

COMPLIANCE TO STANDARD PRECAUTION PRACTICE FOR INFECTION PREVENTION AND ASSOCIATED FACTORS AMONG PUBLIC HEALTH CARE WORKERS IN EAST ARSI ZONE, OROMIA REGION, SOUTH EASTERN ETHIOPIA



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RESEARCH THESIS SUBMITTED TO DEPARTMENT OF EPIDEMIOLOGY, COLLEGE OF HEALTH SCIENCES JIMMA UNIVERSITY; IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS FOR MASTER OF PUBLIC HEALTH IN GENERAL PUBLIC HEALTH.

COMPLIANCE TO STANDARD PRECAUTION PRACTICE FOR INFECTION PREVENTION AND FACTORS ASSOCIATED AMONG PUBLIC HEALTH CARE WORKERS IN EAST ARSI ZONE , OROMIA REGION, SOUTH EASTERN ETHIOPIA.

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JUNE,2015.

JIMMA, ETHIOPIA

Abstract:

Background: Infection in healthcare facilities is a major public health problem in most developing countries like Ethiopia. Currently the overall incidence of health care associated infection has been increasing and burden of these infections is staggering. Thus, it is important to assess compliance to standard precaution practices and associated factors among health care workers for better intervention.

Objectives: The objective of this study was to assess compliance to standard precaution practices for infection prevention and associated factors among health care workers in Arsi zone ,Oromia regional state.

Methods: Institution based cross sectional study was conducted from February 2015 to June 2015 in health institutions found in East Arsi zone. Data were collected using pre tested questionnaire interview method from 300 health care workers selected by simple random sampling technique. Collected data were checked, coded and entered into EPI DATA version 3.1 and exported to SPSS version 20 for analysis. Frequency, Mean and standard deviation were calculated. Both bivariate and multivariable logistic regression analysis was done. Variables that had P-value less than 0.25 in bivariate analysis entered in to multivariable logistic regressions to control confounders. P-value less than 0.05 were set as statistically significant.

Result: 300 (95.5%) health care workers were participated in the study. Out of total respondents 192(64%)of respondents' had complied to standard precaution practices and 108(36%)health care workers poorly complied to standard precaution practices.

Result of multiple logistic regression analysis showed that service years ,knowledge of health care workers ,attitude ,and standard precaution practices were independently associated with compliance to standard precaution practices.

Conclusion: In this study, a total of 300 (95.5%) health care workers were participated in the study. More than half of 192(64%) health care workers complied to standard precaution practices. This study concluded that sex ,age, educational status ,profession, supply in the health institution ,training, monitored and evaluation ,knowledge, attitude s and standard precaution practices were factors associated with compliance to standard precaution practice.

Acknowledgments

I would like to mention my respect and acknowledgment to Jimma University Department of Epidemiology, Oromia Health broau for giving me this chance and Arsis Health Office for their valuable support during proposal development

I am very grateful to my advisors Mr.Desta Hiko and Mr.Alemeyow Atomsa of the Department of Epidemiology for their unreserved guidance and constructive suggestions and comments.

I would like to acknowledge Mr.Tadele H/Meryem and Gemechu Befa who helped me a lot during the proposal development providing me constructive comment and suggestions and the invaluable moral support and academic guidance.

My honest gratitude also goes to my wife Sr Zemzem Damma for her unreserved moral and financial support.

Finally, I would like to extend my thanks to those data collectors, supervisors and study participants who had volunteered to participate during interview.

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List of acronyms

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
CDC	Center for Disease Control and Prevention
COR	Crude Odd Ratio
CI	Confidence Interval
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HCWs	Health Care Workers
HLD	High Level Disinfection
HIV	Human Immunodeficiency Virus
IP	Infection Prevention
KAP	Knowledge Attitude and Practice
MOH	Ministry of Health
NGOs	Non Governmental Organizations
NSIs	Needle Stick Injury
OR	Odds Ratio
PAS	Proportional Allocate to Size
PPEs	Personal Protective Equipments
SNNPR	Southern Nation, Nationalities, and Peoples Region
SP	Standard Precaution
SPSS	Statistical Package for Social Science Research
SRS	Simple Random Sample
WHO	World Health Organization

1.Introduction

1. 1 Background

Standard Precautions are work practices required to achieve a minimal level of infection control for the treatment of all clients regardless of diagnosis. It refers to all policies, procedures and activities which aim to prevent or minimize the risk of transmission of infectious disease at health care institutions(1,2).

The use of standard precautions is recommended for all patients, regardless of suspected or confirmed infection status. It is applied in any setting in which health care is delivered based on the principle that all blood, body fluids, secretions, excretions except sweat, non-intact skin, and mucous membranes may contain transmissible infectious agents(1,2).

Standard precaution includes -hand hygiene(routine hand washing, hand antiseptic, ,and surgical hand scrub), use of personal protective equipment -such as: caps, gowns, masks, aprons, drapes closed boots or shoes goggles or glasses, sterile drapes) prevention of needle stick or sharp injury, waste management, instrument processing(decontamination, cleaning ,sterilization) ,processing linen, housekeeping and clinical laboratory services(1,3).

It is not safe to take precautions only with those from so-called risk groups for infection with blood borne pathogens as many people belonging to risk groups are not infected and many infected people do not belong to risk groups..

Recognizing this threat, the U.S. Centers for Disease Control and Prevention (CDC) proposed a series of procedures for preventing occupational exposures and for handling potentially infectious materials such as blood and body fluids. Therefore, health care workers advised to practice regular hand hygiene; use protective barriers such as gloves and gown whenever there is contact with mucous membranes, blood and body fluids of patients; safe injection practices and dispose of sharps, body fluids, and other clinical wastes properly(2)

compliance to standard precaution practices in infection prevention and control measures aim to ensure the protection of those who might be vulnerable to acquiring an infection both in the general community while receiving care due to health problems in the range of settings (6).

1.2.Statement of the problem

Infection in hospitals and other healthcare institutions is a problem for health services around the world and major public health problem which is receiving considerable attention and the problems related to this is very serious which causes major health risks that leads to morbidity, mortality and costs(money and time)(4,5).

The World Health Organization (WHO) estimates that about 3million HCWs face occupational exposure to blood borne viruses each year (2 million to HBV, 900,000 to HCV, and 300,000 to HIV), 90% of the infections that result from these exposures are in low income countries)(2).

Developing countries, especially those in sub-Saharan Africa, that account for the highest prevalence of HIV-infected patients in the world also report the highest incidences of occupational exposures.

Reports indicate that standard precautions are effective in preventing both occupational exposure incidents and associated infections. Studies have extensively reported suboptimal and non-uniform compliance to standard precaution practices by health care workers in both developed and developing countries(2,7) In Ethiopia, there are only a few studies that describe occupational exposures and compliance to standard precaution practices among health care workers.

In 2006, the Ethiopian Public health Association indentified standard precautions as an area of research gap and public health importance in the country citing lack of investigations in this area and the apprehension of health care workers in handling HIV/AIDS cases. Since then, the governmental and non-governmental organizations (NGOs) have given attention to standard precautions by increasing supplies such as safety boxes, PPEs, materials for hand washing and waste disposal. However, the evidence base surrounding standard precautions in this resource poor setting remains limited(2,7).

Hospital acquired infections in developing countries has always been there, it is becoming one of the areas which get attention of health providers, programmers and evaluators. HBV, HCV, HIV and many other infectious organisms have been there for many years and continue to be a common reason for poor and ill health of health care workers and patients or clients(8,9).

In countries with limited resource, it is important to develop the health care staff compliance to standard precaution practices as well as, use of the recommended infection prevention practices to minimize their risk of accidental exposure or injuries and provide safe service to clients should be a standard practice.

Unless appropriate standard precaution is in practice health care facilities can be the source of infection and epidemic disease for the community at large. Yet, very few studies are conducted in Ethiopia to assess compliance to standard precaution practices among health care workers and risk factors associated in health institution(8,10).

In Ethiopia, there is dramatic increase in the development of health institutions. Despite, Ethiopian Federal Ministry Health have clearly defined policies and procedures to implement standard precautions, less emphasis is given at the institution level for the preventive strategies in reducing occupational injuries and increasing conformity with standard precautions. Still the problem is important and different study are recommending infection control teams and researchers need to consider the reasons for poor compliance to standard precaution practices and provide a supportive environment that is conducive to the routine long-term application of standard precautions(4,10).

Very few studies were conducted in Ethiopia to assess compliance to standard precaution practices among health care workers and factors inhibiting the practice. So this study is attempted to assess compliance to standard precaution practices and risk factors associated among health care workers who have direct contact with patients in public health institutions of Arsi zone,

2.Literature Review

2.1 Compliance to standard precaution practice.

2.1. 1 Compliance to hand hygiene practice and risk factors.

The CDC guidelines specify that hand hygiene should occur with any patient contact and health care workers should wash his hand with a non-antimicrobial soap and water or, an antimicrobial soap and water when hands are visibly soiled, or contaminated. If hands are not visibly soiled, health care workers can use an alcohol-based hand rub for routinely decontaminating hand in clinical situations before having direct contact with patients; before starting work, going for a break and leaving for home; after contact with a patient (such as in taking pulse or blood pressure, or lifting a patient); after contact with body fluids or excretions, mucous membranes, non intact skin; if moving from a contaminated body site to clean-body site, during patient care, after contact with inanimate objects and after using toilet and after nose blow (10,11)

Study conducted in Nigeria health institutions indicate that IEC materials are not a common source of information probably because they are largely unavailable within the facility, and where found are either not visibly placed, worn out or outdated. (12)

According to the study conducted in North Eastern Nigeria revealed that 56.7% of the health care workers knew that their hands had to be washed before and after patient care. However, compliance with hand hygiene is noticed in only 38.7% of the knowledgeable health workers. 61.3% did not wash their hands before or after taking care of patients(3). Similar finding in Mekele indicated that practice of Health care workers related to hand washing and found out 61.5% of the HCWs always practiced hand washing after any direct contact with patient.(4)

In the current study conducted in United Arab Emirates, 58.2% of nurses know that standard precautions are aimed at protecting Health care workers from getting infections from patients, 23.5%thought they are to prevent patients getting infected from Health care workers and 45.9% said that SPs aimed to protect both Health care workers as well as patients from infections.

Similar findings among 82 nurses in a public hospital in Brazil showed that 11.0% understood standard precautions as protective measures for professionals only, 52.4% for both professionals and patients, 7.3% for patient care independent of the diagnosis, and 9.8% for patients with diagnosed infection.(7) According to study conducted in Mekele showed that practice of health care workers related to hand washing and found out 61.5% of them always practiced hand washing after any direct contact with patient (4)

Finding on health care workers in Mekele indicated that the overall hand hygiene practice by the respondents is 69.0 % among whom majority are after a certain procedure than before commencing it (82.5% vs. 50.9%).

Study conducted in Mekele also indicated that the practice of hand washing before and after performing medical procedures, 84.3% did not wash their hands prior to a medical procedure and even if they do, they practiced simple hand washing but the pattern reversed when looked at after performing procedures among them. Many studies inferred that most health workers think that sterility can be effectively maintained by wearing gloves without prior washing of hands and the knowledge as well as awareness about transmitting infection to patients are still lacking (13)

2.1. 2 Compliance to personal protective equipment practices and risk factors .

In study that is undertaken in Mekele revealed that 90% of the Health care workers worn gown, 86.7% of the Health care workers always used glove, use of goggles and/or mask is particularly poor, that only 10.5 % of the Health care workers always worn goggles in workplace having exposure to blood and other body fluids(4) This finding is a bit higher than a study done in Southern Nigeria which is only 5% of the Health care workers always worn goggles during deliveries or surgeries(4)

Study that is conducted in India shows the use of gloves appeared to be considerable while drawing blood (81.0%) and during instances when coming in contact with mucous membranes or non intact skin of the patients (88.3%).(14)

About 45.6% of the participants admitted using face masks while suturing, another 53.1% while undertaking procedures like inserting a naso gastric tube, and 39.5% during a lumbar puncture. When confronted with a situation in which the risk of fluid splash is high and the HIV status of

the patient is unknown, eye protection and protective gowns are said to be used by only 36 (22.2%) and 46 (28.4%) Health care workers, respectively. However, in situations where patient's HIV status is known to be positive, almost 96 (59.2%) participants stated the use of eye protection and gowns(14).

2.1. 3 Compliance to Prevention of needle stick or sharp injury practices and risk factors

According to WHO report ,the most effective means of preventing the transmission of blood-borne pathogens is to prevent exposure to NSIs. Primary prevention of NSIs is achieved: through elimination of needle recapping, and use of sharps containers for safe disposal have reduced NSIs by 80%, with additional reductions possible through the use of safer needle devices.

Control measures to prevent NSI: substitute injections by administering medications through another route, non re-capping, emptying them before they're full, and establishing the means for safe handling and disposing of sharps devices before beginning a procedure, avoiding overuse of injections and unnecessary sharps using PPEs(15)

According to the study conducted in Addis Ababa Hospitals Health Professionals, injection safety training is protective from sharp injuries. If health professionals take injection safety training the risk of getting sharp injuries decreased by 47.9% as compared to those health professionals who do not take injection safety training (AOR= 0.52, 95% CI: 0.32, 0.84) keeping other variables constant. (16).Over use of injection 5.65 times increase the risk of sharp injuries (AOR= 5.65, 95% CI: 2.4, 13.3)-(16)

Injection safety training, over use of injections, infection prevention training, work load, recap, availability of safety box, disassembling of syringe and needles, SPs are significant predictors of sharp injuries.(16).Infection prevention training protects from sharp injuries. if health professionals take infection prevention training they protect themselves from sharp injuries in 70% of the cases as compared to those health professionals that do not take infection prevention training (AOR= 0.3,95% CI: 0.18, 0.5).(16)

Recap increase the risk of health professional to sharp injuries. If health professionals never recap they protect themselves from sharp injuries in 61.6% of the cases (AOR=0.38, 95% CI: 0.18, 0.81) keeping other variables constant.(16)

The presence of safety box decrease the risk of sharp injuries by 96%, (AOR= 0.04, 95% CI: 0.013, 0.1) If health professionals properly apply SPs on in their daily activity, the risk of sharp injuries will decrease by 61.8% as compared to those health professionals that do not properly apply SPs keeping other variables constant (AOR= 0.38, 95% CI: 0.22, 0.66).

The risk of sharp injuries to those health professionals that disassemble needle and syringe is 5.38 times higher than those health professionals that didn't disassemble needle and syringe (AOR= 5.38, 95% CI: 2.68, 10.76)(11,16) .

The study conducted in Bair Dar found out 17.0% of the Health care workers recapped used needles in the last one year. The finding also supported by observed practice that, 11.8% of Health care workers recap used needles. In study that is conducted in Bair Dar show that 19.5% of Health care workers had history of sharp and needle stick injuries within the last twelve months This finding is lower than study report in Hawasa (30.5%), the study done in SNNRP (32.4%) and the finding from Uganda Kampala (57%) (6)

The study conducted in Addis Ababa found out significant differences in the practice of standard precautions among different group of Health care workers that affects the practice; females are more likely than males to practice standard precautions and this finding is similar with the study done in America(10) Young Health care workers had a good practice of standard precautions when comparing with those old ones(10)

Studies conducted in Mekele found out significant differences in the practice of standard precautions among different profession and accordingly non-physicians are significantly more compliant than physicians .Similarly, the present study also showed that comparing with laboratory technician, Nurses and Doctors had less likely to practice standard precautions. In this study the odd of good practice is likely to be higher in Health care workers trained for standard precautions that who didn't take training. Unfortunately, this finding is dissimilar with a study done in two administrative region of Ethiopia and India that taking training is not found to be a predictor for the good practice.(4)

A study done in Ethiopia showed that, nurses with less experience are at a higher risk of exposure to infectious diseases and had weak SP practice. But in the present study, work experience had not statistically significant for good practice of standard precautions(4)

2.1. 4 Compliance to handling and disposing sharps and risk factors.

Study conducted in Bair Dar indicated that availability of safety box decreases the risk of sharp injuries. Keeping other variables constant lack of safety box predisposes health professionals in 96.4% of the cases with AOR=0.04, 95% CI: 0.013, 0.1) (11).

Regarding the availability of in site collection materials for wastes , nearly two third, 64.4% of units in each health care facilities use safety box, 13.8% use of plastic pail without cover, 9.4% use plastic pail with cover and 4.4% use non standard, locally prepared sharp container(6). According to the study conducted in Nigeria regarding sharp management, 24 (14.5 %) of 165 respondents admitted to always recapping needles, 31(18.8%) to detaching needles from syringes and 19 (11.5%) to manipulating needles (including bending, cutting or breaking)(8) One hundred and thirteen (68.5%) claimed never to use syringes with needles on agitated patients, and 95 (58.2%) claimed to protect their fingers anytime they had to break a glass ampoule or bottle(12)

According to CDC, waste must be properly handled within the clinic setting, even before it is taken for incineration, burial or other disposal, to protect clients, staff, and the community.

Waste from healthcare institutions may be non-contaminated or contaminated (studies in other countries have shown that approximately 85% of the waste generated in the hospitals is non-contaminated) (8)

In the current study done in United Arab Emirates, 58.2% of nurses believed that standard precautions are aimed at protecting Health care workers from getting infections from patients, 23.5% thought they are to prevent patients getting infected from Health care workers and 45.9% that they aimed to protect both Health care workers as well as patients from infections(7)

Study that is conducted in Bair Dar show that ,more than half of the respondents (55.6%) had positive attitude about infection prevention. In spite of this fact significant number of Health care workers in this study had negative attitude about infection prevention. (6)

2.1.5 Compliance to Cleaning linen, instruments processing and waste management practices and risk factors.

The study done in Bangladesh indicates that, length of service of 18.4% respondents is less than 5 years, of 26.4% is 5–10 years, of 31.2% is 10–15 years, and of 24% respondents is more than 15 years.(7). Of all the respondents, 61.6% had trained on hospital waste management, while 38.4% did not have training. A study is conducted in Nigeria by Akter et al. they reported that nurses, and laboratory technicians had no training on the handling and the disposal of medical waste. Of the 82 respondents 32 (38%) mentioned that they did not receive any training on handling medical waste. (3)

Only seven respondents mentioned that they received training, Among the respondents, 46.4% knew that waste produced by clinical care provider during providing care is hospital waste; 25.6% knew that waste produced by patient is hospital waste; 15.2% knew that waste produced by investigation department workers is hospital waste, and 12.8% knew that waste produced by cleaner and supporting staff is hospital waste. (3)

In the answer of knowledge about general waste only 4% gave all correct answers. More than half of the respondents did not know any of the general waste. In the answer of knowledge about infectious waste 6.4% gave all right answers. In the answer of knowledge about pharmaceutical waste only 8% gave all correct answers, and of knowledge about biomedical waste only 7.2% gave all correct answers.

The greater awareness on standard precautions among health care workers with longer years of experience in this study may be due to their participation in a greater number of seminars, conferences and training some of which may include standard precaution which not only encouraged safer work practices but also improved concordance with policy and procedures (3)

As study conducted in Addis Ababa, half (50%) of the respondents reported no knowledge on SPs; more than one third (37%) had average knowledge on standard precautions while 13% had

good knowledge. Knowledge on standard precautions is highest among women than men, and among nurses (85.5%) compared with other health workers(3).

Study that is conducted in Bangladesh showed that Knowledge about biomedical waste management rules among the technically qualified personnel like the doctors, nurses, and laboratory staff is satisfactory but is low among the housekeeping staff. Low level of knowledge is mainly attributed to poor training facilities and also to relatively low educational level of the staff.(18)

In Bangladesh, among the respondents self-opinions 88.8% said there is no good infrastructure for waste management; 95.2% said there is no logistic supply, and 92% respondents said there is no sufficient manpower for waste management and proper waste management facilities are not available in the study place. Bangladesh, an estimated 255 tons of medical waste is generated in Dhaka every day. Most of which is dumped in municipal bins.(17)

The study conducted in Bair Dair indicates the nurses had significantly positive attitude when compared to the technicians and the housekeeping staff ($P < 0.05$). In one of the study, it is also found that 98% of the nurses and 79% of the housekeeping staff had a positive attitude while only 59% of the technical staff had a positive attitude.(6) Training of both the technical staff and the nontechnical staff is critical for the proper and appropriate management of biomedical waste.(6)

According to the study conducted in Addis Ababa, decontamination-is the first step in handling used instruments and gloves. Immediately after use, all instruments should be placed in an approved disinfectant such as 0.5% chlorine solution for 10 minutes to inactivate most organisms, including HBV and HIV Soak in 0.5% chlorine solution for 10 minutes(10)

Study conducted in India regarding the transportation of bio-medical wastes among 58 medical practitioners who segregate the bio-medical waste 44 respondents (75.8%) said that the waste is collected from the facility for transport in plastic bags. Of the rest, 9(15%) selected closed containers, one by open container. Surprisingly 4 of them did not know anything about the collection and transportation process(18)

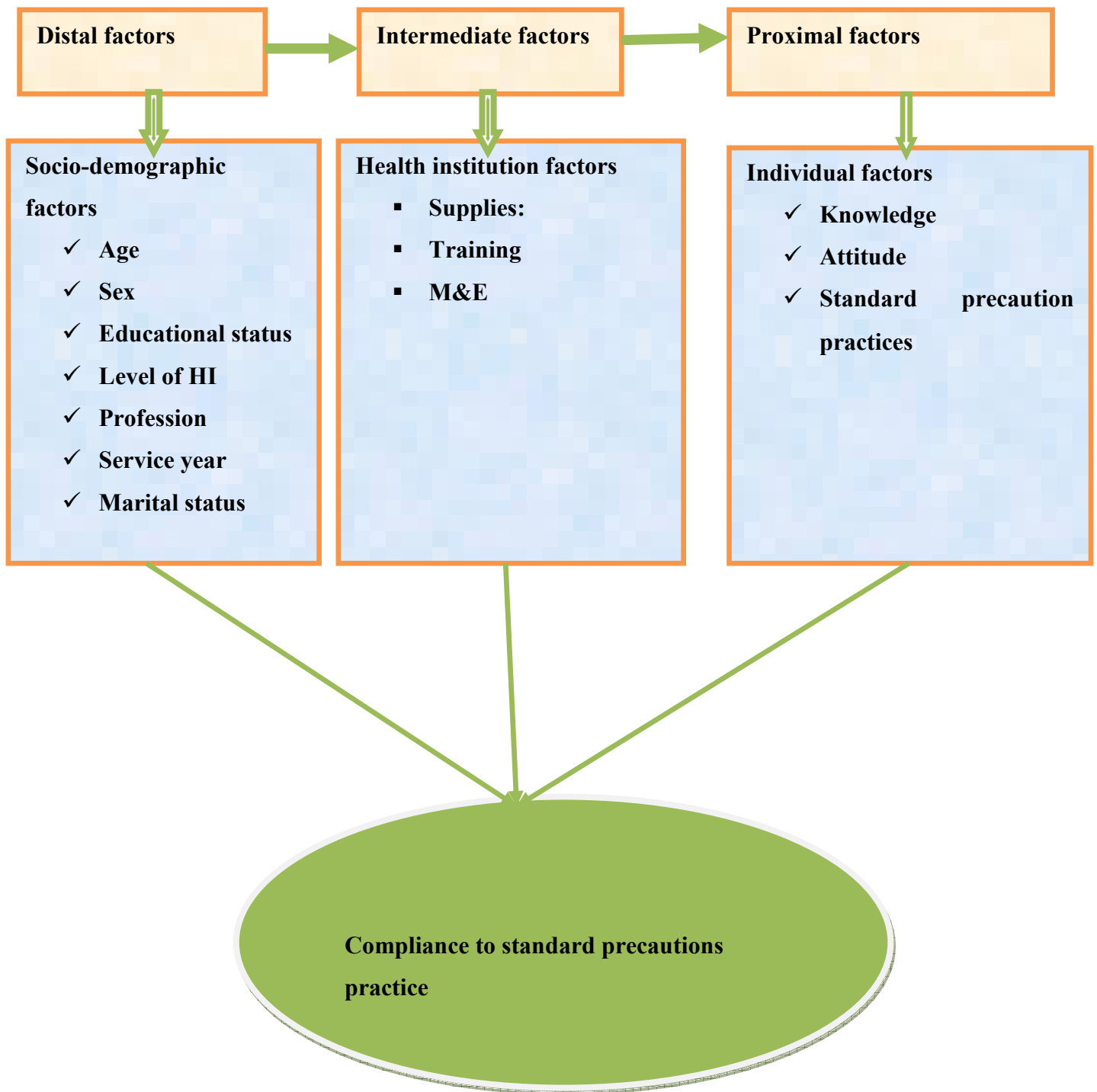


Figure 1. Conceptual framework(from infection prevention guide line)

2.2 Significances of the study

In countries with limited resource, it is important to develop the health care staffs knowledge, attitude and practice on standard precautions to comply to standard precaution practices, to minimize their risk of accidental exposure or injuries and provide safe service to clients .

Health care workers, planners ,managers and evaluators should not ignore this high morbidity and life threatening infection situation. On top of these, unless appropriate standard precaution is in practice health care institutions can be the source of infection and epidemic disease for the community at large. Yet ,very few studies are conducted in Ethiopia to assess compliance to standard precaution practices of health care workers and associated risk factors in health institution. Therefore, this study is designed to assess compliance to standard precaution practices and identify the behavioral determinants for safe or unsafe practice.

The proposed study would have a significant input in identifying and improving standard precaution practices at the health institution level in the study area and in the community at large.

Risks of accidental exposure or injuries will be minimized and health care staffs can provide safe service to clients. Health institutions will not become the source of infection and epidemic disease for the community at large.

SPs practices will be one of the areas which get attention of health care providers, programmers and evaluators. Health care institutions will not become the major health risks that leads to morbidity, mortality and cost(time and human power).

3. Objectives:

3.1 General objective.

To assess compliance to standard precaution practice and associated factors among public health care workers in East Arsi Zone,2015

3.2 Specific objectives

- To assess compliance to standard precautions practices.
- To identify factors associated with compliance to standard precaution practice among public health workers

4. Methods

4.1 Study area and period

The study was carried out in East Arsi Zone, Oromia Regional State, located in the South eastern part of Ethiopia on 215km away from Addis Ababa.

There were 1,389 health care workers who had been working in the health institutions and the study was conducted from February 2015 to May 2015.

4.2. Study design

Institution based cross-sectional study design was used

4.3. Population

4.3.1 Source population

All health care workers who were currently working in health institutions in Arsi Zone during data collection time.

4.3.2 Study population

Healthcare workers (Surgen, Internist, Gyn&Obstetrician, Paediatrician, GP, Dentistry, BSC Nurse, HO, Diploma Nurse, Midwives of all types and Laboratory technicians,) and supportive staff (housekeeping personnel, and laundry personnel) who were currently working and directly exposed to infections in randomly selected health institutions in Arsi Zone during data collection time.

4.3.3. Inclusion Criteria

Selected health care workers who were currently on their work at health institutions in the Arsi Zone.

4.3.4. Exclusion Criteria:

Head of health institutions.

4.4. Sample size determination and sampling procedure

Sample size was determined using a single population proportion formula using the following assumptions: A 5% significance level, 5% margin of error, 95% confidence interval and prevalence 50% (Proportion of health care workers who complied with standard precaution practice)

$$N = \frac{[Z_{\alpha/2}]^2 pq}{d^2} = 384$$

where :-

$$n = \text{minimum sample size} = 384$$

$P = 50\%$ (Proportion of health care workers who complied with standard precaution practice)

d- Margin error =5%

$Z_{\alpha/2}$ value -standardized normal distribution at $1-\alpha$ % significance level=1.96

But since the total number of health care workers in study area was less than 10,000, the finite population correction formula was used to determine sample size

$$n_f = n / [1 + n/N]$$

Where :-

n_f = final sample size

N = total health care workers in the health institutions .

n = minimum sample size=384

$n_f = 384 / [1 + (384/1389)] = 299$ Adding 5% of 299=15 study participants, the final sample size is 314. Therefore, the required samples sizes is 314 health care workers.

4.5. Sampling procedures

The sampling frame consists of two hospitals(Assela referral Hospital and Robe district Hospital) and 29 health centers. Sampling frame of each health care worker was prepared in Hospitals and Health centers. Then, proportional allocation to the size of study participants to each Hospitals and Health centers was used to determine 314 health care workers participating in the study.

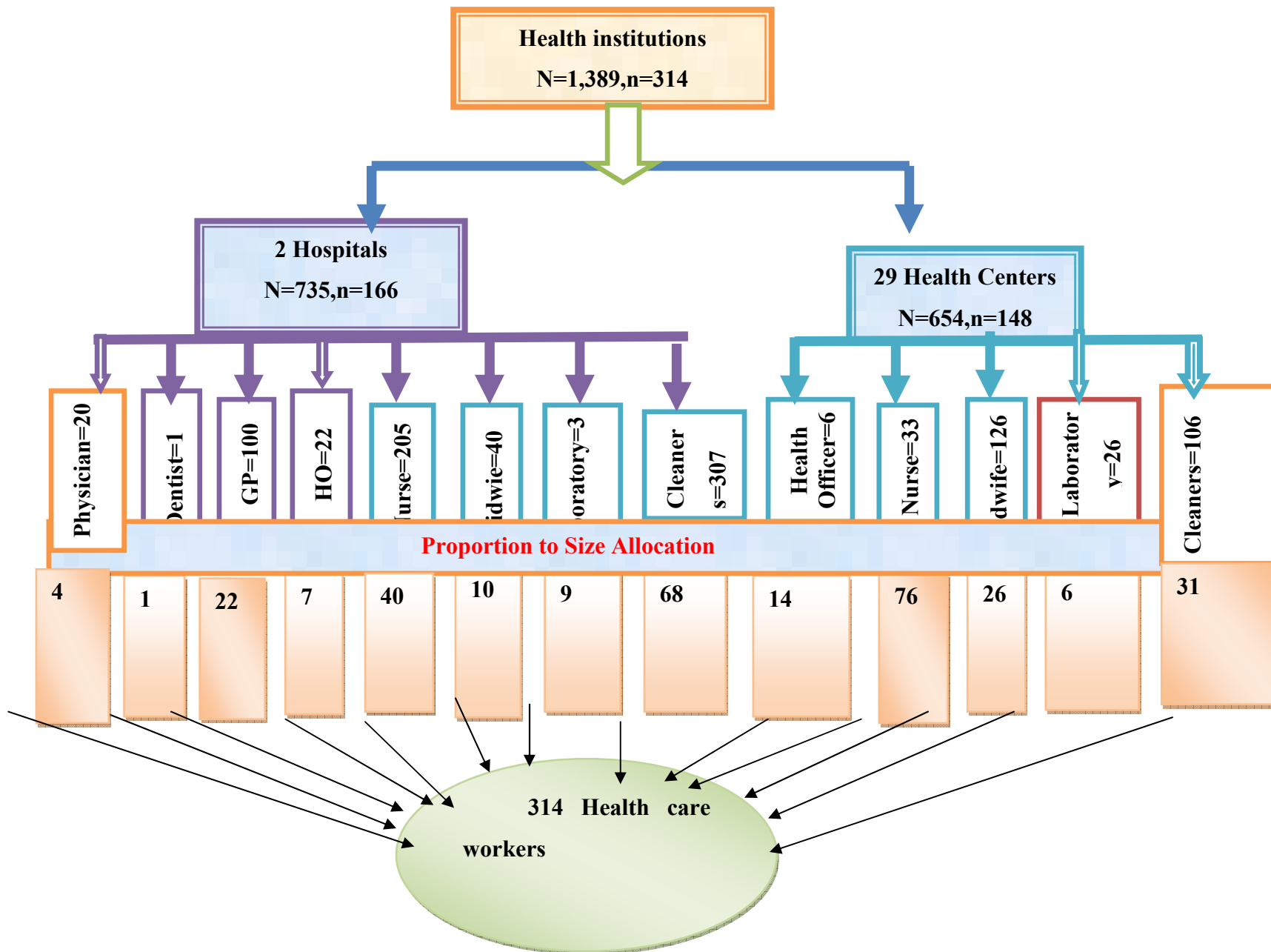


Figure 2: Schematic presentation of sampling procedure

4.6 Data Collection procedure

Quantitative methods of data collection was employed.

Assessment of compliance to standard precaution practice of health care workers on standard precaution by using face to face interview structured questionnaire that is adopted from different literatures and infection prevention guidelines ,five Bsc nurse for data collectors and one HO as supervisors for five days were used (10) .

4.7. variables

4.7.1. Dependent variables

Compliance to standard precaution practices

4.7.2. Independent variable

- **Socio demographic risk factors:** Age, sex, year of service, educational status, profession ,level of health institutions, marital status.
- **Health institution related factors/issues:** supply(personal protective devices, water, availability of antiseptics ,safety boxes ,and syringes with needles. ,monitoring and evaluation.
- **Individual factors:** knowledge, Attitude, standard precaution practices(hand hygiene ,Personal protective equipments, Injection safety, handling and disposing sharps, instrument processing and waste management)

4.8. Measurements

knowledge on standard precautions -There were 17 questions to assess knowledge of health care workers on standard precautions. All correct answers were given a score 1 and 0 for all incorrect answers and score > mean score 51.5% related to knowledge was considered as knowledgeable.

Attitude towards standard precautions-These 14 questions were based on attitude of health care workers on standard precautions. There were attitude questions based on Likert's scale type.

Scores for positive statements were given from 5-1 (5-Strongly agree to 1-Strongly disagree) and statements were recoded for the purposes of analysis.

All individual answers were summed up to obtain mean scores 27.6%, dividing all participants into two groups (Positive attitude and Negative attitude). Likert's scale was applied to measure the attitude. All individuals answers was computed to obtain total scores and calculated for means. The mean score was used to divide the participants into two groups that were positive group, and negative group. Respondents who scores > 27.6% correct answers was classified as positive attitude.

Standard precaution practice-There were 23 questions included to assess practice of health care workers on compliance to standard precaution practices. Participants were asked to rate from 1-5 (1-Never, 2-rarely, 3-Sometimes, 4-Often, 5-Very often). Mean score was used to classify the observed frequencies (poorly practiced and Practiced) on standard precautions was obtained by using face-to-face interview..

The mean score was used to divide participants into two groups. The highest level of practices was considered score > 63.7%, practice < 63.7% poorly practiced.

4.9. Data processing and analyses

Data was edited, entered; cleaned and analyzed using SPSS version 20. Descriptive statistics like mean, standard deviations, frequency tables, chi-squared test was done. Then, binary logistic regression was used to identify candidate variable at p-value 0.25 for multivariable logistic regression to identify predictors of compliance to standard precaution practices. Possibility of

multicollinearity between independent variables was checked before running multivariable logistic regression. P- Value < 0.05 was used to declare statistical significance and finding was presented using odds ratio and their 95% confidence intervals.

4.10. Operational definitions.

Attitude towards standard precautions-is belief and intention to follow the principles of standard precautions by health care workers.

Likert's scale was applied to obtain total scores and calculated for means. The mean score :

positive group-----scores>27.3%

negative attitude-----<27.6% correct answers

compliance - the extent to which certain behavior (for example, following physician's orders or implementing healthier lifestyles) is in accordance with the physicians' instructions or health care advice(Infection prevention guide lines).

Compliance to standard precautions practices: Compliance to standard precautions practices was determined using the modified standard precautions questionnaires, i.e. using questions related to practices of health care workers to standard precautions.

Rating questioners were included from 1-5(1never ,2Seldom,3 Sometimes,4-Often,5-Very often)

Scores more than "mean score" 64%,was considered compliance to standard precaution practices and scores less than "mean score" was considered as poor compliance to standard precaution practices.

Enough supply-always available for all health care workers..

Hand hygiene (practiced)- those health care workers who performed hand hygiene practices >15.05 mean score.

Handling sharps(practiced)- those health care workers who performed handling sharps >9.7 mean score.

Health care workers - those health care workers, who do have contact with syringes, needles, other sharp materials, blood and body fluids by the virtue of their duties. there: technical staffs: (Surgen,Internist,Gyn&Obstatrcian,Paedatercian,GP,Dentistry, BSC Nurse ,HO, Diploma Nurse ,Midwives of all types and Laboratory technicians,) and supportive staff (housekeeping personnel, and laundry personnel).

Health care providers- health care workers besides other health care giver(other technical staffs and supportive staffs).

Health Institutions -Zonal hospital, district hospitals and health centers which delivers health services to the patients.

Injection safety(practiced)- those health care workers who performed safe injection practices >11.31 mean score.

Instrument processing waste management(practiced)- those health care workers who performed instrument processing waste management >14.37 mean score

Over prescribing injection-repeatedly giving medication parent rally more than other routes.

Routine hand washing-Frequent using of plain soap and clean water after ,before and in between any contacts.

Personal protective equipment(practiced)- those health care workers who performed/used personal protective equipment >11.16 mean score.

Sharps -Suture needles, scalpel blades, scissors, wire sutures, broken glass or any object that can cause a puncture or cut.

waste management -All activities, administrative and operational (including transportation activities), involved in the handling, treatment, storage and disposal of waste.

4.11. Ethical consideration

The ethical approval and clearance was obtained from ethical review board of JU ,College Public Health and Medical science Research and Publication Committee.

Permissions was obtained from the concerned bodies of Arsi Health Office, Worde Health Offices and selected Health institutions.

Written consent was taken from each selected participant and head of the health institution to confirm willingness and those not willing was given the rights to do so.

Confidentiality was ensured throughout the process. Before administering the questioner the study subjects was informed about the purpose and significances of the survey to get the consent of the respondents the procedure

4.12. Dissemination plan.

The finding of this study will disseminated to Jimma University Epidemiology department, College of public Health and Medical science , EPHA (Ethiopian public Health Association) and MOH (Ministry of Health) of Ethiopia. Oromia Regional State Health Bureau and Arsis Zone Health Office will supplied with a copy of the research. Furthermore, the finding will be presented on appropriate seminars, conferences and workshops. And publishing with scientific journal will be considered one of the study finding.

4.13 Data quality control

Five data collectors(Bsc nurse) and one supervisors (HO)were recruited and training was given for one day on how to collect data, confidentiality and how to control missing values Measurements and responses were crosschecked for missed, irregularities, inconsistencies, and unlikely response .To maintain the quality of the data and avoid any problem the researcher and the supervisors crosscheck by recollecting data from 5% of the study population.

5.Results

5.1. socio-demographic characteristics

In this study, a total of 300 (95.5%) health care workers were participated in the study and 192(64%) health care workers complied to standard precaution practices From health care workers who complied to standard precaution practice ,60(56%) health care workers who poorly complied and complied 91(47%,)to standard precaution practices were found in age group 25-30years.

Concerning sex ,there were 97(51%) female and 95(49%) male health care workers who complied to standard precaution practices in this study. Regarding profession ,there were 101(93%) poorly complied and 107(56%) complied non-technical health care workers in the study.

Concerning educational status,191(99%) who complied to standard precautions practices were health care workers who had degree above where as 74(69%) poorly complied health care workers were those who had diploma and below. Among health care workers who participated in this study,59(51%) who poorly complied and 86(45%) complied to standard precaution practices were found in the service category of 2-5years and 54(50%) who poorly complied ,and114(59%) complied were from health centers. Among health care workers ,77(71%) who poorly complied and128(67%) complied to standard precaution practices were married individuals

The age category 25-30years (p-value=0.09), \geq 31years (p-value =0.003),female (p-value =0.0001),technical (p-value =0.0001),2-5years of services(p-value =0.05), \geq 6 service years(p-value=0.19) and Assela zonal teaching hospital (p-value =0.14),married (P-value =0.21 and separated (P-value = 0.08) were candidate for multivariable logistic regression on Bivariate analysis.(Table 5-1.)

Table 1. Socio-demographic characteristics of health care workers in East Arsi zone, Oromia region, 2015.

Explanatory variables	Compliance to standard precaution practice		p-value	COR (95%CI)
	Poor compliance(n=108)	Compliance(n=192)		
	Number (%)	Number (%)		
Age category				
<25 years	16(15)	12(6)		1
25-30 Years	60(55)	91(48)	0.09	2.02(0.89,4.57)
≥31 years	32(30)	89(46)	0.003	3.71(1.58,8.68)
Sex				
Male	22(20)	95(49)		
Female	86(80)	97(51)	0.0001	0.26(0.15-0.45)
Profession				
Technical	7(6)	85(44)	0.0001	11.46(5.06-25.96)
Non technical	101(94)	107(56)		1
Education Status				
Degree and above	34(30)	191(99)	0.51	43.5(58.47-57.47)
Diploma and below	74(70)	1(1)		1
Years of service category				
<2 years	7(6)	25(13)		1
2-5 years	59(55)	86(45)	0.05	0.41(0.17,1.00)
≥6 years	42(39)	81(42)	0.19	0.54(0.22,1.35)
Level of health institutions				
Assela zonal hospital	43(40)	62(32)	0.14	0.68(0.41-1.13)
Arsi Robe district hospital	11(10)	36(19)	0.38	0.68(0.30-1.58)
Health centers	54(50)	94(49)		1
Marital status				
Single	26(24)	61(31)		1
Married	77(71)	128(67)	0.21	0.71(0.41,1.21)
Separated	4(4)	2(1)	0.08	0.21(0.04,1.24)
Widowed	1(1)	1(1)	0.55	0.41(0.03;7.08)

5.2. Individual characteristics

Regarding knowledge of health care workers on standard precaution practice, 82(76%) of health care workers who poorly complied to standard precaution practice had poor knowledge while 177(92%) health care workers who complied to standard precaution practice were knowledgeable.

Regarding attitude of health care workers on standard precautions ,71(65%)who poorly complied to standard precautions were those who had negative attitudes on standard precautions where as 71(66%) who complied to standard precautions were those who had positive attitudes on standard precautions. Regarding hand hygiene practices,100(93%) who poorly complied to standard precaution practices were those who poorly practice hand hygiene technique where as 167(87%) who complied to standard precautions practices were those practiced hand hygiene technique.

Those health care workers ,78(72%) who poorly complied and 196(99%) complied to standard precautions practices were those health care workers who practiced personal protective equipments. Regarding injection safety practices, health care workers 191(99%) who complied to standard precautions practices were those health care workers who practiced injection safety. Health care workers ,117(61%) who complied to standard precautions practices were those health care workers who practiced or handled sharps safely. Regarding Instrument processing and waste management practices, those health care workers,90(83%) who poorly complied to standard precautions practices were those health care workers who poorly practiced instrument processing and waste management but those health care workers 189(96%) who complied to standard precautions practices were those health care workers who practices instrument processing and waste management

From individual factors category, knowledgeable (p-value=0.0001),Positive attitude (p-value=0.0001),practiced hand hygiene (p-value =0.001),personal protective equipment(p-value =0.0001),safety injection(p-value =0.0001), handling sharps(p-value =0.003) and instrument processing and waste management(p-value =0.0001) were candidate for multivariable logistic regression on bivariate analysis.

Table 2. Individual characteristics of health care workers in East Arsi zone ,Oromia region,2015.

Explanatory variables	Compliance to standard precaution practice		p-value	COR (95%CI)
	poor compliance(n=108)	Compliance(192)		
	Number(%)	Number(%)		
Knowledge category				
poor knowledge	82(76)	15(8)		1
Knowledgeable	26(24)	177(92)	0.0001	32.21(18.72-74.00)
Attitude category				
Negative	71(66)	48(25)		1
Positive	37(34)	144(75)	0.0001	5.76(3.44-9.63)
Hand hygiene practice category				
poorly practiced	100(93)	25(13)		1
Practiced	8(7)	167(87)	0.0001	12.13(6.88-21.37)
PPE practice category				
poorly practiced	30(28)	2(1)		1
Practiced	78(72)	190(99)	0.0001	0.03(0.01-0.12)
Injection safety practice category				
poorly practiced	77(71)	1(1)		1
Practiced	31(29)	191(99)	0.0001	14.21(4.42-27.12)
Handling sharps practice category				
Poorly practiced	56(52)	75(39)		1
Practiced	52(48)	117(61)	0.35	0.80(0.50-1.28)
Instrument processing and waste management practice category				
poorly practiced	90(83)	8(4)		1
Practiced	18(17)	184(96)	0.0001	0.01(0.001-0.02)

5.3. Health institution factors.

Among health care workers who reported that there were enough supplies at their health institutions 70(65%) health care workers poorly complied to standard precautions practices while 129(67%) complied to standard precautions practices.

Regarding training, 103(54%) those health care workers who complied to standard precautions practices were those who got training on standard precautions where as 81(75%) those who poorly complied were those who did not get training on standard precautions .

Concerning monitoring and evaluation,95(88%) health care workers who poorly complied to standard precautions practices were those who reported that there were no monitoring and evaluation on standard precautions, where as 152(79%)who complied to standard precaution practices were those who reported that there were monitoring and evaluation on standard precautions..

Enough supply (P-value=0.0001) and training on standard precautions (p=0.0001) candidate multivariable logistic regression on Bivariate analysis.

Table 3 Health institution factors of health care workers in East Arsi zone, Oromia region,2015.

Explanatory variables	Compliance to standard precaution practice		p-value	COR (95%CI)
	poor compliance(n=108)	Compliance(n=192)		
	Number(%)	Number(%)		
Supplies to apply standard precautions				
Yes	70(65)	129(67)		1
No	38(35)	62(33)	0.0001	0.29(0.17;0.48)
Training on standard precautions				
Yes	27(25)	103(54)		1
No	81(75)	89(46)	0.0001	3.47(2.06;5.84)
Monitoring and Evaluation on standard precautions				
Yes	13(12)	152(79)	0.56	1.92(0.98;3.78)
No	95(88)	40(21)		1

4. Multivariate analysis of factors associated with Compliance to standard precaution practice

In this study, a total of 300 (95.5%) health care workers participated in the study and 109(36%) health care workers poorly complied to standard precaution practices where as 192(64%) health care workers complied to standard precaution practices

Regarding health care workers service year, health care workers who had 2-5 service years AOR=0.17, 95%CI: (0.04,0.80) and ≥ 6 service years AOR=0.18, 95%CL: (0.02,0.58) were 0.17 times and 0.18 times more likely complied to standard precaution practice compared to those health care workers who had below 2 service years respectively.

Regarding knowledge of health care workers on standard precaution practices, those health care workers who were knowledgeable AOR=14.86,95%CI;(5.32,41.27) were 14.86 times complied to standard precaution practice compared to those health care workers who had poor knowledge about standard precaution practices.

Regarding attitudes of health care workers on standard precaution practices those health care workers who had positive attitude AOR=2.42, 95%CI: (1.02,5.84) 2.42times complied to standard precaution practices compared to those who had negative attitudes on standard precaution practices.

Regarding instrument processing and waste management practice ,those health care workers who practiced instrument processing and waste management activities AOR=11.26, 95%CI: (5.08,32.51) were 11.26 times complied to standard precaution practices compared to those who poorly practiced instrument processing and waste management .

Concerning hand hygiene practices, those health care workers who practiced hand hygiene technique AOR=14.45, 95%CI: (5.57,37.50) were 14.45 times complied to standard precaution practices compared to those who poorly practices

Table.4 Multivariable analysis of factors associated with Compliance to standard precaution practice

Explanatory variables	Compliance to standard precaution practice		COR (95%CI)	P-value	AOR (95%CI)
	poor compliance (n=108)	Compliance (n=192)			
	Number(%)	Number(%)			
Knowledge category					
poor knowledgeable	81(75)	3(2)	1		1
Knowledgeable	27(25)	189(98)	32.21(18.72,74.00)	0.0001	14.82(5.32,41.27)
Hand hygiene practice category					
poorly practiced	100(93)	25(13)	1		1
Practiced	8(7)	167(87)	12.13(6.88,21.37)	0.0001	14.45(5.57,37.50)
Instrument processing and waste management practice category					
poorly practiced	90(83)	8(4)	1		1
Practiced	18(17)	184(96)	0.01(0.001,0.02)	0.0001	11.26(5.08,32.51)
Attitude category					
Negative	84(78)	35(18)	1		1
Positive	24(22)	157(82)	5.76(3.44-9.63)	0.0001	2.42(1.01,5.84)
Service year category					
<2years	7(6)	25(13)	1		1
2-5years	59(55)	86(45)	0.41(0.17,1.00)	0.02	0.17(0.04,0.80)
≥6years	42(39)	81(42)	0.54(0.22,1.35)	0.01	0.12(0.02,0.57)

6. Discussion

This study showed that from health care workers who were participated in the study 36% health care workers poorly complied to standard precaution practices where as 64% health care workers complied to standard precaution practices. This findings is different from the study conducted in Mekele which showed that from health care workers who participated in the study 43% health care workers complied to standard precaution practices(4).The possible reason for this finding might be due to difference in socio demographic factors and accessibility. This implies that lack of recognizing perceived seriousness of chronic infection in this population.

This finding showed that health care workers who had below 2 service years AOR=8.55 and 2-5 service years AOR=1.48 were 8.55 and 2.5 times more likely complied to standard precaution practice compared to those health care workers who had six and above service years. This finding almost in line with study done in Mekele (AOR=2.5) the odd of complying to standard precaution practices was 2.5 times higher in young age more than health care workers of older age (4,6).

The reason for this most likely recent memory ,strong commitment and fear of nosocomial infection but the finding was inconsistent with the study done in Bihar Dar ,that was ,health care workers who had working experience greater than10years AOR=1.48 the odd of complying to standard precaution practices was 1.48 times higher than the younger health care workers.(3,6).This discrepancy might be due to the greater compliance to standard precaution practices among health care workers with longer years of experience due to their participation in a greater number of seminars, conferences and training some of which may include standard precautions which not only encouraged safer work practices but also improved concordance with policy and procedures

.Concerning hand hygiene practices, those health care workers who practiced hand hygiene technique AOR=14.45 were14.45 times complied to standard precaution practices compared to those who. poorly complied .In this finding, there were 87% Health care workers who complied to standard precaution practices that had practiced hand hygiene techniques. This finding is almost in line with study done in Pune (India) that was 85% health care workers who complied to standard precaution practices had practiced hand hygiene techniques (14).

The reasons for this were most likely good health institution infrastructure ,availability of needed supplies ,fear of chronic infections like Hepatitis B virus ,Hepatitis C virus and HIV/AIDS virus and Organizational promotion and support keep hand hygiene programs, modify hand hygiene behavior (e.g., education, training and motivation),address overcrowding and understaffing and improve infrastructure. This implies that fear of infections ,supplies, monitoring and evaluations were the important pre-requisites to practice hand hygiene technique.

Regarding knowledge of health care workers on standard precaution practices, those health care workers who had knowledge AOR=14.86 were 14.86 times complied to standard precaution practice compared to those health care workers who had poor knowledge about standard precaution practices and 98% health care workers who complied to standard precaution practices had knowledge on standard precaution practices This finding is different from the study done in Behir Dar(84%), Addis Ababa (50%) and United Arab Emirates (75%) health care workers who complied to standard precaution practices had knowledge about standard precaution practices (6,7,10)

The reasons were most likely health care workers might get access to read guide lines on different standard precautions ,upgrade their educational level and have got in-service training to comply standard precaution practices .It implies upgrading educational level, in-service training and fear of infection were needed to get knowledge.

Concerning attitudes of health care workers on standard precaution practices, those health care workers who had positive attitude AOR=2.42 were 2.42 times complied to standard precaution practices compared to those who had negative attitudes on standard precaution practices. In this study,82% health care workers who complied to standard precaution practices had positive attitudes on standard precaution practices. This finding is inconsistent with study done in Behir Dar which shows that 56% health care workers who complied to standard precaution practices had positive attitude on standard precaution practices (6).

The reasons most likely information gap, supplies ;good health institution infrastructure ,training and good chance to upgrade education level

Limitations of the study

Respondent bias and interviewer bias

7. Conclusion and recommendation

7.1 Conclusion

In this study, a total of 300(95.5%) health care workers participated in the study and 109(36%) and 192(64%) health care workers poorly complied and complied to standard precaution practices respectively.

From this study we concluded that those health care workers who had service years 2-5 , found in the age group 25-30 years, had knowledge and positive attitudes on standard precaution practices and those health care workers who practiced hand hygiene technique ,personal protective equipments; safety injection, handling sharps and instrument processing and waste management's complied standard precaution practices than those who poorly complied standard precaution practices.

Those health care workers who reported that there were enough supplies in their health institutions ,those who got training and monitored and evaluated complied to standard precaution practices than those who did not get

The majority of the study participants who complied to standard precaution practices were married ,females ,technical staffs, and those who had degree and above

7.2 Recommendations

Though participants had better knowledge and positive attitude towards standard precautions their practice of complying to standard precaution practices was not optimum as per the national guide line.

Therefore improving institutional supplies like hand hygiene material, PPE, water supply and different sterilizers and disinfectants improve standard precaution practice. The studied Health institutions should integrate standard precaution practices with routine works and improving sustainable supplies like PPE, water supply and hand washing facilities at patient care site to correct the unsafe practice, and encouraging the health care workers to use personal protective equipment .Arsi zone administration office should supervise, monitoring and evaluate healthcare workers standard precaution practice as one of health service activities. Oromia health berou should also improve the pre service training with adequate time and durations for immediate engagement of the new employee to standard precaution practice

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9. Annex

Table 5: Proportion to size allocation of study participants in Arsi zone, 2015

Ser. No	Health Institution		Health care workers													Total	n*Nj/N
			Surgeon	Inferni2st	Gyn&Obstatrcian	Paedatercian,	GP	Dentistry	BSC Nurse	Health Officer	Diploma Nurses	Midwifes of all types	Laboratory technicians	housekeeping personnel	laundry personnel		
1	Assela referral Hospital	N	6	5	6	6	90	1	30	20	115	25	30	230	20	584	139
		n*Nj/N	1	1	1	1	20	1	6	6	24	6	7	50	6	139	
2	.Robe district Hospital	N					10		10	2	50	15	8	42	15	151	36
		n*Nj/N					2		2	1	10	4	2	8	4	38	
3	Adele HC	N							0	2	11	6	2	4	0	25	5
		n*Nj/N							0	1	2	1	1	1	0	6	
4	Robe HC	N							2	2	10	6	1	4	0	25	5
		n*Nj/N							1	1	5	1	1	1	0	6	
5	.Huruta HC	N							3	4	12	5	2	4	0	30	7
		n*Nj/N							1	1	2	1	1	1	0	7	
6	.Seru HC	N							2	2	10	4	2	3	0	33	8
		n*Nj/N							1	1	2	1	1	1	0	7	
7	Bale HC	N							2	2	8	4	2	4	0	22	5
		n*Nj/N							1	1	2	1	1	1	0	7	
8	Ticho HC	N							2	2	6	4	2	4	0	20	5
		n*Nj/N							1	1	1	1	1	1	1	7	
9	Tena HC	N							2	2	6	4	2	4	0	20	5
		n*Nj/N							1	1	1	1	1	1	1	7	
10	Sude HC	N							2	2	5	3	2	3	0	17	4
		n*Nj/N							1	1	1	1	1	1	0	6	
11	Lode Hetosa HC	N							2	2	8	4	2	4	0	22	5
		n*Nj/N							1	1	2	1	1	1	0	7	
12	Huruta HC	N							2	2	8	4	2	4	0	22	5
		n*Nj/							1	1	2	1	1	1	0	7	

		N															
13	Sire HC	N						2	2	7	3	2	4	0	20	5	
		n*Nj/ N						1	1	1	1	1	1	0	6		
14	Iteya HC	N						2	2	10	4	2	4	0	24	5	
		n*Nj/ N						1	1	1	1	1	1	0	7		
15	Gonde HC	N						2	2	7	4	2	3	0	20	5	
		n*Nj/ N						1	1	1	1	1	1	0	6		
16	Boru Jawi HC	N						2	2	6	5	2	3	0	20	5	
		n*Nj/ N						1	1	1	1	1	1	0	6		
17	Sagure HC	N						2	2	10	5	2	4	0	26	7	
		n*Nj/ N						1	1	2	1	1	1	0	7		
18	Mnesa HC	N						3	2	8	5	2	3	0	23	5	
		n*Nj/ N						1	1	1	1	1	1	0	6		
19	Honkolo Wabe HC	N						2	2	6	4	2	3	0	19	3	
		n*Nj/ N						1	1	1	1	1	1	0	6		
20	Abomsa HC	N						2	2	8	4	2	4	0	22	5	
		n*Nj/ N						1	1	1	1	1	1	0	6		
21	Asako HC	N						2	2	6	5	2	4	0	21	5	
		n*Nj/ N						1	1	1	1	1	1	0	6		
22	Shirka HC	N						2	2	6	4	2	4	0	20	5	
		n*Nj/ N						1	1	1	1	1	1	0	6		
23	Sage HC	N						2	2	10	6	2	4	0	26	6	
		n*Nj/ N						1	1	2	1	1	1	0	7		
24	DiksisHC	N						2	2	10	4	2	3	0	23	8	
		n*Nj/ N						1	1	1	1	1	1	0	6		

25	Dera HC	N							2	2	12	4	2	4	0	26	7
		n*Nj/ N								1	1	2	1	1	1	0	7
26	Assela HC	N							2	3	12	5	2	4	0	28	7
		n*Nj/ N								1	1	2	1	1	1	0	7
27	Chole HC	N							2	2	8	4	2	3	0	21	5
										1	1	1	1	1	1	0	6
28	Halila HC	N							2	2	6	3	2	3	0	18	5
		n*Nj/ N								1	1	1	1	1	1	0	6
29	Gololch HC	N							2	2	7	4	2	4	0	21	5
		n*Nj/ N								1	1	1	1	1	1	0	6
30	Habura HC	N							2	2	5	4	2	3	0	18	5
		n*Nj/ N								1	1	1	1	1	1	0	6
31	Mert HC	N							1	2	8	5	2	4	0	22	6
		n*Nj/ N								1	1	1	1	1	1	0	6
	Total	N	6	5	6	6	100	1	100	89	433	166	64	378	35	1389	314
		n*Nj/ N	2	2	2	2	24	1	24	21	104	40	15	91	8	314	

10. Questioner English version

Informed Consent Form for Quantitative face to face interview questionnaires:

100A. Name of health institution

100B. Date _____ 100C. Time started-----

100D. Department----- 100E. Code number of the checklist

Hallo! Good morning?

My name is Sr./ Ato -----.

Today I am here to collect data on **"the assessment compliance to standard precaution practices and risk factors associated with it"**.

The objective of this questionnaire is to assess compliance to standard precaution practices and risk factors associated with it among healthcare workers in East Arsi Zone.

I would like to assure you that the study is confidential. I will not keep a record of your name and address. You have a right to stop the interview at any time, or to skip any question that you do not want to answer. Your correct answer to the questions can make the study achieve the goals. Therefore, you are kindly requested to respond genuinely and voluntarily with patience.

The interview may take about ----- minutes.

Do you have any question?

Are you willing to participate in the interview?

Yes, Go to the next page

No, Thank them and interrupt the interview

Signature of the consenting interviewer-----

100F. Result of the interview: 1. Completed 2. Partially completed

3. The interviewee refused 4. Others-----

Data collector's Name:----- Signature -----

Supervisor's name----- Signature -----

Part-1.Socio-demographic factors (Give response by "circling" the number)

S/No	Question related to knowledge.	Response
101	Level of Health Institution	1. Zonal hospital 2. District Hospital 3. Health center
102	Age	-----
103	Sex	1. Male 2. Female
104	Profession	1.Surgeon 2.Internist 3.Obs&gynecologist 4.Pediatricians 5.Dentistry 6.GP 7.Health Officer 8.Bsc Nurse 9.Diploma Nurse 10.Midwives of all types 11.Lab technicians 12.Housekeeping personnel 13.Laundry personnel
105	Education Status .	1.Grade 1-8 2 .Grade 9-12 3.Diploma and above
106	Years of service	-----
107	Marital status	1. Single 2. Married 3. Separated 4. Widowed

Part-2. Health institution factors. (Give response by "circling" the number)

S/ No	Question	Response				Skip To
		Yes	No	Not Available	I do not know	
208	Is there enough supplies to apply standard precautions?	1	2	88	99	2→212 88→212 99→212
209	If "1" ,what are they?					
	1.water	1	2	88	99	
	2.Soap	1	2	88	99	
	3.Alcohol	1	2	88	99	
	4.others	1	2	88	99	
210	Did you take training on standard precautions?	1	2	88	99	2or88or 99→214
211	If" 1 "on which standard precautions did you take training?					
	1.Hand hygiene	1	2	88	99	
	2.Personal protective equipment	1	2	88	99	
	3.Safe injection practices	1	2	88	99	
	4.Handling and disposing sharps	1	2	88	99	
	5.instrument processing and waste managements	1	2	88	99	
212	Is there M&E on standard precautions?	1	2	88	99	

Part-3.Individual characteristics(Give response by "circling" the number)

S/ No	Question	Response			skip
		Yes	No	I do not know	
313	Do you know when you have to wash your hands?	1	2	99	2 or 99-->317
314	If "1" When do you wash your hands?				
	1. Before commencing the Procedure	1	2	99	
	2.Before any contacts	1	2	99	
	3 Before completing the procedure	1	2	99	
	4.After any contacts	1	2	99	
315	Do you know what can be used to keep your hand hygiene?	1	2	99	2 or 99→319
316	If"1" What do you use to keep your hand hygiene?				
	1. Plain water	1	2	99	
	2. Antimicrobial soap and water	1	2	99	
	3.Any Alcoholic solutions	1	2	99	
	4. Surgical hand scrub	1	2	99	
	5.Any water	1	2	99	
317	Can you list Hand hygiene techniques?	1	2	99	2 or 99→321
318	If"1" what are they?				
	1. Routine Hand washing	1	2	99	
	2.Using gloves and hand antiseptis	1	2	99	
	3. Antiseptic Hand rub	1	2	99	
	4. Surgical Hand scrub and using surgical gloves	1	2	99	
319	Can you mention the Steps that increase the chances of success of the staff towards hand washing?	1	2	99	2 or 99→323
320	If"1" wha are they?				
	1. Widely disseminating current guidelines for hand hygiene practices	1	2	99	
	2. Making available alternative options like waterless alcohol-based hand rubs.	1	2	99	
	3.Strong punishments.	1	2	99	
321	Do you know the aim of standard precaution?	1	2	99	2 or 99→325
322	If"1" what are they?				
	1. protecting Health care workers from getting infections from patients	1	2	99	

	2.to prevent patients getting infected from Health care workers	1	2	99	
	3.aimed only to protect Health care workers from infections	1	2	99	
	4.to get incentives	1	2	99	
323	Do you know Personal protective equipments?	1	2	99	2 or99→327
324	If"1"what are they?				
	1.Gloves	1	2	99	
	2.spread sheets	1	2	99	
	3.Gowan	1	2	99	
	4.shirts	1	2	99	
325	Can you tell when do you use Personal protective equipments?	1	2	99	2 or99→329
326	If"1"when do you use them?				
	1.before touching anything potentially infectious and wet	1	2	99	
	2.After touching broken skin, mucous membrane, blood, body fluids, secretions or excretion or soiled instrument	1	2	99	
	3.before performing invasive procedures.	1	2	99	
	4.Before touching any person	1	2	99	
327	Do you know the types of gloves that can be used during surgical procedure?	1	2	99	2 or99→331
328	If"1"what are they?				
	1.Disposable clean examination gloves	1	2	99	
	2.Sterile surgical glove	1	2	99	
	3.High-level disinfected surgical gloves	1	2	99	
	4.Utility gloves	1	2	99	
	5.Any available gloves	1	2	99	
329	Do know how do you prevent needle stick or sharp injuries?	1	2	99	2 or99→333
330	If"1"how do you prevent needle stick or sharp injuries?				
	1. by open damping	1	2	99	
	2. disposing or sharps in puncture resistant containers	1	2	99	
	3.Avoiding Work loaded	1	2	99	
	4.Reusing needle and syringes.	1	2		
	5.Avoid Recapping needle and syringes	1	2	99	
	6 .By using safety box and other open container	1	2	99	

	7. safely passing sharp instruments	1	2	99	
331	Are you familiar with the method to Prevent Contamination of Injection Equipment and Medication	1	2	99	2 or99→335
332	If"1"what are they?				
	1. Use multi-dose vials rather than single dose vials	1	2	99	
	2. Swabbing of a new vial tops with an antiseptic or disinfect is unnecessary.	1	2	99	
	3. Skin preparation that is visibly soiled with soap and water before injection.	1	2	99	
	4. Discard a needle that has touched any surface.	1	2	99	
333	Can you list the types of sharp collection materials?	1	2	99	2 or99→343
334	If"1"which of the followings?				
	1. Safety box/ card box/	1	2	99	
	2.Plastic pail with lid	1	2	99	
	3.Plastic pail without lid	1	2	99	
	4.Any open container.	1	2	99	
335	Can you mention methods which Prevent Access to Used Needles and Syringes?	1	2	99	2 or99→339
336	If"1"what are they?				
	1. Seal sharp containers for transport during disposal	1	2	99	
	2. put sharps containers close to the point of use within arm's reach	1	2	99	
	3. Shake a container to settle its contents and make room for more sharps.	1	2	99	
	4. Do mark the fill line at the three quarters full level.	1	2	99	
337	Do you know the advantage of waste management?	1	2	99	2 or99→341
338	If"1"what are they?				
	1. to protect people from accidental injury,	1	2	99	
	2. to prevent the spread of infection to healthcare workers.	1	2	99	
	3. to prevent the spread of infection to the local community	1	2	99	
	4. to safely dispose of hazardous materials	1	2	99	
339	Can you list the types waste materials that generate from health institutions?	1	2	99	2 or99→343
340	If"1" what are they?				
	1. Non-contaminated wastes	1	2	99	
	2.Contaminated waste	1	2	99	
	3.Sterile wastes	1	2	99	

341	Are you familiar with the steps of waste management?	1	2	99	2 or 99 → 345	
342	If "1" what are they?					
	1. Segregation	1	2	99		
	2. Opn dumping	1	2	99		
	3. Decontamination	1	2	99		
	4. Disposal	1	2	99		
343	The function of " Incineration" is non controlled burning of solid, liquid or gaseous combustible wastes .	1	2	99		
344	Are familiar with the steps in processing contaminated instruments ,and other Items?	1	2	99	2 or 99 → 348	
345	If "1" what are they?					
	1. decontamination (soak in 0.5% chlorine solution for 10 minute)	1	2	99		
	2. Disposal	1	2	99		
	3. Sterilization	1	2	99		
	4. High-level disinfection	1	2	99		
	5. Segregation	1	2	99		
346	Do you know from where health institution wastes are generated?	1	2	99	2 or 99 → 350	
347	If "1" from where?					
	1. Used materials from health care providers	1	2	99		
	2. Pharmaceutical waste	1	2	99		
	3. Patients waste	1	2	99		
S/No	Questions related to Attitudes	Responses				
		Very dissatisfie d=1	Dissatisfie d=2	Neutral=3	Satisfied= 4	very satisfied= 5
348	A non irritating, antiseptic hand rub can be made by adding either glycerin, propylene glycol or sorbitol to alcohol.	1	2	3	4	5
349	Preference to wash hands before and after the procedure.	1	2	3	4	5
350	Telephones and door knobs are not source of infections.	1	2	3	4	5
351	Removing rings, watches and bracelets is sometimes	1	2	3	4	5

	appropriate in surgical hand scrub.					
352	Using personal protective equipment is not an easy task.	1	2	3	4	5
353	Using PPE harm patients psychologically, so do not use it	1	2	3	4	5
354	Don't use latex gloves if you have allergy to latex	1	2	3	4	5
355	Do keep fingernails trimmed moderately short to reduce the risk of tearing gloves.	1	2	3	4	5
356	Gloves should be worn for non-critical procedures such as bed making	1	2	3	4	5
357	Syringes and needles can be reused.	1	2	3	4	5
358	Any locally available sharp containers can be used.	1	2	3	4	5
359	Sharp collection materials:-					
	1. Safety box/ card box/	1	2	3	4	5
	2. Plastic pail with lid	1	2	3	4	5
	3. Plastic pail without lid	1	2	3	4	5
	4. Any open containers	1	2	3	4	5
360	Wastes can be reused.	1	2	3	4	5
361	Some wastes can be managed without using personal protective equipments	1	2	3	4	5
S/NO	Questions related to practices	Responses				
		Never=1	Seldom=2	Sometimes=3	Often=4	Very often=5
362	How often do you wash your hands?	1	2	3	4	5
	1 Before any contacts	1	2	3	4	5
	2. After any contacts	1	2	3	4	5
	3. In between patients	1	2	3	4	5
363	How frequent do you use the following?					
	1. Antimicrobial soap	1	2	3	4	5
	2. Plain water	1	2	3	4	5
	3. Alcohol antiseptics and water	1	2	3	4	5
364	How frequent do you wear the following PPEs ?					
	1. Gown	1	2	3	4	5
	2. Gloves	1	2	3	4	5
	3. Apron	1	2	3	4	5
	4. Maske	1	2	3	4	5
	5. Others personal protective equipments	1	2	3	4	5
365	How often do you the following techniques to avoid needle stick or sharp injuries:					
	1. Avoid recapping and other hand manipulation of	1	2	3	4	5

	needles					
	2.Using safety boxes	1	2	3	4	5
	3.Avoid disassembling sharps	1	2	3	4	5
	4.Avoid over passing sharps with other person.					
366	How often do you use the followings?					
	1.Incinerator	1	2	3	4	5
	2.Open damping	1	2	3	4	5
	3.Burial in the pit	1	2	3	4	5
	4.Damping	1	2	3	4	5
367	How frequently you process contaminated instruments, gloves and other items using?					
	1.Decontamination (soak in 0.5% chlorine solution for 10 minute)	1	2	3	4	5
	2.Cleaning	1	2	3	4	5
	3.Sterlization	1	2	3	4	5
368	How frequent housekeeping and laundry personnel wear gloves and other personal protective equipment?	1	2	3	4	5
369	How often housekeeping and laundry personnel thoroughly wash all linen items including bed sheets, surgical drapes, masks ,and gowns before reuse?	1	2	3	4	5
370	How often do you dispose contaminated wastes?	1	2	3	4	5