

# **Knowledge and practices of hand hygiene among healthcare workers at Neville Fernando Teaching Hospital**

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## **Abstract**

**Objective:** To assess knowledge, practices and attitudes regarding hand hygiene amongst healthcare workers (HCW) at Neville Fernando Teaching Hospital (NFTH). To describe the level of hand hygiene knowledge amongst HCW and evaluate their hand hygiene practices based on WHO's 'Five Moments of Hand Hygiene'.

**Methodology:** A descriptive cross sectional study was carried out at NFTH - One hundred HCW were sampled and were observed to assess the practices of hand hygiene using the standard tool of WHO. A self-administered questionnaire was used for the assessment of knowledge, practices and attitudes regarding hand hygiene.

**Results:** Overall, majority of healthcare workers were found to have good knowledge of hand hygiene (63.4%). There was a relationship between training and knowledge ( $p=0.001$ ). There was no relationship between profession and hand hygiene knowledge. The overall hand hygiene compliance rate was 38.3%. Hand hygiene compliance was highest after patient contact and lowest before aseptic procedures and after exposure to body fluid. Nurses were found to have a better hand hygiene compliance rate (43.08%) than doctors (31.25%).

**Conclusion:** Hand hygiene compliance was found to be inadequate at only 38.30% despite healthcare workers having good hand hygiene knowledge. Adequate training of healthcare workers regarding hand hygiene guidelines may be a factor to be considered for improvement of hand hygiene compliance.

## **Introduction**

Health care associated infections (HCAIs) affect millions of patients around the world annually. In developed countries 5-15% of hospitalized patients develop a healthcare associated infection. HCAIs contribute towards an increased number of days of hospital stay and a corresponding economic burden. There is limited data on the prevalence of HCAIs in developing countries due to a lack of reliable data. (1).

Hand washing is simple, easily implemented and an effective practice that can reduce the risk of infection. A study conducted in Hong Kong has shown that improvement of hand hygiene knowledge and practices has resulted in significant reduction of MRSA infections healthcare facilities (2).

The World Health Organization (WHO) has introduced evidence-based concept 'My five moments of hand hygiene' which has been aptly used to improve understanding, training, monitoring and reporting of hand hygiene among healthcare workers. Appropriate methods used to assess hand hygiene compliance have shown that it rarely exceeds 30% (3).

A study done at the University of Sri Jayawardenepura to assess the knowledge, attitudes and practices of hand hygiene amongst final year medical and nursing students of the faculty, showed that overall, participants had moderate knowledge (77%) but attitudes and practices of all the participants was overall poor (<50%) (4). It was also demonstrated in Anuradhapura Teaching Hospital, although many of the ICU staff had adequate knowledge about hand hygiene, majority of them had poor attitudes and practices regarding hand hygiene. Majority of them were also dissatisfied with the facilities available for hand hygiene (5).

While numerous studies have been conducted worldwide to evaluate knowledge and practices of hand hygiene in the healthcare setting – the focus of this study is to assess the knowledge, attitudes and practices of healthcare workers within NFTH – which has not been done previously.

### **Methodology**

A descriptive cross sectional study was carried out. Initially, observation of the hand hygiene practices at selected units in the NFTH took place in February 2015. HCW were directly observed to assess their practices of hand hygiene. The audit sheet used was the standard tool designed by the WHO – 'Hand Hygiene Observation – Data Collection form'. A total of 15 observation sessions were carried out in the following units: Medical Intensive Care Unit (MICU), Pediatric ward, Medical ward, Surgical ward, Phlebotomy lab, Obstetrics and Gynecology ward, Surgical Intensive Care Unit (SICU), Neonatal Intensive Care Unit (NICU), Dialysis Unit and Psychiatric ward. A moment was observed and it was recorded whether the healthcare worker observed hand hygiene before/after the moment – if hand hygiene was observed it was recorded

as a ‘correct moment’. (5 moments of Hand Hygiene described by the WHO– Before patient contact, before an aseptic/clean procedure, after patient contact, after exposure to body fluids and after contact with patient surroundings (1) ).

This was followed by the distribution of a structured self-administered questionnaire to collect data on the practices, knowledge and attitudes of healthcare workers towards hand hygiene from 100 healthcare workers – including medical doctors, medical students, nurses and nursing students. Convenience sampling was used for this study.

## Results

### Knowledge of Hand Hygiene

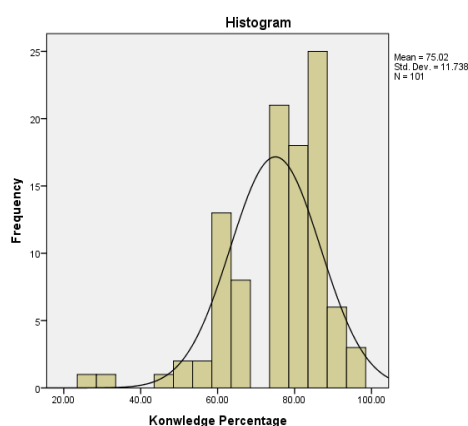
Healthcare worker knowledge on hand hygiene was analyzed through the questionnaire - percentage mark was calculated and then categorized as follows:

- Excellent Knowledge: 80% and above
- Good Knowledge: 51-79 %
- Poor Knowledge: 31 – 50%
- Very Poor Knowledge: 30% and below

**Table 1: Hand hygiene knowledge level in healthcare workers**

Level of Knowledge	Frequency	Percentage %
Excellent	34	33.66
Good	64	63.36
Poor	2	1.98
Very Poor	1	1.00
Total	101	100

**Graph 1: Distribution of percentage score regarding hand hygiene knowledge**



Overall, majority of healthcare workers were found to have good knowledge of hand hygiene 63.4%. While, 33.7% had excellent knowledge on hygiene, only 2% had poor knowledge and 1% had very poor hand hygiene knowledge.

The data was analyzed to find out if there was a relationship between previous hand hygiene training and the healthcare workers level of knowledge on hand hygiene. Pearson Chi Square test was applied to the data. The value obtained was  $p = 0.001$  at 3 degrees of freedom demonstrating is a relationship between previous hand hygiene training and the level of knowledge of hand hygiene.

Data was also analyzed to find out if the level of knowledge regarding hand hygiene significantly differed across different groups of healthcare workers. Value obtained was  $p = 0.248$  (at 9 degrees of freedom) showing there was relationship between level of knowledge regarding hand hygiene and profession

### **Attitudes regarding hand hygiene**

When asked if they thought hand hygiene is effective in preventing healthcare associated infections – an overwhelming majority – 92.1% said they thought hand hygiene was highly effective in preventing health care associated infections.

To follow the effectiveness of hand hygiene in preventing infections, healthcare workers were asked to give an estimate of the percentage of situations requiring hand hygiene that they actually perform hand hygiene for – either using alcohol hand rub or by hand washing. Majority of healthcare workers (72.3%) said they performed hand hygiene in greater 75% of situations requiring hand hygiene. In other words, they thought they had a hand hygiene compliance rate of 76-100%

82% of healthcare workers also stated that their colleagues attached importance to good hand hygiene and 72.4% stated that patients attached importance to the fact they perform good hand hygiene. Finally, when asked about the effort that needed to be put into by them, majority – 75.8% said hand hygiene required a great amount of effort.

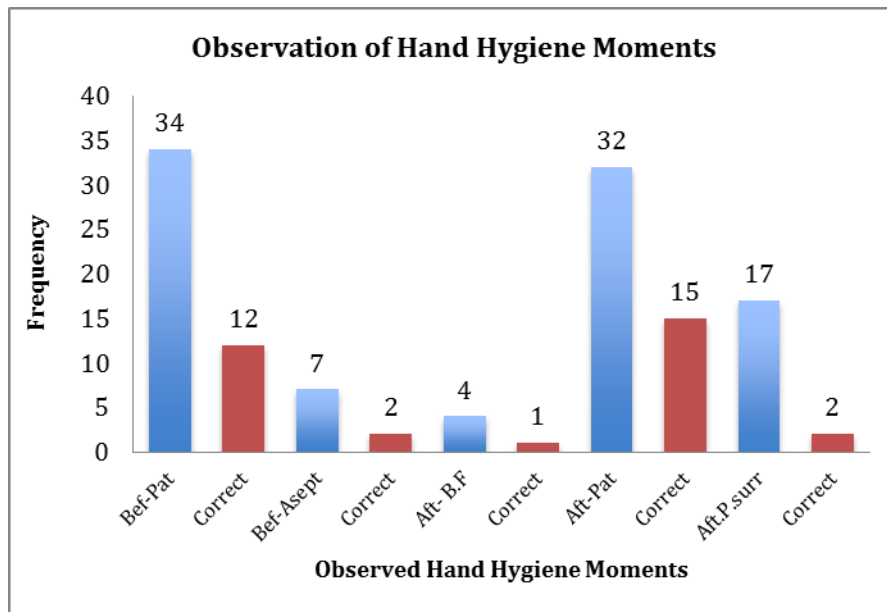
### **Observation of Hand Hygiene Practices of Healthcare Workers – Audit Data**

A moment was observed and then it was recorded whether the healthcare worker observed hand hygiene before/after the moment – if hand hygiene was observed it was recorded as a ‘correct moment’. Hand Hygiene Compliance (HCC) was calculated using the formula:

Hand Hygiene Compliance (HCC) was calculated using the formula:

$$\text{HHC} = \left( \frac{\text{Total number of correct moments}}{\text{total number of observed moments}} \right) \times 100$$

**Graph 2: Observation of the ‘5 Moments of Hand Hygiene’**



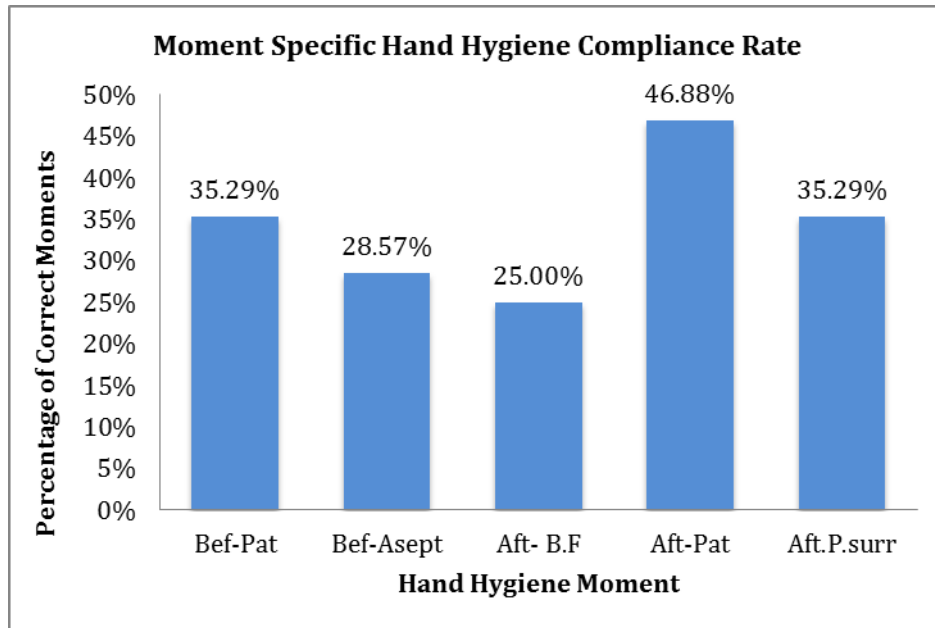
The total number of observed moments (considering all five moments of hand hygiene) was 94, of which there were 36 correct moments, giving an overall Hand hygiene compliance rate of 38.30%. This overall hand hygiene compliance rate is of interest when considering the hand hygiene compliance rate that healthcare workers stated they thought they had in the questionnaire was 76-100%.

The total number of observed moments and the total number of correct moments was also recorded separately for each moment of hand hygiene.

The blue bars indicate the total number of observed moments for each hand hygiene moment while the red bar on its right represents the total number of correct moments for that hand hygiene moment.

The percentage correct hand hygiene moments were calculated for each moment – this represents the moment specific hand hygiene compliance rate.

**Graph 3: Moment Specific Hand Hygiene Compliance Rates**



The above graph shows that the adherence of hand hygiene was highest after patient contact (Aft-Pat) - 46.88%, followed by before patient contact (Bef-Pat) and After contact with patient surroundings (Aft.P.surr) – 35.29% with the lowest hand hygiene compliance rates being for before aseptic procedures (28.57%) and after exposure to body fluid (25.00%). It can be inferred from this data that if a healthcare worker touched a patient/s 100 times – they only performed hand hygiene (either using alcohol hand rub or hand washing) 47 times, whereas they are required by WHO guidelines to perform hand hygiene every time after patient contact.

The hand hygiene compliance rate amongst doctors and nurses were also calculated. This was not done for other healthcare worker categories as there was insufficient data regarding observed moments for the other healthcare worker categories.

**Table 2: Hand Hygiene Compliance amongst doctors and nurses**

Profession	Total Number of Observed Moments	Total Number of Correct Moments	Hand Hygiene Compliance Rate
Medical Doctors	16	5	31.35%
Nurses	65	28	43.08%

The above table shows that nurses had a better hand hygiene compliance rate (43.08%) than doctors (31.25%). The hand hygiene compliance rate amongst nurses

was higher than the total hand hygiene compliance rate (38.30%), while the hand hygiene compliance rate for doctors was lower than the total hand hygiene compliance rate, showing that that nurses demonstrated better hand hygiene practices.

## **Discussion**

Majority of health care workers had a good knowledge (63.4%), while 33.7 had excellent knowledge on hand hygiene. This could be due to the fact that 90% of health care workers had some form of training on hand hygiene. The Pearson's chi square test proved the significant effect of previous hand hygiene training amongst the health care workers on their level of knowledge on hand hygiene. One of the benefits of this test is, that we were able to prove that conducting training in hand hygiene will result in healthcare workers having better knowledge on hand hygiene.

There was also found to be no significant effect between the levels of knowledge regarding hand hygiene and professions. This may be because all groups of health care workers received similar hand hygiene training. Also, it could be as a result of taking smaller samples for each health care worker group. In order to see a relationship, the study can be repeated with bigger samples for each health care worker group.

Health care workers stated that they thought that they observed a hand hygiene compliance rate of 76-100%. When compared against actual observed rate, which is 38.30%, it a gross overestimate. According to worldwide rates, adherence of HCWs to recommended hand hygiene procedures ranges from 5-89% (1). Appropriate methods used to assess hand hygiene compliance have shown that it rarely exceeds 30%. (3). This shows that the hand hygiene compliance rate at NFTH is similar to worldwide rates.

According to the moment specific hand hygiene compliance rates, the adherence of hand hygiene was highest after patient contact (35.29%), while the lowest rates were observed before aseptic procedures (28.57%) and after exposure to body fluids (25.00%). This could be due to general lack of adherence of Health Care workers to good hand hygiene practices. Also, healthcare workers are more likely to perform hand hygiene after touching a patient as it is easier to identify this a moment that requires had hygiene since they are aware that the patients are ill and therefore may

harbor pathogenic microorganisms. However, it is unusual that the lowest rates were seen before aseptic procedures and after exposure to body fluids as these are some of the most important moments where hand hygiene is required. A reason for this could be that data collected on observation of these particular moments were not enough. Another possible reason could be that healthcare workers wrongly assume that if gloves are worn it dispenses with the need to perform hand hygiene.

Furthermore, nurses were found to have a better hand hygiene compliance rate of 43.08% when compared to doctors, which was 31.25%. This proved that nurses had better hand hygiene practices than the doctors. At the university hospitals in Geneva, compliance with hand hygiene was shown to be higher among nurses as well (66%) when compared to doctors (10%) (6). The better hand hygiene compliance of nurses could be attributed to the fact that nurses are more willing to learn about and change hand hygiene habits.

One limitation of this study is the sample size - 100. Another limitation was the method of collecting the audit data - direct observation as if healthcare workers were aware that they were being observed it may have affected their behavior regarding hand hygiene, (Hawthorne effect) - to limit this effect a single auditor was assigned to each ward. Only direct observations by the auditor were recorded and no assumptions were made. Healthcare workers were also not informed that their hand hygiene practices were being observed. The numbers of staff members were less during some of the audit sessions and there was a shortage in the number of patients in the hospital, thus limiting the amount of data collected – this occurred mainly in the Pediatric ward and Emergency Treatment Unit (ETU).

### **Conclusions**

Majority of healthcare workers had good knowledge of hand hygiene 63.4% and 33.7% had excellent knowledge on hygiene.

An overwhelming majority – 92.1% of healthcare workers said they thought hand hygiene was highly effective in preventing health care associated infections.

Health care workers stated that they thought that they observed a hand hygiene compliance rate of 76-100%. However, the actual hand hygiene compliance rate calculated after direct observation was 38.30%.



Hand hygiene compliance was highest after patient contact - 46.88%. Lowest hand hygiene compliance rates being for before aseptic procedures (28.57%) and After exposure to body fluid (25.00%).

Nurses had a better hand hygiene compliance (43.08%) than doctors (31.25%) in the studied population.

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