ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
SCHOOL OF PUBLIC HEALTH

IMPROVING LOW IMPLEMENTATION RATE OF INFECTION PREVENTION AND PATIENT SAFETY AMONG NURSES IN ADAMA HOSPITAL MEDICAL COLLEGE

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A CAPSTONE PROJECT REPORT SUBMITTED TO ADDIS ABABAUNIVERSITY COLLEGE OF HEALTH SCIENCES SCHOOL OF PUBLIC HEALTH IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS IN HEALTH CARE AND HOSPITAL ADMINISTRATION

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ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, SCHOOL OF PUBLIC HEALTHMASTER OF HEALTH CARE AND HOSPITAL ADMINISTRATION CAPSTONE PROJECT

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Declaration

1. This capstone project is my original work, and all those sources of material all are used for the project has been duly acknowledged.

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  All nurses, from Adama Hospital Medical College who participated in the study to complete the questionnaire.

LIST OF ACRONYM

AHMC-Adama hospital medical collage

ART-anti retroviral therapy

ART-anti retroviral therapy

BPR- business process reengineering

BSC- balanced score card

CCO- chief clinical officer

CEO-chief executive officer

CDC-center for disease prevent

CASH-clean and attractive

CSA-Central statistical agency

EHIRG- Ethiopian hospitals implementation reform Guidelines

HAI-Hospital acquired infection

HBV- hepatitis B virus

HCP-health care personnel

IPD-in patient department

IPPS-infection prevention and patient safety

MDR TB-multi drugs resistant TB

OPD- out patient department

PPE-personal protective Equipment

SPH-social and population health

Abstract

Background: Infection prevention is very essential for the safety and wellbeing of patients, hospital staffs and visitors of the hospital.All health care professionals and Nurses in particular are often exposed to various infections during the course of carrying out their nursing activities. Therefore nurses should have sound knowledge and strict adherence to infection prevent practice in order to prevent hospital acquired infections.
Objective: Improve the implementation rate of infection prevention and patient safety from 37%to 80% in Adama Hospital medical college by end of June 2019.

Methods:pre-postintervention study design was used in a consultative approach to increase the implementation rate of infection prevention and patient safety in Adama hospital by creating awareness among nurses in providing practical on-service training.

The sample size for the study was determined by using single population proportion formula considering 83% proportion of good practice and 16.7% of proportion of HCW who got any training on infection prevention and patient safety.The sample size selection was done by considering the rule of thumb andtheselection of nurses considers proportional allocation to each department based on the size of nurses and then simple random sampling method was used.Data was calculated manually by using Microsoft Excel and manual calculators to calculate percentages. Data were collected from 83 sampled nurses' though self-administered checklists and the collected data were counted, tallied and checked for quality and before data analysis.

Result: The finding of this studyshows that there waslow implementation rate for infection prevention 37% during pre-implementation period and later increased to 80% after the intervention strategy has implemented.

Conclusions: Nosocomial infections have been recognized as a problem affecting the quality of health care and a principal source of adverse healthcare outcomes. Increased hospital stay days due to prolonged wound healing in the hospital has increased costs of healthcare, economic hardship to patients and their familiesas evidenced this capstone project during the study period.

Key word: infection, health care, nurses, practice, knowledge, implementation.

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CHAPTER1: INTRODUCTION

1.1. Background

Organizational description

Adama Hospital Medical College **(AHMC)** was previously known by the name Hayile Mariam Mamo Memorial Hospital. The Hospital was established by missionaries from abroad in 1938 E.C and it was among the first non-governmental Hospitals in the country. It is the only public Medical Hospital situated at Adama town of Oromia Regional State at the earth distance of 100 kms to southeast of Addis Ababa, Ethiopia. Adama Hospital was possessed by the government of Ethiopia during the dergue regime in 1970 E.C and has served by giving medical services being a Referral Public Hospital in the region for many years until it became medical college in 2003.

Currently, Adama Hospital medical college has a total of 604 Staffs out of which 188administrative and the rest 416are technical staffs including senior specialists of diversified professionally qualified physicians working together in a collaboration serving more than **1000** patients every day and over 5 million catchment population those who come mainly from Oromia, Amhara and Somale regions.

The hospital is providing medical services in different service delivery points includes, outpatient services, inpatient services, emergency care services, minor and major surgery, laboratory services, X-ray & ultrasound services, pharmacy,Neurology,Neonatology,Dermatology,Ophthalmology,MDRTB,MCH,delivery services, ART and VCT service**,** Dentistry, Psychiatry, physiotherapy services.

In addition the library (broadband supported knowledge center) plays a basic role to reduce morbidity, mortality, disability and improve the health status of the people in the catchment area through providing comprehensive package of preventive, curative and rehabilitative health information services through integrated and collaboration with stakeholders.

The hospital is working to implement different hospital reforms including CASH in order to prevent hospital acquired infections. Health care professionals and nurses in particular are often exposed to various micro-organisms during the course of carrying out their nursing activities

which can cause serious or even lethal infections. With emphasis on prevention of the disease, infection prevent should be considered by nurses as a main responsibility and the nurses should have enough information related skills (1).It has been estimated that the risk of health care-associated infection is 2 to 20 times higher in developing countries compared to developed countries and 5% and 10% of patients admitted to hospitals in developed countries acquire these infections.One-third of these infections can be prevented since the main way of their transmission is the hands of the healthcare personnel that this way of transmission can be prevented by infection prevention (2).

However, from the assessment conducted within the inpatient department of the Adam hospital, there was an inadequate infection prevention implementation practice among Nurses, other health professionals and care giver workers. Hence there is a need for awareness creation through training of nurses in order act properly on infection prevention and patient safety in the Hospital.

1.2.Statement of the problem

Infection prevention and patient safety in hospitals is expected to be fully implemented as per the standard set by ministry of health to prevent Hospital acquired infections and patient safety. It has been estimated that the risk of health care-associated infection is 2 to 20 times higher in developing countries compared to developed countries and 5% and 10% of patients admitted to hospitals in developed countries acquire these infections (3).

Health care professionals and nurses in particular are often exposed to various micro-organisms and spreading of infections during the course of carrying out their nursing activitieswhich can cause serious or even lethal infections.With emphasis on prevention of the disease, infection prevent should be considered by nurses as a main responsibility and the nurses should have enough information related skills because they play the main role in patient care (4). One-third of these infections can be prevented since the main way of their transmission is the hands of the healthcare personnel that this way of transmission can be prevented by infection prevention (1).

In the previous year, the infection prevention rate of Adama specialized Hospital had been very low throughout the year as obtained from repot of the hospital Environmental and sanitation department and It was 37 % which was below the standard. Even though the problem was big, no improvement measure had been taken. Hospital infection prevention implementation by the nurses has been proposed as a measure gap that is due to low awareness of nurses on infection prevention and patient safety practice in all departments and despite the comments given repeatedly by regional health bureau and stake holders to improve this problem the improvement was not as the intended to improve the problem.

Therefore, assessing the awareness and practice or the skill on infection prevention and patient safety as early as possible can give way to manage the limited resource available in the hospital(5).So I have started to think that if capstone project is applied it may solve the problem and I share this idea to management committee and the committee agreed that this is one of the main problems of hospital and they agreed to support me financially and technically. So the purpose of this project was to assess infection prevention and patient safety practice among Nurses inAdama Hospital medical college, East Shoa, Ethiopia. The expected out come after this project completed was 80%.

1.3.Significance of the study

The study is aimed at assessing the level of infection prevention awarenessamong Nurses at Adama hospital medical college. There is an insufficient implementation practice of nurses; therefore, it is important to create awareness on infection prevent measures in this hospital.

The findings from this project will explore existing practice and may be used in applying scientific intervention strategies and improve the current level for a better medical services in the hospital by optimizing infection preventknowledge and awareness among Nurses.It also helps to provide information for the hospital administrator, health offices and private health care workers regarding proper prevention strategies.It will also help as base line for future studies on this topic area.

CHAPTER 2: OBJECTIVE OF THE STUDY

2.1 .General objective

- Improve awareness and implementation rate of infection prevention and patient safety among nurses in Adana Hospital by the end of June 2019

2.2 .Specific Objectives

- To assess awareness level and practice of infection prevention among nurses.
- Improve implementation rate of infection prevention from 37% to 80% by the end of June 2019.

CHAPTER 3: ROOT CAUSE ANALYSIS

After the problem was identified and prioritized by the senior management team ofAdamaHospital, we state the root causes on fish bone diagram for low implementation of infection prevention and lack of awareness of nurses from the peoples` factor, lack of supervision and no work plan procedure from procedures` factor, from the supply factor shortage or in adequate protective material and chemicals and in adequate latrine and lack of hand washing facility from (environmental factor). Finally, we identified the root causes and scope of the problem after the baseline assessment conducted at January, 2019. The pre-intervention assessment showed that the hospital had not created awareness because of,

1. Lack of awareness of nurses on infection prevention
2. No focal person for IPPS
3. Inadequate latrine facility
4. No protective materials in the Hospital.
5. Hospital is not implementing regular supervision
6. No CASH sanitary campaign.
7. No facility based guideline for IP implementation.
8. Lack of hand washing facility were contributors to the existence of low standards. Finally, these 8 possible causes were taken for further discussion and enrolled in the root cause analysis using fish bone tool as follow:

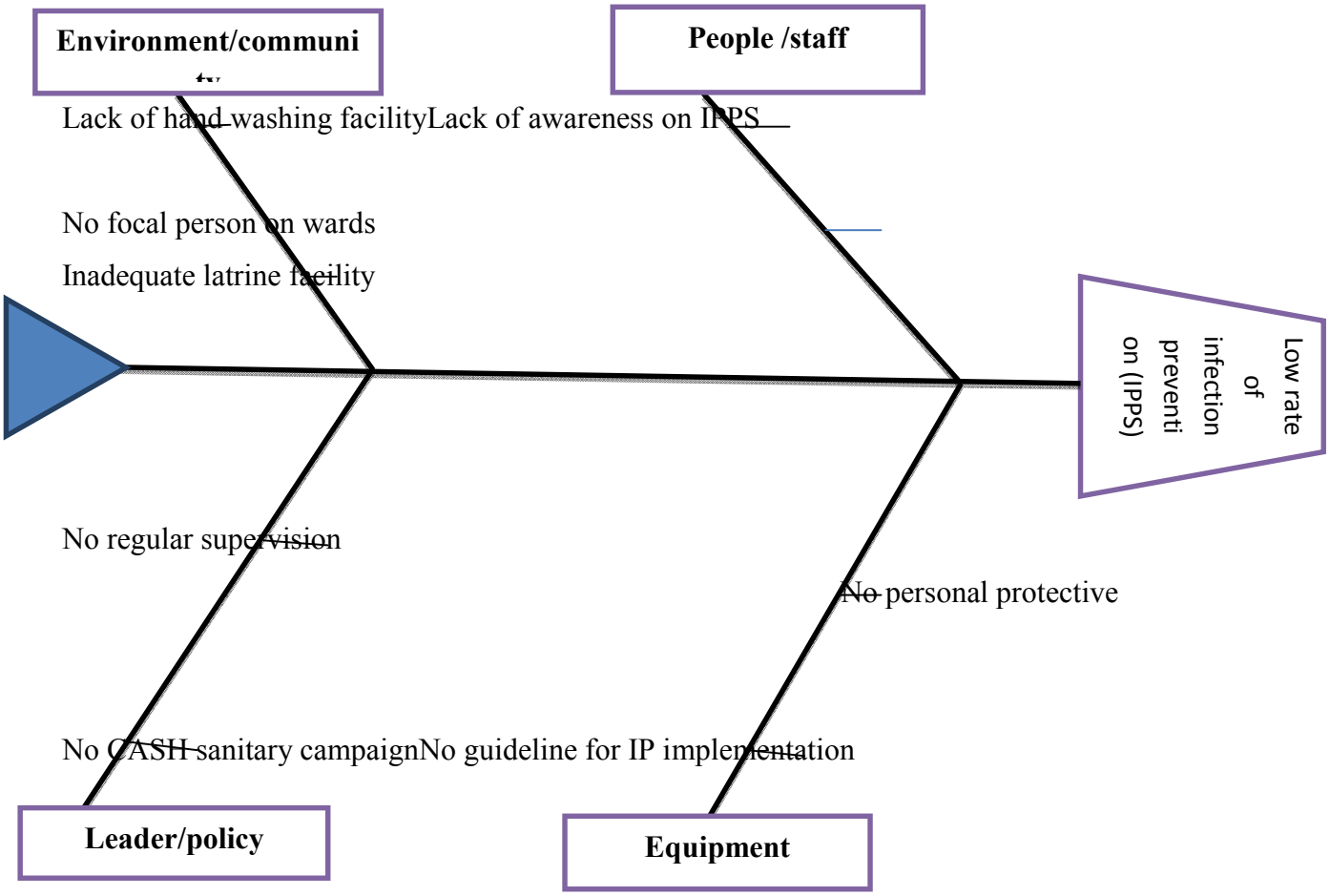


Figure 1: Fish bone diagram showing possible causes of low implementation of IPPS in Adama specialized Hospital

Table 1.Identified possible root causes of low implementation rate of Infection Prevention and Patient Safety in Adamaspecialized Hospital 2019

S.no	List of possible root causes of the Problem	Evaluation Criteria				Total	Rank
		Severity	Frequency	Acceptance	Cost		
1	Poor implementation of CASH	4	4	3	3	14	3
2	Inadequate latrine facility	5	4	4	3	16	**2**
3	No facility based guideline	3	3	2	4	12	4
4	Lack of awareness of nurses	**5**	**4**	**5**	**4**	**18**	1
5	Lack of hand washing facility	3	1	2	3	9	7
6	Shortage personal protective equipment	2	2	3	4	11	5
7	No regular supervision	2	2	3	3	10	6
8	No focal person on CASH	3	1	2	2	8	8

Each root cause was proved and disproved by interviewing respected nurses and department heads, the matron, outpatient head, in patient heads nurses and other respected staffs whether the listed root causes are true causes or not using focused group discussion and observing from documents and performance reports of the Hospital. The main root cause is lack of awareness of nurse on hospital reform especially on CASH. In general the hospital does not work on implementation of infection prevention and patient safety in the hospital as per the standard. Since fishbone does not tell the real cause of the problem it needs further analysis in order to know the real cause of the problem.

After the root causes identified then planned on the intervention to be implemented by nurses on the way to implement properly using the necessary materials as per the standard of implementation guideline. The data were collected through self-administered checklist and observation in the area of solid and liquid waste disposal sites and management as well as availability of protective materials in the Hospital.

CHAPTER4: LITERATURE REVIEW

4.1. Over view of infection prevention and prevent

Nosocomial infection, also known as hospital-acquired infections is one of the leading causes of death and has much economic cost due to increased hospitalization and prognosis (6). According to WHO (2010), Hospital acquired infection is defined as an infection occurring in a patient during the process of care within a health care facility which was not present or incubating at the time of admission. These infections are those occurring more than 48 to 72 hours after admission and within ten days after hospital discharge (7). Due to the admission of patients with different organisms, the hospital environment has become saturated with highly virulent organisms, namely: Staphylococcus aureus, Streptococcus pyogenic, Escherichia coli, Pseudomonas aureginosa and Hepatitis viruses that survive in a hospital. These organisms cause diseases ranging from minor skin infections to life-threatening conditions such as sepsis (8).

Many factors promote infection among hospitalized patients–decreased immunity among patients; increasing variety of medical procedures and invasive techniques creating potential routes of infection; and the transmission of drug-resistant bacteria among crowded hospital populations, where poor infection prevent practices may facilitate transmission.

Despite progress in public health and hospital care, infections continue to develop in hospitalized patients, and may also affect hospital staff. The burden of HAI is substantial in developed countries, where it affects from 5 per cent to 15 per cent of hospitalized patients in regular wards and as many as 50 per cent or more of patients in intensive care units(Ibid).

In developing countries, the magnitude of the problem remains underestimated or even unknown largely because diagnosis of hospital acquired infection is complex and surveillance activities to guide interventions require expertise and resources. Infectious patients are admitted into hospitals and therefore hospitals have become common settings for transmission of diseases. In hospitals, infected patients are a source of infection transmission to other patients, health care workers and visitors (9).

Studies has observed that nurses do not apply infection prevention and prevent measures in the hospital setting which is required to ensure patient safety. Lack of awareness, attitude and practices in infection prevention and prevent contribute to high rates of hospital-acquired infections (10).The majority of health care professionals are nurses and therefore nurses have the ability to facilitate safe patient care through infection prevention and prevent knowledge, attitude

and practice in hospitals (11). Hospital Associated Infections (HAIs) have been associated with significant morbidity and mortality, as well as greatly increased health care costs (12).

4.2. Standard precautions

In recent years, increasing attention has been paid to the protection of the personnel, in particular against the transmission of blood borne infections, e.g. AIDS and viral hepatitis B and C. Standard Precautions are the minimum infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where healthcare is delivered. These practices are designed to both protect healthcare personnel (HCPs) and prevent them from spreading infections among patients, especially those due to blood-borne pathogens (national guideline).

Hand Hygiene is the most important and effective procedure to prevent and prevent the spread of hospital associated infections (HAIs). It is mainly the responsibility of Nurses to carry this out at the right moment during patient care.

4.3. Practices of nurses toward Infection Prevention

A study in Palestine revealed that high means practices scores were found among those who were at the age group of 20-30 years, females, had years of experience 5 years or less (1). Significant statistical differences were found in mean practices scores only in relation to gender. It reveals that nurses who had master degree displayed higher mean knowledge scores as compared to the other two groups (diploma & bachelor) and Significant statistical differences were found in mean knowledge scores (1).

A survey of nurses' knowledge, attitude and compliance with infection prevent guidelines in Birmingham teaching hospitals were conducted by Stein, Makarawo, & Ahmad (2003). The results of this study indicated that overall knowledge regarding blood-borne virus transmission from an infected patient after needles stick injury was low (44.0% for hepatitis B virus, 38.1% for hepatitis C virus, and 54.6% HIV). According to the authors of this study; education, monitoring, improved availability of resources, and disciplinary measures for poor compliance are required to improve infection prevent practices in hospitals (15, 16).

A study in south west Ethiopia showed that among 135 HCW's, 59 (43.7%) of them disposed sharp materials such as used needles in open pails, 91(67.4%) in sharp and liquid proof container without removing syringe,59 (43.7%) in sharp and liquid proof container separating the needle from syringe, 42 (31.1%) mixed with other wastes/rubbish and 107(79.2%) in safety box (18).

The purpose of the literature review was to understand what is currently known about awareness and practices of nurses in infection prevention and prevent. The role of nurses in infection prevention and prevent, as well as the impact of inadequate awareness in infection prevention, were included in the literature review. Furthermore, the impact of negative and positive attitudes towards infection prevention and prevent and nurses' understanding of the code of conduct regarding infection prevention and prevent was reviewed too (4).

In Adama Hospital Medical collegenurseawareness towards the implementation of infection prevention practice was low. Lack of awareness; attitude and practices in infection prevention and patient safety among nurses contribute to high rates of hospital-acquired infections. There is also in sufficient sanitary facility and shortage of personal protective material to implement infection prevention and patient safety in the hospital.

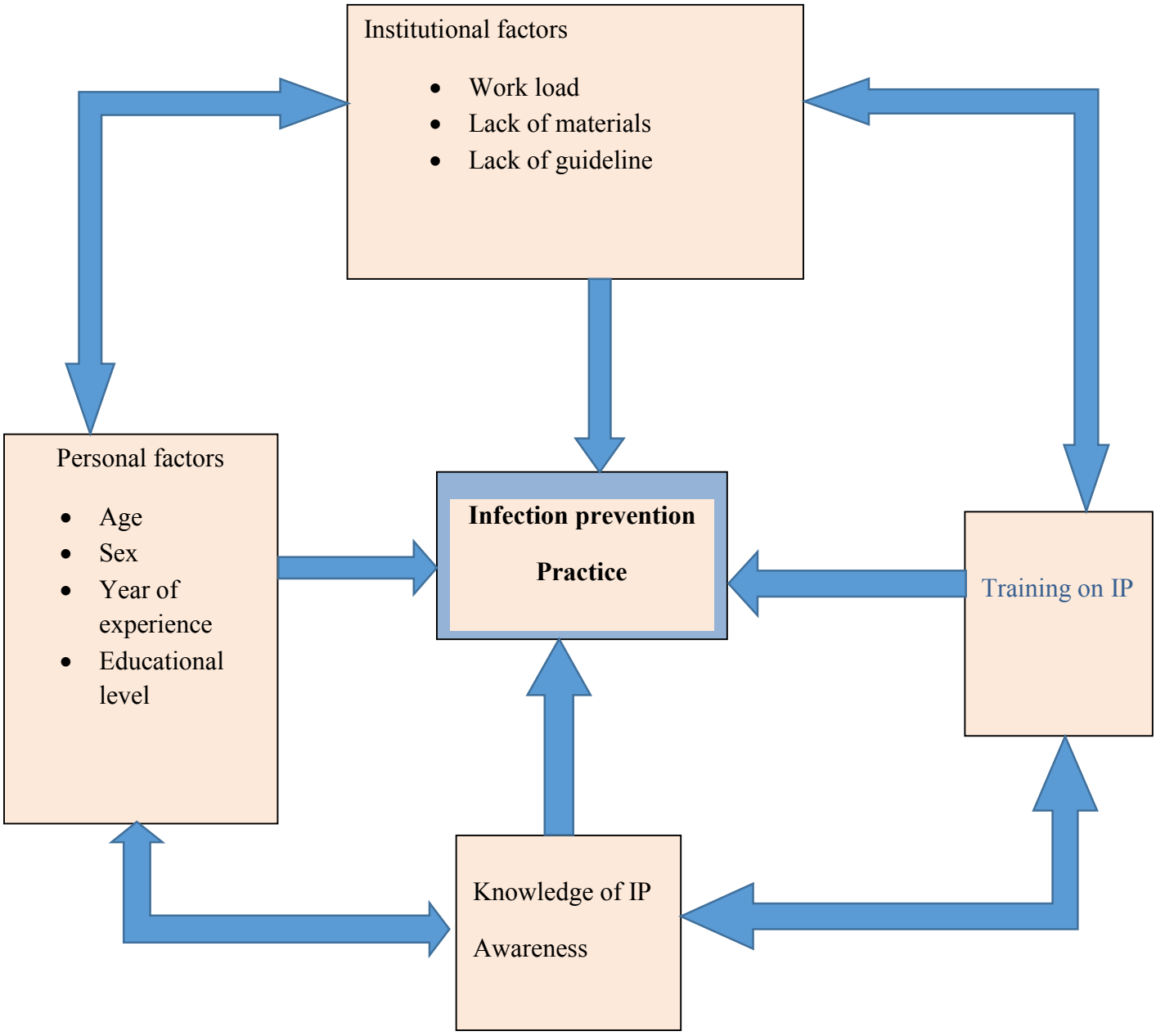


Figure 2: Conceptual framework of infection prevention practice developed from literatures.

CHAPTER5:METHOD AND MATERIALS

5.1. Project area and period

The study was conducted in Adamahospital medical college from (February - April and June 2019) to improve implementation rate of infection prevention.It is the only public specialized teaching Hospital of Oromia Regional Statesituated inAdama town at a distance of 100 kmsalong the road that connects Addis Ababa with Dire Dawa.

5.2 .Study Design

Pre - post intervention study design was used

5.3 .Population

5.3.1. Source population

The source population was all nurses working in Adama Hospital medical collegeduring the study period.

5.3.2 .Study population

Nurses working in Adamahospital medical college inpatient wards during the study

5.4 .Inclusion and exclusion criteria

5.4.1. Inclusion criteria

- Nurses who have been working in the hospital for more than three months.

5.4.2 .Exclusion criteria

- Students nurses practicing from other colleges, who are critically sick and those on maternity leave, voluntary service providers who stays few weeks and not actively participate in the study.

5.5.Sample size determination

There were a total of 225 nurses in Adama hospital medical college. The sample size for the study was determined by using single population proportion formula considering 83% proportion of good practice and 16.7% of proportion of HCW who got any training on infection prevention and prevent in a study conducted at Dessie Hospital(19).

5.6.Sampling technique

The sample size selection was done by considering the rule of thumb and nurses were selected proportionally allocated to eachdepartmentbased on the size of nurses in the departments and then simple random sampling method was used. The total nurses found at day working hour during sample collection in the department were labelled.Based on the protocol reviewed a sample of 83 nurses were selected for pre-post interventional study using standardized check list/questionnaire to assess the awareness of nurses on the implementation of infection prevention and patient safety in Adama hospital.

A pre-intervention baseline data were collected in February 2019 and the baseline was found out that the IP standards met were low and the awareness of nurses towards the implementation was also low. Therefore, an intervention was done to improve the awareness of nurses on IP practice and a follow-up data was collected. Accordingly, I conducted detail interviews to assess the knowledge and practice of nurses towards infection prevention which indicate that they could not have enough knowledge. The data was collected from ICU, EOPD, Medical, Surgical, paediatrics, Obstetrics and Gynaecologywards and other specialityclinic of the hospital.

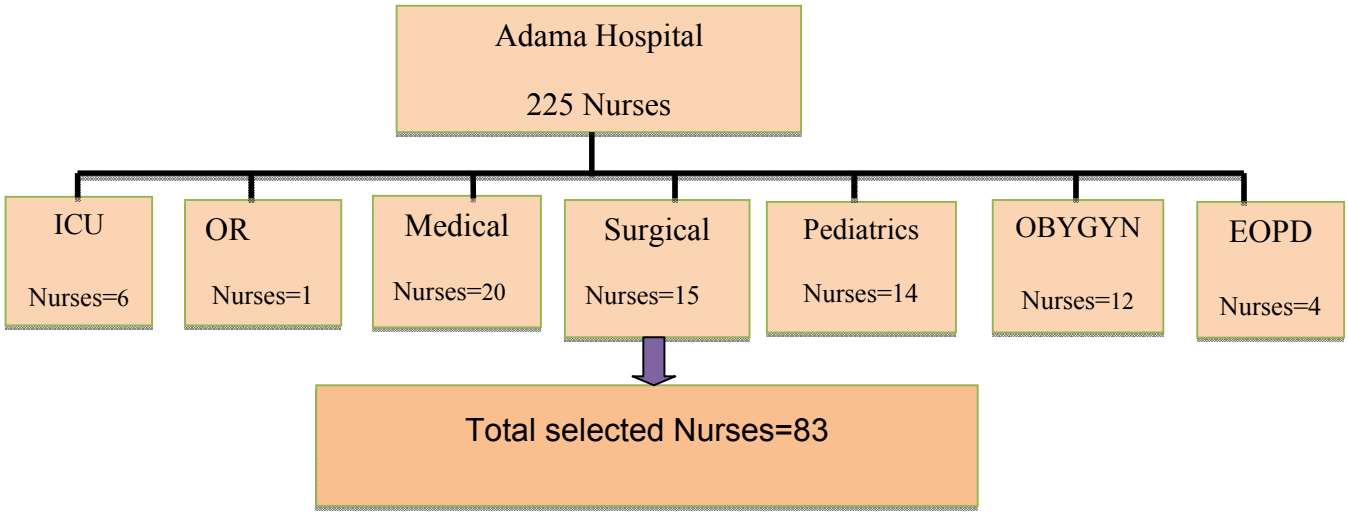


Figure 3: Schematic presentation of sampling procedure, AHMC, 2019

5.7.Measurement and variables

5.8. Data collection instrument and procedure

The baseline data assessment was carried out from 83 nurses, who were working in Adama hospital medical college. Post intervention data collection was held from 20-26, May 2019 by self-administered questionnaire. We assess availability of infection prevention (IP) format using yes/no questioner and implementation of infection prevention practice by using pre-prepared standardized checklist. The staff awareness was assessed by detailed discussion and the percentage of IP standards achieved or met out of the 8 standards measure was made to compare with the findings at the baseline. The questionnaire contains variables for socio-demographic, clinical characteristics and knowledge and practice of nurses towards infection prevention and patient safety. There was also observational check list that would tell the practice of nurses while they are doing procedures.

5.9.Study Variables

Dependent Variable

- Infection prevention practice

Independent variable

- Age
- Sex
- Department
- Overcrowded work place (wards, outpatient department)
- Lack of personal protection equipment
- Lack of commitment on in infection prevention programs
- Lack of guideline on standard precaution in the hospital
- Lack of awareness about standard precautions in hospital settings
- Inadequate hand washing facility

5.10. Data processing and analysis

After data was collected by self-administered checklists and put together for processing, the data quality process was checked by assigned supervisor. Data was calculated manually by using Microsoft Excel and manual calculators to calculate percentages. After the data collected from 83 samples of nurses, the collected checklists were counted, tallied and checked for quality. The data was calculated manually and the results of the awareness of nurses were displayed in percent and by charts.Descriptive statistics like frequency tables and summaries were used to describe the study variables.

5,11.Data quality assurance

The questionnaire is prepared in English and each completed questionnaire was checked to ascertain all questions whether properly filled or not. Discussions about the data collection tool were held with respondent nurses before data collection for having common understanding. Nurses were oriented on the checklist that used for data collection and the way to fill the data.

5.12. Ethical consideration

Before intervention started ethical clearance was obtained from Addis Ababa University School of public health ethical committee.

The study protocol was approved by the Adama hospital medical College, Research Ethics Review Committee. Formal letter was obtained from Adama hospital medical college. Data was collected with the consent of nurses after they are informed about the objective, procedures, and benefits of the study. The identification of the respondents was done through numerical codes which were secured and nurses were reassured for confidentiality of the information they provided to study.

5.13.Dissemination of the study result

The final result of this study will be presented to Addis Ababa university school of public health department of health care and Hospital Administration. Adama hospital medical college and to other concerned governmental and nongovernmental organization.

5. 14.Operational definitions

Knowledge: Respondents who respond 50% and above of questions to assess knowledge as having 'good Knowledge', while those who respond below 50% of questions to assess knowledge as having 'poor Knowledge'.

Practice: Respondents who fulfil 50% and above of questions to asses Infection prevention practice was as 'good practice', while those fulfil below 50% of questions to asses Infection prevention practice was as 'poor practice'.

Infection: multiplication of micro-organisms in the body leading to disease

Health care associated infection: Any infection that arises as a result of healthcare, regardless of the care setting.

Infection prevention and prevent: hand washing, waste segregation, injection safety and provision of policies and guideline

Health care associated infection: Any infection that arises as a result of health care, regardless of the care setting.

CHAPTER 6: INTERVENTION

After root cause analysis was conducted different interventions were developed in order to come to the best intervention used to implement proper infection prevention strategy in the hospital. Initially consensus was made with management team of the hospital to avail infection prevention protective materials, arrange waste disposal site and waste management systems. The best intervention was selected based on the criteria such as political feasibility, cost effectiveness, time required and impact on productivity. On intervention plan, the main focus was to create awareness of nurses and the intervention was planned and implemented by providing onsite training.

Table 2: The alternativesintervention on infection prevention in Adama hospital June 2011

Real cause	**Alternative Interventions**
Lack awareness of nurses on IPPS	awareness Creation by providing training
	Develop facility based guideline
	Assign focal person
	Providing protective materials

The training was given for almost all nursesand the materials was obtained from Ethiopian hospitals reform implementation guideline and blueprint for Hospital management in Ethiopian and CASH manual for hospitals are the main resource materials for the training.The discussion was conducted among the nurses and was chaired by Chief Nursing Officer (matron) and IP focal person as vice chairperson to evaluate daily IP practices. Discussionwas focused on what have happened in caring patient and what infection prevention practices look like as part of patients care in the hospital.

Table3.Comparative analysis of alternativeintervention for the infection prevention and patient safety in AdamaSpecialized Hospital

S. no	Strategic Alternatives	Evaluation Criteria				Total
		Impact on problem	Expense / Cost/	Political feasibility/ Acceptance	Frequency /Time	
1	Develop facility based guideline	4	4	3	2	13
2	awareness Create by training	5	4	5	4	**18**
3	Assign focal person	5	3	4	3	15
4	Create team sprit	4	3	2	1	10

I have compared the alternative strategies to select best strategy using evaluation criteriausing decision matrix. The best strategywas selected after ranking according to the evaluation criteria set in the decision matrix:Accordinglycreating**awareness** among nurses and consequentlyimprove infection prevention practice was the first priority intervention. During the training, nurses were grouped according to their department and received training to implement the strategyand impact on improving quality of patient care by implementing standardized IPPS in the hospital. The onsite training was given from February 1-7, 2019 for one week to all nurseswereтargeting on how to apply both internal and external cleanliness of the hospital environment, keeping sterile techniques, proper waste disposal for both solid and liquid waste, use of protective materials and hand washing before, assigning responsible focal person (Ambassador) to each department for IPPS implementation procedure.

Table: 4. Ghant chart Showing implementation plan for the IPPS

s.no	Tasks/activity	Responsible person	Timeline												Budget
			January		April				May				June		
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
1	Identifying/ assessment of the problems	Investigator	√												**1000**
2	Discussion on problems	SMT		√											**1500**
3	Prioritizing problem	SMT, Investigator			√		√								**----**
4	Searching for budget	ORHB,SMT						√							**600**
5	Preparing training materials	Investigator							√						**5000**
6	Invite trainers	Administration								√					250
7	Inviting participants	Matron									√				----
	Refreshment	Finance													**14800**
8	Providing training	Investigator, envt' health										√			**-----**
9	**implementation**	Nurses										√	√		1500
10	**Evaluation**	Investigator												√	400
11	**Report writing**	Investigator												√	450
	Total cost														25500

6.1. Implementations accomplished

As part of this project, the activities accomplishedwere,developing facility based guideline and training of nurses on the infection prevention, assigning focal person, assigning CASH committee, availing personal protective materials and arranging waste management system. After manual was developed by the hospital's SMT it was used as a tool which helps all nurses of Adama hospital medical college to accomplish their IP activities as per the standards. Procedures were established to ensure efficient organizational infection prevention committee activities, practice of standard prevention precautions, provision of health education for all patients and hospital communities.

All the nurse staffs in Adama hospital Medical College is net worked in 1 to 5 in which one of the five good performer become a leader of the network and daily network meeting are conducted. Infection prevention is one of the priority discussion area identified as a problem and everyone has believed that the problem would never be solved unless all staff mainly nurses are not working in a collaborative approach towards infection prevention in every department of the hospital.

The other nice initiation started and now on continuation was nurses' morning session in which infection prevention and nursing care standard are the major discussion points.

CHAPTER 7: EVALUATION PLAN AND EVALUATION OF INTERVENTIONS

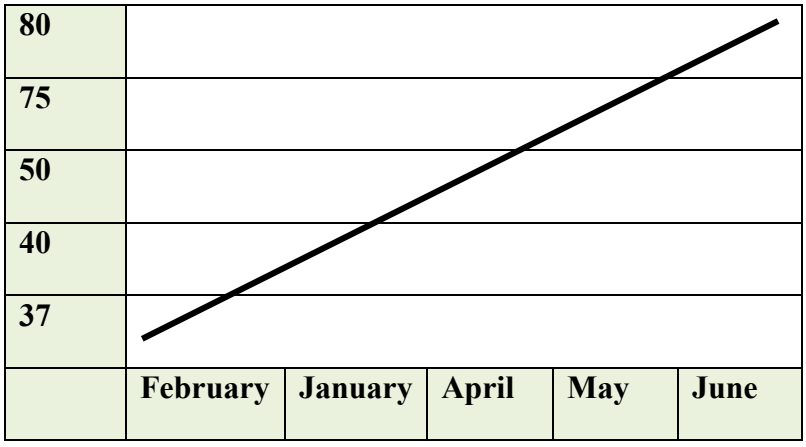
The evaluation plan and evaluation step of the project was carried out by using the correct indicators which helps to calculate and measure the information obtained using the indicators. These indicators are a measure that monitor or evaluate interventions and they are Valid, reliable, feasible/realistic, SMART and comparable. In general I used the indicators (input, process (activity), and result or product indicators) in order to evaluate the results of interventions.

Processes indicators-Availability of IPPS procedures, development of facility, based guideline**,** no of Nurses trained/sensitized. **Outcome indicators-** Percent of score completeness of infection prevention practice, % of availability ,% of completeness of IPPS and **Outcome indicators-** Improved IPPS rate 37% to 80% , Increased patient satisfaction 6.2 to 8.0 by scaling 0-10 score

Table: 5. showing the trend on improvement of infection prevention at adama Hospital in 2019

Indicators	**target**	**February**	**January**	**April**	**May**	**June**
Improve infection prevention implementation	**80%**	**37%**	**40%**	**50%**	**75%**	**80%**

Objective: to improve implementation of infection prevention and patient safety.



CHAPTER 8:RESULTS AND DISCUSSION

8.1.Results

8.1.1. Socio-demographic characteristics of study samples

A total of 83 nurses filled the questionnaires with a response rate of 96.4% among them 26(31.3%) male and 57(68.7%) were females.About19 (14.1%) were single and 116 (85.9%) were married. From the total respondents 38(45.8%) of them were found within age categories of 20 to 30 followed by age group of 31-40 which is 27(32, 5%) the mean age is 21year and standard deviation is 5.7.Regarding their profession 53(63.9%) were BSc nurses followed by 23(27.7%) had diploma and the same sample was used at post intervention assessment.

Table 6. Assessment the base line on demographic and characteristics of the sample N=83

Variable	Parameter	No	%
Age	20-30 years	38	45.8
	31-40 years	27	32.5
	41-50 years	15	18.1
	51-60 years	3	3.6
Education	Nursing Diploma	23	27.7
	Bachelor	53	63.9
	Master	7	8.4
Gender	Male	26	31.3
	Female	57	68.7
Marital status	Single	16	19.3
	Married	64	77.1
	Divorced	3	3.6
Experience	5 years or less	12	14.5
	6-15 years	33	39.8
	16-25 years	24	28.9
	>25 years	14	16.8
Training course	Yes	41	49.4
	No	42	50.6

The likelihood of infection prevention and patient safety before the intervention and after intervention was 37% for pre intervention and increased to 80% in post intervention and the time required to implement pre to post-intervention was 5 months period. During the intervention period the improvement of infection prevention standards were changeless in February to April and in June two standards were met and the standards improved from 37% to 50% as a result of intervention taken in standards 2(standard awareness creation and its activities) and 3(standard on having facility based guideline and operational plan) were met. At the end of project duration the improvements has been achieved from 50% to 75% and then to 80% as a result of the standards 4(standard on standard precaution) and 5(standard on transmission based precaution) were met. The analysis of data from the baseline regarding the number of met standards showed a change in surgical site infection rate decrease from 0.4 % to 0.2%.

Generally, the change in the number of infection prevention standards in Adama hospital medical college ranged from 37% in pre-intervention to 80% in the post intervention. There was significant statistical relationship between awareness of nurses and participation on training courses which is ($p<0.05$).

Table 7: result of Infection Prevention standards met in Adama hospital, Feb to June, 2019

Accomplishments	Time accomplished	No of standards met	% of standards met
Pre intervention	February	2/8	37%
Follow up	April	4/8	50%
Post intervention	May	6/8	80%
Difference	June	4	40%

Table 8 : Status of nurses' knowledge attitude and practice on IPPS Adama hospital June 2019

Activities	Pre-intervention		Post-intervention	
	Agree	Dis-agree	Agree	Dis-agree
Hospital-acquired infections can be transmitted by medical equipment	80(96.4%)	3(3.6%)	83(100%)	0(0%)
Nosocomial infection is an infection that the patient comes with from home.	15(18.1%)	68(81.9%)	4(4.8%)	79(95.2%)
Nurses should familiar with hospital-acquired infection guidelines,	67(80.7%)	16(19.3%)	83(100%)	0(0%)
Nurses considered all staff and patients as potentially infectious	79 (95.2%)	4 (4.8%)	81(97.6%)	2(2.4%)
Handling body fluids with bare hands if gloves are not available.	2 (3%)	81(97%)	0(0%)	83(100%)
Nurses have knowledge on how to prevent hospital acquired infection,	76(91.6%)	6 (7.2%)	83(100%)	0(0%)
Limited beds available, patients with communicable diseases may be admitted in the same ward with other patients.	11(13.3%)	72 (86.7%)	5(3.6%)	78(93.9%)
Micro-organisms are destroyed by using clean water	3(3.6%)	80(96.4%)	1(1.2%)	82(98.8%)
Infection prevention does not improve patient outcome	16(19.3%)	67(80.1%)	2(2.4%)	81(97.6%)
Nurse should adhere to policies and procedures on infection prevent at all times.	80(96.4%)	3(3.6%)	83(100%)	0(0%)
Nurse should attend in-service training/workshop related to infection prevention and prevent	79(95.2%)	7 (3.6%)	81(97.6%)	2(2.4%)
workload affects their ability to apply infection prevention guidelines	54 (65.1%)	29(34.9%)	77(92.8%)	6(7.2%)
it is not nurse responsibility to comply with	6(7.2%)	77(92.8%)	0(0%)	83(100%)

the hospital acquired infection guidelines.				
Infection prevention guidelines are important to all health-care settings	81 (97.5%)	2(2.5%)	83(100%)	0(0%)
Screening of patients to detect colonization even if no evidence of infection are done.	68(81.9%)	15(7.7%)	80(96.4%)	3(3.6%)
wear personal protective equipment when handling linens,	58(69.8%)	25 (13.1%)	74(89.2%)	5(6.0%)
surgical operation sites are shaved with razors	44 (53.0%)	38(45.9%)	73(87.9%)	10(12.0%)
in-service training related to infection prevention necessary yearly	18 (21.7%)	65(78.3%)	6(7.2%)	77(92.8%)

Majority of nurses 80(96.4%) agreed that hospital-acquired infections can be transmitted by medical equipment such as syringes, needles, catheters, stethoscopes, thermometers etc. In this regard 3 (3.6%) of the nurses who participated in the study lacked knowledge in infection prevention and prevent posing a risk in transmitting HAIs. In agreement, (CDC) Centers for Disease Prevent and Prevention (2014) indicated that Pseudomonas Aeruginosa and other contagious diseases could spread by equipment that gets contaminated and not properly cleaned.

About 68 (81.9%) nurses disagreed with the statement that nosocomial and other infections are an infection that the patient comes with from home but 15(18.1%) of the nurses who participated in the study have agreed that nosocomial infection is acquired at home. This indicates that these nurses did not know how hospital-acquired infections were acquired hence posing a risk of transmitting nosocomial infection.

Similarly 72 (86.7%) participants disagreed with the statement that if there are limited beds available, patients with communicable diseases may be admitted in the same ward with other patients. However, the current study shows that n= 12 (14.5%) had no knowledge about the importance of isolating patients with communicable diseases hence posing a risk for hospital-acquired infections.

Majority of participants 67 (80.7%) agreed that they were familiar with hospital-acquired infection guidelines, whereas some participants16 (19.3%) disagreed that they were unfamiliar with hospital-acquired infection guidelines.

Almost all participants 81(97%) disagreed with the statement that they can handle body fluids with bare hands if gloves are not available. Unfortunately, two (3%) participants agreed that they could handle body fluids with bare hands if gloves are not available. However, use of personal Protective equipment (gloves) is one of the practices required to achieve a basic level of infection prevent (24, 25, 26).

Even though 79 (95.2%) agreed that they should attend in-service training related to infection prevention and prevent regularly, the current study indicated 36 (43.4%) do not attend in-service training related to infection prevent regularly.

Almost 54 (65.1%) agreed that the workload affects their ability to apply infection prevention guidelines, while some participants 29(34.9%) disagreed that the workload affects their ability to apply infection prevention and prevent. In agreement, Cimiotti and Sloane (2012:486-490) indicated that there is a relationship between nurse staffing and hospital acquired infections.

Majority of nurses 77 (92.8%) disagreed with the statement that it is not their responsibility to comply with the hospital acquired infection guidelines. The current study shows that 6 (7.2%) nurses indicated that it was not their responsibility to comply with HAIs guidelines.

Majority of nurses 52 (62.7%) reported that personal protective equipment is not always accessible for them to comply with infection prevention measures. Nevertheless some participants 31(397.3%) agreed that personal protective equipment is always accessible.

About 67(80.1%) disagreed with the statement that infection prevention does not improve patient outcome in agreement with literature has shown that infection prevention does improve patient outcome as it reduces on days of patient hospitalization. However 17(19%) of the nurses indicated that infection prevention does not improve patient outcome hence posing a risk for hospital- acquired infections.58 (69.8%) agreed that they wear personal protective equipment

When handling linens, while some of the nurses n= 25 (30.2%) indicated that they do not wear personal protective equipment when handling linen. According to MOH (2013:57), hospital linen may become contaminated by blood, body fluids or excreta and by skin shedding thus poses an infection risk to staff during handling on the ward, during transport or processing at laundry.

8.2.DISCUSSION

The findings of this project show low implementation rate for infection prevention which was less than 37%during baseline assessment and later increased to 80% after the intervention strategy has implemented. In Africa, the hospital-wide prevalence of nosocomial infections varied between 2.5% and 14.8%. In surgical wards, the cumulative incidence ranged from 5.7% to 45.8% showing the need to focus on infection prevention and prevent strategies (4).

Though study on nosocomial infections was not conducted in Adam Hospital medical college, Adama hospital may also have such a problem and there may be improvement after intervention taken similar to the improvement in the IP standards. Surgical site infection rate in a Kenyan University hospital was found to 7.0%. The risk factors associated to this prevalence were high length of hospital stay and poor wound management stemmed from poor infection prevention practice (6).Hospital acquired outbreak was reported from a South African hospital and found to have been prevented by intensive infection prevent measures(7).

However, such an outbreak had never seen in Adama hospital before and after an intervention taken. In this study the first infection prevention score for Adama hospital medical college was 37% before implementation and it was 50% in April and then to 80%in May-June2019. The result at April was without improvement because of fewer acceptances of intervention by the staff. The result was showed us a after the intervention was taken fast change was achieved but, less than that of TukurAnbessa. Because the change obtained in TukurAnbessa referral hospital is in three year duration whereas the project duration in Adama hospital was three month (10).

As the study conducted in TukurAnbessa showed, the first infection prevention standard surveillance was done at October 2009 in which the score obtained was 33% and there were two other surveillances done in TukurAnbessa in February 2010. A study done by FMOH on IP guidelines for health care facilities indicated , although the spread of infectious diseases in hospital has been recognized for many years, understanding how to prevent nosocomial infections and implementing policies, standards and practices that are successful have been more difficult. Standard precautions which apply to all clients and patients attending health care facilities and transmission based precautions which applied primarily to hospitalized patients (1).

Adama hospital medical college, then, is applied isolation precaution entailing the three precautions. These are; Air born precaution, Droplet precaution and Contact precaution. These precautions were not implemented before infection prevention was not identified as a problem. But after the intervention has been taken these precautions are practiced and nosocomial infections have been expected to reduce. So the practices of isolation precaution based on Federal Ministry of Health was practiced well (11).In waste disposal method which was indicated in checking up of possible cause six of this project and the study done in London hospitals indicated health care wastes must be segregated immediately by the person generating the waste to appropriate color-coded waste bins, defined as with current national and local policies. And in the case of Adama general hospital, segregation of waste was head ache before the problem was investigated and the intervention was taken. But after the implementation of the intervention there is a great improvement on waste segregation practices. (12)

A study in south Africa showed nosocomial infection rate is 15% and an associated attributable mortality of 5%, it could that health care associated infection rank, either directly or indirectly among the most important causes of death. Although the study in our hospital as a hospital in developing countries, has not been done before intervened the prevalence of nosocomial infections may occur in a similar or more than a study in South Africa. (13).

Strength

- The intervention and methodology taken was helpful for the achievement of the results.
- Involvement and commitment of SMT
- Enough references were used to discuss the results of situation from international to local.

Limitations

- financial limitation

CHAPTER 9: CONCLUSION AND RECOMMENDATION

9.1. Conclusion

Hospital acquired infection is a common problem all over the world. Therefore, up to date knowledge and nursing skills can play important roles in infection prevent. Nurses should have the opportunity to practice infection prevent on a day-to-day basis as an integral part of patients' care. In general based on the discussions made with Adama Hospital SMT and the staffs from different departments using the prioritization and ranking matrix, we concluded that the first priority defined problem of Adama specialized Hospital is-**Low implementation rate of infection prevention** in all departmentswhich is only 37 % achieved from the hospital plan and the first critical problem that needs immediate attention

The implementation of infection prevention and patient safety (IP) standards were improved by creating awareness among nurses using the national guideline and organizational based manual which was prepared by IP committee of Adama hospital as an intervention. Awareness creation was given for all nurses regarding the guideline, implementation of infection prevention and practices for one week. As result the improvement was changed from 37% at the baseline to 80% after implementation of the strategy.

9.2 Recommendation

- The hospital has to strengthen the further follow up and sustainability of the project.
- The hospital has to plan to be able to equip the shortage of IP equipment's by itself from its revenues collected.
- Regular assessment and supportive supervision by SMT should be given.
- Intensive and continuous training for the workers should be given by infection prevention committee.
- Implementation of the Ethiopian hospitals reform guideline strategies must be practical in the hospital reform department and CASH committee.

Generally, the Hospital governing board, SMT in collaboration with the hospital staff has to have set action plan by involving all concerned stakeholders for the betterment and implementation of IPPS within the time scheduled.

Reference

1. Fashafsheh I etal. Knowledge and Practice of Nursing Staff towards Infection Prevent Measures in the Palestinian Hospitals . Journal of Education and Practice .ISSN 2222-1735 (Paper) ISSN 2222-288X (Online) Vol.6, No.4, 2015
2. Stein, A.D., Makarawo, T.P., & Ahmad, M.F., (2003). A survey of doctors' and nurses' knowledge, attitudes and compliance with infection prevent guidelines in Birmingham teaching hospitals. Journal of Hospital Infection. 54 (1), 68-73.
3. World Health Organization [WHO]. (2013). The first Global Patient safety challenge: "Clean care is safer care". Geniva: WHO. Retrieved February12, 2013, from http://www.who.int/gpsc/background/en/index.html.
4. DamteM (2008) Assessment of knowledge, attitude, practice of healthcare workers on universal precaution. Ethiopia public Association 4: 20-7.
5. HMIS Participatory Manual Two, Individual Medical Record By CDC Grant Number 5U2GPS001486
6. World Health Organization. Prevention of hospital acquired infections-Apractical guide. 2nded. Geneva: WHO, 2015. Document no. WHO/CDS/EPH/2005.12. Electronic access: http://whqlibdoc.who.int/hq/2002/WHO_CDS_CSR_EPH_2002.12.pdf
7. Cole M. (2008). Infection prevent: worlds apart primary and secondary care. British journal of community nursing 12(7):301,303-306.
8. FMOH. Ethiopian Hospital Service Transformation Guidelines. Volume 1 Chapter 6 Hospital management initiative September, 2016
9. Nejad S.B., Allegranzi B., Syed S.B., Ellis B.PittetD,Sydnor& Perl, (2011). Health-care-associated infection in Africa: a systematic review. Bulletin of the World Health Organization; 89:757-765.
10. Hayeh and Esena, awareness, attitude and practices in infection prevention and prevent contribute to high rates of hospital-acquired infections 2013.
11. Benson and Powers, Hospital Associated Infections (HAIs) associated with significant morbidity and mortality 2011:36-41
12. Rosenthal, Wisconsin &Bribane ability to facilitate safe patient care through infection prevention and prevent knowledge, attitude and practice in hospitals 2008:1

13. Stein, A.D., Makarawo, T.P., & Ahmad, M.F., (2003). A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. Journal of Hospital Infection. 54 (1), 68-73.
14. Allesranzi B, pittet D. (2009) Role of hand hygiene in healthcare associated infection and prevention. Journal of hospital infection. Jan;73: 305- 315
15. Gajić Z, et al. Health care workers and exposure to blood-borne infections ArhHigRadaToksikol 2013;64:145-151
16. Katowa P. Mukwato, Compliance With Infection Prevention Guidelines By Health Care Workers At Ronald Ross General Hospital Mufulira District. Medical Journal of Zambia, Volume 35 Number 3
17. FMOH. Leadership, Management and Governance In-Service Training Manual For Federal and Regional Health Managers. 2017/ Addis Ababa
18. Yakob, et al., Knowledge, Attitude and Practice towards Infection Control Measures among Mizan-Aman General Hospital Workers, South West Ethiopia. J Community Med Health Educ 2015, 5:5 http://dx.doi.org/10.4172/2161-0711.1000370
19. Alemayehu R, Ahmed K, Sada O (2016) Assessment of Knowledge and Practice on Infection Prevention among Health Care Workers at Dessie Referral Hospital
20. Blueprint for Hospital Management in Ethiopia by Yale University and William J. Clinton Foundation 2007
21. Eshetu BTW, Legesse B (2007) Knowledge, attitude, practice on infection prevention among health and medical Students. Addis Ababa.
22. Knowledge and Practice of Nursing Staff towards Infection Prevent Measures in the Palestinian Hospitals Dr. Fashafsheh Journal of Education and Practice Vol.6, No.4, 2015
23. Improving of Ethiopian hospital reform implementation guideline, infection prevention standards in suhul hospital, northern Ethiopia, By YibrahAlemayehu November 25, 2013
24. Humphreys, H Infection prevent practices among doctors and nurses in a tertiary care hospital. (2012).

Annex

Questionnaires

1. What are the major problems seen in the hospital?

2. Which problem you think has public health importance when compare them?

3. How do you perceive its severity and priority which one should can first?

4. What is your reason or how do you evaluated in terms of its priority problem?

5. Does a system support to supervise infection prevention activities?

6. Does the hospital have a cash committee and work task force plan that addresses infection prevention guideline according to the standard set for hospitals?

7. Is there written policies describing the responsibilities of each committee in the Hospital?

8. Does the hospital have standardized procedures for the safe and proper disposal of solid and liquid waste management of medications by designated clinical staff?

9. Does the hospital have regular cash implementing program for both internal and external cash?

10. Does all the hospital staffs participate on cash implementing program?

Part two questions

Activities	Pre-intervention		Post-intervention	
	Agree	Dis-agree	Agree	Dis-agree
Hospital-acquired infections can be transmitted by medical equipment				
Nosocomial infection is an infection that the patient comes with from home.				
Nurses should familiar with hospital-acquired infection guidelines,				

Nurses considered all staff and patients as potentially infectious				
Handling body fluids with bare hands if gloves are not available.				
Nurses have knowledge on how to prevent hospital acquired infection,				
Limited beds available, patients with communicable diseases may be admitted in the same ward with other patients.				
Micro-organisms are destroyed by using clean water				
Infection prevention does not improve patient outcome				
Nurse should adhere to policies and procedures on infection prevent at all times.				
Nurse should attend in-service training/workshop related to infection prevention and prevent				
workload affects their ability to apply infection prevention guidelines				
it is not nurse responsibility to comply with the hospital acquired infection guidelines.				
Infection prevention guidelines are important to all health-care settings				
Screening of patients to detect colonization even if no evidence of infection are done.				
wear personal protective equipment when handling linens,				
in-service training related to infection prevention necessary yearly				

S, no	Suggested root causes	Method of verification	Accept /reject
1	Lack of staff commitment	Observation/checklist	×
2	Lack of training on IPPS	Documentation/interview	×
3	No focal person on CASH	Documentation/checklist	×
4	Poor implementation of reform/CASH	Observation/checklist/interview	√
5	Old and poor set up of the wards	Observation/documentation	×
6	Lack of hand washing facility	Observation/interview	×
7	No regular supervision	Documentation/checklist	×
8	Inadequate latrine facility	Observation/Interview	×
9	Lack of cleaning materials	Observation/interview	×
10	No enough personal protective equipment	Documentation/interview	×