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### RESEARCH ARTICLE

## HAND HYGIENE KNOWLEDGE ASSESSMENT AMONG GRADUATE MEDICAL STUDENTS IN ASIR GOVERNMENTAL HOSPITALS, SAUDI ARABIA.

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#### Key words:-

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### Abstract

**Objectives:** This study aims to assess the knowledge and practice of hand hygiene among graduate medical students in Asir governmental hospitals in Asir region.

**Methods:** A cross-sectional survey design was used to gather data from the graduate medical students who were practicing how to provide care services in Asir region hospitals. A sample of 100 members was selected randomly from the total working individuals in Asir region Hospitals. WHO standard questionnaire for hand hygiene for healthcare workers was used to collect data about workers knowledge.

**Results:** Results regarding the knowledge assessment indicated that there is a Good knowledge of the graduate medical students about the main route of transmission of potentially harmful germs between patients. Moreover, results revealed that this knowledge level must be improved by further Medical educational sessions.

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### Introduction:-

Hand hygiene represents a self vaccination of the workers, since it reduces the infection probability though several efficient means such as scrubbing, rinsing, drying...etc. Effective hand hygiene both before and after the required tasks in the health settings will minimize the gremial population and helps avoiding getting infected by different types of germs.

In hospitals, hand hygiene could be the most common effective way to control the infection caused by the hospital resident microbes. Those infections are believed to kill thousands of people every year.

The World Health Organization (WHO) had worked hardly in the last decades to increase the awareness and importance of hand hygiene in the health care providing sector, and issued specific recommendations regarding this matter. World Health Organization (WHO) recommendations included the purpose of hand hygiene, the correct and effective procedure of hand hygiene and who is required to perform that task.

The purpose of hand hygiene as stated in WHOM standards included controlling the hospital source infections, and avoids transmitting microbial organisms among patients and care givers.

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Moreover, WHO determined who is required to be committed to hand hygiene protocols during their jobs, and those included health care workers, caregivers, and anyone who is involved in direct or indirect patients care task.

Despite considering hand hygiene as an infection control limiting factor, and a measure for controlling infections related to hospitals, the compliance of the workers in the health sectors with the recommended hand hygiene was under the required satisfying measures.

Specific key factors played a role in the insufficient health workers compliance towards hand hygiene protocols, those factors included lack of knowledge about the importance of following and applying hand hygiene procedures and its role in eliminating resident germs, consequently minimizing the infection opportunity. Another factor is the shortage of hand hygiene facilities when correlated to staff number, and the absence of administrative commitment to hygiene protocols in specific health care providing places.

In 2002, the Centre of Disease Control (CDC) issued a guideline for hand hygiene in health care settings. And recommended the usage of the waterless alcohol based protocols for hand hygiene, because of the efficiency of these materials in eliminating the germs, minimizing the infections, and preventing the transmitting of germs within the health care setting environment.

Three years later, the World Health Organization (WHO) published its hand hygiene guideline which contained the recommendations to the health care settings for establishing effective strategies for promoting hand hygiene approaches. WHO guidelines pointed to the importance of hand hygiene in infection control procedures, as well as recommended of the health care settings administrators commitment of applying the hand hygiene procedures within their institutions. Several studies have indicated that it could improve the hand hygiene compliance by several means such as the application of alcohol based protocols as recommended in CDC guidelines, improving the health workers knowledge, and commitment of the stakeholders in the health sector to hand hygiene guideline application within their setting.

In a study performed by Pittet *et al.*, the application of a hand hygiene program, they concentrated on promoting alcohol based hand hygiene, had resulted in significant improvement in hand hygiene compliance.

The increment of hand hygiene compliance improvement consequently leads to the reduction of both MRSA and nosocomial infections.

Graduate medical students represent one of the largest percentage of health care workers in the health care settings, and they are of the most exposed elements to deal with the patients more compared any other health care workers. Therefore it's important to identify study and assess their knowledge about the suitable hand hygiene strategies and procedures that contribute to promote the hand hygiene compliance.

Saudi Arabia, as a developing country suffers from the spread of nosocomial infections in health care settings, due to the resources limitations.

A study conducted by Basurrah *et al.*, to investigate the hand washing and gloving practice among health care workers in medical and surgical wards in a tertiary care centre in Riyadh city, had found that hand hygiene practice should be improved by multifaceted strategies, and this requires the increasing of hand washing and alcohol based hand rubs settings and providing them in the health care institutions.

## **Methodology:-**

### **Aims of the study:-**

This study aims to assess the knowledge and practice of hand hygiene among graduate medical students in Asir governmental hospital in Asir region.

**Research questions and hypothesis:-**

In light of the purpose of the study, this study will address specific questions:

Q1.	<i>What's the level of knowledge among graduate medical students in Asir region hospitals about hand hygiene?</i>
Q2.	<i>What are the lowest fields of knowledge and what could be done for improvement?</i>
Q3.	<i>Is there any strong indicator of graduate medical students hand hygiene compliance?</i>

**Research Methodology:-**

The methodology of the research indicates the general pattern to valid and reliable data for the problem under investigation.

**Significance of the study:-**

This study is significant for several reasons. Such as providing an overview of graduate medical students' knowledge about hand hygiene in Asir region hospitals , and represents an introduction for other studies to be performed regarding infection control procedures in the same hospital to reduce the nosocomial infections.

**Research Design:-**

The research design used in this study is a cross sectional design. A cross-sectional survey design was used to gather data from the graduate medical students who were providing care services in Asir region hospitals.

**Research Setting:-**

The study was conducted at Asir governmental hospital in Asir region.

**Research population:-**

The population of the study included all the graduate medical students practicing and providing health care services in Asir governmental hospital in Asir region in the kingdom of Saudi Arabia.

**Sample Size:-**

Convenient sampling technique was used. A sample of 100 members was selected randomly from the total working individuals in Asir region Hospitals.

**Data Collection:-**

WHO standard questionnaire for hand hygiene for health workers was used to collect data about workers knowledge. 150 questionnaire were distributed, 119 returned, 19 empty questionnaire were excluded .

The questionnaires were delivered to the respondents in the hospital and were collected soon after. they were provided with envelopes and instructed to drop them at the designated collection point. Data was analysed by SPSS Software.

**Results:-**

It can be seen from table (1) that the majority of the sample was of the age range 19-25 years, which constitutes 45% of the sample, while 35% of the sample was within the second age range that was 26 to 35 years.

The third age range of 36 to 45 years was represented by only 15% of the sample. While the lowest representation was for the age range 46 to 65 years, that was only 5% of the total sample. The second demographic variable was gender, in which females constituted the majority of the sample with a percentage of 82%, while males were only 18%.

The following table represents the demographic variables distribution within the study sample (Table 1)

**Table 1:-** Study sample distribution according to the demographic variables.

Variable	Frequency	Percentage
Age		
19-25	45	45%
26-35	35	35%

36-45	15	15%
46-65	5	5%
<b>Gender</b>		
Male	18	18%
Female	82	82%

### Knowledge assessment results

The following table shows the knowledge assessment results for the respondents (Table 2).

**Table 2:-** Study sample responses to Hand Hygiene questionnaire items.

No	Item	Percentage
1.	Which of the following is the main route of transmission of potentially harmful germs between patients? ( Health care workers hands when not clean )	68%
2.	What is the most frequent source of germs responsible for health care associated infections? ( Germs already present on or within the patients )	49%
<b>Which of the following hand hygiene actions prevent transmission of germs to the patients</b>		
3.	Before Touching a patient (Yes)	96%
4.	Immediately after risk of body fluid exposure ( yes)	97%
5.	After exposure to immediate surroundings of a patient ( No )	31%
6.	Immediately before a clean / aseptic procedure (Yes)	90%
<b>Which of the following hand hygiene actions prevent transmission of germs to the health care workers</b>		
7.	After touching a patient ( Yes )	96%
8.	Immediately after risk of body fluid exposure ( yes)	82%
9.	Immediately before a clean / aseptic procedure (No)	53%
10	After exposure to immediate surroundings of a patient ( Yes )	80%
<b>Which of the following statements , on alcohol-based hand rub and hand washing with soap and water is correct</b>		
11.	Hand rubbing is more rapid for hand cleansing than hand washing ( True )	76%
12.	Hand rubbing causes skin dryness more than hand washing ( True )	42%
13.	Hand rubbing is more effective against germs than hand washing ( False )	39%
14.	Hand washing and hand rubbing are recommended to be performed in sequence ( False )	35%
15.	What's the minimal time needed for alcohol based hand rub to kill most germs on your hands? ( 20 seconds )	41%
<b>Which type of hand hygiene method is required in the following situation</b>		
16.	Before palpation of the abdomen ( Rubbing)	33%
17.	Before giving an injection ( Rubbing)	39%
18.	After emptying a bed pan ( washing)	78%
19.	After removing examination gloves ( rubbing/washing)	73%
20.	After making a patients bed ( rubbing)	39%
21.	After visible exposure to blood ( washing)	63%
<b>Which of the following should be avoided as associated with increased likelihood of colonization of hands with harmful germs</b>		
22.	Wearing jewellery ( Yes )	98%
23.	Damaged skin ( Yes )	96%
24.	Artificial fingernails ( Yes )	93%
25.	Regular use of hand creams ( No )	76%

**Discussion:-**

Results regarding the knowledge assessment indicated that there is a moderate knowledge of the graduate medical students about the main route of transmission of potentially harmful germs between patients, where 68% of the sample answered correctly that the health care workers hands when not clean is the main route while 32% gave incorrect answer and have no knowledge about that item.

Regarding the most frequent source of germs responsible for health care associated infections, 49% answered correctly that germs already present on or within the patient, which indicates to a poor knowledge about that part.

Four items were used to investigate and assess the knowledge level about hand hygiene actions that prevent transmission of germs to the patients.

Items representing the actions were ; before touching a patient and immediately before a clean / aseptic procedure, indicated a very high level of knowledge with a percentage of 96% and 90%, respectively.

While the item concerned with the action of immediately after risk of body fluid exposure, got a moderate to high correct answer response with a percentage of 79%.

The lowest percentage was for the item regarded to ( After exposure to immediate surroundings of a patient ) which got a percentage of 31% .

Next field was to examine the knowledge about the hand hygiene actions that prevent transmission of germs to the health care workers. Four items were examined here ; the first was ( After touching a patient ) that got the highest percentage of 96%, the second was ( Immediately after risk of body fluid exposure ) ,82% answered correctly (Yes).The third item that got the lowest percentage was ( Immediately before a clean/ aseptic procedure ) , was 53% of the total sample.

The last item examines the action (after exposure to the immediate surroundings of a patient ) got a percentage of 80% as a correct answer among the total sample response.

Hand hygiene knowledge assessment also included investigating the sample response whether specific statements about alcohol based hand rub and hand washing with soap and water are correct or not .

First statement stated that hand rubbing is more rapid for hand cleansing than hand washing got 76% agreement to be correct, while the statement that says that hand rubbing causes skin dryness more than hand washing showed low to moderate knowledge indicator with a 43% of the total sample. On the other hand 39% of the sample believed that hand rubbing is more effective against germs than hand washing which is incorrect statement.

Investigating if the hand washing and hand rubbing are recommended to be performed in sequence indicated that a poor knowledge of the graduate medical students about hand hygiene, and that was obvious by the low percentage of the correct answer which was 35%.

Last statement in the field examined the knowledge about the minimal time needed for alcohol based hand rub to kill most germs on your hands, which is 20 seconds, but low knowledge about that was detected by a 41% of the tested sample of graduate medical students.

Furthermore, knowledge assessment examined the most suitable method of hand hygiene in specific situations. Respondents were asked about the suitable methods in six different situations, the first was (Before palpation of the abdomen), only 33% answered correctly by choosing the rubbing method, while the second situation was (before giving an injection), 39% responded correctly by choosing rubbing method. In the third situation ( after emptying a bed pan ) , washing was the right method which was chosen by 78% of the respondents .Fourth item( after removing examination gloves ) , 73% of the respondents had chosen both methods; rubbing and washing , correctly.

Next item regarding the suitable method after making a patient bed, 39% of the respondents had chosen a suitable method which is rubbing. While in the last situation which is ( after visible exposure to blood ) , 63% had chosen the correct method which is washing by soap and water. Last topic to be investigated regarding graduate medical

students knowledge of hand hygiene, was the role of specific items in increasing the likelihood of colonization of hands with harmful germs.

Wearing jewellery, damaged skins, and artificial fingernails, were detected to be the highest associated factors in germs colonization on hands with a percentage of 98%, 96%, and 93%, respectively. While 70% answered correctly on the association of (Regular use of hand creams).

### **Conclusion:-**

According to the previous results it can be concluded that graduate medical students in Asir region hospitals have a good knowledge about hand hygiene, but this knowledge must be improved in several parts, such as:

1. Frequent source of germs responsible for health care associated infections.
2. Hand hygiene procedure after exposure to surroundings of a patient.
3. Knowledge about hand hygiene immediately before a clean/ aseptic procedure and its importance in preventing the transmission of germs to the health care workers.
4. Knowledge about alcohol-based hand rub and its difference from washing by water and soap.
5. More knowledge about the cases of hand hygiene and the suitable method for each case.

### **Future work:-**

- ✓ Conducting training programs and workshops about hand hygiene and its importance in minimizing nosocomial infections in hospitals.
- ✓ Activating the infection control team role to educate the graduate medical students regarding hand hygiene protocols.
- ✓ Encouraging the health care settings stakeholders to show more commitment towards WHO guidelines of hand hygiene.

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