Assessment of Hand Hygiene Compliance Using the WHO Hand Hygiene Observation Form

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Abstract

Introduction: Hand Hygiene (HH) prevents cross infection in hospitals; however adherence to guidelines is commonly poor. While the techniques involved in hand hygiene are simple, the complex interdependence of factors that determine hand hygiene behavior makes the study of hand hygiene complex.

Objectives: The objectives of this study are:
1. To obtain a status queue of hand hygiene compliance rate as regards different professional categories of health care workers.
2. To implement ward infrastructure survey, to provide baseline data on hand hygiene resources.

Methods: This is a cross-sectional, audit study conducted in 1 Intensive Care Unit, 1 Emergency Unit and 2 Inpatient Wards at Misr University for Science and Technology Hospital (The Memorial Souad Kafafi Medical Center). The study took place in a six-week period from April-May 2014. Health workers were observed performing their usual duties caring for clinical patients. Details regarding patient contact and hand hygiene compliance among the health workers were noted.

Results: In our study we recorded 2782 opportunities for HH and evaluated hand hygiene compliance among health workers in 4 service locations of Misr University for Science and Technology Hospital. The hand hygiene compliance among doctors and nurses at the selected locations in the teaching hospital was generally low. The overall HH compliance rate is 57.30% among doctors and nurses in all selected locations.

Conclusion: Implementing hand washing training programs for undergraduate doctors, house officers and nurses is very important. Those training programs should be done at intervals and assessed for the improvement of hand washing practices. Continuous monitoring and performance feedback is beneficial besides the increase in supplies necessary for hand washing and institutional support.


Introduction

HEALTHCARE-associated infections remain a major cause of morbidity and mortality. One of the principal mechanisms responsible for the transmission of microorganisms in the hospital is contact with the contaminated hands of healthcare workers (HCWs) [1]. Health care worker Hand Hygiene (HH) is therefore critical for patients’ wellbeing. Whilst failure of health care workers to comply with the best hand hygiene practice is a problem in all health care settings, issues of lack of access to adequate cleaning equipment and in some cases even running water make practicing good hand hygiene particularly difficult in low-resource developing country settings [2].

Improved compliance with hand washing was associated with a significant decrease in overall rates of nosocomial infection and respiratory infections in particular.

Hand hygiene technique is seldom incorporated into research studies and audits designed to increase compliance. As a result, numerous unanswered questions remain concerning this aspect of hand hygiene. In order to be effective, efforts to improve compliance with hand washing guidelines must be multifaceted and should include increasing the availability and accessibility of hand washing sinks and alcohol-based hand rubs [3].

Transmission of health care-associated pathogens from one patient to another via Healthcare Workers’ (HCWs’) hands requires five sequential steps: (I) Organisms are present on the patient’s skin, or have been shed onto inanimate objects immediately surrounding the patient; (II) Organisms must be transferred to the hands of HCWs; (III) Organisms must be capable of surviving for at least
several minutes on HCWs' hands; (IV) Handwashing or hand antisepsis by the HCW must be inadequate or entirely omitted, or the agent used for hand hygiene inappropriate; and (V) The contaminated hand or hands of the caregiver must come into direct contact with another patient or with an inanimate object that will come into direct contact with the patient.

Without adequate hand hygiene, hand contamination increases and contaminated HCWs' hands have been associated with endemic Healthcare Associated Infections (HAIs) [4]. Therefore, hand hygiene is the primary measure to prevent HAIs and will help decrease the spread of antimicrobial resistance. However, many determinants, such as lack of time, lack of equipment/supplies, and behavioral factors, often result in HCWs neglecting hand hygiene. Although many HCWs perceive their performance as high, their hand hygiene compliance is usually <40% in the absence of interventions [4,5].

Hand hygiene performance varies according to work intensity, type of ward, professional category, and time of day/week. Compliance is usually lower in settings with high care intensity (e.g., intensive care units), among physicians, and before rather than after touching a patient [4,5]. Indeed, HCWs tend to comply more frequently with indications that protect themselves (e.g., after exposure to body fluids, after glove use, after contact with the patient or the patient's environment) [4,6].

In an Egyptian study by Abd El-Aziz and Bakr, [7] in a university hospital; the overall hand hygiene compliance among Health care workers is 34%. As regard compliance to hand hygiene in ICU; their results in the chest ICU=33.4%, NICU pediatric=62.5% & NICU gyn. 39.4%. As regard the variation in compliance to hand washing hygiene among different health care workers, doctors showed the highest compliance (37.5%) in comparison to nurses (36.4%) and housekeepers (22.6%). 23.2% of the observed opportunities in their study showed inappropriate hand washing. This appeared most in having a short contact time less than 30sec. and improper drying.

Hand hygiene:

Hand hygiene can be performed either by rubbing with an alcohol-based formulation or by washing with soap and water. Soaps are available as bar, leaf, powder, and liquid, but must be placed alongside running water, and re-stocked when needed to achieve compliance. Plain soap has minimal antimicrobial activity; however it can be used for hand washing because mechanical friction removes many transient microorganisms [4,8].

According to WHO, alcohol-based hand rubs should be the preferred method for hand hygiene [4,8] as they have the broadest antimicrobial spectrum, require a short time (20-30sec.) for effective antimicrobial decontamination, have better skin tolerance, and are readily available at the point of care (i.e., where care is provided) [4,9].

Hands should be washed with soap and water when visibly dirty or visibly soiled with blood or other body fluids. If exposure to potential spore-forming pathogens is strongly suspected or proven, including outbreaks of Clostridium difficile, hand washing with soap and water is the preferred means [10].

The efficacy of an alcohol-based hand rub depends on its quality, the amount used, the time spent rubbing, and complete coverage of the hands' surfaces. These parameters also apply to washing with soap and water [4,11].

Summary of hand hygiene technique was mentioned in Epidemic and pandemic alert and response Infection control published by WHO [12] as follow:
- Hand Washing (HW) (40-60sec.): Wet hands and apply soap; rub all surfaces; rinse hands and dry thoroughly with a single use towel; use towel to turn off faucet.
- Hand Rubbing (HR) (20-30sec.): Apply enough product to cover all areas of the hands; rub hands until dry.

Five moments for hand hygiene:

The newly developed five moments for hand hygiene has emerged from the WHO [4] to add value to any hand hygiene improvement strategy.

The my 5 moments for hand hygiene approach defines the key moments when health-care workers should perform hand hygiene.

Considering the scientific evidence, this concept merges the hand hygiene indications recommended by the WHO into five moments when hand hygiene is required. This approach proposes a unified vision for HCWs, trainers and observers to minimize inter-individual variation and enable a global increase in adherence to effective hand hygiene practices [4].

This approach recommends health-care workers to clean their hands:
- Before touching a patient.
- Before clean/aseptic procedures.
• After body fluid exposure/risk.
• After touching a patient, and
• After touching patient surroundings.

A commitment to improve nurses' hand hygiene practice across the 5 moments should focus on individual strategies to combat distraction from other duties, peer-based initiatives to foster a sense of shared responsibility, and management-driven solutions to tackle staffing and resource issues. Hand hygiene following touching a patient's surroundings continues to be reported as the most neglected opportunity for compliance [13].

Hand hygiene monitoring and feedback:

One of the five essential elements of WHO Multimodal Hand Hygiene Improvement Strategy is evaluation and feedback. Part of this evaluation is monitoring hand hygiene practices and infrastructure, while providing performance and results feedback to the staff [4].

In particular, monitoring hand hygiene compliance is of crucial importance to:
• Assess baseline compliance by Health-Care Workers (HCWs).
• Provide feedback to health-care workers about defective practices as well as improvement.
• Evaluate the impact of promotion interventions, and
• Investigate outbreaks [15].

The three major methods for measuring hand hygiene compliance used are direct observation, self-report and indirect measurement of hand hygiene product usage. Each method has advantages and disadvantages.

Unobtrusive direct observation of hand hygiene practices by a trained observer is noted by World Health Organization [15] to be the gold standard for evaluating compliance.

An advantage of the direct observational method is that it allows institutions that are attempting to improve HH compliance to know more specifically where an intervention is needed to target resources to their own particular problems. Another advantage of direct observation is that it is the only method that can assess HH technique. In a study conducted by Chassin et al., Lean, Six Sigma, and change management tools were used to identify specific causes of hand hygiene noncompliance in hospitals and target specific interventions to remedy the most important causes. This approach allowed hospitals to customize their improvement efforts by focusing on the most prevalent causes. Such a targeted approach may be more effective, efficient, and sustainable than "one-size-fits-all" strategies [15].

There are drawbacks to direct observation. It is costly and need well trained personnel. Another problem with direct observation is the possibility that staff members change behavior when they know that they are being observed [16]. If the purpose of HHC monitoring is to improve practice and minimize transmission of infection, then a focus on progressively improving performance rather than on achieving a target may offer greater opportunities to achieve this [17].

The advantage of self-report over observation of HH is a significant savings of resources but the validity of self-report data must be assessed.

Measurement of product usage is an efficient method for collecting HH episode data but product usage data do not offer the level of detail that direct observation provides [16].

Evaluation and repeated monitoring of a range of indicators reflecting hand hygiene infrastructures and practices, is a vital component of any successful hand hygiene campaign [14]. Psychosocial determinants of self-reported Hand Hygiene Behavior (HHB) of physicians and nurses in Intensive Care Units (ICUs) at Hannover Medical School, Germany were identified using a self-administered questionnaire. Self-reported compliance was operationalized as always disinfecting one's hands when given tasks associated with risk of infection. Behavioral planning, maintenance self-efficacy and action control were assessed as psychological factors, and personnel and material resources, organizational problems and cooperation on the ward were assessed as perceived environmental factors. The associations between self-regulatory strategies and compliance indicate that HHB is a habit in need of self-monitoring [18].

Hand hygiene infrastructure:

The WHO guidelines on hand hygiene in Health Care state that compliance with hand hygiene is only possible if the health-care setting ensures an adequate infrastructure and if a reliable and permanent supply of hand hygiene products at the right time and at the right location is provided in accordance with the "my 5 moments for hand hygiene" approach [10].

The first one of the five essential elements of WHO multimodal hand hygiene improvement strat-
egy is system change. System change refers to ensuring that the health-care facility has the necessary infrastructure in place to allow healthcare workers to perform hand hygiene.

Hand hygiene should be better understood and practiced in all healthcare facilities, through a series of interventions such as: Specific training courses, the presence of a gel sanitizer next to each patient's bed or in each patient's room, as well as the adoption of the new international guidelines in all units [19].

**Aim of the work:**

The objectives of this study are:

1- To obtain a status queue of hand hygiene compliance rate as regards different professional categories of health care workers as well as indication-related within the four selected locations.

2- To implement ward infrastructure survey, to provide baseline data on hand hygiene resources within the same locations.

**Method and Methods**

**Method of audit:**

This cross-sectional, audit study of health workers at Misr University for Science and Technology Hospital (The Memorial Souad Kafafi Medical Center) took place over a six-week period in April - May 2014.

Health workers were observed performing their usual duties caring for clinical patients, they were not aware of being observed.

Details regarding patient contact, hand hygiene compliance, among the health workers were noted.

**Selection of survey sites:**

Four locations were selected based on the clinical services they provide and the critical importance of hand hygiene in the prevention of healthcare associated infections among health staff and patients. Two high-risk patient contact locations (Intensive Care Unit and Emergency Room) and two medium-risk patient contact locations (two inpatient wards serving medical and surgical cases) were selected for the survey.

**Data collection:**

Technically competent health personnel (Infection Control Officer) collected the data using World Health Organization's (WHO) Hand Hygiene observation form [20] to assess HH compliance among health workers.

Also World Health Organization's (WHO) ward infrastructure survey document [21] was used to collect data about hand hygiene resources.

Observer conducted her activity at times with a high density of care, to allow her to gather a greater number of opportunities more quickly. Each service location was checked twice daily at different times of the day, starting at 8:00am and ending at 5:00pm each day.

The “My five moments for hand hygiene” concept was used to assess HH compliance: Before touching a patient, before performing an aseptic/clean procedure, after body fluid exposure risk, after touching a patient, and after touching patient surroundings. This was based on (WHO) hand hygiene observation form.

Hand hygiene compliance (defined as the proportion of times that health-care workers performed hand hygiene of all observed moments when this was required) was calculated for doctors and nurses in the service provision locations and reported as a percentage [4].

**Hand hygiene basic percent compliance is calculated as follows:**

\[
\text{Compliance (\%) = \frac{\text{Actions}}{\text{Opportunities}} \times 100}
\]

**Hand hygiene Indication-related percent compliance is calculated for each indication as follows:**

\[
\text{Compliance (\%) = \frac{\text{Actions}}{\text{Indications}} \times 100}
\]

This calculation is not exactly a compliance result, as the denominator of the calculation is an indication instead of an opportunity. Action is artificially overestimated according to each indication. However, the result gives an overall idea of health-care worker's behaviour towards each type of indication.

In addition, data was collected on the availability and functionality of basic hand hygiene materials and equipment based on the World Health Organization Ward infrastructure survey.

Hand hygiene material/equipment was rated to be present if it was functional during the period of observation.

**Results**

Hand hygiene compliance among health workers in 4 service locations of Misr University for Science and Technology Hospital.
As displayed in [(Table 1) and Fig. (1)] hand hygiene compliance among doctors and nurses at the selected locations in the teaching hospital was generally low. Overall, the high-risk patient contact location (ICU), offered relatively higher HH compliance (62.88%), than other locations (inpatient ward 1-2 and ER) 56.36%, 53.24%, 56.85% respectively. The overall average compliance for nurses ranged from 56.13% in inpatient ward 1, 56.77% in inpatient ward 2, 58.89% in ER and 64.62% in ICU. The overall average compliance for doctors ranged from 47.75% in inpatient ward 2, 54.86% in ER, 56.60% in inpatient ward 1 and 63.19% in ICU. The nurses had a higher percentage of HH compliance than doctors in inpatient ward 2, ER, and ICU. HH compliance percentage of nurses and doctors is relatively equal in inpatient ward 1. The lowest percentage of HH compliance was found in inpatient wards and it was 56.13% among nurses and 47.75% among doctors. The highest percentage of HH compliance was found in ICU and it was 64.62% among nurses and 63.19% among doctors.

Table (1): Percentage of indication-related compliance with hand hygiene among health workers (doctors and nurses) in 4 service locations of Misr University for Science and Technology Hospital.

<table>
<thead>
<tr>
<th></th>
<th>Nurses</th>
<th>Doctors</th>
<th>Total per session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Opp (n)</td>
<td>HW*</td>
<td>HR*</td>
</tr>
<tr>
<td>SInpat.1</td>
<td>351</td>
<td>131</td>
<td>66</td>
</tr>
<tr>
<td>Inpat.2</td>
<td>354</td>
<td>159</td>
<td>46</td>
</tr>
<tr>
<td>#ER</td>
<td>343</td>
<td>127</td>
<td>75</td>
</tr>
<tr>
<td>##ICU</td>
<td>342</td>
<td>123</td>
<td>95</td>
</tr>
<tr>
<td>Total</td>
<td>1390</td>
<td>540</td>
<td>281</td>
</tr>
</tbody>
</table>


Table (2) & Fig. (2) show estimated HH Opportunities (% of HH indications performed) for care-related HH practices. In the selected locations, the percentage of HH actions performed was higher; After body fluid exposure risk (92.95%), before clean/aseptic procedure (79.77%), and after touching a patient (59.29%) than after touching patient surroundings (38.73%) and before touching a patient (31.19%). Before touching a patient showed the lowest percentage of compliance in inpatient ward 2 (20.00%) compared to (34.69%) compliance as the lowest percentage after touching patient surroundings in the same location. HH compliance after exposure to body fluids of patients represented the highest percentage in all locations (98.97% in ICU, 94.50% in inpatient ward 2, 93.62% in inpatient ward 1, and 86.51% in ER).

It is important to note that health workers (doctors and nurses) in the ICU had a relatively higher percentage of HH compliance for after body fluid exposure risk, before clean/aseptic procedure, and before touching a patient than workers in the other locations (98.97%, 90.28%, 46.75%) respectively.
Table (2): Total estimated HH opportunities (% of HH indications performed) for care-related HH practices in 4 service locations of Misr University for Science and Technology Hospital.

<table>
<thead>
<tr>
<th></th>
<th>Before touching a patient</th>
<th>Before clean/aseptic procedure</th>
<th>After body fluid exposure risk</th>
<th>After touching a patient</th>
<th>After touching patient surroundings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indicator (n)</td>
<td>Action (%)</td>
<td>Indicator (n)</td>
<td>Action (%)</td>
<td>Indicator (n)</td>
</tr>
<tr>
<td>Inpatiet.1</td>
<td>220</td>
<td>25.45%</td>
<td>125</td>
<td>80.30%</td>
<td>94</td>
</tr>
<tr>
<td>Inpatiet.2</td>
<td>230</td>
<td>20.00%</td>
<td>97</td>
<td>73.30%</td>
<td>109</td>
</tr>
<tr>
<td>ER</td>
<td>223</td>
<td>32.29%</td>
<td>158</td>
<td>72.15%</td>
<td>126</td>
</tr>
<tr>
<td>ICU</td>
<td>231</td>
<td>46.75%</td>
<td>144</td>
<td>90.28%</td>
<td>97</td>
</tr>
<tr>
<td>Total</td>
<td>904</td>
<td>31.19%</td>
<td>524</td>
<td>79.77%</td>
<td>426</td>
</tr>
</tbody>
</table>

Availability and function of basic hand hygiene materials/equipment in 4 service locations of Misr University for Science and Technology Hospital.

Table (3) shows that in all four locations where sinks are available Elbow/wrist operating tap are not available. Basic equipment for HH such as running visibly clean water, hand operating tap, soap in all sinks, disposable towels and bottle alcohol-based hand rub affixed on trolley/bed are available in all locations. Regarding alcohol hand rub wall dispensers they are available in ICU only. Hand wash and rub technique posters are not available in all four locations. A hand hygiene compliance audit is not performed in all four locations.

The overall HH compliance rate is 57.30% among doctors and nurses in all selected locations.

Fig. (3) shows that the majority of staff (75.00%) used alcohol hand rub technique while (4.77%) used hand wash technique before clean/aseptic procedure with compliance rate 79.77%. Hand wash represented the prominent technique in the rest procedures (after body fluid exposure risk 86.85%, after touching a patient 56.44%, after touching patient surrounding 33.99%, and before touching a patient 20.91%).

![Fig. (2): Percent of total estimated HH opportunities for care-related HH practices in 4 service locations.](image1)

![Fig. (3): Percent of hand wash and hand rub for care related HH practices.](image2)
Table (3): Hand washing and hand rub facilities and resources available in 4 service locations of Misr University for Science and Technology Hospital (Ward Infrastructure Survey Form) (WHO 2010).

<table>
<thead>
<tr>
<th>Facilities and resources</th>
<th>Inpat.1</th>
<th>Inpat.2</th>
<th>ER</th>
<th>ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is running and visible clean water available?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Is hand operating tap available?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Is elbow/wrist operating tap available?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Are disposable towels available in all sinks?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Is soap available at all sinks?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Is an alcohol-based handrub available?</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Is wall dispenser available?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Is bottle affixed on trolley/bed available?</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are posters illustrating handwash technique displayed beside each sink?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Are posters illustrating handrub technique displayed close to the dispensers?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Total 6/11 6/11 6/11 7/11

1: Yes. 0: No.

Discussion

Hand hygiene prevents cross infection in hospitals, however adherence to guidelines is commonly poor [22]. While the techniques involved in hand hygiene are simple, the complex interdependence of factors that determine hand hygiene behavior makes the study of hand hygiene complex [23].

In our study we evaluated hand hygiene compliance among health workers in 4 service locations of Misr University for Science and Technology Hospital. The hand hygiene compliance among doctors and nurses at the selected locations in the teaching hospital was generally low.

Our results are much better than Abd El-Aziz and Bakr, who made cross sectional descriptive & observational study that was conducted on 2189 opportunities among health care workers in Ain Shams University Hospitals. They found the overall hand hygiene compliance among Health care workers is 34%, also Patarakul et al., had found from their observational study that hand hygiene among HCWs before patient contact was less than 50% [24]. On the other hand, Chassin et al., (2015), during conducting a hand hygiene quality improvement project, found that HH compliance at baseline was 47.5% [15].

Overall, the high-risk patient contact location (ICU), offered relatively higher HH compliance than other locations (inpatient ward 1-2 and ER) respectively. As regard compliance to hand hygiene in ICU, our results are much better than Abd El-Aziz and Bakr, (2008) as their results were in the chest ICU=33.4%, NICU ped.=62.5% & NICU gyn. 39.4%. Our results were also much better than Medeiros et al.,(2015) who recorded 4,837 opportunities for HH in 4 intensive care units in 4 hospitals, with an overall HH compliance 27%. This result was obtained before introducing a multidimensional HH approach, which included administrative support, supplies availability, education and training, reminders in the workplace, process surveillance, and performance feedback. After introducing this approach, HH compliance raised to 58% [25]. This gives an idea for our need to such programs in order to raise our compliance to hand hygiene. Also our results lie within the range of Lipsett and Swoboda which is 28%-74% [26]. Our results were comparable with Won et al., (2004) who had conducted their study in NICU in a level III teaching hospital where they found compliance to hand hygiene to be 43% [27].

As regards the variation in compliance to HH among different health care workers. The nurses had a higher percentage of HH compliance than doctors in inpatient ward 2, ER, and ICU. HH compliance percentage of nurses and doctors is relatively equal in Inpatient ward 1. The lowest percentage of HH compliance was found in Inpatient wards. The highest percentage of HH compliance was found in ICU. Our results are much better than Medeiros et al., who had found that nurses showed higher compliance (55%) than doctors (48%) [25]. Our results are comparable with the results of Miranda-Novales et al., which showed that HH compliance of nurses was 67% while HH compliance of physicians was 62% [28]. This disagrees with Abd El-Aziz and Bakr, (2008) who found that doctors showed the highest compliance (37.5%) in comparison to nurses (36.4%) and housekeepers (22.6%).

As regards washing hands before and after doing different procedures, in the selected locations,
the percentage of HH actions performed was higher; after body fluid exposure risk, before clean/aseptic procedure, and after touching a patient than after touching patient surroundings and before touching a patient. Before touching a patient showed the lowest percentage of compliance in inpatient ward 2 compared to compliance after touching patient surroundings in the same location. HH compliance after exposure to body fluids of patients represented the highest percentage in all locations. It is important to note that health workers (doctors and nurses) in the ICU had a relatively higher percentage of HH compliance for after body fluid exposure risk, before clean/aseptic procedure, and after touching a patient than workers in the other locations. Our results are much better than Abd El-Aziz and Bakr, who found that 20.6% and 7.9% of HCW wash their hands before and after invasive procedures in comparison to 13.8% and 35.6% in Arenas et al., study who had conducted their study among HCW in haemodia-lysis units in Spain [29]. 22.5%, 38.6% and 70.4% of the nurses in Hassan and Aboul-Asm, study performed hand washing after removing gloves, patient contact and after body fluid contact in comparison to 61.4%, 43.9% and 39.8% of the observed opportunities among HCW in Abd El-Aziz and Bakr, study.

Alcohol-based rubbing reduces the mean bacterial counts on hands more effectively than hand washing with antimicrobial soaps [30,31]. The majority of staff used alcohol hand rub technique while minority used hand wash technique before clean/aseptic procedure. Hand wash represented the prominent technique in the rest procedures this disagree with Abd El-Aziz and Bakr, study who found that 64.2% of the observed opportun-ities in this study used routine hand washing with soap, in comparison to 99.3% in Kuzu et al., study and only 31.7% used alcohol hand rub in comparison to Wendt et al., (52.2%) who had conducted his study in a university hospital in Heidelberg, Germany [32,33]. In our study, alcohol-based hand rub compliance rate was 79.77% while this compliance rate reached 66% in the study conducted by Mu-humuza et al., after applying three-phase Practical Application of Clinical Evidence System audit and feedback tool [2].

A complex interplay of cognitive, socioecono-mic and technical factors may determine hand washing practice among hospital based health workers especially doctors, regardless of the location of the country or hospital they work in [34]. Administrative support [31] and improved availability of resources [35] provides a positive influence in efforts to improve HW adherence to improve infection control in hospitals. In our study, in all four locations where sinks are available, elbow/wrist operating tap is not available. Basic equipment for HH such as running visibly clean water, hand operating tap, soap in all sinks, disposable towels and bottle for alcohol-based hand rub affixed on trolley/bed are available in all locations. Alcohol hand rub wall dispensers are available in ICU only. Hand wash and rub technique posters are not available in all four locations. A hand hygiene compliance audit is not performed in all four locations. As a result of an audit performed during the annual National Health Services staff survey in England, the hand-hygiene compliance score increased from 80% to 95% [36].

In Abd El-Aziz and Bakr, (2008) study ward assessment had marked deficiency in supplies and resources necessary for performing hand washing as only 10% of the wards had available automatic sinks and hand drying material. Only 40% of the wards had sinks where soap was available. Ji et al., had found that being short of water accounted for 22% of reasons of non-compliance to hand washing [37]. In Abd El-Aziz and Bakr, study 20% of the observed wards had no available sinks. Improving the availability of materials and supplies essential for hand hygiene is a basic step in improving the compliance with hand washing. In a study conducted by Babiarz et al., (2014), it com-pared the HHC for a traditional wall-mounted unit and a novel sanitizer-dispensing door handle device in a hospital inpatient ultrasound area. HHC increased from 24.5% to 77.1% for the exam room with the sanitizer-dispensing door handle, whereas it remained unchanged for the other rooms. Technical improvements like a sanitizer-dispensing door handle can improve hospital HHC [38].

Conclusion:
Hand hygiene prevents cross infection in hospitals, however adherence to guidelines is commonly poor. Implementing hand washing training programs for doctors and nurses is very important. Those training programs should be done at intervals and assessed for the improvement of hand washing practices. Continuous monitoring and performance feedback is beneficial beside increase in supplies necessary for hand washing and institutional sup-port. Also a focus on HH auditing or supervision should be adopted and more effective workplace reminders should be implemented to combat forgetting.
References


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