Napata College
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Knowledge and Attitude of Health Care Workers for the "5 Moments Hand Hygiene" of Infection Control *(Omdurman Teaching Hospital and Mohammed Elamin Hamid for Pediatric)*

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Dedication

We dedicate to those who have been there for us when we need.

To those who never get tired of helping and supporting us all through the way. To our parents

To our friends and family

To our colleagues especially, and our teachers

ACKNOWLEDGMENT

Firstly, thanks to Allah for helping to achieve this work. And we would like to express our profound thanks to **Dr. Hassan Ismaeil Osman Ahmed** for his support and encouragement towards us at every stage in successful completion of our project.

We place our gratitude to our parents who always encouraged us to pursue our interest, who have led us onto the right path. We are undoubted for all the love and affection thy bestowed upon us. Many are responsible the knowledge and experience we gained during our project. With profound sense of gratitude and regards we acknowledge for support extended to our friends for their support in completion of this project.

Finally, we would also like thank to all those who knowing or unknowingly helped to all of us throughout our project.

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LIST OF ABBREVIATIONS

5MHH:	Five Moments for Hand Hygiene
HAI:	Hospital acquired infections
HCAI:	Health care-associated infections
HCRI:	Hickman catheter-related infection
HCW:	Health care workers
HH:	Hand hygiene
ICU:	Intensive Care Unit
TPB:	Theory of planned behavior
TTM:	Transtheoretical Model of behavior change
WHO:	World Health Organization

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Abstract

This study was carried in two teaching hospitals at Omdurman, Khartoum State. The objective of the study was to assess the knowledge, attitude, and practice of Five Moments of Hand Hygiene among Medical staffs in two teaching hospitals, Omdurman, Khartoum State, Sudan. Data was collected via questionnaires, interviews and personal observation of the health care workers performing hand hygiene. Data analysis was performed using SPSS. The majority of the health workers at the two institutions agreed to most of the questions. More than 95% agreed that hand hygiene compliance can be improved by displaying posters and reminders at point of care. While 90% agreed that compliance with HH can be improved by administrative orders and continuous observation. 98% of the health worker said should be enrolled in training sessions regarding IC and HH practices.

CHAPTER ONE
INTRODUCTION

1.1 Introduction:

Hand hygiene is recognized as the leading measure to prevent cross-transmission of microorganisms and to reduce the incidence of health care associated infections (1). Although hand hygiene is simple, still its compliance among health care providers is as low as 40% (2). Continuous efforts are being carried to identify effective and sustainable strategies to address this problem.

One of such efforts is the introduction of an evidence-based concept of "My five moments for hand hygiene" by World Health Organization. These five moments that call for the use of hand hygiene include the moment before touching a patient, before performing aseptic and clean procedures, after being at risk of exposure to body fluids, after touching a patient, and after touching patient surroundings. This concept has been aptly used to improve understanding, training, monitoring, and reporting hand hygiene among healthcare workers (3).

Hospital acquired infections (Hospital acquired infections) are infections acquired in hospital by a patient who was admitted for a reason other than that infection (4). Hospital acquired infections are one of the important public health problems in many countries throughout the world. A WHO study has also shown that the highest prevalence of nosocomial infections occurs in intensive care units and in acute surgical and orthopedic wards (5).

Nurses constitute the largest percentage of the health care workers (HCW) (6) and they are the “nucleus of the health care system” (7). Because they spend more time with patients than any other HCWs, their compliance with hand washing guidelines seems to be more vital in preventing the disease transmission among patients.

Hospital acquired infections results in higher morbidity, mortality, and additional costs. It is well recognized that the risk of transmission of pathogens when providing medical care and the incidence of Hospital acquired infections can be kept low through appropriate standardized prevention procedures. However, it has been well documented that the level of compliance with the use of proven HAI measures by healthcare workers (HCWs) has been disappointing (8). To over-come this problem, it is vital to implement and practice prevention and control strategies with demonstrated value consistently and rigorously. Among the different strategies, the adherence to guidelines for disinfection is an essential ingredient for activities aimed at preventing the Hospital acquired infections.

The importance of hands in the transmission of hospital infections has been well demonstrated (9) and can be minimized with appropriate hand hygiene (10). However, compliance with hand washing is frequently suboptimal.

The prevalence of hospital acquired infections is high in intensive care unit due to patient and environmental factors. The patients are critically ill and usually immune compromised which predispose them to acquire infections more easily. Critically ill patients requiring urgent and emergency interventions in ICU may cause difficulties to the health care workers to engage in recommended hand hygiene practices (11).

1.2 Problem Statements:

Hand hygiene by nurses at hospitals was reported to be very low, as there are no well documented guidelines and published in the workplace.

1.3 Justification:

The importance of five-minute hand wash in prevention and /or reduction of infection to the health care workers and to all those in the health institute is vital and highly recommended. This study is to highlight this importance.

1.4 Objectives:

General Objective:

To assess the knowledge, attitude, and practice of Five Moments of Hand Hygiene among Medical staffs.

Specific objective:

To evaluate the significance of hand hygiene in two teaching hospitals in Khartoum State, viz: Omdurman Teaching Hospital and Mohammed Elamin Hamid for Pediatric, Omdurman, Khartoum State, Sudan.

CHAPTER TWO
LITERATURE REVIEW

2.1 Background:

Estimates indicate that hundreds of millions of patients suffer from health care-associated infections (HCAI) each year worldwide (12). The most common HCAI are urinary tract, surgical site, lower respiratory tract and bloodstream infections. In addition to increased morbidity and mortality, these infections contribute significantly to the financial burden borne by patients, their families, and the health care system. The increasing incidence of HCAI with antimicrobial-resistant bacteria further complicates the issue. Although the risk of acquiring these infections exists worldwide, the risk and impact are likely to be higher in resource-constrained settings where compliance with standard recommendations for infection prevention and control is generally not optimal. The capacity of existing systems to respond to the increased demand associated with HCAI, such as length of stay, cost, effective antimicrobial therapy and advanced technology is also limited in such settings.

2.2 Importance of Hand Hygiene:

It has long been known that Practicing hand hygiene (HH), either washing the hands with water and soap or using alcohol-based hand rub is the most effective way of preventing the spread of infectious diseases (13). Hand hygiene is simple, easily implemented and an effective practice that can reduce the risk of infection (14).

Although health care related infections are a major threat to patients' health and safety, it is highly preventable by proper hand hygiene (HH) (15).

Health care workers, especially nurses and physicians, have the most physical contact with patients, and thus they are the primary vector for infection transmission within hospitals.

A proper hand hygiene before and after each contact with any patient is an important measure to prevent Hickman catheter-related infection (HCRI) in cancer patients (16). Health care related infection is estimated to affect 10% of patients in developed countries, and 25% in developing countries (17).

The reasons for low levels of practice of hand hygiene have not been defined in developing countries probably due to limited observation and studies on hand hygiene (18).

2.3 Hand Hygiene Awareness:

Wisniewski stated that lack of awareness and knowledge among health care workers as regard the importance, techniques, methods and quality of hand hygiene considered the main factors that contribute to non-compliance to Hand Washing among health care workers (19). Hand hygiene also is an effective and cost-efficient way to reduce the number of microorganisms, thereby reducing the rate of transfer of microorganisms to hospitalized patients and this will reduce the number of HCRI (20).

Healthcare workers have been identified as the most common vehicle for transmission of most nosocomial infections (health care associated infections) from patient to patient and within the healthcare environment (21). These infections can be life-threatening and difficult to treat. Health care associated infections can be received from infected or draining wounds, frequently colonized areas of the intact patients‟ skin, patients‟ gowns, bed linen, bedside furniture and other objects in the immediate environment of the patient.

Any healthcare worker, who is involved in patient care directly or indirectly, should be aware of HH importance and also be able to carry out HH properly (22). Assessing the knowledge, practices and attitudes for health care workers may also help in recognizing the factors that affect their compliance with HH, as it is still low (23). Improved levels of knowledge, attitude and compliance with hand washing is usually associated with a significant decrease in overall rates of nosocomial infection and respiratory infections in particular (24).

2.4 Guidelines for Hands Hygiene:

Several guidelines were published by both international and local organizations around the world such as WHO, CDCD and the Sri Lankan college of microbiologists (25) on hand hygiene. Regular training programs and surveys needs to be carried out regularly to assess the hand hygiene practices among the health care workers in Sri Lanka, especially in the intensive care units in order to implement infection control measures.

In the Sri Lankan theatre settings, a study demonstrated that only 60% of the doctors performed appropriate hand washing before entering the theatre'. Noncompliance with hand washing may be due to a variety of reasons, including: lack of appropriate facilities for hand washing, high staff-to-patient ratios, insufficient knowledge and attitudes of the staff, and allergies to hand washing products. Therefore, it is important to address these issues in hospital infection control.

2.5 Factors Associated with Health Care Workers:

A variety of factors have been associated with compliance to healthcare worker (HCW) hand hygiene (HH) (26). In 2005, the World Health

Organization (WHO) introduced “My Five Moments for Hand Hygiene (5MHH) to promote HH and minimize the risk for healthcare-associated infection (26). Two theory-based behavioral approaches associated with sustained promotion of healthy behavioral change are from constructs within the transtheoretical model of behavior change (TTM) and the theory of planned behavior (TPB) (27).

Although some behavioral considerations for HH have been reported, the understanding of HH compliance has not been evaluated within the TTM stages of change constructs (28). The TTM stages of change construct focuses on categories of behavioral commitment to the adoption of a healthy behavior (such as fruit and vegetable consumption) or eradication of an unhealthy behavior (such as tobacco cessation) (29). The TPB is an intrapersonal behavioral theory with 3 domains: attitude toward behavior, subjective norm, and perceived behavioral control (30).

CHAPTER THREE

MATERIAL AND METHOD

3.1 Research Methodology:

3.1.1 Study Area:

There are two study areas: Omdurman Teaching Hospital and Mohammed El-Amin Teaching Hospital for Children

3.1.2 Population Size:

This will comprise of a total of one hundred, and it included: doctors, nurses and midwives.

3.1.3 Data Collection:

Data will be collected via questionnaires, interviews and personal observation of the health care workers performing hand hygiene.

3.2 Data Analysis:

Data will be entered in Excel sheet and then uploaded into Statistical Packages for Social Sciences (SPSS) version 20 for analysis.

3.3 Data Presentation

Data was presented in form of tables.

CHAPTER FOUR

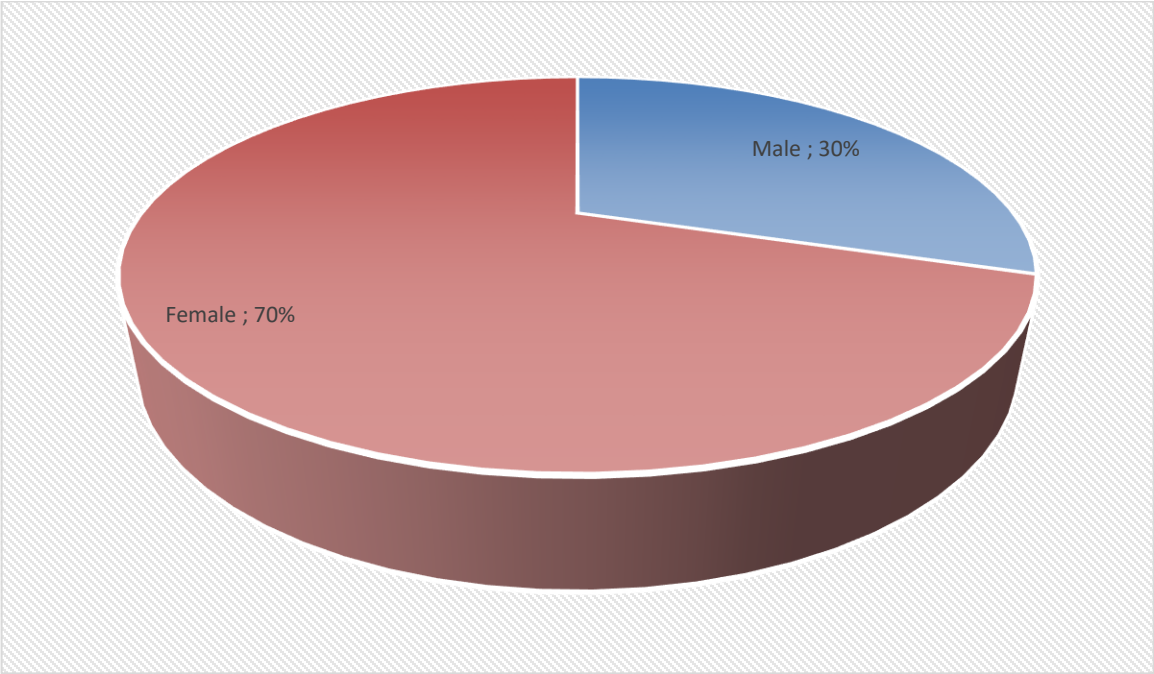
RESULTS AND DISCUSSION

Table (4.1): Distribution of the health care workers according to age group.

Age group	Frequency	Percentage
20 – 25 years	75	75%
25 – 30 years	14	14%
30 – 35 years	7	7%
More than 35 years	4	4%
Total	**100**	**100%**

The majority of the health care workers (75%) were in the age group 20 – 25 years, 14% in group 25 – 30 years, 7% in group 30 – 35 years and 4% aged more than 25 years.

Figure (4.1): Distribution of the health care workers according to sex group



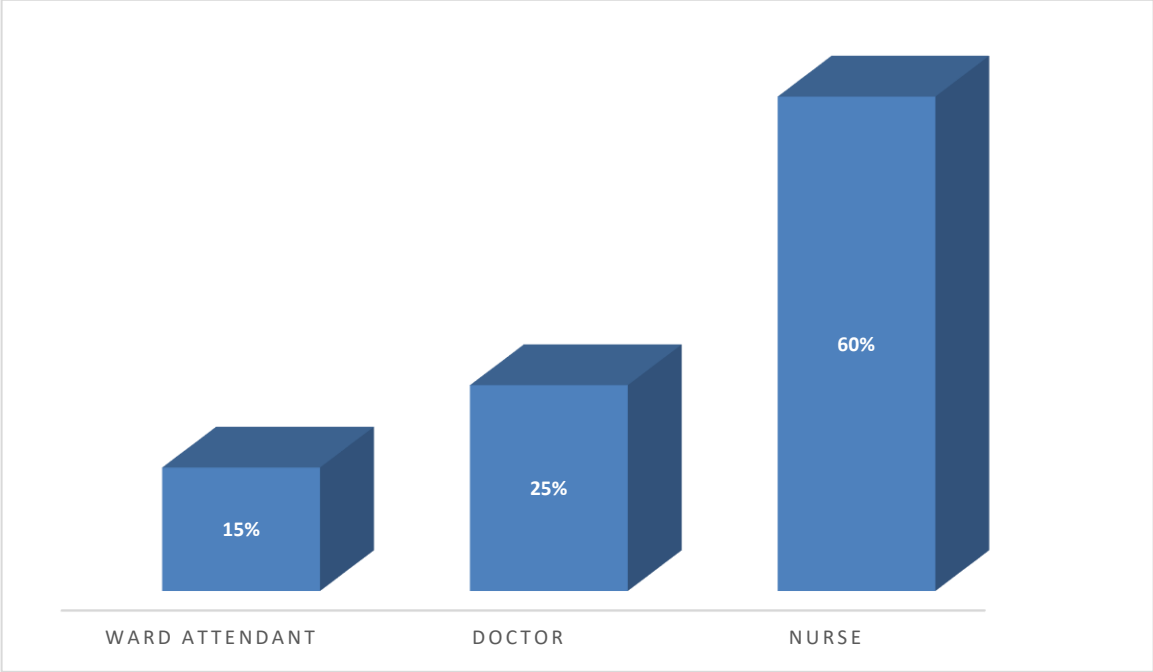
Females were 70% and males were 30%, female to male ratio was 1:5

Table (4.2): Distribution of the health care workers according to marital status.

Marital status	Frequency	Percentage
Single	66	66%
Married	30	30%
Divorced	4	4%
Widowed	0	0
Total	**100**	**100%**

As shown in table (4.3) highest percentage of the health care workers (66%) were single, 30% were married, and 4% were divorced, while none of them were widowed.

Figure (4.2): Distribution of the health care workers according to professional.



Nurses were 60%, doctors were 25%, while 15% were midwives.

Table (4.3): Distribution of the health care workers according to department.

Department	Frequency	Percentage
Internal medicine	10	10%
Trauma and orthopedics	20	20%
General surgery	10	10%
Infection and tropical disease	10	10%
Pediatrics	50	50%
Total	**100**	**100%**

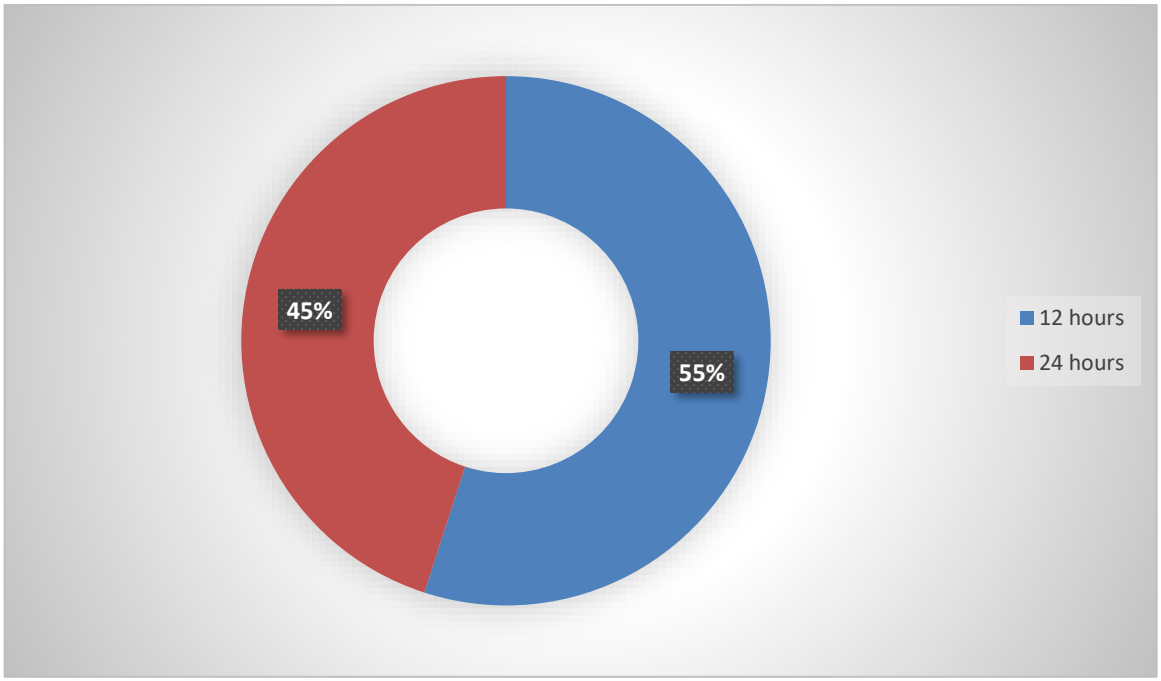
The table shows 50% of the health workers were in pediatrics department, 20% in trauma and orthopedics, while 10% were shared in internal medicine, genera surgery and infection and tropical disease.

Table (4.4): Distribution of the health care workers according to year of experience.

Duration of experience	Frequency	Percentage
1 – 2 years	42	42%
3 – 4 years	35	35%
5 – 6 years	14	14%
More than 6 years	9	9%
Total	**100**	**100%**

Majority of the health care workers were 42% in years group 1 – 2 years, 35% in group 3 – 4 years, group 5 – 6 years were 14%, while 9% more than 6 years.

Figure (4.3): Distribution of the health care workers according working hours per day.



The majority of health care workers (55%) working 12 hours per day, while 45% working 24 hours per day.

Table (4.5): Ever heard about hand washing practices.

Hear about hand washing hygiene	Frequency	Percentage
Yes	95	95%
No	5	5%
Total	**100**	**100%**

Most of health care workers, 95% have heard about hand washing practices while only 5% don't heard about it.

Table (4.6): Frequent access to clinical information (via various source).

Access to clinical information	Frequency	Percentage
Yes	90	90%
No	10	10%
Total	**100**	**100%**

The table shows 90% of health care workers have access to clinical information, while on 10% haven't.

Table (4.7): Ever received training in hang hygiene in the last 3 years.

Training in hand hygiene (last 3 years)	Frequency	Percentage
Yes	12	12%
No	88	88%
Total	**100**	**100%**

88% of health care workers have not received training in hand hygiene in the last 3 years, while 12% have received training.

Table (4.8): Hand hygiene actions that prevent transmission of germs to the patient are done before touching a patient.

Hand hygiene before touching a patient	Frequency	Percentage
Yes	98	98%
No	2	2%
Total	**100**	**100%**

The table shows 98% said yes, hand hygiene prevented transmission of germs to the patients before touching a patient, while only 2% said no.

Table (4.9): Hand hygiene actions that prevent transmission of germs to the health care workers are done immediately after a risk of body fluid exposure.

Hand hygiene done immediately after exposure to patient's body fluids	Frequency	Percentage
Yes	99	99%
No	1	1%
Total	**100**	**100%**

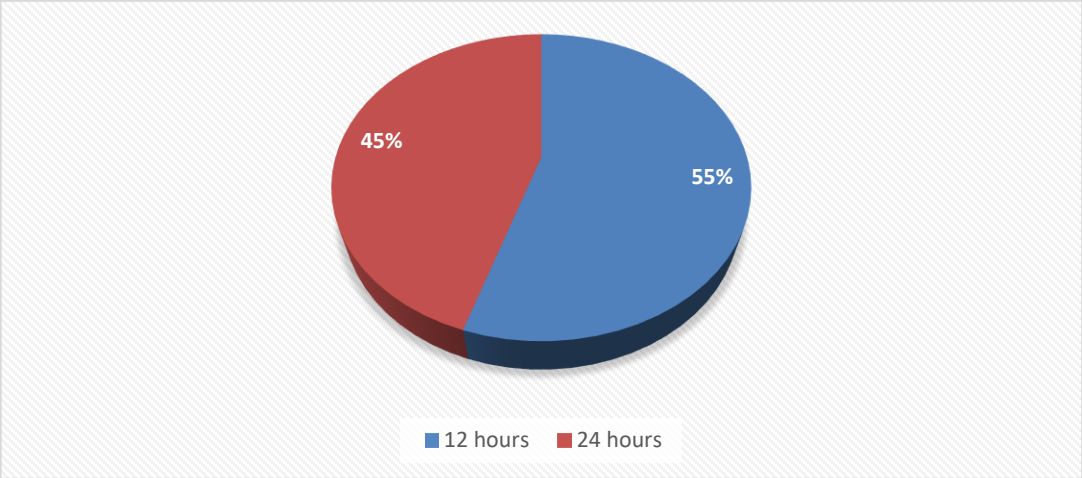
The table shows hand hygiene actions prevent transmission of germs to the health care workers were 99%, while only 1% do not.

Table (4.10): Hand hygiene actions that prevent transmission of germs to the health care workers are done after touching a patient.

Hand hygiene done after touching a patient	Frequency	Percentage
Yes	100	100%
No	0	0
Total	**100**	**100%**

The table shows 100% of health care workers agreed that hand hygiene actions that prevent transmission of germs to the health care workers are done after touching a patient.

Figure (4.4): Artificial fingernails are associated with increased likelihood of colonization of hands with harmful germs.



The majority of health care workers (87%) said artificial fingernails are associated with increased likelihood of colonization of hands with harmful germs, while 13% did not agree.

Table (4.11): Damaged skin is associated with increased likelihood of colonization of hands with harmful germs.

Damaged skin associated with harmful germs in hands	Frequency	Percentage
Yes	89	89%
No	11	11%
	100	**100%**

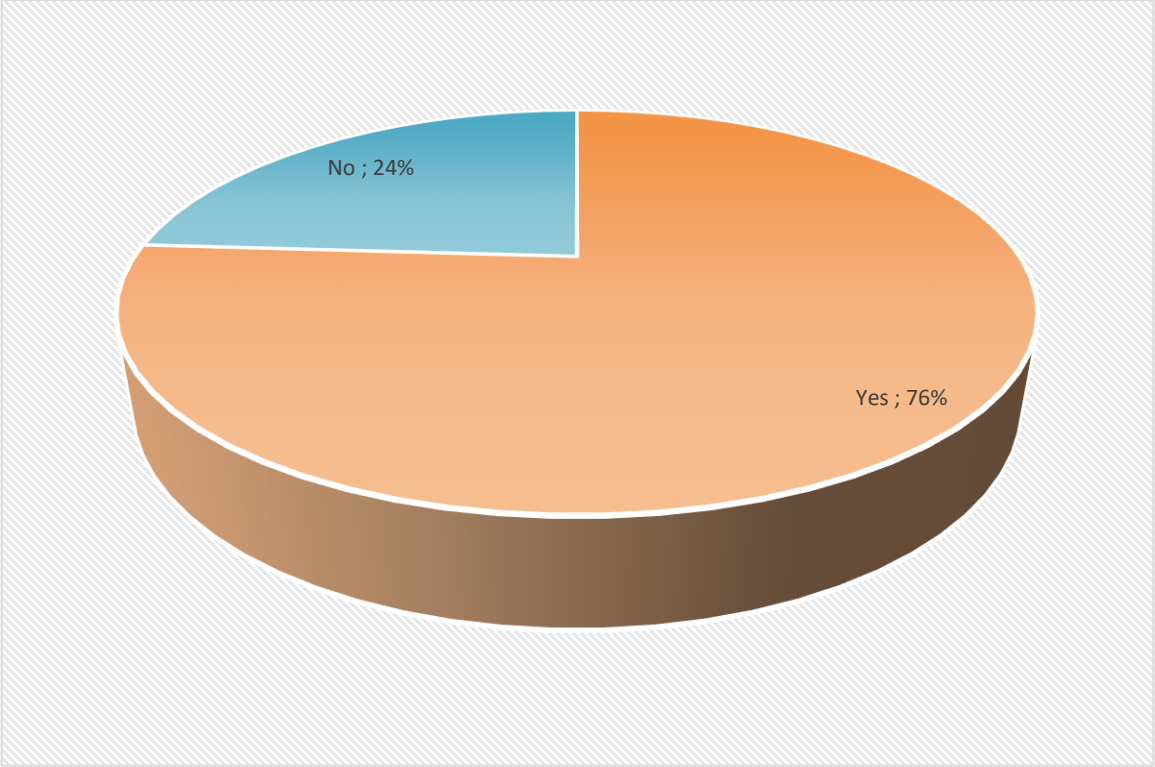
Those who agreed that damaged skin is associated with increased likelihood of colonization of hands with harmful germs were 89%, while 11% did not agree.

Table (4.12): Hand hygiene actions that prevent transmission of germs to the patient are done immediately before a clean/aseptic procedure.

Hand hygiene done immediately before a clean/aseptic procedure	Frequency	Percentage
Yes	95	95%
No	5	5%
Total	**100**	**100%**

The table shows 95% of health care workers said hand hygiene that prevent transmission of germs of the patient are done immediately before a clean/aseptic procedure, while only 5% do not.

Figure (4.5): Wearing jewelry is associated with increased likelihood of colonization of hands with harmful germs.



The figure shows 76% of health care workers said wearing jewelry is associated with increased likelihood colonization of hands with harmful germs, while 24% did not agree.

Table (4.13): Hand hygiene actions that prevent transmission of germs to the health care workers are done after exposure to the immediate surroundings of a patient.

Hand hygiene is done immediately after exposure to a patient' surroundings	Frequency	Percentage
Yes	88	88%
No	12	12%
Total	**100**	**100%**

The table shows 88% of health care workers said that preventing transmission of germs to the health care workers is done after exposure to the immediate surrounding of a patient, while 12% do not.

Table (4.14): Hand rubbing is more effective against germs than hand washing.

Hand rubbing is effective than hand washing	Frequency	Percentage
True	35	35%
False	65	65%
Total	**100**	**100%**

65% of the health care workers disagree that hand rubbing is more effective than hand washing, while 35% saying that the statement is true.

Figure (4.6): Which type of hand hygiene method is required after making a patient's bed?

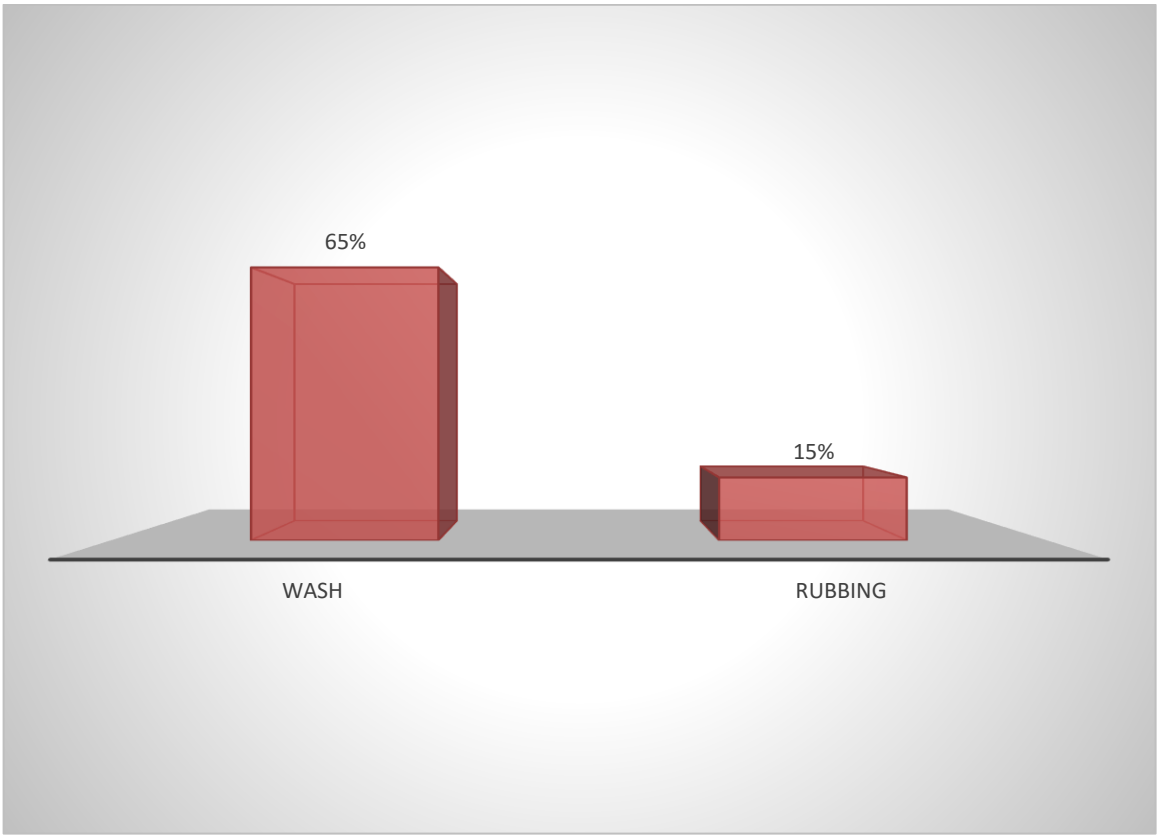


Figure (4.6) shows wash hand hygiene method required after making a patient`s bed were with 65% health workers agreeing to that, while 20% of health workers saying other methods are required. On the other hand, only 15% saying hand rubbing is required.

Table (4.15): Effectiveness of hand hygiene in preventing disease transmission.

Effectiveness of hand hygiene	Frequency	Percentage
Very low	6	6%
Low	9	9%
High	31	31%
Very high	54	54%
Total	**100**	**100%**

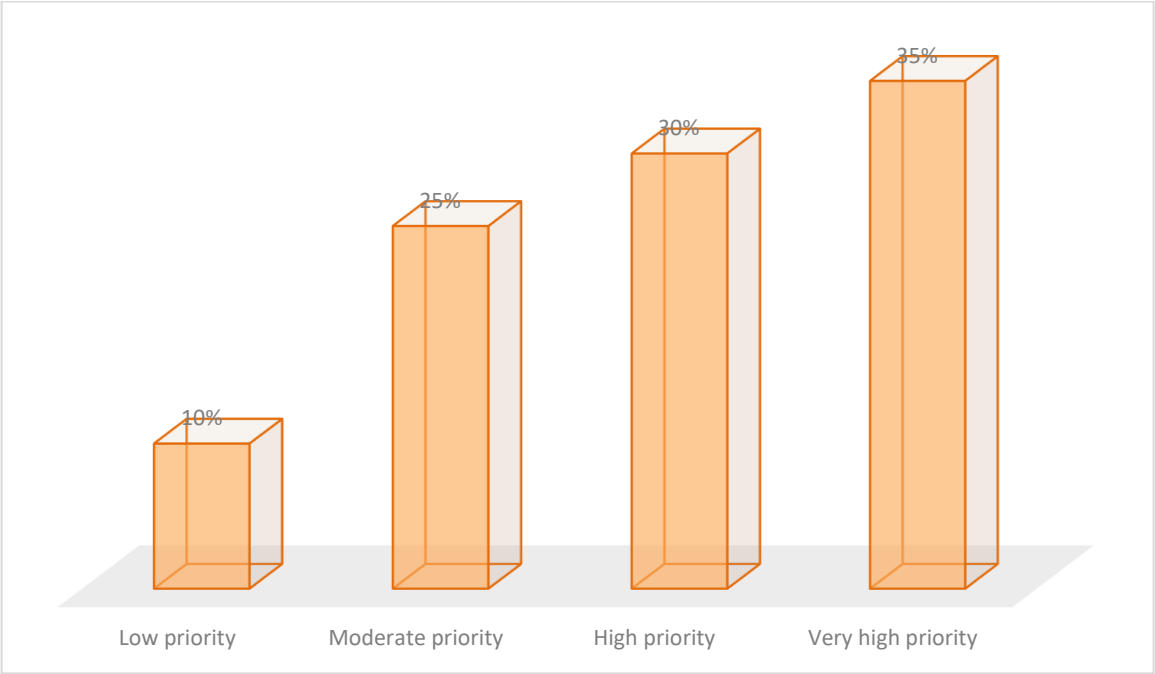
54% of the health workers saying that hand hygiene is very high effective in preventing disease transmission at the work place and 31% said hand hygiene are highly effective. On the other hand, 9% and 6% said hand hygiene were low and very low, respectively.

Table (4.16): What hand hygiene can prevent?

	Frequency	Percentage
Malaria	0	0
Diarrhea diseases	69	69%
Pneumonia	10	10%
Respiratory tract infection	21	21%
Total	**100**	**100%**

Most common risk factor of hand hygiene can prevent were diarrhea disease (69%), while 21% were respiratory tract infections, and 10% were pneumonia. No malaria is transmitted via hands.

Figure (4.7): How important is hand washing to your institution?



The figure shows that 35% were with very high priority of importance of hand washing to the institution, 30% with were high priority, 25% were with moderate priority, while 10% were with low priority.

Table (4.17): Average percentage of situations you actually perform hand washing.

Average % of situations in which they perform hand washing	Frequency	Percentage
≤ 20%	3	3%
21 – 40%	12	12%
41 – 60%	22	22%
61 – 80%	27	27%
81 – 100%	30	30%
Don't know	6	6%
Total	**100**	**100%**

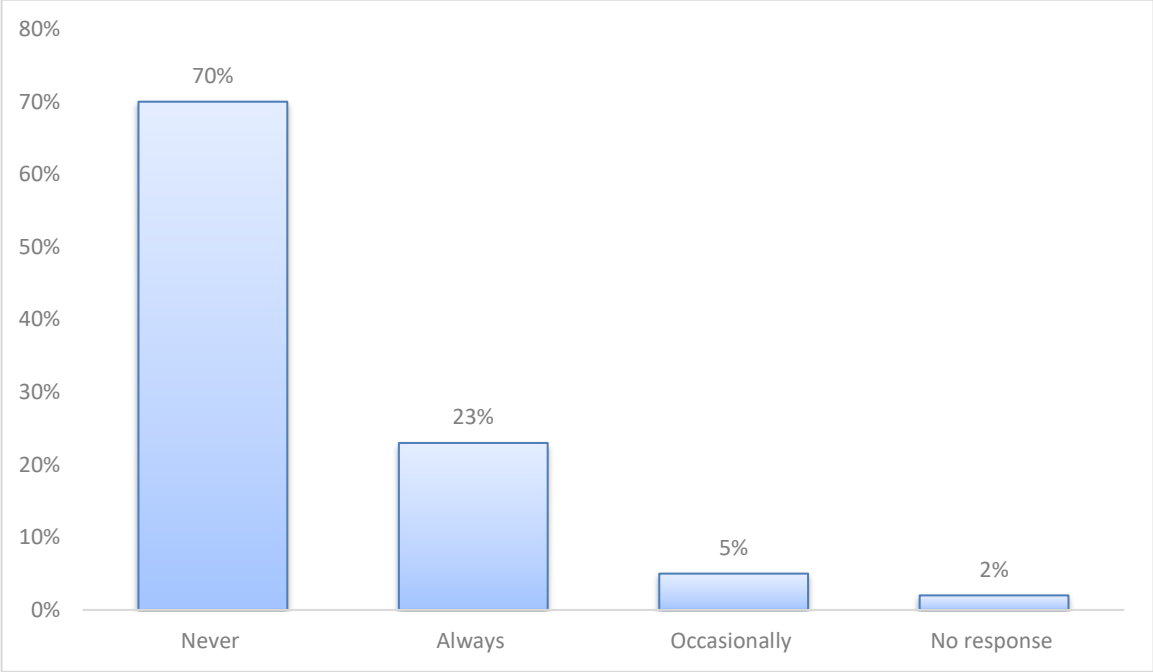
The majority of health care workers (30%) 81 – 100% had average percentage of situation they actually perform hand washing, 27% were 61 – 80%, 22% were 41 – 60, while 12% were 21 – 40% and only 3% were ≤ 20%.

Table (4.18): Number of times health workers wash hands.

Number of times of hand washing	Frequency	Percentage
1 – 2 times	2	2%
3 – 5 times	7	7%
Over 5 times	11	11%
Every check	80	80%
Total	**100**	**100%**

The table shows number of times health workers were 80% wash hands every check, while 11% were over 5 times, 7% were 3 – 5 times, while 2% were 1 – 2 times.

Figure (4.8): How often do you practice hand-washing before interacting with patients?



The figure shows practice of hand-washing before interacting with patient with 70% of health worker never wash their hands, 23% were always, occasionally were 5% and only 2% were no response.

Table (4.19): How often do you practice hand-washing after interacting with patients?

Practicing hand washing after interacting with patients	Frequency	Percentage
Never	72	72%
Always	21	21%
Occasionally	5	5%
No response	2	2%
Total	**100**	**100%**

The table shows practice hand-washing after interaction with patients 72% were never, while 21% was always, 5% occasionally and only 2% were no response.

Table (4.20): Germs already present on or within the patient is the most frequent source responsible for health care-associated infections.

Germs from patients are the frequent source of health care-associated infection	Frequency	Percentage
Yes	91	91%
No	9	9%
Total	**100**	**100%**

The table shows 91% germs already present on or within the patients are the most frequent source of health care-associated infection, while only 9% do not.

Table (4.21): The minimal time needed for alcohol-based hand rub to kill most germs on your hands is 20 seconds.

20 seconds is the minimal time of alcohol hand rub need to kill most germs	Frequency	Percentage
Yes	29	29%
No	71	71%
	100	**100%**

The table shows 71% disagreed saying that they do not need 20 seconds to rub hand to kill most of germs on their hands, while 29% do agreed.

Table (4.22): The recommended hand hygiene action in different situations.

Recommend hand hygiene actions in different situations	Frequency	Percentage
Yes	29	29%
No	71	71%
	100	**100%**

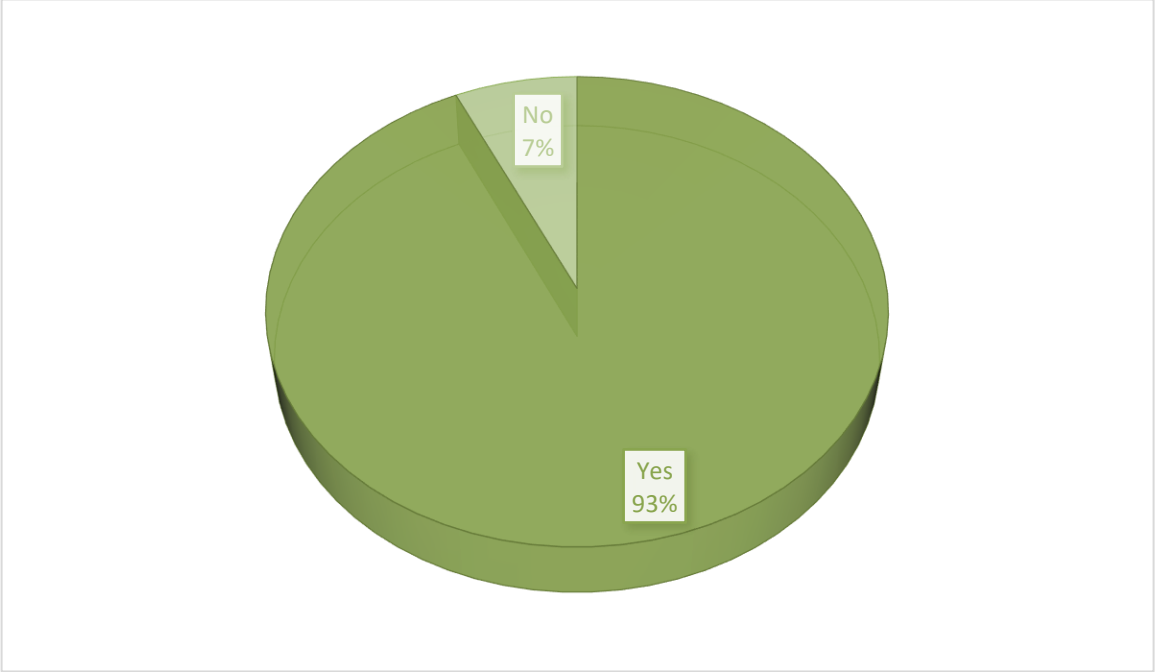
The table show 71% do not recommend hand hygiene action in different situations, while 29% do.

Table (4.23): Corrected hand hygiene practices should be followed at all times.

Corrected hand hygiene practices should be followed at all times	Frequency	Percentage
Yes	100	100%
No	0	0
Total	**100**	**100%**

The table shows 100% were agreed with corrected hand hygiene practices should be followed at all times.

Figure (4.9): A health care personnel should have sufficient knowledge and training about hand hygiene (HH).



The figure shows 93% agreed that health care workers should have sufficient knowledge and training about HH, while only 7% do not.

Table (4.24): Hand washing is always possible in case of emergencies.

Hand washing always possible in case of emergencies	Frequency	Percentage
Yes	9	9%
No	91	91%
Total	**100**	**100%**

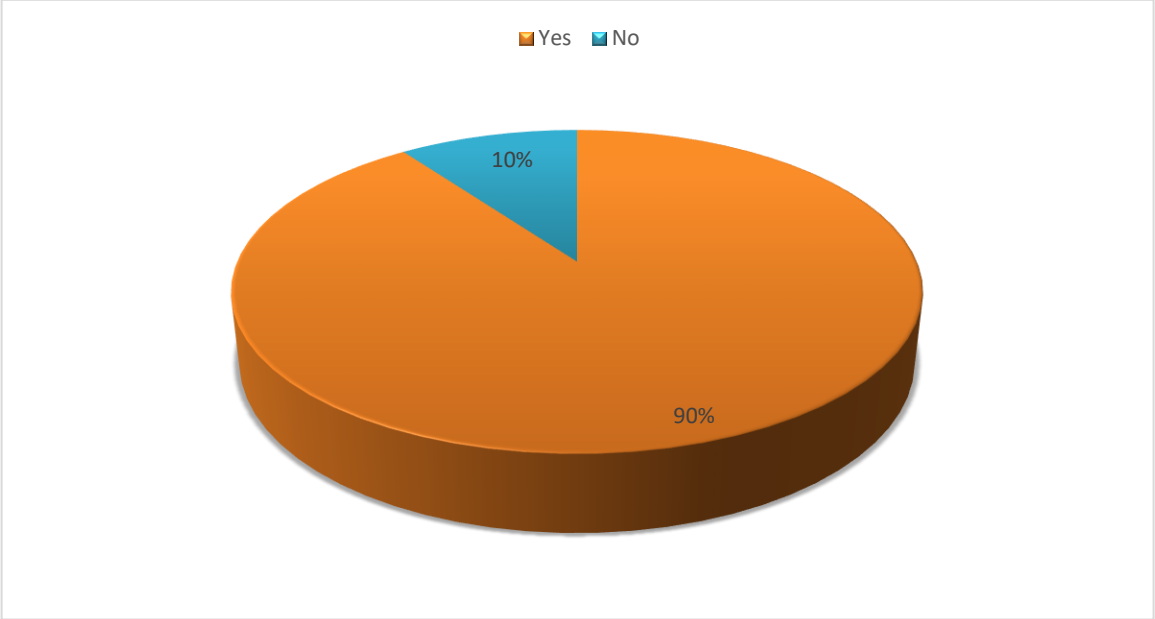
The table shows hand washing not always possible in case of emergencies with 91% of the health care workers disagreed, while only 9% said it is always possible.

Table (4.25): A health care personnel should enroll in regular training sessions regarding IC and HH practices.

Should enroll in regular training session regarding IC and HH	Frequency	Percentage
Yes	98	98%
No	2	2%
Total	**100**	**100%**

The table shows 98% that health care personnel should enroll in regular training sessions, while only 2% disagreed.

Figure (4.10): Compliance with HH can be improved by administrative orders and continuous observation.



The figure shows 90% agreed that compliance with HH can be improved by administrative order and continuous observation, while on 10% disagreed.

Table (4.26): Hand hygiene compliance can be improved by displaying posters and reminders at point of care.

Hand H compliance to be improved by displaying posters and reminders	Frequency	Percentage
Yes	98	98%
No	2	2%
Total	**100**	**100%**

The table shows 98% agreed that HH compliance can be improved by displaying posters and reminders at point of care, whereas only 2% disagreed.

6. CONCLUSION AND RECOMMENDTOINS

6.1 Conclusion:

From the obtained results we could conclude that five moments hand hygiene is not much well practiced in as declared by the health workers investigated.

6.2 Recommendations:

1. Much more care should be given to hand hygiene,
2. Providing the health care workers with all necessary hygienge tools, like soap, alcohol and gloves,
3. More training of 5-moments hand hygiene is needed,
4. The ministry of health is required to take great care when addressing health workers hygiene to minimize incidents of Hospital acquired infections.

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