College of Medicine and Health Sciences

School of Health Science

LOW HAND HYGIENE COMPLIANCE AMONG GISENYI DISTRICT HOSPITAL CLINICAL STAFF

A dissertation submitted in partial fulfillment of the requirements for Master of Hospital and Healthcare Administration (MHA)

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DECLARATION

This capstone dissertation is my original work and has not been presented to any other Institution. No part of this capstone should be reproduced without the authors' consent or that of university of Rwanda.

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Sign _____ Date _____

DEDICATION

This capstone dissertation paper is lovingly dedicated to my beloved wife, brothers, sisters, my mother and to my all family. They have given me the drive and discipline to tackle any task with enthusiasm and determination. Without their support, this capstone thesis would not have been made possible.

ACKNOWLEDGEMENT

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LIST OF ACRONYMS/ABREVIATIONS

%:	Percentage
HAI:	Hospital acquired infection
ABHR:	Alcohol based hand rubbing
HCWs :	Health care workers
HHP:	Hand hygiene practice
MDR:	Multi drug resistance
EHO	Environment Health Officer
MHA:	Master of Hospital and Healthcare administration
OPD:	Outpatients department
HH:	Hand hygiene
QI:	Quality improvement
RCA:	Root cause analysis
WASAC:	Water Sanitation Authority Company
WHO:	World health organization
SSA:	Sub-Saharan Africa

ABSTRACT

Background: Hospital-acquired Infections (HAI) represent an important cause of morbidity and mortality in hospitals. HAIs increase the length of stay, and are associated with substantial risk of mortality. Good hand hygiene compliance reduces HAI rates and cross-transmission of antimicrobial-resistant pathogens. There is low hand hygiene compliance among clinical staff of Gisenyi Hospital.

Objective: To increase hand hygiene compliance among clinical staff of Gisenyi District Hospital from 37.5% to 51% from December 2016 to March 2017

Root cause: The main root cause identified include: Lack of knowledge regarding hand hygiene practice and unavailability of hand hygiene supplies.

Design: A pre and post interventional study design was used during this project.

Intervention: Educating Clinical staff on Hand hygiene practice trough training, Increasing the Availability and accessibility of soap, paper towels and Availability and providing pocket-sized ABHR bottles for Clinical staff with Alcohol-based hand rub.

Results: Before intervention data showed that the overall hand hygiene compliance was 37.5% while post-intervention showed that the compliance reached 53.7 %, resulting in an improvement change of 16.2% ($p<0.001$).

Conclusion: Health care workers need to protect themselves, protect co-workers, patients and ensure the wellbeing of patients. It has long been recognized that hand hygiene is the most effective way to prevent the spread of infection, thereby ensuring patient safety. Pres and post intervention study design have been used in this project. The identified priority solutions/strategies to improve hand hygiene compliance among Gisenyi District Hospital clinical staff were: Educating clinical staff on Hand hygiene practice. Increase the Availability and accessibility of soap, paper towels Availability and providing pocket-sized ABHR bottles to clinical staff with Alcohol-based hand rub.

KEY DEFINITIONS

Hand hygiene: Hand hygiene is a general term for removing microorganisms with a disinfecting agent such as alcohol or soap and water. Hand hygiene should be conducted by health care workers before seeing patients, after contact with bodily fluids, before invasive procedures, and after removing gloves

Hand hygiene opportunity: A hand hygiene opportunity is defined as the requirement for a hand hygiene action before or after a single or multiple hand hygiene indications (i.e., a number of hand hygiene indications can occur before a hand hygiene action is required)

Clinical staff: In this study a clinical staff refers to professional Doctors and nurses who are allowed by law, regulation, and facility policy to perform or assist in the performance of a specified health care professional service

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CHAPTER ONE: INTRODUCTION

1.1Background

Hospital-acquired Infections (HAI) represent an important cause of morbidity and mortality in hospitals. HAIs increase the length of stay, and are associated with substantial risk of mortality. Good hand hygiene compliance reduces HAI rates and cross-transmission of antimicrobial-resistant pathogens. Healthcare workers' hands become progressively colonized with potential pathogens during patient care.(1–3)

Gisenyi District hospital is located in Western province, Rubavu District, was founded in 1930 as a health post and became a hospital in 1950. The hospital serves to population of 404278 from 12 sectors in Rubavu district. Referrals are received from Rubavu, Nyabihu, Rutsiro districts and Democratic Republic of Congo Goma town/. By 2016, the hospital has 331 beds with an average occupancy rate of 74.9%. The hospital is divided into two departments: Health care department and Support department(4)

The clinical department has the following services:

Outpatient (OPD), Inpatient (internal medicine,Gynaecology and obstetrics,pediatric, surgery ,neonatology),Emergency ,Ambulance ,Pharmacy ,Operating theater room, People living with HIV, Paramedical services (Dental, ophthalmology, Medical imaging, Mental health, Physiotherapy ,Laboratory and Nutrition(5)

The Support department has the following services:

Administration, Accounting, Procurement, Logistics, Stock, Recovery, Cashier, Public relation and customer care, Monitoring and Evaluation, Secretariat Library and archive and Maintenance

The hospital has a total of 216 staff, with:

Medical Director	1
General practitioners	14
Nurses and midwife	139
Paramedical staff	25
Supporting staff	37
	216

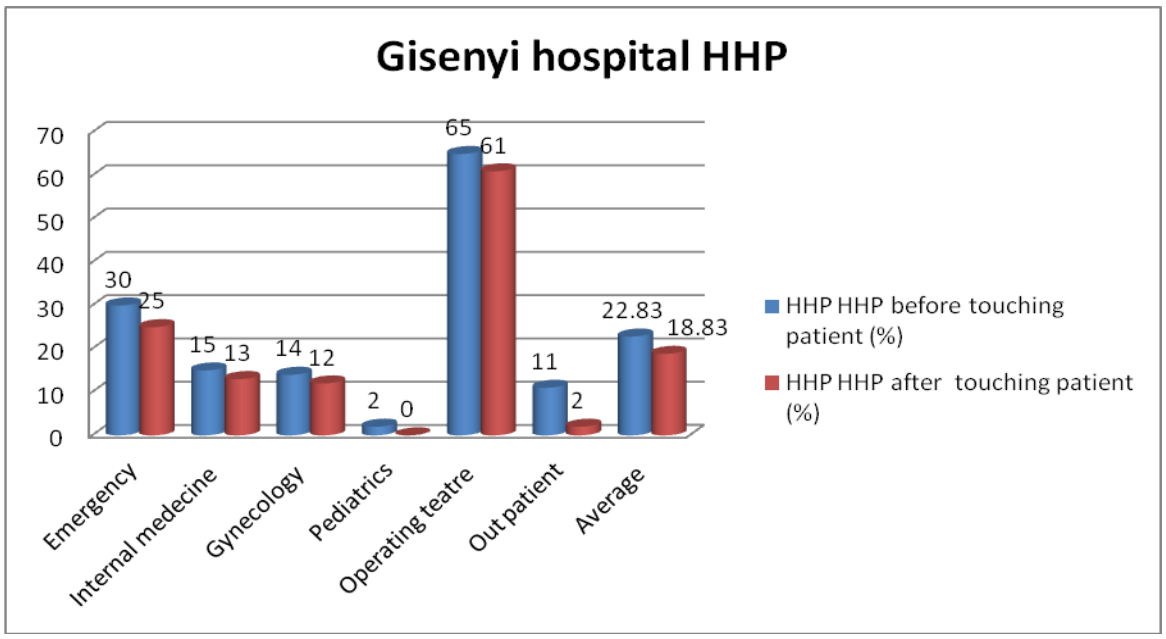
source:(5)

Gisenyi Hospital is committed to avail water at all the times and have sufficient water supply from Water Sanitation Authority Company (WASAC). During dispatching program, the Hospital has implemented the water Tanks system (the rain water) which helps to get water for cleaning, and washing during WASAC water interruption. A part from water supply, the there are sinks installed in all health care services and hand washing supplies is one of hospital priorities.

1.2 Hand hygiene situation in Gisenyi Hospital

With scientific evidence based, hand hygiene is now regarded as one of the most important element of infection control activities. In the wake of the growing burden of healthcare associated infections, the increasing severity of illness and complexity of treatment , superimposed by multi-drug resistant (MDR) pathogens infections ,health care practitioners are reversing back to the basic infection preventions by simple measures like hand hygiene (6)

Referred to successive reports from quality improvement committee through infection prevention focal person, especially the last report conducted by Infection prevention committee in February 2014 reporting that there was an increase of hospital acquired infection and c-section infection and when assessing hand hygiene practice (HHP) before and after patient touching in different hospital departments, the same report reveals that there was a poor hand hygiene compliance as shown by the following figure:



Source:(5)

1.3 Problem statement

There is low hand hygiene compliance among Gisenyi District Hospital Clinical staff.

In February 2014, infection prevention control committee reported that there was an increase of hospital acquired infection and c-section infection and when assessing hand hygiene practice (HHP) before and after patient touching in different hospital departments, the same report reveals that there was poor hand hygiene compliance

1.4 Objective of the study

To increase hand hygiene compliance among clinical staff of Gisenyi District Hospital from 37.5% to 51% from December 2016 to March 2017.

1.5 Hypothesis

H^0: Training of clinical staff on hand hygiene practice will not improve hand hygiene compliance.

H_a: Training of clinical staff on hand hygiene practice will improve hand hygiene compliance.

1.6 Justification of the project

This capstone dissertation will be significant to the overall Rwandan society considering the increasing negative consequences of non compliance of hand hygiene practice especially in health care setting and their negative effects. HH compliance is beneficial for HAI prevention and consequent improvements in morbidity and mortality rates as well as decreases in healthcare costs. The success of this project will serve as a contribution and experience for others health care settings with similar problems. Lastly the results will be valuable to researchers interested in the same area in Rwanda.

1.7 Organization of the dissertation

This capstone dissertation project is divided into 6 main chapters;

Chapter 1: Is an introduction of the dissertation and provides an overview of the hospital background, the problem statement, the magnitude of the problem, the objective of the project, the hypothesis and at lastly the justification of the project.

Chapter 2: Focused on the review of the existing literatures on hand hygiene compliance. In literature review, some guidelines and standards related to HHP have been reviewed.

Chapter 3: Focused on the methodology.

Chapter 4: Focused on data analysis, presentation and interpretation of the findings.

Chapter 5: Focused on the discussion of the project

Chapter 6: Focused on conclusions and recommendations of the capstone.

CHAPTER TWO: LITERATURE REVIEW

According to world health organization report, it is estimated that 1.4 million people worldwide are suffering from infection acquired in hospitals(7). Health care-associated infection (HAI) occurs worldwide and affects both developed and developing countries. in developed countries ,it is reported that between 5% to 10% of patients acquired one or more infection and 15% to 40% of patients admitted to critical care are thought to be affected(7).When it comes to the resource poor settings, rate of infection can exceed 20% but due to the limited of data availability more research are urgently needed to assess the burden of disease in the developing and transitional countries. There is substantial evidence that hand hygiene is a fundamental action for ensuring patient safety. Non compliance with hand hygiene, however remain a major problem in hospitals.

The most important factor in preventing the spread of illness is the performance of hand hygiene. Most health care professionals recognize this and yet compliance is usually <50%. The literature suggests that compliance is related to access to resources, socio-cultural factors, education along with attitude and role modeling. Average compliance with hand hygiene recommendations varies between hospital wards, among professional categories of health-care workers, and according to working conditions, as well as according to the definitions used in different studies.(8–10)

Following to the recent research compliance of hand hygiene varies between hospital wards among professional categories of health care workers and according to the working conditions as well as according to the definition used in different studies(11). A study done in at Eight Hospitals in the United States by Mark, 2015, at baseline, hand hygiene compliance averaged

was 47.5% across all eight hospitals and after interventions the increase in compliance across the eight hospitals was from 47.5% to 81.0% ($p < .001$).

2.2. Hand hygiene practice in Rwanda

To date, no many studies have yet investigated focusing on hand hygiene compliance countrywide. According to statistics data from the study done by Solange at Nyamata District Hospital in 2016, more than half of health care professional staff were complying with HHP. The some study reported that before intervention the compliance were 25% while post-intervention showed that the compliance reached 60.2 %($p<0.001$). Another study done in SSA case study of Gitwe rural hospital by Ian reported that Overall HH compliance improved from 34.1% at baseline to 68.9% post intervention ($P<.001$), and HH knowledge was significantly enhanced ($P<.001$).

2.3 Risk Factors for Non compliance

Several barriers to appropriate hand hygiene have been reported. Reasons reported by health-care workers for the lack of adherence with recommendations include skin irritation, inaccessible supplies, interference with worker-patient relation, forgetfulness, insufficient time, high workload and understaffing, and lack of scientific information demonstrating impact of improved hand hygiene on hospital infection rates.(10,12)

The most frequently reported reasons associated with poor compliance, in addition to those mentioned above, are inconveniently located or insufficient numbers of sinks; low risk for acquiring infection from patients; belief that glove use obviates need for hand hygiene; and ignorance or disagreement with guidelines and protocols. Hand cleansing can increase skin pH, reduce lipid content, increase trans-epidermal water loss, and even increase microbial shedding.

Soaps and detergents are damaging when applied to skin on a regular basis, and health-care workers need to be better informed about their effects. Lack of knowledge and education on this topic is a key barrier to motivation. Alcohol based formulations for hand disinfection or alcohol based hand sanitizer) are less irritating than antiseptic or non antiseptic detergents.(8,13,14)

The value of easy access to hand hygiene supplies, whether sink, soap, medicated detergent, or waterless alcohol-based hand rub solution, is self explanatory. Asking busy health-care workers to walk away from the patient bed to reach a wash basin or a hand antisepsis solution invites noncompliance with hand hygiene recommendations. Building engineering could facilitate compliance, but hand hygiene behavior should be carefully monitored to identify negative effects of newly introduced approach. Failure to remove gloves after patient contact or between dirty and clean body site care for the same patient constitutes noncompliance with hand hygiene recommendations.(15)

Washing and reusing gloves between patient contacts is ineffective, and hand washing or disinfection should be strongly encouraged after glove removal. Additional barriers to hand hygiene compliance include lack of active participation in promotion at the individual or institutional level, of a role model for hand hygiene, of institutional priority assigned to hand hygiene, of administrative sanctions for noncompliance; and of an institutional climate encouraging safety. A system change may be necessary for improvement in hand hygiene practices by health-care workers.(16–18)

2.4 Strategies for Improvement

Improvement in hang hygiene practices requires questioning basic beliefs, continuous assessment of the stage of behavioral change, interventions with an appropriate process of change, and supporting individual and group creativity. Because of the complexity of the process of change, single interventions often fail, and a multimodal, multidisciplinary strategy is necessary.(11)

A framework for change should include parameters to be considered for hand hygiene promotion, together with the level at which each change must be applied: education, motivation, or system. Some parameters are based on epidemiologic evidence and others on the authors' and other investigators' experience and review of current knowledge. Some parameters may be unnecessary in certain circumstances and helpful in others. In particular, changing the hand hygiene agent could be beneficial in institutions or hospital wards with a high workload and a high demand for hand hygiene when waterless hand rub is not available.

Several parameters that could potentially be associated with successful promotion of hand hygiene would require a system change. Enhancing individual and institutional self-efficacy (the judgment of one's capacity to organize and execute actions to reach the objective), obtaining active participation at both levels, and promoting an institutional safety climate represent major challenges that exceed the current perception of the infection control practitioner's role. More research is needed to determine whether education, individual reinforcement technique, appropriate rewarding, administrative sanction, enhanced self-participation, active involvement of a larger number of organizational leaders.(15)

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter describes methodology of the study. The subtopics under this chapter include; study design, magnitude of the problem root Cause Analysis, Intervention, Measures, Data analysis and ethical Considerations.

3.2 Study design

This study was a pre and post interventional study design with a descriptive component and an analytical component, a baseline assessment from March to April 2016 was conducted to measure the magnitude of the problem. A root cause analysis was also conducted in the pre-intervention period. Based on the identified final root cause, best solutions ware implemented in January 2017. A post-intervention evaluation was conducted from March to April 2017. The pre- and post-interventional results were compared to evaluate the impact.

3.3 Magnitude of the problem

From March to April 2016, Data on magnitude ware collected using WHO standardized data collection tool that provided information on the compliance of hand hygiene practice. It was an observational survey. The observation was conducted on 25 hand hygiene observation sessions over the period of 2 weeks by three observers: Accreditation focal person, Infection prevention focal person and Environment health officer. The observers (accreditation focal person and environment health officer) were trained by infection prevention focal person before the survey. Every session least 15 minutes each. The observation have been done either during morning rounds (9h00AM-12h00 PM) or in the afternoon rounds (2h00PM-5h00PM).The periods of observation were not formally announced to the staff. As defined by WHO hand hygiene opportunities or moments that include before Patient Contact, Before an Aseptic Task, After

Body Fluid Exposure Risk, After Patient Contact, After Contact with Patient Surroundings Were all considered between opportunities or occasions. We observed a total of 400 opportunities and 150 actions of HHP. The action (hand washing or alcohol-based hand-rub) taken during the opportunities were noted and compliance was calculated by dividing number of actions with number of opportunities. The following formula: compliance (%) = Action /Opportunitiesx100. Compliance was categorized according to the professional category of clinical staff (Nurse or Doctor). After analysis in EXCEL soft ware, the overall hand hygiene compliance for clinical staff at Gisenyi hospital was 37.5%. Medical Doctors comply with hand hygiene than nurses. Compliance to hand hygiene during morning time is higher than afternoon time for both nurses and Medical Doctors (see appendix 2).

3.4 Root Cause Analysis

We worked in a collaborative team of staff members to apply problem solving and quality improvement techniques to define the problem, understand its root causes, set objectives, consider alternative strategies to address the problems and fulfill the objectives and select strategy to implement a set of planned tasks. A review of literature was conducted to collect information related to common causes and barriers to hand hygiene compliance in health care settings. The team also conducted a brainstorming sessions with different hospital staffs to seek their opinions. During RCA Plan we collected information on: People/Staff, Environment**,** Equipments and Materials**,** Policies and System.

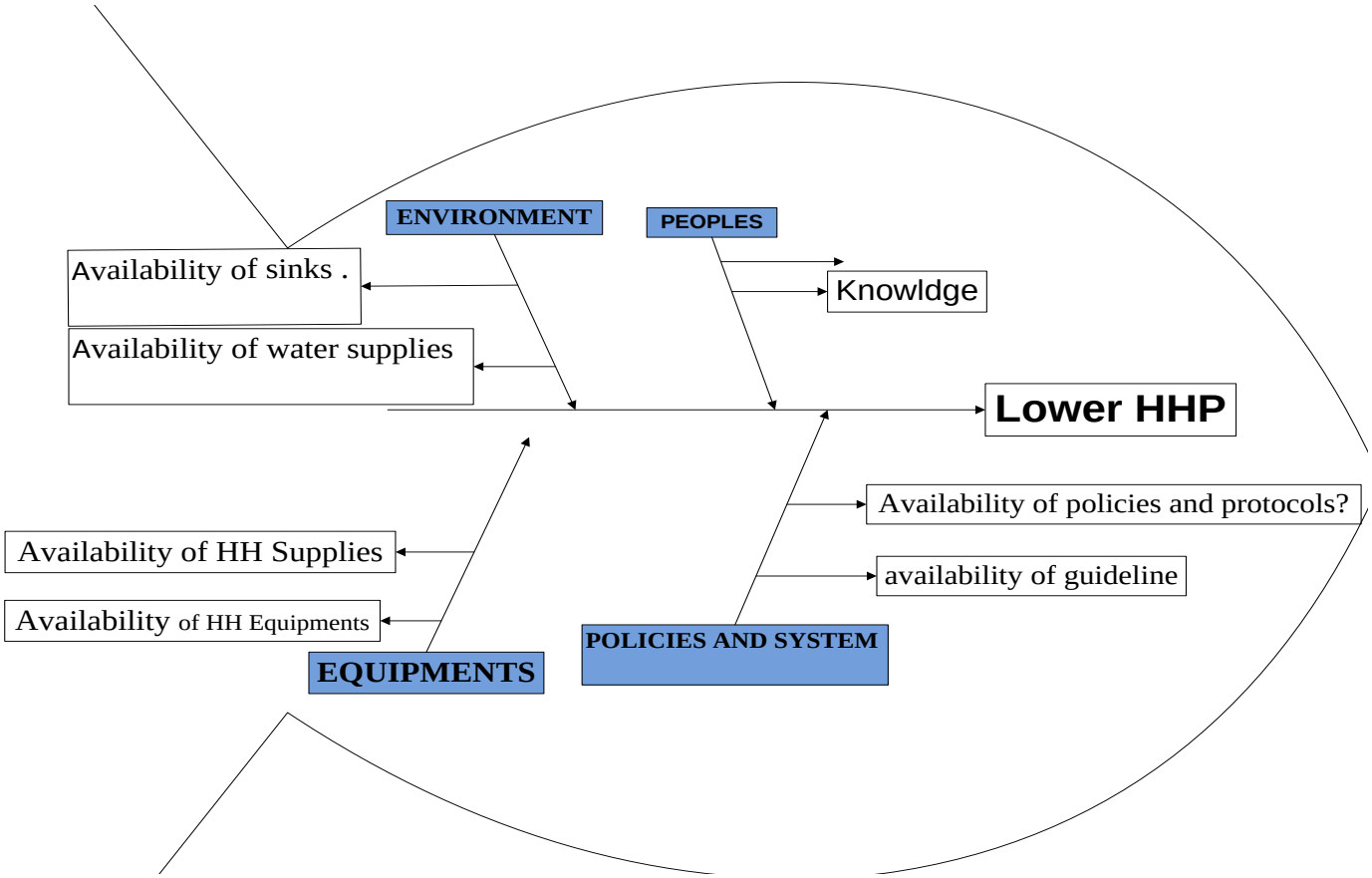


Figure 1: Fishbone diagram on hand hygiene compliance.

3.6. The results from root cause analysis:

To do so, we checked nurses and Doctors personal files using checklist to see if they have completed training regarding hand hygiene practice as shown by the following figure.

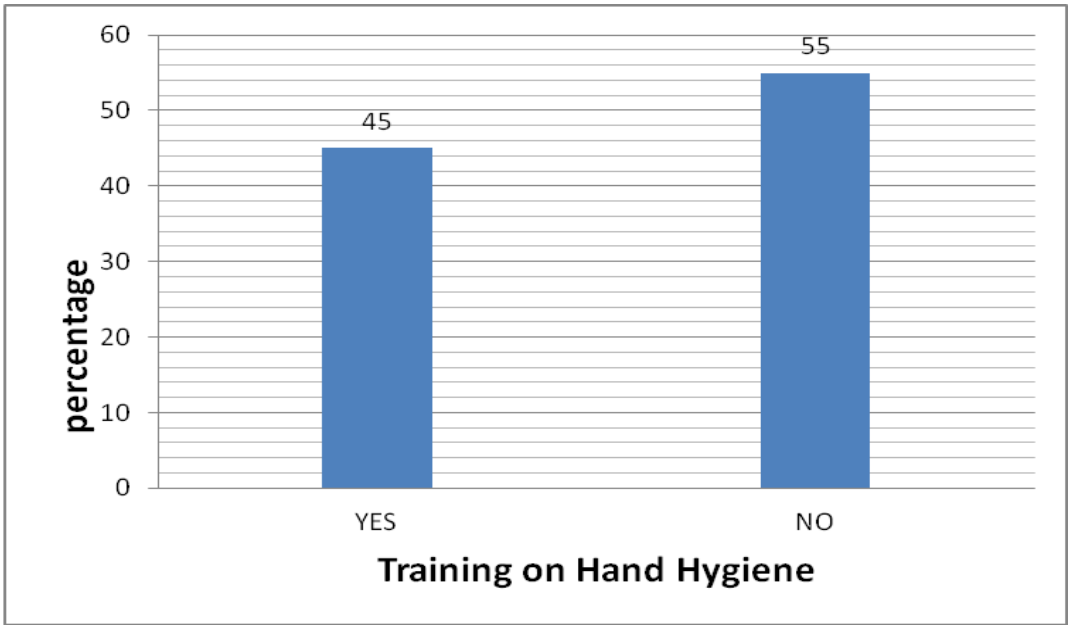


Figure 2: Assessing the Knowledge Regarding Hand Hygiene Practice (HHP)

Over 40 files (of nurses and Doctors working in maternity, Pediatrics, surgical and internal medicine departments) checked, the results shows that only 18 have got training on hand hygiene practice, so the rate of HHP training is 45%

For more precision a knowledge test was given to the concerned health care staffs (nurses and Doctors working in maternity, Pediatrics, surgical and internal medicine departments) in the purpose of increasing the precision of information. The results are shown in the following table.

Table 1. Knowledge test results on HHP (N=40)

		N	%
Overall		40	100
Grading /marking			
	<40	15	37.5
	40-50	7	17.5
	50-60	5	12.5
	60-70	7	17.5
	>70	6	15

The above results showed that the majority of staffs who participated for the knowledge test didn't get 50% (22/40).this show that the majority of staff don't' have enough knowledge on HHP

Assessing the availability of Equipments, Policies and procedures:

To check the Availability of HH Supplies and equipments in the services (Soap, alcohol based hand sanitizer, towels and the Availability of sinks , water supplies and availability of policies and procedures, a combined check list have been be designed. The spot checks have been done for 30 days (one month). We checked either during morning time or afternoon. Checking functionality and availability with "Yes "or "No". To assess the availability of policy and procedures regarding hand hygiene practice, we assessed the availability of policy in the service" Yes or No". We have also assessed the awareness of staff regarding those policies and procedures by brainstorming.

The results are summarized in the following table:

Table 2: Assessing the availability of HH, policy, Supplies and equipments

Indicator	N/30 days	%
Water Availability	21	70
Liquid Soap Availability	13	44
Alcohol Hand Sanitizer	8	26
Paper Towels Availability	5	16
Policy And Procedure Availability	29	98
Sinks Availability	29	96

The above table 2 depicts the availability of materials, equipments and the presence of policy and procedures that facilitate hand hygiene practice. As it is shown by the result from 30 days, it shows that there is no consistency of availability of, soap, alcohol hand sanitizer and towels. To assess the availability and consistency of water, foot activated taps (Kandagirukarabe) were considered as source of water were primary source (sinks) were missing.

The final root cause:

Reference of Statistical analysis data of our analysis, the results sturdily indicating that the main root causes of low hand hygiene practice were:

-Lack of knowledge regarding hand hygiene practice is a barrier because 55% didn't get training and over 50% staff who participated for knowledge test on HHP didn't succeed as it have been shown in the knowledge scores test it the table 1.

-The other sounding causes is unavailability of hand hygiene supplies (equipments and materials) including inconsistency of availability of liquid soap, alcohol based hand sanitizer and towels (see table 2)

3.7 Intervention

Intervention has been done based on the findings from the comparative analysis. Comparative analysis has been done through the following criteria: impact, time to effect, feasibility, and cost. Evaluations have been done with qualitative and quantitative data, Listen to reason *and* intuition.

Table 3: Decision Matrix

5- Most ideal; 1 – least ideal. (Means that highest score is five (5), while the lowest score is derived to one (1).

Strategic alternatives	**Evaluation criteria**				
	Impact	**Cost**	**Feasibility**	**Time**	**Total**
Educating healthcare workers (HCWs) on proper HH practice	4.3	4	4.5	5	**17.8**
Placing HH visual reminders in the workplace	4	3	3	2	12
Availability and providing pocket-sized ABHR bottles for HCWs with Alcohol-based hand rub	4	4	5	2	**15**
increase the Availability and accessibility of soap, paper towels	4	4.5	4.5	3	**16**
Increase water and foot activated taps	3.8	2	4	2	11.8

The identified priority solutions/strategies to improve hand hygiene compliance among Gisenyi Hospital clinical staffs were:

1. Educating Clinical staff on Hand hygiene practice trough training.

For this solution we found that this is simplest and most cost-effective interventions can have the greatest impact, we used on job training during morning staff and use the internal facilitators from the hospital there was no budget allocation for this intervention. This strategy used less time compared to others interventions without barriers. The implementation was done after Preparing training materials, identify participants, Request of the day to train participants, and even participants were informed before. Health care workers were encouraged by hospital leadership to take part in educational training programs designed to improve HH compliance. Training sessions were given during morning staffs. Pres and post test were given to participants. Quality improvement focal person and environmental Health officer conducted the training sessions using a Power Point presentation and training handouts. Training concentrating on the definition of HAI, impact of HH on patient outcomes, patterns of transmission with emphasis on HH, and the WHO recommendations on why, when, five Moments for Hand Hygiene (Before touching a patient, Before clean/aseptic procedures, After body fluid exposure/risk, After touching a patient, and After touching patient surroundings) and how to perform HH in healthcare settings.

2. **Increasing the Availability and accessibility of soap, paper towels**

This intervention adopted on the second range due to different reasons; has lower cost and impacted positively in motivating staff as they have facilities in the service. And did not take

mach time to deliver or to increase all requested supplies. Quantification and request were done by the project team, after endorsement of budget by hospital director the procurement officer was in charge of transmission of purchase order and Delivery of hand hygiene supplies. Environment health officer was responsible to ensure the availability of supplies in respective departments as requested by head of departments.

3. Availability and providing pocket-sized ABHR bottles for Clinical staff with Alcohol-based hand rub.

With providing pocket-sized ABHR bottles for HCWs with Alcohol-based hand impacted more positively on the compliance. Alcohol-based hand rubs known to be more practical in improving hand hygiene practices and reduce the incidence of infection Furthermore, alcohol-based hand rubs have been shown to provide superior efficiency in accomplishing hand hygiene as compared to use of antimicrobial soap and water. After the training activities, health care workers were given pocket-sized bottles in their respective departments. To ensure the consistency of availability of ABHR, we adopted to use hospital made hand sanitizer by following hand sanitizer formulations recommended by WHO. The Director of Pharmacy was responsible to keep ABHR stocked so that doctors and nurses could refill their bottles.

3.8 **Measures**

To measure the impact of interventions, process indicators have been evaluated and monitored as planned. Those indicators include number of clinical staff trained, analyzing the results of pre and post test, HH supplies availability in services and alcohol based hand sanitizer available for the services. Then finally we measured hand hygiene compliance as outcome indicator

3.9 Data Analysis

For the analysis of results, Descriptive analysis have been be used , specific data on numerators and denominators have been used to calculate the proportions of variables. Microsoft Excel have been be used to for the compilation of data and statistical test and P-value set at 0.05 as level of significance .

3.10 Ethical Considerations

The implementation of this project was completed within the norms stipulated by both the academic and administrative legal frameworks. A research clearance certificate was released by the MHA Program coordination of University of Rwanda. The access to data collection process only started after the approval and issuance of authorization letters from leadership of Gisenyi Hospital. Additionally to this, the data collection process did not affect the normal work process and the treatment received by the patients

CHAPTER FOUR: RESULTS

Results from outcome indicators

a. Clinical Staff Knowledge Evaluation

A total number of 40 clinical staff (6 out 8 Doctors and 34 of 42 nurses) attended training sessions offered. Each participant completed a questionnaire immediately before and after the training session. The results are summarized in the following table .

Table 4 Pre and post test results on Hand hygiene training

	PRE INTERVATION			POST INTERVATION				
	Success			Success				
Questions	YES	NO	% of success	YES	NO	% of success	Difference	P-Value
Q1	21	19	52.5	23	17	54.76	2.26	0.653
Q2	15	25	37.5	26	14	61.90	24.40	0.0138
Q3	21	19	52.5	25	15	59.52	7.02	0.365
Q4	20	20	50	21	19	50.00	0.00	0.823
Q5	19	21	47.5	23	17	54.76	7.26	0.374
Q6	21	19	52.5	27	13	64.29	11.79	0.1709
Q7	11	29	27.5	22	18	52.38	24.88	0.012
Q8	17	23	42.5	31	9	73.81	31.31	0.001
Q9	9	31	22.5	34	6	80.95	58.45	0.001
Q10	32	8	80	34	6	80.95	0.95	0.556
Q11	13	27	32.5	29	11	69.05	36.55	0.0003
Q12	19	21	47.5	27	13	64.29	16.79	0.0704
Q13	20	20	50	25	15	59.52	9.52	0.059
The response rate			45.76923	The response rate		63.55		

The above Table reveals that the overall response rate on questionnaires was 45.7% before training and 63.5% after training.

b. Availability of Hand Hygiene supplies

Availability and Function of Hand Hygiene supplies (liquid soap, ABHR, Paper towels) among the maternity, pediatrics, and internal medicine, neonatology and surgery departments were checked. The spot checks have been done during one month (30days) Checking functionality and availability with "Yes "or "No" for each criteria, at each point of service. Liquid soap and ABHR was available the majority of the time. (See the table 4.)

Table 5: Pre and post intervention comparative results on the availability of Hand Hygiene supplies

INDICATOR	PRE INTERVENTION	POST INTERVENTION	DIFFERENCE	P-value
Liquid soap				
Availability days/month	13days /30	26Days/30	13 Days	0.0004
Alcohol hand sanitizer				
Availability days/month	8Days/30	24 Days/30	16 days	0.00003
Paper Towels				
availability days/month	5Days/30	9Days/30	4 Days	0.2222

The results shows that before interventions out of 30 days, only liquid soap was available 13 days (44%) and after the intervention the availability increase to 26 days per month(86%) (p-value <0.05) . Regarding the availability of ABHR The results shows that before intervention alcohol based hand sanitizer was available only 8 days per month(26%) and increased to 24 days(80%) after intervention(p-value<0.05). The some results shows that there is no significant increase of paper towels availability after intervention.

Hand hygiene practice among clinical staff

Data on outcome indicator have been collected using WHO standardized data collection tool that provided information on the compliance of hand hygiene practice as it have been done on the magnitude of the problem by observation method .A total number of 18 observation sessions of HH compliance were conducted. Data were collected for 760 HH opportunities; 400 HH opportunities were reported before the intervention and 360 HH opportunities were reported after the intervention. The overall HH compliance of Doctors and nurses increased from 37.5% at baseline to 53.9% post intervention with P<0.001; Compliance improved independently. Nurse compliance improved by 19% and physician compliance improved by 13.9% (P<0.001) Significance level was 0.05. (See Table 5)

Table 6: Hand hygiene compliance before and after interventions

Professional category	**Pres intervention N=400**	**Post intervention N=360**	**Changes**	**P-value**
Nurses	89/254(34.7%)	104/196(53.7%)	19%	0.001*****
Doctors	59/145 (40.9%)	90/164 (54.8%)	13.9%	0.001*
Overall compliance	150/400(37.5%)	194/360(53.7%)	16.2	0.001*

The results show that overall hand hygiene improved from 37.5 % to53.7 with P-Value <0.05. Nurse compliance improved by 19 % and Doctors compliance improved 13.9%.

CHAPTER FIVE: DISCUSSION

The objective of this study was to increase hand hygiene compliance among clinical staff. This is one of the few studies to report the successful implementation of a multimodal HH improvement strategy at DH Hospital; it is also one of few studies reporting on HHP quality improvement Project in Rwanda.

The methods used in this HH intervention were pres and post intervention design study. by analyzing the staff knowledge on hand hygiene practice, the study results reveals that the response rate on questionnaires given to the staff during training period was 45.7% before training and 63.5% after training. The majority of the time, the literature sagest low hand hygiene compliance in most of the situations was associated with lack knowledge, olso they suggest that good attitude seems to be more necessary in improvement of hand hygiene practice(8).

The some to our results, a quasi-experimental study conducted by Benedetta .A et al, it was shown that Clinical staff' knowledge improved at all sites with an increase in the average score from 18·7 (95% CI 17·8–19·7) to 24·7 (23·7–25·6) after educational sessions. 2 years after the intervention, all sites reported ongoing hand-hygiene activities with sustained Hand hygiene improvement(19). Another study conducted in India examined the performance of knowledge and attitude of nurses showed that most of them had medium knowledge, poor attitude, and poor performance regarding hand hygiene practice(9)

In this study, we found that the availability and providing hand hygiene supplies was the key success for our project because our results show that before interventions out of 30 days, only liquid soap was available 13 days (44%) and after the intervention the availability increase to 26

days per month. Regarding the availability of ABHR The results shows that before intervention alcohol based hand sanitizer was available only 8 days per month(26%) and increased to 24 days. comparing to the study done by Alix Thomson ,reported that by providing knowledge to health care worker of Hopital du Point G, in Bamako, Mali, alongside with the provision of individual 100ml bottle of alcohol hand rub, after six months of implementation the evaluation results shows that hand hygiene practice increased from 8% at baseline to 21.8%.

In our study, the overall HH compliance of doctors and nurses increased from 37.5% at baseline to 53.7% post intervention P<0.001 Significance level was 0.05. Compliance improved independently. Nurse compliance improved by 19 % and Doctors compliance improved 13.9% .A study in sub-Saharan Africa case study of Gitwe hospital showed doctors and nurses to have a valuable results in HHP improvement contrary to our results, the same study showed nurses to have higher rates of compliance compared to Doctors(20) and the Indian study in pediatric department reported that Doctors had the higher compliance rate(17). In this study, contrary to our findings, we found that Nurse had higher rates of compliance. These results may be attributable to differences in training between physicians and nurses, Nurse are always closed to patients, perceived model roles, they are always assisting patients, motivation and this should be explored fully in subsequent studies. The accomplishment of this project in increasing hand hygiene compliance among hospital health worker was attributable to different factors. Strong leadership commitment and support. Hospital Leadership empowered staff, to be actively involved, and continuously drive the project. Due to the complexity of health care, multidisciplinary teams approach and strategies were essential in this project. Another important factor is that the team was fully understood the problem and root causes. Another key

point is that the Implementation plan was flexible to adapt to needed changes as they come up. Another pushing factor is that HCWs were already incentivized to undertake HH due to hospital accreditation process for service improvement from Rwandan Ministry of performance policy. Unfortunately this study didn't explore and give details on hand hygiene compliance for all moments, similar studies should be carried out for deep details and comparison.

This study had several limitations. First, Some HH Supplies have been stolen by patients or care givers (Liquid soap and paper towels when placed in the service to be used),second, Staff turner over, Third, the availability of some hand hygiene equipments (paper towels) were not consistent due to hospital budget constraint. Lastly, study participants were only clinical staff and ideal the project participants should include all hospital staffs.

5.1 Lesson learnt from the project

We realized that an effective quality improvement project requires changes in an organization's culture. This occurs when all staff embraces the philosophy of the project and understands their roles in supporting an organization-wide focus on quality improvement. Hierarchical roles which is important in health care settings, as well as in quality improvement Project and include licensure and appropriate supervision. Therefore, a paradigm shift is needed from team roles to those that also include quality improvement. During this period it was found that for quality to be effectively managed, individuals and groups in an organization should have a clear understanding of their roles and responsibilities relative to the project. Each staff member has a role in ensuring that the objective of QI project is met. Ideally, all contributions are equally valued on the QI project.

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Health care workers need to protect themselves, protect co-workers, patients and ensure the wellbeing of patients. It has long been recognized that hand hygiene is the most effective way to prevent the spread of infection, thereby ensuring patient safety. Pres and post intervention study design have been used in this project. The findings motivated the Hospital leadership to expand the intervention hopitalwide. The identified priority solutions/strategies to improve hand hygiene compliance among Gisenyi District Hospital clinical staffs were: Educating clinical staff on Hand hygiene practice. Increase the Availability and accessibility of soap, paper towels Availability and providing pocket-sized ABHR bottles to clinical staff with Alcohol-based hand rub. After evaluation it shows that that hand hygiene compliance improved from 37.5% to53.7%.

6.2 Recommendations

Lack of knowledge regarding HHP was observed among hospital clinical staff, insufficiency of hand hygiene supplies and equipments were also more prevalent as root cause of low rate of hand hygiene practice. Base on that, the outstanding recommendation from these study findings goes towards to hospital leadership and hospital clinical staff. Hospital leadership and management should provide adequate knowledge and information to all health workers regarding hand hygiene. Hospital should provide hand hygiene supplies to all staff especial Alcohol base hand sanitizer at regular basis. Clinical staff should maintain a culture of HHP as priority in HAI prevention. as this study brings a valuable contribution in filling the acknowledged gap in this area ,the major limitations that we faced is that we didn't explore and give details on hand

hygiene compliance for all moments, similar studies should be carried out for deep details and comparison and find out why most the case doctors comply more than nurses .

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APPENDIXES

Appendix 1: Permission to conduct the study

HABANABAKIZE Epaphrodite

RUBAVU DISTRICT

Gisenyi District Hospital

Tel:0788753059/0722753059

Email: ephana130@yahoo.fr

2nd August 2016

GISENYI HOSPITAL
RECEIVED ON 02/08/2016
SIGNATURE

The Director of Gisenyi Hospital

R.E: **REQUEST FOR PERMISSION TO CONDUCT A QUALITY IMPROVEMENT PROJECT**

Sir,

I humbly request permission to conduct a quality improvement project at Gisenyi hospital.

I am presently registered at the University of Rwanda, Masters Degree in Hospital administration and health care management (MHA), under the supervision of **Dr Egide KAYONGA NTAGUNGIRA** .The title of the Project is "**Improving Hand Hygiene Compliance among Gisenyi Hospital health care workers**" structured questionnaire, tally sheet, observation and brainstorming with staff . The information will be treated as strictly confidential. There are no medical risks or other discomforts associated with the project.

The results of the project may help hospital to deliver a good quality service to the client and community in whole.

Yours Faithfully

HABANABAKIZE Epaphrodite

Rubavu 12/August/2016

Mr HABANABAKIZE Epaphrodite

University of Rwanda

Kigali

Dear Epaphrodite,

RE: Your request for the permission to conduct a quality improvement project at Gisenyi hospital

Reference is made to letter of 2nd August 2016 requesting the permission to conduct a quality improvement project on "**Improving Hand Hygiene Compliance Among Gisenyi Hospital health care workers** "at Gisenyi Hospital.

I am pleased to inform you that you allowed to conduct your research at Gisenyi Hospital. we kindly request you to share with us your findings

We wish you all the best in this endeavor.

Dr KANYANKORE William

Director of Gisenyi Hospital

CC:

-Administrator of Gisenyi Hospital

Appendix 2: Hand hygiene auditing form used

The following form has been used for assessing the magnitude.

	DEP:				**WORD:**			**PERIOD:**							
	Prof.cat.			**Prof.cat.**			**Prof.cat.**			**Prof.cat.**			**Total per session**		
Session N°	**Opp (n)**	**HW (n)**	**HR (n)**	**Opp (n)**	**HW (n)**	**HR (n)**	**Opp (n)**	**HW (n)**	**HR (n)**	**Opp (n)**	**HW (n)**	**HR (n)**	**Opp (n)**	**HW (n)**	**HR (n)**

Calculation	**Act (n) =** **Opp (n) =**			**Act (n) =** **Opp (n) =**			**Act (n) =** **Opp (n) =**			**Act (n) =** **Opp (n) =**			**Act (n) =** **Opp (n) =**		
Compliance																

Appendix 3: Hand Hygiene Compliance among Gisenyi Clinical Staffs before interventions

Personnel	**HHP Compliance**		
	Morning time	**Afternoon Time**	**Overall**
Nurses	36%	32%	34%
Doctors	42%	40%	41%
Total	**39%**	**36%**	**37.5**

Appendix 4

Check list used to assess availability of equipments supplies and policy:

Indicator	**Date ……**		**Day…….**
	Yes	No	Comment
Water Availability			
Liquid Soap Availability			
Alcohol Hand Sanitizer			
Paper Towels Availability			
Policy And Procedure Availability			
Sinks Availability			

Appendix 5:

Hand Hygiene Knowledge Test from WHO

Attempt All Questions.

Decide whether each of the following statements is T (true) or F (false). Write your response for each statement in the space provided.

1. Hand hygiene can contribute to infection control . _____

2. **Hand Hygiene** covers both: Hand washing using soap and water, Cleaning hands with waterless or alcohol-based hand sanitizers _____

3. Hand hygiene is the most important measure to avoid the transmission of harmful germs and to prevent health care-associated infections. _____
4. Do not use hot water to rinse your hands. _____

5. After hand rubbing or hand washing, let your hands dry completely before putting on gloves_____
6. Hands should always be washed after removing gloves following a health care procedure. _____

The following are multiple-choice questions. More than one option may be correct for each question. Please circle the correct response(s) for each question.

7. Hand washing:
   a) Decreases client sickness and death
   b) Is usually performed appropriately in most health care facilities
   c) Protects both the client and service provider from infections

8. Which of the following is the main route of cross-transmission of potentially harmful germs between patients in a health-care facility? (*tick only one best answer*)

a) ☐ Health-care workers' hands when not clean

b) ☐ Air circulating in the hospital

c) ☐ Patients' exposure to colonised surfaces (i.e., beds, chairs, tables, floors)

d) ☐ Sharing non-invasive objects (i.e., stethoscopes, pressure cuffs, etc.) between patients

9. What is the most frequent source of germs responsible for health care-associated infections?
(tick one answer only)

a) ☐ The hospital's water system
b) ☐ The hospital air
c) ☐ Germs already present on or within the patient
d) ☐ The hospital environment (surfaces)

11 . Which of the following hand hygiene actions prevents transmission of germs *to the patient*?

e) Before Patient Contact ☐ Yes ☐ No
f) Before an Aseptic Task ☐ Yes ☐ No
g) After Body Fluid Exposure Risk ☐ Yes ☐ No
h) After Patient Contact ☐ Yes ☐ No
i) After Contact With Patient Surroundings ☐ yes ☐ No

12. Which of the following hand hygiene actions prevents transmission of germs *to the health-care worker*?

j) After touching a patient ☐ Yes ☐ No
k) Immediately after a risk of body fluid exposure ☐ Yes ☐ No
l) Immediately before a clean/aseptic procedure ☐ Yes ☐ No
m) After exposure to the immediate surroundings of a patient ☐ Yes ☐ No

13. Which of the following statements on alcohol-based hand rub and hand washing with soap and water are true?

n) Hand rubbing is more rapid for hand cleansing than hand washing ☐ True ☐ False

o) Hand rubbing causes skin dryness more than hand washing ☐ True ☐ False

p) Hand rubbing is more effective against germs than hand washing ☐ True ☐ False

q) Hand washing and hand rubbing are recommended to be performed in sequence

☐ True

☐ False

13.What is the minimal time needed for alcohol-based hand rub to kill most germs on your hands?

(tick one answer only)

r) ☐ 20-30 seconds

s) ☐ 3-5 seconds

t) ☐ 1 minute

u) ☐ 10 -15 seconds

Appendix 6: Implementation plan

Educating healthcare workers (HCWs)								
Task	**Responsible**	**Time bounds**						
		5-Dec-2017	**12-Dec-2017**	**26-Dec-2017**				
Prepare training materials	Imvestigator,EHO							
identify participants	Investigator							
Request of the day to train participants	Investigator							
Inform and invite participants	Investigator							
Print handouts/organize the power point notes	EHO							
Acquire training materials	EHO							

Increase the Availability and accessibility of soap, paper towels, and providing pocket-sized ABHR bottles with ABHR								
Task	**Responsible**	**Time bounds**						
		5-Dec-2016	**13-Dec-2016**	**20-Dec-2016**	**22-Dec-2016**	**29Dec-2016**	**12-Jan-2017**	**8-feb-2017**
Make request	Environment health officer.							
Approval of budget	Administrator							
Prepare of purchase order	Procurement							
Approval of purchase order	Director							
Transmission of purchase order	Procurement							
Delivery of goods	Logistic							
Reception of goods	Logistic							
Request of goods to Administrator	Investigator							
Approval by administrator	Administrator							
Delivery of goods from logistic	Logistic							
Delivery of goods to respective department	Imvestigator,EHO							