WOLKITE UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCE AND DEPARTMENT OF NURSING

KNOWLEDGE, ATTITUDE, AND PRACTICE ON PREVENTION OF NOSOCOMIAL INFECTION AND ASSOCIATED FACTORS AT WOLKITE UNIVERSITY SPECIALIZED HOSPITAL GUBRE TOWN, GURAGE ZONE, SNNPR ETHIOPIA, 2022.

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ACRCONYMS/ABBREVIATIONS

CDC: Communicable Disease Control

HCWs: Health Care Workers

HO: health officer

HAIs: Hospital Acquired Infection

ICU: Intensive Care Unit

NIs: Nosocomial Infection

NNIS: National Nosocomial Infection Surveillance

SNNP: South Nations Nationality and People

WHO: World health organization

WKUSH: Wolkite University Specialized Hospital

ABSTRACT

Background

Nosocomial infection also called hospital-acquired infection is defined as infection by a patient who was admitted for a reason other than infection. An infection occurs patient in a hospital or other than a care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge and also occupational infection among the staff of the facility.

Objective; Assessment of KAP on prevention of nosocomial infection and associated factors among healthcare workers at WKUSTH.

Method and material; a descriptive cross-sectional study was conducted at WKUSTH to assess healthcare workers in the prevention of nosocomial infection by using convenient sampling of patients who acquired the surgical site, medical ward, obstetric and gynecological ward assessed. Data collection was started by sample random method within the study population. Then the data was analyzed by SPSS software version 22.

Keywords: Knowledge, Attitude, Practice, Nosocomial, Infection and Prevention.

CHAPTER ONE

1. INTRODUCTION

1.1 BACKGROUND

Hospital-associated infections (HAIs) are a main problem in current care transfer scenes. They may be caused by endogenous (present on the skin, nose, gastrointestinal lot, etc.) or exogenous infectious agents, accompanying the healthcare specialists' hands being ultimate prevalent transmission passage. Special attention concede possibility be given to this issue and nurses, as care providers, concede possibility present their main offering to the prevention of these infections. Therefore, and as it is deliberate expected the first extensive scope to control HAIs, hand cleanliness should be regularly promoted Hospital-acquired infection [HAIs] continue to be the leading cause of morbidity and mortality among hospital patient and health care workers HAIs arise within 48 hours of admission to the hospital or within 30 days of discharge [1].

Infection prevention is critical in preventing and reducing the rate of hospital-acquired infections linked with health care. Hospital-acquired infections are the most common adverse event in healthcare worldwide, and they can occur as part of an epidemic, affecting the quality of care for hundreds of millions of patients in both developed and developing nations every year [1, 2]. HAIs are defined by the centers for disease control and prevention (CDC)as a localized or systemic infection caused by an unfavorable reaction to the presence of an infectious agent or its toxins acquired from a health care setting that was not in cubing or symptomatic at the time of admission [3]. These infections are a major public health concern and a risk to patient safety, leading to increased morbidity, death, and cost [2, 4]. As some researches show, the overall impact of HAIs includes prolonged hospital stays, long-term disability, increased microorganism resistance to antimicrobials, high expenses for the patient and their families, and untimely death [5, 6, 7] .furthermore, it imposes a huge additional financial strain on the healthcare system [8].

Knowledge is the first step in modifying behavior in relation about health care workers' adherence to clinical practice guidelines [9]. There is some information about health care

workers' knowledge, attitude, and practice in relation to isolation and hygiene precautions. In the hospital, it reveals the significant variation and deficiency in both of these areas [10].

Nosocomial disease infections comprise 85 % urinary disease which causes less dreariness related to others [1]; 5 % to 15 % surgical location disease which depends on the sort of fundamental understanding of well-being [11]; nosocomial pneumonia influences an assortment of patients that ranges 3% per day and causes a tall rate of casualty related with ventilator [12]; and nosocomial bacteremia that can be actuated by living beings colonizing the catheter with the inside of the channel without causing self-evident outside contamination [13].

1.2 Statement of the Problem

HAIs (hospital-acquired infections) are common in both industrialized and developing nations, causing increased morbidity and mortality among hospitalized patient .they must be, controlled, and infection control methods must be used [15]. Despite their best efforts to prevention and control infection, health care providers lack the requisite knowledge to do so. has resulted in the patients prolonged stay in the hospital, functional handicap or lower quality of life, high antibiotic resistance, mental stress, increased financial service expenses for both the patient and their families and lastly, unnecessarily [16].

HAIs occur worldwide and affect hundred and millions of people and they are related to high morbidity and mortality among patients who are admitted to the hospitals or health facilities [7].

There is a low level of compliance with infection prevention measures such as hand cleanliness, glove use, and sharps management. A variety of reasons for non-compliance have been discovered, including a lack of understanding and a negative attitude toward infection control procedures among the health force [18].

Ethiopia has socio-demographic index of around 0.0334 % [18], according to the 2017 G.C. global burden of disease study [GBDS]. Keeping it within the limitation of a developing country, its health care quality remains among the lowest in the world [19]. While Ethiopia faces a wide range of health issues, infection conditions such as lung infection, gastrointestinal infection, HIV/ AIDS, and tuberculosis have remained the country's most serious health issues, accounting for a small percentage of deaths [20].

Only half of the healthcare personnel in Ethiopia employed safe infection practices, according to a meta-analysis of studies. While it varies by geographic region and clinic 15.35 % to 46.3 % of Ethiopia health care workers were unaware of infection prevention practices [21] a high risk of infection in the healthcare context may be caused by a lack of knowledge among healthcare personnel and inadequate prevention methods. According to a study conducted by Bahir Dar Ethiopia, the rate of nosocomial infection ranged from 3.3 % to 12.8 % among 294 patients who underwent clean and clean-contaminated operations [22]..

Hospital-acquired infection preventions are a guideline containing a multitude of protocols needed to be implemented by HCWs, thus greatly reducing the magnitude of HAIs. Several factors such as poor awareness among HCWs and compliance associated with personal, logistical and organizational barriers exert their own effect on proper application of these protocols.11,12 However, based on available evidence in Ethiopia, HCWs' adherence towards infection prevention protocol is still very low.

This study aimed to assess the knowledge, attitude, and practice of health care workers concerning infection prevention and associated factors in WKUSTH.

1.3. **SIGNIFICANCE OF THE STUDY**

The result of this research will have the following significance:

- It will provide important information regarding the magnitude of nosocomial infection and its associated factors.
- It will contribute to health institution, administration and other concerned organization to give grate emphasis to the problem and take appropriate measure.
- It will also serve as reference material for researchers conducting further study on similar problem.

CHAPTER TWO

2. LITERATURE REVIEW

Hospital-acquired Infections (HAIs) are alluded to as nosocomial infection, which happened when a patient contract a sickness whereas within the hospital or when a wellbeing care specialist contracts an infection whereas performing their everyday duties. In case, contamination shows up 48 to 72 hours after confirmation to the hospital or within 10 days of release, it is considered nosocomial [25].

HAIs happen around the world and influence hundreds and millions of individuals and they are related to high rate of morbidity and mortality among patient who are conceded within the hospitals or health facilities [26]. Health workers (HWs) are as well having an expanded chance of getting this contamination [27]. Contamination control measures decrease the spread of HAIs and they include prompt handwashing after exposure to reduce the threat of disease transmission, the utilization of personal protective equipment to diminish contact with infection protest, as well as appropriate disposal of sharp reducing needle–stick wounds [28].

An infringement in disease control traditions helps within the spread of contamination either from patient to patient, patient to wellbeing specialist and wellbeing laborer to patient and attendants or even among staffs subsequently all the HCWs, specialists, the patient ought to entirely adhere to contamination control instructions. Unnecessary and wrong use of broad-spectrum medicines, particularly in health care backgrounds, is boosting nosocomial infection. Nosocomial infections can be prevented by undertaking hand hygiene, recognizing subjects at risk of nosocomial infections and following standard carefulnesses to decrease transmission. Infection prevention in special subgroup cases – burns patients, involve labeling the source of the organism, labeling of organisms, desolation assuming that necessary, early removal of necrotic tissue, prevention of nervous system infection, early food and surveillance [29,]

According to the study carried on Gonder University, it shows that, out of 236 participants were included in the study with a 100% response rate; 90 % and 57.2 % of the participants had good knowledge and positive attitude towards HAI prevention, respectively. Meanwhile, only 36 % of

the study participants had good practice towards HAI prevention, suggesting less than satisfactory scores in this study. Level of education and work experience were significantly associated with safe-infection prevention attitude and practice (with P value <0.005) [30].

It is obvious that knowledge, attitude, and practices well-being care laborers play a critical role in the prevention of HAIs and act as the pillars that make up the energetic framework of life.

2.1 Knowledge of health care workers on prevention and control of HAIs

The assessment of knowledge of health care workers involves assessing knowledge concerning what HAIs are, their cause, risk factors and sources of infection, and knowledge about infection control measures [30, 31].

2.1.1 Knowledge of health care workers about what hospital-acquired infections are;

Universally, a knowledge, attitude, and practices study showed in Kuwait, as it were 16.8% of the HCWs knew the definition of HAIs. The finding of the study done in Saudi Arabia detailed that the level of knowledge is low regarding what HAIs are. Typically ascribed to lack of assets and preparation opportunities [32]. In a descriptive study conducted in two teaching hospitals of ZABOL city in Iran, 270 HCWs who worked in different wards were randomly sampled to analyze the knowledge regarding standard precautions for prevention of HAIs. This study found that 43 % of the HCWs involved in the study had poor knowledge regarding what HAIs are [33].

2.1.2. Knowledge of the HCWs about risk factors and sources infections;

Nosocomial infection agent may be endogenous or exogenous, and transmitted by direct contact between the HWs and patient or by indirect contact with environmental surface and inanimate objects or by air [34].

Based on a cross-sectional study, conducted that in Kuwait, 69 % of respondents knew that contact is the commonest mode of transmission of this infection.

Another study conducted in Germany showed that, >90 % healthcare respondents understand an early neonatal infection that found to be caused by pathogens from the maternal birth canal

immediately prior to delivery. However, late sepsis was associated with HWs utilization of intravascular catheters; and according to this study, materials used during the care of the patient such as stethoscopes, uniforms, gowns and gloves also contain pathogen [35].

A recent study found better reporting compliance in neonatal intensive care units (NICUs) located in states where reporting is mandatory compared with NICUs in states without such mandates (>90% vs 29-51%). Canada also uses a similar system called Surveillance provincially des Infections Nosocomial (SPIN). All these programs have reported success, improving rates of participation and decreasing rates of central line-associated bloodstream infections [35].

Moreover, a study was conducted in Nepal to find out the level of contamination of 58 stethoscopes, to assess the practices of cleaning and disinfecting as well as suggest corrective measures for them. It was found out that 89.6 % of the diaphragms, 65.5 % of the bells and 72.4 % of all earpieces were colonized by bacterialinfection. It was therefore concluded that pathogenic or nonpathogenic bacteria are almost present on majority of stethoscopes was used by HWs and may transmit nosocomial infection [36].

2.2. Attitude of HCWs on prevention and control of hospital-acquired infection.

According to the Oxford Dictionary, attitude is the way that you think and feel about the someone or infections; the way that you behave towards the someone or something that shows how you think and feel and behave about something [37] and in this case, attitude towards HAIs prevention and factors associated with them.

Despite the knowledge that dirty hands play a significant role in the spread of health-care related pathogens, and that hand hygiene (HH) decreases the spread of these organisms, health-care worker's adherence accompanying HH is poor and as the study investigated the attitude and beliefs about hand hygiene among pediatric residents showed that pediatric residents' compliance with HH was influenced by role designing, balancing hand hygiene accompanying additional competing determinants and the attempt self-guardianship and personal hints. Hands of practice staff are ultimate important vehicles of cross-infection. Furthermore hands of patients can still transfer microbes to other body sites, supplies and staff [38].

Personal and organizational factors contribute to HCWs attitude both positively in relation to prevention and control of the HAIs. The in-depth assessment of the HCWs attitude involves assessing the attitude towards the effectiveness of infection control practice, and fear of contracting infection [39]

According to the consider Zambian Service of Health has shown that Ebola infection scourge within the Democratic Republic of Congo was a public wellbeing hazard as a neighboring country and so preparedness in contamination prevention and control measures should be fortified. Effective knowledge, good attitude and best practices by nurses in Stellenbosch College contamination prevention and control may typically contribute to diminishing in contamination rate within the hospital. Moreover, the study also revealed an extremely positive attitude towards theutility of guidelines and protocols for disinfection [40]

According to the study carried on Bahir Dar city administration, based on the cut of point set in the functional description among questions prepared to assess attitude of respondents 197 (55.6 %) of the study participants had positive attitude and so forth 157 (44.4 %) had negative attitude towards the HAIs contamination prevention [41]

2.3. Practice of HCWs on prevention and control of HAIs

Hospital environment or health care facility act as a reservoir for many potential pathogens therefore in order to accomplish optimum prevention and control of HAIs as an organizational aim, majority of hospital have recognized and come up with written measurable standards of prevention of this infection. This is to eliminate and resolve the fundamental cause and the transmission therefore it is an important element for quality management of patient as part of caring for patient, health care workers have the responsibility to prevention the occurrence of nosocomial infection at all time during the patient care [42]

In Africa, according to Uganda ministry of health, hygiene is the only one most vital way of preventing the nosocomial infection in the hospital or any other health facility and that when there is good or proper hygiene in the health facility, the level of contamination is reduced by 70 %. In addition, the study shows, hygiene in the health facility could be in the form of personal hygiene which involves general cleanliness of the whole body, facility hygiene which also entail

clean environment to reduce the amount of the microbes and as well reducing the transmission of infection in the hospital, instrument hygiene which is the cleaning of all the equipment that have been used in the management of all the patient and finally hand hygiene which act as the most effective way of avoiding the transmission of infection between the health workers and their patient in the hospital [43]

A study conducted in Ethiopia according to the physicians reported performing hand hygiene 7 % and 48 % before and after patient contact respectively prevents the related infections. And they stated the barriers for performing hand hygiene including lack of hand hygiene agent (77 %), sinks (30 %) and proper training (50 %) as well as irrigation and dryness (67 %) caused by hand sanitizer made in accordance with the WHO formulation [44]

An attitude of not washing hands among people included within the provision of wellbeing care can increase the rate of hospital-acquired infections. In a study that was conducted in India, Nair assessed knowledge, attitude and practices of hand hygiene among medical and nursing students at a tertiary wellbeing care centre, the lion's share of understudies had poor knowledge with respect to hand cleanliness [45]

However, in third-world countries, such as Ethiopia, HAIs prevention does not receive adequate attention, particularly in the study area, where the burden of infection disease is considerable. As a practice regarding nosocomial infection prevention and associated factors at WKUSTH. The findings of this study will be reported to the appropriate authorities, who may be able to aid in closing the gap in HAIs prevention application and indicating the steps to be done to address the problem among HCWs.

CHAPTERTHREE

3. OBJECTIVE

3.1. General objective

The aim of this study is to assess knowledge, attitude, and practice on prevent nosocomial infection and associated factors among health care workers at WKUSH, Gurage zone, Ethiopia from February 25 to June 8, 2022.

3.2. Specific objectives

Based on the aim, the following specific objectives will be achieved:

- To determine knowledge of health care provider about nosocomial infection
- To determine attitude of health care workers about nosocomial infection.
- To determine practice of health care workers on nosocomial infection
- To determine factors that affect KAP nosocomial infection prevention techniques.

CHAPTER FOUR

4. METHODOLOGY

4.1. Study area

The study was conducted in WKUSTH, Wolkite, Gurage zone, SNNPR, Ethiopia, which is 170 km South West of the capital city of A.A. on the way to JIMMA. WKUSTH was established in 2011 E.C. and it started giving service in 29/11 /2011 E.C. by recruiting 214 total worker force (91 administrative staffs, the rest 123 was health workers). At the beginning the hospital has started to give service with 112 beds in patient ward (emergency, 19 Labor 14 and NICU, 18). Now, the hospital has 487 total workers, 284 are health workers, 203 are on administrative staff's office. Currently, the hospital has 102 number of nurses, 86 physicians, 13 specialists, 2 other specialists, 26 midwifes, 17 laboratory analysts, 1 biomedical doctor, 20 pharmacists, 5 anesthesiologists, radiology, 2 environmental health workers, 7 health officers, 1 pathologist and other health related worker. Now the total bed numbers are 173 (112 beds in patient ward, 19 beds emergency, 14 beds in laboratory, 18 beds in NIUC and 10 beds in ICU).

4.2. Study period

The study was conducted may 5-20/2014

4.3. Study design

Institution based cross-sectional study was design of the study

4.4. Population

4.4.1. Source population

The source population would be all health care providers found in the WKUSTH.

4.4.2. Study population

All health care providers which are selected by simple randomly sampling technique in the hospital during data collection period.

4.5. Inclusive and exclusive criteria

4.5.1. Inclusive criteria

The study included all health care providers staff and serving in the hospital who are in contact with patients.

4.5.2. Exclusive criteria

Other hospital workers and some health providers due to illness cannot participate this research.

4.6. Sampling method

4.6.1. Sample size calculation

Sample size was calculated by using single population proportion formula based on the following assumption. The study of this p-value the burden of healthcare associated infection in Ethiopia a systematic review and meta-analysis knowledge,practice and attitude [21] 07/2020.

$$N = Z^2PQ/d^2$$

Were; n = sample size

Z = level of confidence (96 % = 1.96)

P = value (0.456 %)

Q = 1-p

D = margin of error (5 %)

$$n = [1.96]^2[0.456]\ [0.544]/[0.05]^2$$

n = 381, since the total population is <10,000

Here, the correction formula in use, n = n/n+1/N

n = 381/381+1/256 = 153

In this study, non- respondent will be 10 % more

n = 153+15

n =168

4.7. Data collection tool and methods

Structured questionnaire was utilized to collect data from health care provider of WKUSTH and in each wards health care workers the questionnaire was English version data collected by our member three in numbers ,questionnaire utilized data collection was conducted after obtaining signature of written consent to give complete information shows their willingness.

4.8. Data quality control

Data was have pre-test an our questionnaire before performing actual data collection this pre-test in attat hospital is done on 5 % of the study subjective which means almost 8 study subjects are participate in this pre-test it help to increased data validity and reliability.

4.9. Data processing and analysis

Data was processing by coding, editing, checking for consistency and accuracy each questionnaire will be checked for completeness, missed value and unlikely response. The association of the study was analyzed by using SPSS statistical software version 21 .

4.10. Sampling procedure

The study design was institution based on cross-sectional study design the source of population was all health care provider who at the time of data collection period and fulfilling the inclusion

criteria the sample size of the study use determined by using single population proportion and correction formula . Simple random sampling technique was utilized to recruit the participant.

4.11. Variable

4.11.1. Depending variable

Knowledge, attitude, and practice nosocomial infection.

4.11.2 Independent

Prevention of nosocomial infection

-Their socio-demographic

-Age

-Sex

-marital status

- ethnicity

- Ward

- Professional rank

- Service years

- religion

4.11.3 Operational definition

Nosocomial infection is also HAIs which are the common condition among hospitalized patient and health care workers [HCWs]. Prolonged hospitalization increased cost of treatment and contribute to death.

good knowledge – those who scored 80 % and above distinct features of nosocomial infections from knowledge question.

Poor *knowledge* – those who scored 60 % distinct features of nosocomial infections from knowledge question

Positive attitude – those who scored above mean to the correct answers from attitude measuring nosocomial infections question.

Negative attitude – those who scored mean and below to the correct answers from attitude measuring nosocomial infections question.

Good practice - those who scored above 80% and above distinct features of nosocomial infection from practice question.

Poor practice -those score practice 60% and below distinct features of nosocomial infection from practice question.

4.11.4. Ethical consideration

Before study conducted was contact research committee of Wolkite University to receive a letter of cooperation. A letter of cooperation was taken from WKU College of medicine and health science department of nursing. Throughout the whole journey in collecting data all members of research respect the member.

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CHAPTER FIVE

5.1RESULT

Socio demographic characteristics

A total of 168 health care workers were participating in the study with a 90% response rate. Most respondents 96 (57.1%) were males and 72(42.9%) were females. The age distribution showed the respondents were between 20-29 years old. From respondents 59 (35.1%) were followers of the orthodox religion. 125(74.4%) of the HCWs have first degree. Moreover, from the total 168 HCWs majority of them 116(69%) have 1-5 years of work experience at WKUSTH.

Table 1 frequency distribution and socio demographic characteristics of health care workers at WKUSTH

Variables	category	frequency	percentage
Age/years	20-29 30-39 40-49 50 and above	98 50 20	58..3 29.8 11.9
Sex	Male Female	72 96	42.9 57.1
Educational status	Diploma Degree Master degree Specialty certificate PHD	15 120 16 12 5	8.9 71.4 9.5 7.1 2.9
Work experience in years	< 1 year 1-5 years >5 years	22 116 29	13.1 69 17.3

Knowledge of Healthcare Workers About HAI Prevention

In this study, the majority of respondents (83.2%) were found to be knowledge about HAI prevention. Among the study participants, the majority (86.5%) has better knowledge about the need for implementation of standard operational procedure and reduction of HAIs. Similarity, 84.4% of the respondents know how nosocomial infection development is favored. Furthermore , more than 88% of the study participants answered that hand washing before and after patient care and wearing personal protection equipment (PPE) were vital to prevent HAIs (Table 2).

Table 2 Knowledge of Health care workers about HAI prevention at WKUSTH

Items	true	False
Nosocomial infection is an infection whose development is favored by a hospital environment	141(83.9)	27(16.1)
Nosocomial infections includes Ventilator associated pneumonia (VAP), Tuberculosis, Urinary tract infection, Gastroenteritis	130(77.4)	38(22.6)
HBV, HCV, Staphylococcus aureus and Pseudomonas aeruginosa are the organisms commonly encountered in nosocomial infections	129(76.8)	39(23.2)
Gloves should always be worn in contact precautions	109(64.9)	59(35.1)
Standard precautions should include the use of protective equipment and frequent hand washing.	132(78.6)	36(21.4)
Diagnosis influences my decision in choosing PPE	118(70.2)	50(29.8)
Patient history will influence my decision in choosing PPE.	110(65.5)	58(34.5)
Washing hands before and after handling patients helps to prevent infection.	123(73.2)	45(26.8)
Wearing N95 mask is important when dealing with air born infection.	137(81.5)	31(18.5)
Wearing surgical masks when doing surgical procedures are vital to prevent infection.	136(81)	32(19)

Attitude of health care worker about HAI prevention

More than half of the respondent,144(85.7) had a favorable attitude toward HAIs prevention. 132(78.2) study participants,strongly agreed that that use of antiseptic is necessary to prevent HAIs. A significant number of the respondent did not agree on the importance of changing mask as a measure of HAIs control (disagree and not sure 76.2).

Table 3 attitude of health care workers about HAIs prevention at WKUSTH

Items	Agree	Disagree	Not sure
It is necessary to categorize hospital waste before disposal.	132(79.8)	25(14.9)	9(5.4)
Hand hygiene after removing gloves is a healthcare associated infection control measure	144(85.7)	16(9.5)	8(4.8)
Use of antiseptic is necessary to prevent nosocomial infection	131(78)	23(13.7)	14(8.3)
Invasive procedures are risk factor for multi-drug resistant organisms.	136(81)	24(14.3)	8(4.8)
Health worker hands are vehicle for transmission of nosocomial pathogen.	145(86.3)	14(8.3)	9(5.4)
Changing mask before going to another patient is a nosocomial infection control measure.	138(82.1)	25(14.9)	5(3)

Practice of health care workers about HAIs prevention

Regarding infection prevention practice, the half of the respondents have poor practice, 54(32.1%), toward HAIs prevention of hand washing before starting work. Majority of HCWs 132(78.6%)always wearing mask during handling TB suspected patient, whereas 36(39.9%) of respondents sometime hand washing before handling new patient (Table 4).

Table 4 practice of health care provider about nosocomial infection prevention at WKUSH

Items	Always	Often	Sometimes	Not at all
Hand washing before starting work	105(62.5)	9(5.4)	54(32.1)	
Hand washing before handling new patients	67(39.9)	34(20.2)	36(39.3)	
Changing gloves before starting handling new patient	101(60.1)	25(14.9)	42(25)	
Wearing mask during handling TB suspected patients	132(78.6)	20(11.9)	16(9.5)	
Using safety cabinets in the laboratory	104(61.9)	27(16.1)	27(16.1)	10(6)
Discarding infectious materials and left-over samples according to the guide line	118(70.2)	23(13.7)	21(12.5)	6(3.6)

1 Factors associated with knowledge of health care workers about infection prevention

In the bivariate analysis factors which were significantly associated with knowledge about infection prevention was age, level of education , working experience, ward, sex of participants, in infection prevention method .after controlling the confounding in multivariate logistic regression analysis sex,work experience, ward, infection prevention were found to be significantly associated with knowledge on infection prevention.

For thus, male healthcare workers at wolikta university specialized hospital 2 times more knowledgeable than those of female healthcare provider [AOR=2.431, 95%,CI={5.117-1.155}].

When we see wards those working in emergency , obstetrics & gynecology and OR have 85%,79% and 84% less likely knowledgeable respectively than those of medical wards. [AOR=0.1965,95%, CI=0.847-0.045),AOR=0.105(0.432-0.026),AOR0.168 CI 95%(0.660-0.043)

Table 5 **Bivariate and multivariate analysis factors towards knowledge of infection prevention among healthcare workers at WKUSH,2022**

Variable		Knowledge		COR{95%CI}	AOR{95CI}	P-value
		true	false			
Age	20-29	67	30	1	1	
	30-39	42	8	1.040{2.05-0.526}	0.875{3.984-0.192}	
	40-49	18	2	0.517{1.406-0.190}	0.639{2.839-0.144}	
Sex	Female	43	42	1	1	0.019*
	male	53	30	1.726{3.200-0.931}	**2.431{5.117-1.155}**	
Educational level	Diploma	114	4	1	1	
	Degree	68	57	3.281{10.863-0.99}	3.908{52.658-0.290}	
	Master deg	8	8	2.750{12.407-0.610}	1.227{11.857-0.127}	
	PHD	9	3	0.917{5.207-0.161}	0.992{10.267-0.096}	
Work experience	>1 years	12	10	1	1	
	1-5Years	64	52	1.026{2.562-0.411}	1.855{11.621-0.296}	0.001*
	<5years	23	7	0.254{0.835-0.77}	1.294{6.788-0.247}	0.003*
ward	Medical	18	12	1	1	
	Surgical	9	17	2.833{8.420-0.953}	0.358{1.356-0.095}	0.002*
	Ob-gyn	12	12	1.500{4.432-0.508}	**0.105{0.432-0.026}**	
	PEDI	9	12	2.000{6.201-0.645}	0.274{1.108-0.068}	0.029*
	Emergency	14	10	2.036{5.562-0.745}	**0.195{0.847-0.045**}	0.011*
	OR	8	5	0.938{3.562-0.247}	**0.168{0.660-0.043**}	
	other	15	6	0.600{1.984-0.181}	0.251{1.542-0.041}	

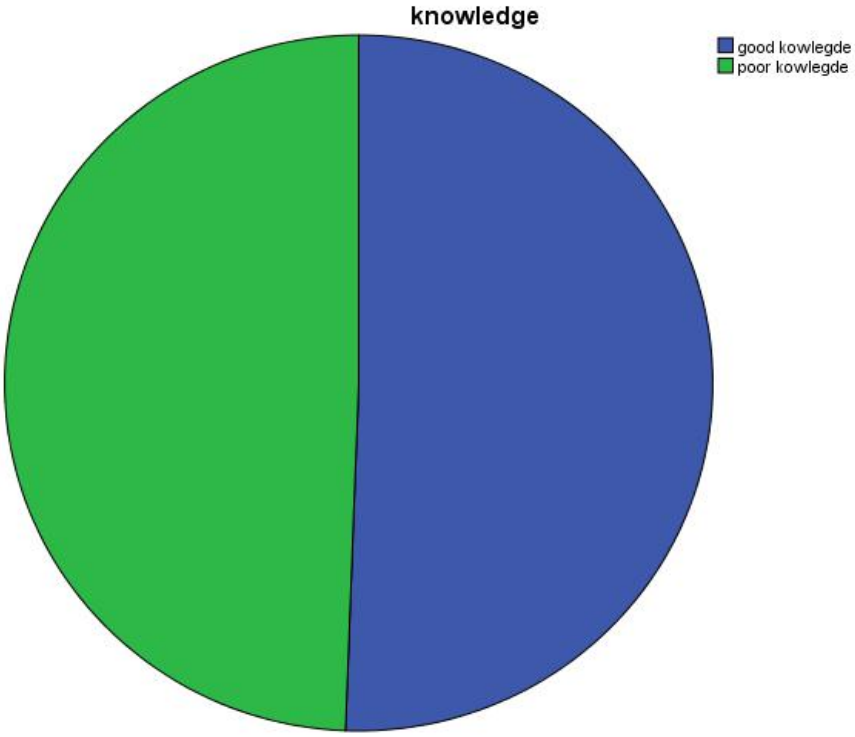

Figure 1 factors associated with knowledge of healthcare workers on infection prevention

2 Factors associated with practice of healthcare worker on infection prevention

In the bivariate analysis ,age,sex,marital status, religion, educational status, experience, ward of the respondent on infection prevention were factors which were significantly associated with practice about infection prevention. When we inter all these variables in to multiple logistics regression only age and religion shows significant association. Health care providers who are between 30 -39 years of age are 9 times more likely to do appropriate infection prevention practice than those of 20-29[AOR=8.769,95%,CI=(112.4-0.62 And protestant religion followers are 79.8% less likely practice when we compared with orthodox followers (0.102,95%,CI=(0.684-0.015)

Table 6 bivariate and multivariate analysis on associated factors of infection prevention practice among healthcare worker at WKUSH,2022

Variable		Practice		COR{95%CI]	AOR{95}	P-value
		Good	poor			
Age	20-29	67	30	1	1	
	30-39	42	8	0.248{1.138-0.054}	**8.769{112.4-0.62}**	
	40-49	18	2	0.583{3.022-0.113}	3.148{37.6.0.263}	
Sex	Female	54	17	1.001{2.054-0.488}	11.053{2.602-0.426}	
	Male	73	23	1	1	
Religion	Orthodox	44	15	1	1	
	Muslim	42	6	3.520{13.22-0.937}	0.260{1.573-0.043}	0.142*
	Protestant	36	13	8.400{36.277-1.95}	**0.102{0.684-0.015}**	0.119*
	Other	5	6	3.323{12.76-0.865}	0.241{1.439-0.040}	0.019*
Marital status	Single	43	10	1	1	
	Married	79	28	1.075{10.68-0.108}	0.202{2.988-0.014}	
	Widowed	1	1	0.705{6.581-0.076}	0.413{5.54-10.031}	
	Divorced	4	1	0.250{8.560-0.007}	2.478{5.394-0.012	
Educational status	Diploma	14	1	1	1	
	Degree	90	34	2.800{35.288-0.22}	0.037{1.299-0.001}	0.144*
	Master.deg	13	3	0.529{2.541-0.110}	0.285{4.463-0.018}	
	PHD	10	2	0.867{6.215-0.12}	0.122{2.286-0.07}	
Work experience	<1	14	8	1	2.622{17.938-0.383}	
	1-5	87	28	0.269{1.054-0.069}	1.780{9.901-0.320}	
	>5	26	4	0.478{1.488-0.154}	1	

ward	Medcial	23	7	2.464{8.259-0.735}	0.823{3.518-0.193}	
	Surgical	23	3	5.750{25.294-1.307}	0.320{1.749-0.059}	
	OBY.GYN	19	5	2.850{10.568-0.76}	0.692{3.245-0.148	
	PEDI	15	6	1.875{6.757-0.520}	1.033{5.052-0.211}	
	Emergency	26	6	3.250{11.219-0.942}	0.889{4.310-0.183}	
	OR	9	4	1.688{7.273-0.392}	1.208{8.031-0.182}	
	Other	12	9	1.253{8.741-0.180}	1	

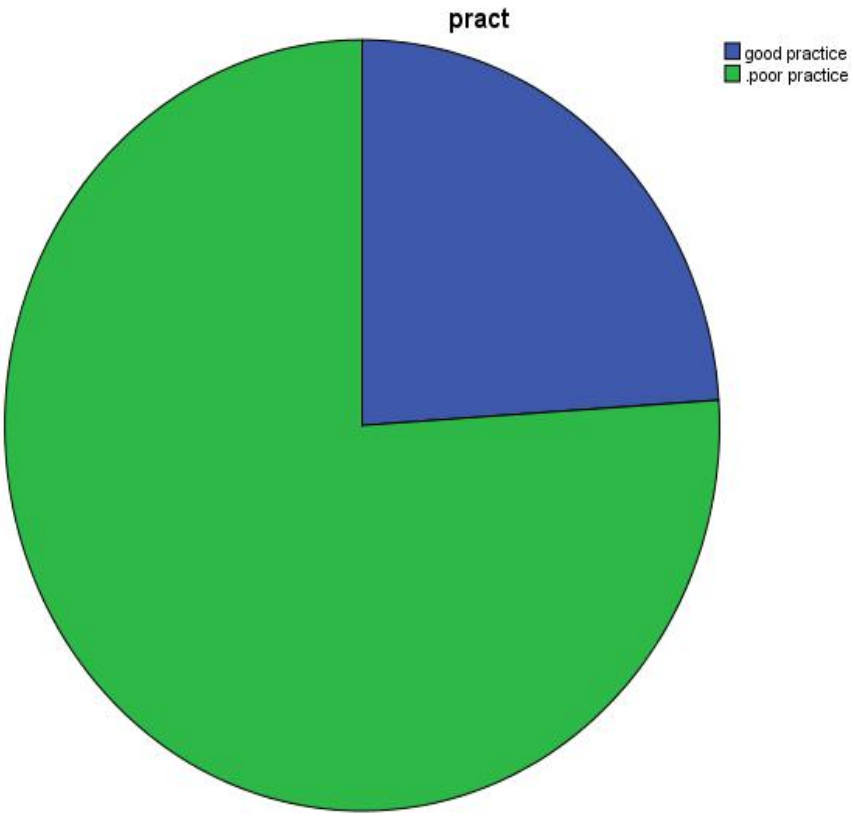

Figure 2 factor associated with practice healthcare workers oh infection prevention.

Chapter six

6.1 Discussion

Infection prevention is one of the most important challenges in the health institution. For this,the study assessed knowledge,practice and associated factors toward infection prevention among HCWs.in this study, the proportion of healthcare workers who were knowledgeable about infection prevention was found to be 83.2%.[35] This finding indicated that majority of the healthcare workers in the hospital had adequate knowledge on prevention of infection.on the other hand, this finding was higher than, the study conducted in bahir dar, Ethiopia and Gaza city, palestine were 83.2% and 50.6% of respondent had had good knowledge ,respectively[36].

The need of positive attitudes about infection prevention is unquestionable to prevent HAIs.more than majority of the respondent {85.7%}had favorable attitude about infection prevention's significant number {15%} of HCWs in this study had unfavorable attitude of infection prevention. The attitude level of participant in our study is found to be above than to that conduct in bahirdar city and Dessie referral hospital (AOR=3.15,95% CI =2.467-5.0250),[AOR=1.25,95%,CI=(0.469-3.074).our study WKUSH adequate knowledge than desise and boarder referral hospital due to more experience, high level of education and collaboration of all healthcare providers each wards

This study revealed that healthcare workers with age were significantly associated with knowledge [AOR=1.830,95% with CI of 3.730-1.185].[41] this might be attributed to the fact that as the healthcare workers get young they are more likely advanced their knowledge thought experience and working with senior staff. Male healthcare workers were found to be two times more likely to be knowledgeable about infection prevention when compared with female. The possible explanation of this finding might be linked with the educational status of participant as the majority of the Bsc or Msc holders were males. This finding is in line with other studies.[42]

In addition, this study revealed that working experience is another factor significantly associated with the practice of infection prevention activities. Healthcare worker who had work experience of above five years were three more likely practice infection prevention activities. Which in line with a study in bahirdar city.

This finding has shown that healthcare workers who had taken infection prevention training and get an variable supply of infection prevention were more likely to have a good practice of infection prevention. The possible explanation for this finding could be the fact that training on current guide lines could upgrade the knowledge and skill of HCWs in that they would easily understand basic principle, standard of practice and implement them consistency. Beside this, up

to date knowledge and skill regarding infection prevention could also increase the confidence of HCWs in complying with recommended guideline and the available supply.[44]

6.2 Limitation of the study

Despite extensive efforts have been made to minimize the possible shortcoming of this study, the finding could be interpreted in the presence of some inevitable limitation. The cross-section nature of this study will make it unable to form a temporal relationship between the outcome and predictor variable. The study is also pronto social desirability bias which could lead to over underestimation of the study found.

The main limitation of this study was only done on the health care workers.

Chapter seven

7.1 Conclusion

The study has demonstrated that majority of healthcare workers who had adequate knowledge about infection prevention and nearly above one third of healthcare provider had poor practical towards infection prevention, individual factors age,educational status, working experience, religion, ward are were significantly associated with knowledge,practice and attitude of infection prevention.

7.2 Recommendation

We would like to recommend wolikta university specialized hospital and guhraga zone minster of health collaboration of infection prevention training and sharing experience for the other sector.

We recommend to other researchers to do this topic by using strong design and by incorporating more hospital.

The other recommendation is that ward rotation is recommended because in our findings some wards have poor practice than other wards

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Annex 1: Questionnaires and informed consent

Consent English version

We are woliket university nursing students carrying out a study to assess “knowledge, attitude and practice on prevention of nosocomial infection and associated factor among health care worker in WKUSTH”. You have been selected to participate in answering questions regarding this topic. The information you give is very valuable and will be treated with maximum confidentiality that is why you are requested not to record your name on this paper. So please feel free to respond to the questions as genuinely as possible.

Consent

I certify that, to the best of my knowledge,I have read and understood the content above and we willingly participate in the study.

Respondent

Participant signature _____

Date _____

QUESTIONNAIRE

PART 1. Socio demographic factors of the HCWs

1. Age of the respondent in years
   A. 21-29 years
   B. 30-39 years
   C. 40-49 years
   D. 50 years and above
2. Sex of respondent
   A. female
   B. male
3. Religion?
   A. orthodox
   B. Islam
   C. protestant
   D. others
4. Marital status of the respondent?
   A. single
   B. widowed
   C. divorced
   D. married
5. Ethnicity of the respondent?

A. GURAGHE
B. AMHARA
C. WOLAITA
D. others

6. How long have you worked in this hospital?

A. <1 years B. 1 to 5 years C. >5 years

7. What is your level of education?

A. Diploma
B. degree
C. master degree
D. specialty certificate
E. PHD

8. Currently in which ward/unit are you working

A. Medical
B. Surgical
C. Gynecology and obstetrics ward
D. Pediatrics ward
E. Emergency ward
F. OR
G. others

9. What is your profession?

A. Doctor
B. nurse
C. health officer
D. midwife
E. Laboratory technologist
F. Pharmacy

10. If you are answered question number 8 as Doctor what is your specialty area?

A. surgery
B. PAEDIATRICS
C. medical
D. gynecology and obstetrics
E. emergency
F. other specify

11. Have you been given any training here in WKUSTH about prevention of nosocomial infection?

A. yes
B. No

PART 2; knowledge of HCWs on nosocomial infection prevention and control

Table1. Knowledge of Healthcare Workers About nosocomial infection Prevention in WKUSTH

Items	true	False
Nosocomial infection is an infection whose development is favored by a hospital environment		
Nosocomial infections includes Ventilator associated pneumonia (VAP), Tuberculosis, Urinary tract infection, Gastroenteritis		
HBV, HCV, Staphylococcus aureus and Pseudomonas aeruginosa are the organisms commonly encountered in nosocomial infections		
Gloves should always be worn in contact precautions		
Standard precautions should include the use of protective equipment and frequent hand washing.		
Diagnosis influences my decision in choosing PPE		
Patient history will influence my decision in choosing PPE.		
Washing hands before and after handling patients helps to prevent infection.		
Wearing N95 mask is important when dealing with air born infection.		
Wearing surgical masks when doing surgical procedures are vital to prevent infection.		

PART 3; attitude of HCWs towards prevention and control of nosocomial infections

Table 2. Attitude of Healthcare Workers About nosocomial infection Prevention in WKUSTH

Items	Agree	Disagree	Not sure
It is necessary to categorize hospital waste before disposal.			
Hand hygiene after removing gloves is a healthcare associated infection control measure			
Use of antiseptic is necessary to prevent nosocomial infection			
Invasive procedures are risk factor for multi-drug resistant organisms.			
Health worker hands are vehicle for transmission of nosocomial pathogen.			
Changing mask before going to another patient is a nosocomial infection control measure.			

PART: 4 practice of HCWs on prevention and control of HAIs

Table 3.Healthcare Workers Practice Towards nosocomial infection Preventionin WKUSTH

Items	Always	Often	Sometimes	Not at all
Hand washing before starting work				
Hand washing before handling new patients				
Changing gloves before starting handling new patient				
Wearing mask during handling TB suspected patients				
Using safety cabinets in the laboratory				
Discarding infectious materials and left-over samples according to the guide line				