interview and observation

PART C: FACTORS AFFECTING COMPLIANCE TO IPC STANDARDS PRECAUTIONS

17	Practicing IPC standards precautions is time consuming especially while attending emergency a) Yes b) no
18	Complying with SP interferes with the ability to provide care a) yes b) no
19	Wearing PPEs cause patient to panic/fear a) yes b) no
20	Wearing Protective gear(PPEs) make us uncomfortable during care provision a) yes b) no
21	Inadequate knowledge on how to don and doff PPEs interfere with my compliance a) Yes b) no
22	No need of wearing PPE if no anticipation of exposure to infection when provide care to patient a) yes b) no
23	Patient care demands (overcrowding) do not allow ample time to comply with Standard precautions a) yes b) no
22	PPEs are not convenient located to enable me to use a) yes b) no

8.1.2 Swahili version

SEHEMU YA A: TAARIFA ZA WASHIRIKI PAMOJA NA UZOEFU WAO WA KAZI

1.	Nambari ya dodoso ……
2.	Umri wako ni miaka …….
3.	Jinsia yako ni a) Mwanaume b) Mwanamke
4.	Je! taaluma yako ni nani? a) Mganga (*CA, CO, AMO, MO, Medical Specialist)* b) Muuguzi (*EN, ANO, NO*) c) Mtaalamu wa maabara ya afya (*Lab attendant, Lab assistant, Lab technologist, Lab scientist*) d) Mtaalamu wa dawa e) Mtaalamu wa Afya ya mazingira f) Mhudumu wa afya g) kada nyingine itaje.....
5.	Una kiwango gan cha elimu? a) Uzamiri b) Shahada c) Stashahada d) Cheti e) Kidato cha nne f) Elimu ya msingi
6.	Unafanya kazi katika kituo cha ngazi ipi ya kutolea Huduma za Afya a) Hospitali b) Kituo cha afya c) Dispensari
7.	Je! Unafanya kazi Idara/Kitengo ipi

	a) Wagonjwa wa nje b) Wadi ya magonjwa ya ndani c) Wodi ya kujifungulia d) Wodi ya upasuaji e) Wodi ya watoto f) Kliniki ya Afya ya Mama na Mtoto g) Nyingine itaje
8.	Umekaa katika kazi hii kwa muda gani …….
9.	Je! Umewahi kujichoma kwa kifaa chenye ncha kali wakati wa kutoa huduma a) Ndio b) Hapana
10	Je! Umewahi kumwagikiwa au kurukiwa na damu au majimaji mengine ya mwili wakati unatoa huduma za afya a) Ndio b) Hapana
11	Je umepata dose tatu(3) za chanjo ya Hepatitis B kwa ajili ya kujikinga uwapo kazini a)Ndio b) Hapana
12	Je! Umepata mafunzo ya Kukinga na Kudhibiti Maambukizo (IPC) mara ngap kwa mwaka mmoja uliopita …….
13	Ni mara ngapi motisha/hamasa (*motivation*) hutolewa kwa watumishi wanaofanya vizuri katika eneo la Kukinga na Kudhibiti Maambukizo katika eneo lako la kazi? a) Kila wiki b) Kila mwezi c) Kila Robo d) Kila mwaka e) mara chache f) Hakuna uhamasishaji (*no motivation*)
14	Je ni mara ngapi huwa unahudhuria mikutano wa IPC katika eneo lako la kazi

	a) Kila wiki b) Kila mwezi c) Robo d) Kila mwaka e) mara chache f) sijawahi kuhudhuria mkutano wowote
15	Je! Umefanyiwa usimamizi shirikishi wa ndani au nje mara ngapi kwenye Viwango vya KKM a) Kila wiki b) Kila mwezi c) Robo d) Kila mwaka e) mara chache f) Hakuna (hakuna supervision niliyofanyiwa)

SEHEMU YA B: TAHADHARI ZA VIWANGO VYA KUKINGA NA KUDHIBITI MAAMBUKIZO (*IPC*)

NA 16	**TAHADHARI ZA VIWANGO VYA KUKINGA NA KUDHIBITI MAAMBUKIZO (*IPC*)**	**Kamwe *(Never)***	**Mara chache sana *(rarely)***	**Mara chache *(sometimes)***	**Maranyingi *(always)***	
I.	Ninaosha mikono yangu kabla na baada ya kumuhudumia kila mteja au mgonjwa					Mahojiano na uchunguzi
II.	Ninatumia maji pekee kuosha mikono yangu					Mahojiano na

						uchunguzi
III.	Ninatumia kitakasa mikono(alchol hand rub) kama njia mbadala ikiwa mikono yangu haionyeshi kuwa na uchafu					Mahojiano na uchunguzi
IV.	Ninarudisha sindano kwenye kifuniko chake baada ya matumizi kama kutoa huduma ya sindano					Mahojiano na uchunguzi
V.	Ninaweka vitu vya ncha kali katika sanduku za kuhifanyia taka za ncha kali					Mahojiano na uchunguzi
VI.	Ninaondoa mara moja Sanduku la taka la vitu vya ncha kali wakati likiwa limejaa ujazo wote					Mahojiano na uchunguzi
VII.	Ninavua vifaa kinga katika eneo maalumu lililoteuliwa/lililotengwa kwa ajili ya kazi hiyo tu					Mahojiano na uchunguzi
VIII.	Ninaoga mara baada ya kurukiwa/kumwagikiwa na kimiminika hatarishi kama damu nk, hata					Mahojiano

	baada ya kuvaa vifaa Kinga					
IX.	Endapo nina vidonda, Ninafunika vidonda vyangu kwa vifaa vya kuzuia maji kabla ya kumuhudumia mgonjwa					Mahojiano na uchunguzi
X.	Ninavaa glavu wakati nipo katika hatari ya kukutana na maji ya mwili, damu, na kimiminika chochote kinachotoka kwa wagonjwa					Mahojiano na uchunguzi
XI.	Ninabadilisha glavu kila ninapotoa huduma kwa mteja mmoja na kwenda mwingine					Mahojiano na uchunguzi
XII.	Ninasafisha mikono yangu mara tu baada ya kuondoa glavu					Mahojiano na uchunguzi
XIII.	Ninavaa barakoa pamoja na “googles”, , ngao ya uso (face shileds), na aproni wakati wowote kukiwa na uwezekano wa kurukiwa/kumwagikiwa na kimiminika chochote					Mahojiano na uchunguzi

	kutoka kwa mgonjwa					
XIV.	Ninafunika kinywa changu na mdomo wangu ninapovaa barakoa					Mahojiano na uchunguzi
XV.	Ninatumia tena *("reuse")* barakoa maalumu ya upasuaji au vifaa kinga binafsi ambavyo hupaswa kuteketezwa vinapotumika mara moja *("disposable")*					Mahojiano na uchunguzi
XVI.	Ninavaa gauni au aproni ninapokuwa kwenye hatari ya kukutana na damu, maji, au kimiminika chochote kutoka kwa mteja/mgonjwa					Mahojiano na uchunguzi
XVII.	Ninaweka taka zenye damu, majimaji ya mwili, na uchafu mwingine kutoka mwilini kwenye mifuko ya plastiki nyekundu bila kujali hali ya maambukizo ya mgonjwa husika					Mahojiano na uchunguzi

VIII.	Ninatakasa sehemu nilipotolea huduma pamoja na vifaa baada ya kutumika					Mahojiano na uchunguzi
XIX.	Ninavaa glavu kutakasa vifaa vilivyotumiwa					Mahojiano na uchunguzi
XX.	Ninasafisha damu au majimaji mengine ya mwili haraka kwa kutumia viambukizi kwanza					Mahojiano na uchunguzi

SEHEMU YA C: MAMBO YANAYOATHIRI WATOA HUDUMA ZA AFYA KUZINGATIA TAHADHARI ZA VIWANGO VYA KUKINGA NA KUDHIBITI MAAMBUKIZO

17	Kufuata tahadhari zote za Viwango vya Kukinga na Kudhibiti Maambukizo zinapoteza muda wa kutoa huduma hasa wakati wa dharura na maafa a) Ndio b) hapana
18	Kuzingatia tahadhari zote za Viwango vya Kukinga na Kudhibiti Maambukizo hupunguza uwezo na kasi ya kutoa huduma a) Ndio b) hapana
19	Kuvaa vifaa kinga mbalimbali husababisha hofu / woga kwa wagonjwa

	tunaowahudumia a) Ndio b) hapana
20	Kuvaa vifaa kinga mbalimbali hutufanya tujisikie tofauti na tulivyozoea hivyo kushindwa kutimiza majukumu yetu ipasavyo wakati wa utoaji huduma za Afya a) Ndio b) hapana
21	Kutokuwa na ujuzi wa kutosha juu ya jinsi ya kuvaa na kuvua vifaa kinga ni sababu kubwa ya kutofuata tahadhari za KKM ikiwemo kuvaa vifaa kinga a) Ndio b) hapana
22	Hakuna haja ya kuvaa vifaa kinga binafsi wakati wa kutoa huduma kwa mgonjwa ikiwa hakuna matarajio ya kuwa kwenye hatari itokanayo na maambukizi a) Ndio b) hapana
23	Mahitaji ya wagonjwa kulinganisha na Mtoa huduma mmoja hainipi wakati wa kutosha kufuata tahadhari zote za viwango vya kuking na kudhibiti Maambukizo a) Ndio b) hapana
24	Vifaa kinga havipatikani eneo linalofikika kwa urahisi ili kuniwezesha kutumia ninapovihitaji a) Ndio b) hapana

8.2 Consent form

8.2.1 Consent form - English Version

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED HEALTH SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS

CONSENT TO PARTICIPATE IN THE STUDY WITH THE TITLE**: "**FACTORS AFFECTING COMPLIANCES TO IPC STANDARDS PRECAUTIONS AMONG HEALTH CARE WORKERS IN SONGWE REGION, TANZANIA**"**

ID NO

1. Introduction:

I am Radenta Paul from Muhimbili University of Health and Allied Sciences School of Public Health pursuing Masters of Science –Applied Epidemiology. I'm the principle investigator in this study that entails to assess the factor affect compliance to Infection Prevention and Control Standards precautions among Health care workers. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions you can ask them and I will clarify.

2. Users:

The study participants involve Health care workers in Healthcare facilities from Dispensary to Regional Referral Hospitals where all cadres who meet patients including clinicians, nurses, laboratory personnel and medical attendants

Your participation in this research is entirely voluntary such that it is your choice to participate or not and the choice that you make will have no bearing on your job or on any work-related evaluations or reports. A maximum of one hour will be used for the interview. Also a maximum of one hour will be used for interview and observation to HCWs while practice their work.

3. Title of study:

To assess factors affecting compliances to IPC standards precautions among Health care workers in Songwe Region, Tanzania

4. Purpose of the study:

This study aims to explore the barriers and other factors hindering Healthcare workers in Tanzania to comply with better IPC standards precautions in Healthcare settings so that to come with way forward as to be in safe side during preparedness and respond to future unexpected infectious diseases outbreaks, HAIs while protecting first line Healthcare workers, patients and community as well.

5. Study procedures:

Semi structured questionnaires will be distributed to selected Health care workers who will be involved in the study and observation checklist will be used by investigators and research assistants to observe Health care workers how they comply with IPC standards precautions .

6. Risk, benefits and confidentiality:

There are no risk factors for you to participate in this study; all information will be kept confidential however a feedback will be given to you for your own benefit whereas information obtained may help you to sustain all good practices that were found during the study and all it may help to address gaps in the compliance of IPCSPs in healthcare settings and this will results in improved health benefits to the healthcare workers as well as clients in healthcare settings

7. Contacts Information:

In case of further queries or questions contact me on telephone number 0768011894 or through email radentap91@gmail.com.

If you ever have questions about your rights as a participant, you may call the Director of the Research and Publications, Dr Bruno Sunguya, P. O. Box 65001, Telephone: 0685217272 Dar es Salaam and Prof Billy Ngasala who is the Main Supervisor (Mob: 0754316359)

8. Statement of Consent:

The purpose and nature of study has been explained to me and I understand that my participation in the study is voluntary and no consequences will result if I refuse to participate. I am free to withdraw at any time. I have the right to know the findings of the study. I consent voluntarily to be a participant in this study

Name of the participant: ..... Signature……..Dates: .....

Name of investigator: ..... Signature: ..... Dates.....

8.2.2 Consent form – Swahili version



RIDHAA YA KUSHIRIKI KATIKA UTAFITI JUU YA MAMBO YANAYOATHIRI WATOA HUDUMA YA AFYA KUFUATA HADHALI ZINAZOKUBALIKA ZA KUKINGA NA KUDHIBITI MAAMBUKIZO (*IPC STANDARDS PRECAUTIONS*) MKOANI SONGWE, TANZANIA

ID No……

1. Utambulisho:

Ninaitwa Radenta Paul kutoka Chuo Kikuu cha Afya Shirikishi Muhimbili, Shule ya Afya ya Jamii, ninasoma shahada ya uzamili ya sayansi ya udhibiti wa Magonjwa (Epidemiolojia). Ni Mchunguzi Mkuu katika utafiti huu unaohusu uchunguzi wa sababu zinazopelekea Watoa Huduma za Afya kutofuata hadhari zinazokubalika za Kukinga na Kudhibiti maambukizo. Fomu hii ya hiyari inaweza kuwa na maneno ambayo huyaelewi. Tafadhali unaweza kunisubirisha wakati wa kupitia taarifa hii na nitakuelekeza. Kama una swali unaweza kuniuliza na nikatoa maelezo.

2. Washiriki:

Washiriki wa utafiti huu ni watoa Huduma za Afya kwa fani mbalimbali waliopo katika Vituo vya Afya kuanzia Zahanati, Kituo cha Afya mpaka Hospital ya Mkoa, Mkoani Songwe.

Ushiriki wako katika utafiti huu ni wa hiyari hivyo una uchaguzi wa kushiriki ama kutokushiriki na pia uchaguzi utakofanya hautakuwa na madhara yoyote katika kazi yako au kazi yoyote inayohusiana na utafiti huu. Muda wa saa moja utatumika kufanya mahojiano na

kumuangalia mtoa huduma anavyofanya kazi zake kwa kufuata Mwongozo wa Kukinga na Kudhibiti Maambukizo katika Vituo vya kutolea Huduma za Afya Nchini.

3. Mada ya utafiti:

Kupima mambo yanayoathiri Watoa Huduma ya Afya kufuata hadhari zinazokubalika za Kukinga na Kudhibiti Maambukizo Mkoani Songwe, Tanzania

4. Lengo la Utafiti:

Utafiti huu unakusudia kuchunguza vizuizi na sababu zingine zinazozuia Watoa huduma ya afya nchini Tanzania kufuata hadhari zinazokubalika za Kukinga na Kudhibiti Maambukizo katika utoaji wa Huduma ya Afya ili kuja na njia bora na kuwa katika upande salama wakati wa utayari na kukabiliana na milipuko ya magonjwa ya kuambukiza yanayotarajiwa ya siku za usoni huku tukihakikisha usalama wa Watoa Huduma ya Afya, wagonjwa na jamii kwa ujumla.

5. Hatua za Utafiti:

Dodoso zilizoandaliwa zitasambazwa kwa watoa huduma ya Afya waliochaguliwa ambao watahusika ili ziweze kujazwa lakini pia, wachunguzi na wasaidizi wa utafiti wataangalia namna watoa huduma ya Afya jinsi wanavyofuata hadhari zinazokubalika za Kukinga na Kudhibiti Maambukizo huku wakiwa wanaendelea na kazi na kujaza katika dodoso la uchunguzi

6. Hatari, Faida na Usiri:

Hakuna mambo yoyote ya hatari kwa wewe kushiriki kwenye utafiti huu; taarifa zote zitawekwa kwa usiri japokuwa mrejesho utatolewa kwa ajili ya faida yako ambapo taarifa zitakazopatikana zitasidia kudumisha mambo yote mazuri yatakayokuwa yameonekana wakati wa utafiti na pia zitasaidia kutatua changamoto zitakazoonekana zinazohusinana na ubora wa huduma za Afya na hivyo kuboresha Kukinga na Kudhibiti Maambukizo kwa watoa Huduma za Afya na wateja katika Vituo vya kutolea huduma za Afya.

7. Taarifa za mawasiliano:

Endapo kuna ulizo au swali la ziada usisite kuwasiliana nami kupitia namba ya simu (0768011894) au barua pepe (radentap91@gmail.com).

Kama una swali kuhusu stahili zako kama mshiriki unaweza kumpigia simu Mkurugenzi wa Tafiti na Uchapishaji, Dk Bruno Sunguya, S.L.P 65001, Simu: 0685217272 Dar es Salaam na msimamizi wa utafiti huu Prof Billy Ngasala (Simu namba: 0754316359).

8. Neno la ridhaa:

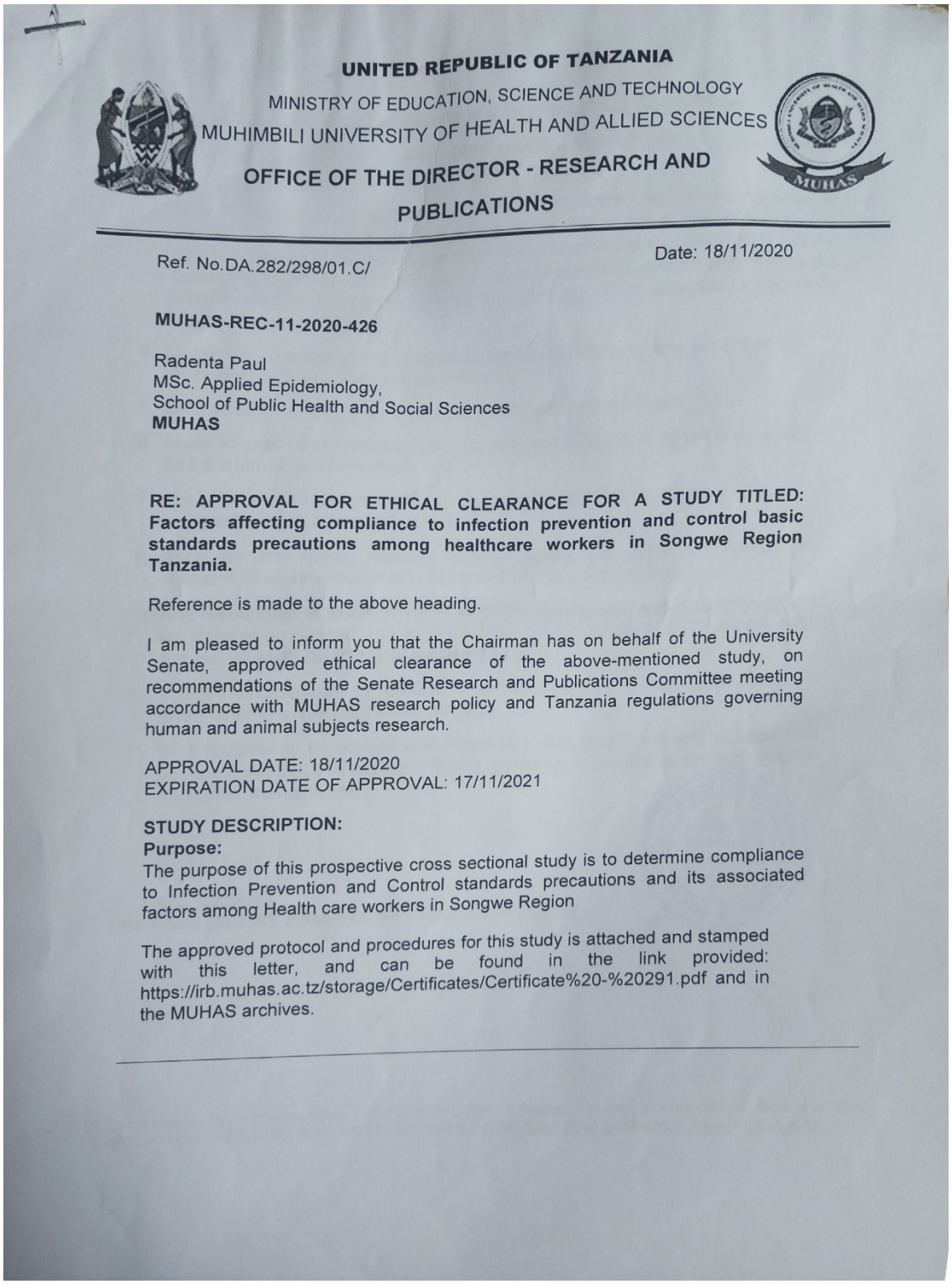
Lengo na asili ya utafiti huu imeelezwa kwangu na nimeelewa kwamba ushiriki wangu ni wa hiyari na hakuna madhara yoyote endapo nitakataa kushiriki. Nipo huru kujitoa wakati wowote. Nina haki ya kujua matokeo ya utafiti huu. Ninatoa ridhaa ya kuwa mshiriki kwenye utafiti huu.

Jina la Mshiriki..... Sahihi……Tarehe.....

Jina la Mchunguzi: ..... Sahihi..... Tarehe.....

8.3 Data collection Permission

8.3.1 Ethical Clearance



UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR - RESEARCH AND PUBLICATIONS

Ref. No.DA.282/298/01.C/

Date: 18/11/2020

MUHAS-REC-11-2020-426

Radenta Paul
MSc. Applied Epidemiology,
School of Public Health and Social Sciences
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: Factors affecting compliance to infection prevention and control basic standards precautions among healthcare workers in Songwe Region Tanzania.

Reference is made to the above heading.

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 18/11/2020
EXPIRATION DATE OF APPROVAL: 17/11/2021

STUDY DESCRIPTION:
Purpose:
The purpose of this prospective cross sectional study is to determine compliance to Infection Prevention and Control standards precautions and its associated factors among Health care workers in Songwe Region

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided: https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%20291.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.
8. Apply for and obtain material transfer agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country,
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

Muhimbili University of Health and Allied Sciences
DIRECTOR
Research & Publications
Box 65001

Dr. Bruno Sunguya
Chairman, MUHAS Research and Ethics Committee

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam: Tel. G/Line: +255-22-2150302/6; Ext. 1038;
Direct Line:+255-22-2152489;Telefax:+255-22-2152489;E-mail:drp@muhas.ac.tz;Web:https://www.muhas.ac.tz

8.3.2 University Introduction letter



UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE STUDIES

In reply quote;

Ref. No. HD/MUH/T.820/2019

20th November, 2020

The Regional Administrative Secretary,
P.O. Box 23,
SONGWE.

Re: INTRODUCTION LETTER

The bearer of this letter is Radenta Paul, a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MSc. Applied Epidemiology

As part of her studies she intends to do a study titled: "**Factors Affecting Compliance to Infection and Control Basic Standard Precautions Among Healthcare Workers inSongwe Region, Tanzania ."**

The research has been approved by the Chairman of University Senate.

Kindly provide her the necessary assistance to facilitate the conduct of her research.

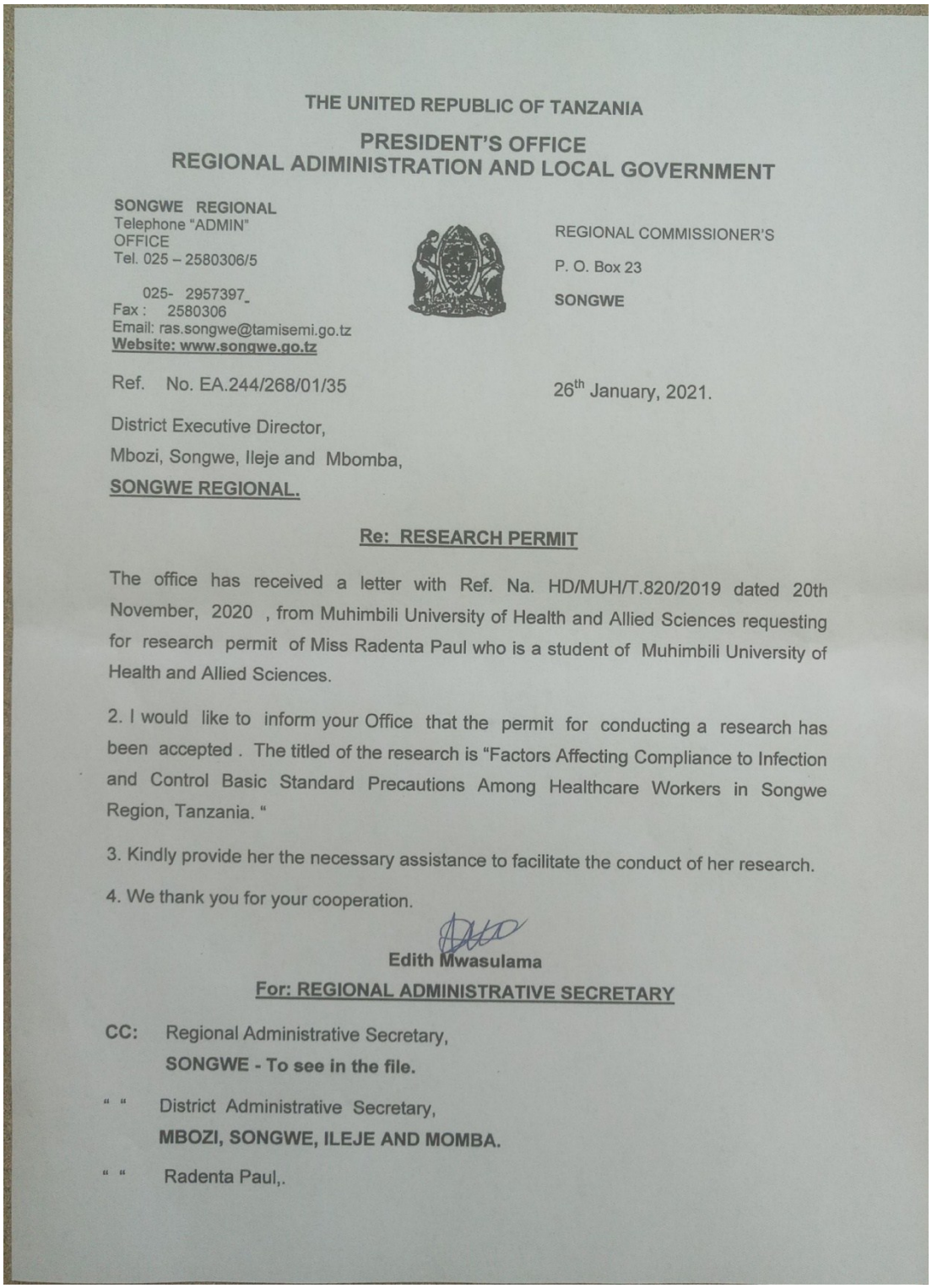
We thank you for your cooperation.

Ms. Victoria Mwamlwa
For: DIRECTOR, POSTGRADUATE STUDIES

cc: Dean, School of Public Health and Social Sciences, **MUHAS**
cc: Radenta Paul

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam: Tel. G/Line: +255-22-2150302/6; Ext. 1015; Direct Line:+255-22-2151378;Telefax:+255-22-2150465;E-mail:dpgs@muhas.ac.tz;Web:https://www.muhas.ac.tz

8.3.3 Field site permission letter



THE UNITED REPUBLIC OF TANZANIA

PRESIDENT'S OFFICE
REGIONAL ADIMINISTRATION AND LOCAL GOVERNMENT

SONGWE REGIONAL
Telephone "ADMIN"
OFFICE
Tel. 025 – 2580306/5

025- 2957397
Fax : 2580306
Email: ras.songwe@tamisemi.go.tz
Website: www.songwe.go.tz

REGIONAL COMMISSIONER'S
P. O. Box 23
SONGWE

Ref. No. EA.244/268/01/35

26th January, 2021.

District Executive Director,
Mbozi, Songwe, Ileje and Mbomba,
SONGWE REGIONAL.

Re: RESEARCH PERMIT

The office has received a letter with Ref. Na. HD/MUH/T.820/2019 dated 20th November, 2020 , from Muhimbili University of Health and Allied Sciences requesting for research permit of Miss Radenta Paul who is a student of Muhimbili University of Health and Allied Sciences.

2. I would like to inform your Office that the permit for conducting a research has been accepted . The titled of the research is "Factors Affecting Compliance to Infection and Control Basic Standard Precautions Among Healthcare Workers in Songwe Region, Tanzania. "

3. Kindly provide her the necessary assistance to facilitate the conduct of her research.

4. We thank you for your cooperation.

Edith Mwasulama
For: REGIONAL ADMINISTRATIVE SECRETARY

CC: Regional Administrative Secretary,
SONGWE - To see in the file.

" " District Administrative Secretary,
MBOZI, SONGWE, ILEJE AND MOMBA.

" " Radenta Paul,.