

## Self- Assessment of Hand Hygiene Compliance by Health Workers in a Neonatal Intensive Care Unit

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### Abstract

**Background:** Healthcare associated infections pose a major significant threat to patients' safety. It has been proven to be the most important cause leading to infant mortality and morbidity and resulting in a tremendous burden to healthcare organizations. Lack of hand hygiene compliance by healthcare workers contribute tremendously to morbidity, mortality rate and global and economic burden.

**Aim:** The purpose of the article is examine hand hygiene self-assessment, perceptions and attitudes of health workers towards hand hygiene in Neonatal Intensive Care Unit

**Methods:** A descriptive, cross sectional study using a structured self-administered questionnaire was utilized where 172 health professionals were recruited. The professionals included nurses and doctors who worked in the Neonatal Unit in a tertiary hospital in Saudi Arabia

**Results:** Research findings indicated a deficit in perception of self-assessment of health professionals working in Neonatal Intensive Care Unit (NICU) about their non-compliance to hand hygiene as a method to reduce HAIs. 67.3% of the respondents viewed their co-workers being compliant with hand hygiene guidelines 82.4% of the respondents viewed non-compliance with hand hygiene after removal/taking off gloves as a factor that presented significant risk of passing infections on to patients.

**Conclusion:** Continuous reinforcement of hand hygiene compliance culture is the key to prevent infants' mortality and morbidity in the Neonatal Intensive Care Units. Healthcare organisations should have zero tolerance to adhering to World Health Organization (WHO)'s recommendations of five moments of hand hygiene and principles that enhance hand hygiene compliance culture.

### Introduction

Health care associated infections (HAIs) are infections that the patient may transmit while receiving treatment for other health-related conditions in healthcare settings [1]. Lack of hand hygiene compliance by healthcare workers contributes tremendously to morbidity, mortality rate and global and economic burden.

They are a threat to patients' safety [1-3]. The most effective strategy to combat HAIs in NICUs is deployment of collective action supporting commitment to change towards appropriate hand hygiene (HH) practices [4]. All Healthcare workers have a vital role in preventing HAIs through effective HH compliance culture [5]. Despite that, neonatal infections remain the main cause of morbidity, poor neurodevelopmental outcomes, as well as deaths among infants [6,7]. Healthcare associated infections remain the major cause of complications that increase the average length of stay amongst NICU patients, since they need to be treated for such infections, and that may also increase the organisational costs [8-17].

**Aim:** The purpose of the article is examine hand hygiene self-assessment, perceptions and attitudes of health workers towards hand hygiene in Neonatal Intensive Care Unit

### Methods

This study was conducted in Neonatal Intensive Care Unit, in a tertiary hospital in Saudi Arabia. 172 Healthcare professionals (HPs) were recruited, comprising of registered nurses and doctors. The study was conducted during the period between February to July 2017

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## Ethical considerations

Permission to embark upon the study was achieved through approval of Health Research Ethics Committee (HREC) of Stellenbosch University. Protocol number S17/02/032. Further permission was sought from the Institutional Review Board of the organisation for approval for research to be conducted in the institution. Informed written consent were obtained from participants.

## Study design

A descriptive quantitative study was conducted by using self-administrative questionnaire.

## Study population and sampling strategy

The study population was all nursing staff (160) and medical (12) staff that are working in NICU. Total population was used and that involves all nurses and physicians who are employed fulltime in NICU and who have worked in the NICU department for a period of one year and above. The fact that the population was small the researcher decided to use the total population in the study. The participants name was picked electronically through organisation data scheduling. Each respondent was given a structured questionnaire. This was completed at their own time without interfering with the work activities. The researcher explained the purpose to the respondents, and reassuring them about the privacy and anonymity. An informed consent was obtained and the respondent was issued with envelopes place the answered questionnaires and seals the envelopes.

## Data analysis

Data was analysed, and descriptive statistics were used to describe the ability of the medical and nursing staff to effectively understand the importance and readiness to reduce HAIs in NICU. Data was entered in on Excel sheets and then analysed by the researcher using SPSS (Statistical Package for Social Sciences) version 22.0 2016. Descriptive analysis was used to examine all data. Quantitative data analysis technique was applied, and descriptive statistics were used to explain data. P value of less than 0.05 was considered as significant. A further analysis was applied to determine the statistical difference between variables [1-3].

## Results

Table 1 represents hand hygiene self-assessment whereby

self-assessment analysis on HH compliance of the HPs in NICU is described. HPs indicated that they comply with recommended guidelines regarding HH, while taking care of patients in NICU. That is evidenced by 97.5 % (6.96 +- 0.25) of the respondents indicated their compliance. However regarding respondents' assessment of their co-workers compliance with HH, only 67.3 % (6.37+-1.00) believed that their colleagues complied. Therefore question B3 had a uppermost variance with a Standard deviation(SD) of 1.00 whereby 6(3.7%) respondent believing their colleagues do not comply with the recommended recommendations. The standard deviation in question B1 to B5 is constant and equivalent which indicates less variability in the individual responses throughout self- assessment of HH variance on the struggle to adhere to recommended guidelines. Majority of the respondents (99.4%) perceived HH as a useful measure to prevent infection in NICU ( 6.99 +-0.16).

Table 2 represents description and attitude and perceptions related to HH. General attitude and perception of the HPs was positive, and that is important in preventing infection with no variance (SD=0.00) in question C1 and C2. Further, their perception on the need for HH after contact with body fluids considered as a useful measure to prevent infection 100% (7.00+-0.00). However respondents viewed non-compliance with HH after removal/ taking off gloves as a factor that presented significant risk of passing infection to patients. Respondents did not perceive the need to improve HH compliance with a high perception as 98.1 % (6.97 +-0.19) demonstrating no motivation to improve. The results in Table 2 showed that the respondents did not perceive the need to improve in hand hygiene compliance and that is supported by 98.1 % (mean 6.97 +-0.19) indicated no motivation to improve on hand hygiene compliance culture. Respondents' attitude towards prevention of infection was largely established on the fact that they felt non-compliance with hand hygiene in certain situations would increase risk of infection considerably. Non-compliance with hand hygiene after treating of dirty/contaminated and clean/sterile wounds (98.7% 6.99±0.11) respondents indicated that this would present substantial risk of infection to patients.

The respondents indicated that they know the recommended indications for hand hygiene (HH) 97.5% (6.96 +-0.25 ). The availability and accessibility of recommended guidelines enhanced their knowledge of HH and thus encouraged more approaches by HPs to conform with HH. HPs in NICU and the majority of the respondents (96.9%) had attended an infection control course in the organisation which would likely impact

Table 1: Hand hygiene self-assessment.

Table 1: Absolute and relative frequencies of answers with hand hygiene of self-assessment among all respondents. (n=159)									
Questions (score specification)	1	2	3	4	5	6	7	Mean	SD
	Absolute frequency/ relative frequency (%)								
B1. Do you think that in caring for patients you follow good hand hygiene according to the recommended guidelines? (never (1) - always (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.6)	7 (4.4)	151 (95.0)	6.94	0.26
B2. Do you know recommended indications of good hand hygiene? (not at all (1) - fully (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (1.3)	2 (1.3)	155 (97.5)	6.96	0.25
B3. Do your colleagues comply with hand hygiene according to recommended guidelines? (never (1) - always (7))	0 (0.00)	1 (0.6)	1 (0.6)	4 (2.5)	33 (20.8)	13 (8.2)	107 (67.3)	6.37	1.00
B4. Do you think that your behaviour with hand hygiene is considered as exemplary by your colleagues? (not at all (1) - of course (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	13 (8.2)	28 (17.6)	118 (74.2)	6.66	0.62
Is it difficult to adhere to hand hygiene according to recommended guidelines? (always (1) - never (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	8 (5.0)	151 (95.0)	6.95	0.22

\*mean-average scales value

Table 2 : Description of attitudes, and perceptions related to hand hygiene.

Questions (score specification)	1	2	3	4	5	6	7	mean	SD
	Absolute frequency/ relative frequency (%)								
Do you perceive hand hygiene in the following situation "between treating of dirty/ contaminated and clean / sterile would "as useless or useful measure to prevent infection in healthcare? (useless (1) - useful (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	159 (100.0)	7.00	0.00
Do you perceive hand hygiene in the following situation "after contact with body fluids" as useless or useful measure to prevent infection in healthcare? (useless (1) - useful (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	159 (100.0)	7.00	0.00
Do you perceive hand hygiene in the following situation "after removal/taking off gloves" as useless or useful measure to prevent infection in healthcare? (useless (1) - useful (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.6)	0 (0.00)	158 (99.4)	6.99	0.16
Does non-compliance with hand hygiene in the following situation "in treating of dirty / contaminated and clean/sterile wound" presents risk of infection to patients? (no risk (1) - significant risk (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (1.3)	157 (98.7)	6.99	0.11
Does non-compliance with hand hygiene in the following situation "upon contact with body fluids" presents risk of infection to patients? (no risk (1) - significant risk (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.6)	158 (99.4)	6.99	0.08
Does non-compliance with hand hygiene in the following situation "after removal/ taking off gloves" presents risk of infection to patients? (no risk (1) - significant risk (7))	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	4 (2.5)	24 (15.1)	131 (82.4)	6.80	0.46
Do you feel that you can improve compliance with hand hygiene? (yes -perhaps - no)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (0.6)	2 (1.3)	156 (98.1)	6.97	0.19

\*mean-average scales value

their insight of hand hygiene practices. The health professionals displayed a high degree of self-assessment as described with grades between 6 and 7. Majority of the respondents (99.4%) perceived hand hygiene as a useful measure to prevent infection in the NICU (6.99±0.16).

## Conclusion

This study exposes that there is still some degree of non-compliance in hand hygiene while taking care of patients, additionally, after the removal of gloves among some HPs during their self-assessment. That may be associated with the perception of HPs thinking their hands are still clean since they were covered by gloves during the performance of procedures. Nevertheless, on the other hand it was identified that the standard deviation in question B1 and B2, SD=0.22 with the lowest variation in B5 showing struggle in hand hygiene compliance according to recommended guidelines. That may be viewed as lack of some degree of hand hygiene compliance culture. The research findings showed that the self-assessment and perception majority of the respondents have knowledge about hand hygiene and prevention of HAIs in NICU and its significance. However, the results show that there are some HPs who still find it difficult to adhere to hand hygiene compliance culture in certain circumstances, for an example difficulty in performing hand hygiene after the removal of gloves. In this study, the majority of respondents 99.4% (n=159) perceived hand hygiene as the useful measure to prevent infection in NICU, however, the response in B3 showed that SD=1.00 had a height variance on the respondents' belief about their colleagues' compliance to hand hygiene. In summary, the researcher recognises that there are some deficiencies among some HPs in relation with adherence to hand hygiene. Some HP's, during their self-assessment, acknowledged that some of their colleagues are not adhering to correct performance of hand hygiene. Therefore, in order to prevent HAIs in NICUs, it is of vital importance for all HPs to perform hand hygiene properly while taking care of patients. There is an vital need for HPs to recognise hand hygiene as the significant method that reduces HAIs in NICU. It can be concluded

that the majority of the respondents were HPs who attended the educational training regarding hand hygiene compliance and HAIs reduction. However, despite that, HPs among them were still identified as showing some degree of non-compliance in relation to compliance in hand hygiene and reduction of HAIs. The solicitation of WHO's strategies to improve hand hygiene compliance has been recognised in many studies that were conducted and it displayed incredible enhancement according to the literature [18]. Therefore Healthcare organisations should implement innovative methods to enhance a hand hygiene compliance culture in an approach to reduce HAIs in NICUs. There is a need to devise innovative strategies that may enrich hand hygiene compliance culture. Innovative strategies may serve as a motivation to HPs to comply in hand hygiene [19-49].

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## Competing interests

Authors declare no personal or financial relationships which could have inappropriately influenced the study

## Author's contributions

LDM is the principal investigator for this study and assumed primary responsibility for writing the article. KDK provided guidance, analysis of the study.

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