

## A Study On Hand Washing Practices Among Health Care Workers In Embu Referral Hospital, Embu County

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### ABSTRACT

**Introduction:** There is very little published information on hand washing practices of Health Care Workers (HCWs), their knowledge, perceived barriers & facilities for practicing hand washing in hospitals from Kenya. So this study was undertaken. Such studies give important inputs for further research, policy making & planning. **Materials & Methods:** This cross-sectional study which was conducted in Embu Referral hospitals of Embu County had two components: 1) Direct observation of hand washing pre & post patient contact followed by 2) administration of anonymous questionnaire testing knowledge. A total of 142 hand washing opportunities were studied. The study was conducted in consenting Departments affiliated to the hospital. Two study tools based on use were: 1) Performa to record practices; and 2) Questionnaire to test knowledge of HCWs. **Results:** Only 129 observations could be made. Though the HCWs had general awareness about Hand Washing Practices (HWP), they lacked information about specific aspects & the practices were poor. Low hand washing rates (%) were observed among nurses (28) & doctors (23). There was a gap between knowledge and practice. Knowledge of doctors on various aspects of hand washing was inadequate though it was better than nurses. "High Work Load" & "Lack of Time" were perceived to be important barriers for Hand Washing Practices (HWP). Shortage of sinks was noticed in different Departments. **Conclusion:** There is a need to develop guidelines for hand washing practices & the facilities for it in the Departments of Embu County Hospital.

**Keywords:** Hand washing, health care worker, hospital.

### Introduction

Health Care Workers' (HCW) hands become progressively colonized with commensal flora as well as with potential pathogens during patient care. Contaminated hands could be vehicles for the spread of certain viruses and bacteria. Nosocomial infections constitute a major challenge of modern medicine. On an average, infections complicate 7% to 10% of hospital admissions (Haley RW *et al*, 1985). Transmission of microorganisms from the hands of Health Care Workers (HCWs) is the main cause of nosocomial infections, and hand washing remains the most important preventive measure (Larson EL, 1995). A review on Hand hygiene practices suggests that the compliance of HCW to recommended hand hygiene procedures ranges from 5% to 89% with an average compliance rate of less than 50% ([http://whqlibdoc.who.int/hq/2009/WHO\\_IER\\_PSP\\_2\\_009.07\\_eng.pdf](http://whqlibdoc.who.int/hq/2009/WHO_IER_PSP_2_009.07_eng.pdf)). There is evidence that hand antiseptics reduce the transmission of health care associated pathogens and the incidence of Health Care Associated Infection (HCAI) (Boyce JM, Pittet D., 2002). A study on hand washing practices (HWP) would help in 1) understanding Problems that need to be addressed in this area; 2) Identify the training needs for planning intervention; 3) Give inputs for policy makers; and 4) Identify Areas that need further research. This information would help in reducing the magnitude of HCAs. There are no published studies from Kenya.

### Study Objectives

There is no published study that examines the HWP, knowledge of HCWs, perceived barriers & facilities available in hospitals. Hence this study was undertaken with the following objectives:

1. To know the knowledge of HCWs with regard to hand washing techniques and choice of agents used for antiseptics before and after contact with patients.
2. To observe the hand washing practices among HCWs before and after contact with patients.
3. To identify the barriers for practicing hand hygiene.

### Materials & Methods

**Study Setting:** Embu County is located in the Eastern Part of Kenya. It has only one Referral Hospital. This health care facility provides services to the local population.

**Study Design:** This is a cross sectional study with two components. Firstly, direct observation of HWP among HCWs before and after patient care followed by administration of an anonymous questionnaire to test their knowledge.

**Study Units:** Hospital Clinical Departments. The clinical Departments with the following criteria were included: 1. Inpatient admissions. 2. Intensive Care Unit (ICU). 3. Minor theatres. 4. Medical Wards. 5. Obstetric and Gynaecologic wards. 6. Paediatric wards. 7. Surgical wards. Those excluded were: 1. Diagnostic Centres and Laboratories. 2. Departments that declined to give consent.

**Study period:** The study was conducted between May 1st 2015 and June 2015.

**Sample size:** The only published study about compliance rates for HWP from Kenya reported the compliance rate of 74.8% among HCWs of the hospitals (Water, sanitation and hygiene in health care facilities WHO 2014). Using the formula for infinite population, at 5% allowable error, 90% power & 10%

non-response the sample size was computed to be 142 hand washing opportunities pre & post contact with the patients.

### **Sampling:**

All clinical Departments that gave consent were included in the study.

**Operational definitions:** Based on World Health Organization (WHO) guidelines ([http://whqlibdoc.who.int/hq/2009/WHO\\_IER\\_PSP\\_2](http://whqlibdoc.who.int/hq/2009/WHO_IER_PSP_2)), the following operational definitions were used:

1. Handwashing: Washing hands with plain or antimicrobial soap and water.
2. Antiseptic agent: An antimicrobial substance that inactivates microorganisms or inhibits their growth on living tissues e.g.: alcohol, chlorhexidine, iodine etc.
3. Compliance with hand washing: defined as either washing hands or wrists with water and plain soap or rubbing with an antiseptic solution before and after patient care.
4. Non Compliance: Any deviation from the above mentioned definition of compliance & departure from the room after patient care without handwashing.
5. Health care worker: A Nurse or doctor involved with patient care.

**Study Instruments:** Based on WHO guidelines ([http://whqlibdoc.who.int/hq/2009/WHO\\_IER\\_PSP\\_2009.07\\_eng.pdf](http://whqlibdoc.who.int/hq/2009/WHO_IER_PSP_2009.07_eng.pdf)), two instruments were devised:

1. An anonymous questionnaire to test the knowledge of HCW. It covered the following components of information (Scoring Range): 1) Indications (0-11); 2) Choice of agents (0-5); 3) Duration (0-1); and 4) Barriers of hand washing. The questionnaire had a mix of open and close ended questions (including single and multiple response questions).
2. A Proforma to observe and know handwashing practices. It covered the following components:

1) Areas scrubbed; 2) Agent used; 3) Time taken for hand washing; and 4) Methods of drying hands. The areas scrubbed and the washing techniques were encircled on a pictorial scale consisting of 12 steps devised by the WHO ([http://whqlibdoc.who.int/hq/2009/WHO\\_IER\\_PSP\\_2009.07\\_eng.pdf](http://whqlibdoc.who.int/hq/2009/WHO_IER_PSP_2009.07_eng.pdf)). This contains pictures of correct and wrong techniques. Presence / Absence of certain facilities for HWP in these hospitals were also included.

**Pre-Testing & Modification:** When the Proforma & questionnaires were pretested in neighbouring Muranga County, the following circumstances compelled us to make certain modifications:

1. As per the WHO guidelines ([http://whqlibdoc.who.int/hq/2009/WHO\\_IER\\_PSP\\_2009.07\\_eng.pdf](http://whqlibdoc.who.int/hq/2009/WHO_IER_PSP_2009.07_eng.pdf)), HCWs should wash their hands even before recording the pulse or blood pressure. As this was not practiced in many of the hospitals we omitted it from our proforma. So, certain activities which had a higher risk of microbial transmission like: all contacts with mucous membrane, non intact skin, any secretions and

excretions and manipulations (opening or disconnecting) of patients' vascular lines or other tubes were observed. For example, in surgical wards we observed wound dressing, debridement, insertion of urinary catheter etc.

2. Certain wrong practices like washing of hands only once before attending to many patients in the ward, cleaning of visibly soiled hands with alcohol based hand-rubs, concomitant use of soap and alcohol based hand-rubs etc were observed.

So questions about the appropriateness of these practices were included in questionnaire (in true / false format) & scored on a 5 point scale (Range 0-30).

**Data Collection:** In each Department the data was collected from a maximum of two HCWs from ICU, each ward and minor theatre. The practices were observed before and after contact with the patients and the proforma were filled.

This was followed by administration of questionnaire in English language. If both the activities could not be performed on the same day, a revisit was made.

**Data Analysis:** Information obtained was analysed by SPSS version 10. Results have been expressed as proportions. The knowledge component has been expressed as total scores, mean and standard deviation. Significance of difference in 'Mean' knowledge scores was assessed using students' independent 't' test. Comparison of proportion of doctors and nurses with inadequate/satisfactory and good knowledge was done. 'P' <0.05 was considered significant.

### **Results**

Only 129 observations could be made from 7 Clinical Departments giving us a response rate of 90.8%.

#### **Knowledge on various aspects of hand washing**

Overall knowledge of the HCWs for various indications of Hand washing are as follows [Correct answers (%)]:

Before touching the patient (100), after touching patient (97.7), Before handling an invasive device for the patient (86.7), Working in ICU (96.1), After handling blood or other body products with gloves (83.7), While examining patients in OPD (76.7), After using a hand sanitizer (58.1), Attending to a patient after being interrupted by a phone call (57.4). Most of them (46.5) had satisfactory knowledge about the choice of agents used & inadequate knowledge (34.1) about duration of hand washing. Knowledge about certain common wrong practices are presented in Table 1. Comparison of knowledge between doctors & nurses (Table 2) on various aspects of hand washing reveals that doctors had better knowledge though the knowledge of doctors on some aspects is inadequate.

**Table 1:** Knowledge of HCWs regarding certain wrong practices

Knowledge about wrong practices	Correct Answer (%)	Wrong Answer (%)
Hand washing should be practiced only before touching a patient	96 (74.4)	33 (25.6)
It is sufficient to wash hands only once before attending to many patients in the ward	109 (84.5)	20 (15.5)
Visibly soiled hands can be cleansed using an alcohol based hand rub	73 (56.6)	56 (43.4)
Soap and alcohol based hand rub can be used concomitantly	56 (43.4)	73 (56.6)
Generally it is not essential to wash hands after patient contact to prevent health care associated infections.	106 (82.2)	23 (17.8)
Gloves should be changed or removed if moving from a contaminated body site to either another body site within the same patient or the environment.	100 (77.5)	29 (22.5)

**Table 2:** Comparison of knowledge between Doctors and Nurses

Grading of Knowledge on Hand washing (Scores)	Doctors (%)	Nurses (%)	Mean Scores (Standard Deviation)	Student's Independent 't' Test (p)
<b>Indications</b>				
Inadequate (< 5 )	1 (1.2)	3 (7.0)	Doctors 8.69 (1.23)	4.19 (0.000)
Satisfactory (6 to 9)	59 (71.1)	34 (79.1)	Nurses 7.65 (1.46)	
Good (10 - 11)	23 (27.7)	6 (14)		
<b>Choice of Agents</b>				
Inadequate (< 2)	6 (7.2)	12 (27.9)	Doctors 4.41 (1.14)	5.68 (0.000)
Satisfactory (3-4 )	34 (41)	26 (60.5)	Nurses 3.19 (1.16)	
Good (5-6)	43 (51.8)	5 (11.6)		
<b>Knowledge of certain wrong practices</b>				
Inadequate (< 15)	0 (0)	4 (9.3)	Doctors 23.04 (2.77)	4.33 (0.02)
Satisfactory (16 to 24)	63 (75.9)	33 (76.7)	Nurses 20.47 (3.80)	
Good (25-30)	20 (24.1)	6 (14)		

### Hand washing Practices

Use of gloves before contact with patients, disposing it and walking away without washing hands after contact was the common practice in these hospitals (Table 3). Less or inadequate time was spent on hand washing (12.36%). Most of the times (78%) the areas scrubbed were not adequate. Rubbing "palm to palm" was the common practice (68%). Missed areas included: 1. Dorsum of the hand. 2. Interdigital spaces. 3. Tips of the fingers. Enough soap was not applied to

cover all the areas (83%). Wiping the hands to Non-Sterile cloth was the most common (57%) method of drying. These cloths were not single use cloths. Uses of other methods for drying are as follows (%): Sterile cloth (19), Tissue paper (16), and not drying (8). Those who used alcohol hand rubs did not apply it completely on the entire palm (42%). Long nails could be seen on the hands of some (14%) HCWs. Proportion of nurses (28%) who followed hand hygiene practices was higher than doctors (23%).

**Table 3:** Practices Pre & Post contact with patients

Hand washing Practices	Pre-Contact (%)	Post-Contact (%)
Use of Gloves	81 (62.8)	--NA--
Soap & Water	13 (10.1)	23 (17.82)
Alcohol based agents	16 (12.4)	18 (13.95)
No Hand washing	19 (14.7)	88 (68.21)

### Barriers & facilities for hand washing

HCWs perceive that high work load, shortage of time & not enough sinks are some important barriers for practising hand washing (Table 4).

Though the hospitals made available gloves, soap, water there were inadequate number of sinks (Table 5).

**Table 4:** Perceptions on the barriers of hand washing

<b>Perceived Barriers for practising hand washing</b>	<b>Yes (%)</b>	<b>No (%)</b>
Increased workload	92 (71.3)	37 (28.7)
Lack of time	86 (66.7)	43 (33.3)
Location and shortage of sinks	81 (62.8)	48 (37.2)
Lack of encouragement	78 (60.5)	51 (39.5)
Irritation and dryness of hand	71 (55.0)	58 (45.0)
Lack of role model from senior staff	70 (54.3)	59 (45.7)
Shortage of water	58 (45.0)	71 (55.0)
Low risk of acquiring infection from patient	43 (33.3)	86 (66.7)

## Discussion

The knowledge of doctors on various aspects of hand washing is better than nurses. There are no comparable studies from Kenya. Poor knowledge about hand washing practices are reported from Turkey (Asiye D. Akyol RN, 2005).

Though the level of knowledge of doctors is better than nurses, it is inadequate regarding choice of agents. Many HCWs do not recognize the inappropriateness of certain wrong practises (Table 1). Information about hand hygiene is generally limited to antiseptic /disinfecting agents in the undergraduate medical curriculum. Though the nurses study it in detail, knowledge acquired during student days seem to have been forgotten. There is a need to reorient the interns,

postgraduates & nursing students before they begin their work in the hospitals.

Practices of the HCWs reflect that it is not in tune with their knowledge. They do not practice what they know. Use of gloves is not a substitute for hand washing ([http://whqlibdoc.who.int/hq/2009/WHO\\_IER\\_PSP\\_2009.07\\_eng.pdf](http://whqlibdoc.who.int/hq/2009/WHO_IER_PSP_2009.07_eng.pdf)) so, the use of gloves without associated hand washing amounts to noncompliance.

Low proportion of HCWs practiced hand washing with soap & water. But when we include glove users the proportion is higher.

Higher rates of hand washing are reported by Mehta et al, 2005. Their study was conducted in ICUs of tertiary care centres where the compliance rates are likely to be higher.

**Table 5:** Facilities for hand washing available at the site of patient care

<b>Presence of following facilities</b>	<b>Number (%)</b>
<b>Antimicrobial Soap</b>	
1. Yes	106 (82.2)
2. No	23 (17.8)
<b>Alcohol Based Agents</b>	
1. Yes	115 (89.1)
2. No	14 (10.9)
<b>Sinks</b>	
1. Yes	117 (90.7)
2. No	12 (9.3)
<b>Sterile Towel</b>	
1. Yes	72 (55.8)
2. No	57 (44.2)
<b>Sterile Gloves</b>	
1. Yes	126 (97.7)
2. No	3 (2.3)
<b>Hand Drier</b>	
1. Yes	4 (3.1)
2. No	125 (96.9)
<b>Continuous water supply at sinks</b>	
1. Yes	103 (79.8)
2. No	26 (20.2)
<b>Posters Explaining Hand washing technique</b>	
1. Yes	63 (48.8)
2. No	66 (51.2)
<b>Sink Bed Ratio (n=95)</b>	
1. Less than 1:10	44 (46.3)
2. At least 1:10	44 (46.3)
3. More than 1:10	7 (7.4)

The pattern of perceived barriers for practicing hand washing practices has not been explored. The pattern seen in this study reflects that the Health Care Workers seem to consider hand washing as "burdensome". The nature of facilities available is reasonable considering the fact that this study included hospital clinical departments.

The sink bed ratio is less in this hospital. There are some limitations in our study. The number of Departments included in our study is small.

This kind of study should be conducted in several hospitals that may include the private hospitals as well.

The findings provide important inputs for policy makers. Absence of standard guidelines for hand hygiene & facilities for practicing it compelled us to develop our own tools which may have limited the extent of facilities studied in the Departments. There are no clear cut guidelines for what constitutes "adequate hand washing facility" for the Departments so we could only report the presence / absence of facilities for hand washing.

## Conclusion

Though the Health Care Workers have a general awareness about the Health Work Practices they lack specific information.

Incorrect Health Work Practices were observed in many departments of this county Hospital.

## Recommendations

There is a need to reorient the Health Care Workers before they begin the hospital work about hand hygiene practices. There is a need to evolve national guidelines on standard hand washing practices and facilities in hospitals in our country.

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## Recommended citation

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