

Level of Knowledge and Practice on Hand Hygiene among Student Nurses in Selected Paediatric Hospital at Mangalore

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Abstract

A non-experimental descriptive study was undertaken to determine the level of knowledge and practice on hand hygiene among the student nurses. A total of 60 student nurses were selected using convenience sampling technique. A structured questionnaire and an observation checklist were developed and validated to collect the data. The results revealed that 53.3 percent of student nurses had good level of knowledge and 60 percent of student nurses had an average level of practice on hand hygiene. No significant association was found between level of knowledge and practice on hand hygiene and demographic variables such as age of the students, gender, year of study, type of nursing course attended on hand hygiene. A significant positive correlation was found between knowledge and practice scores of hand hygiene among student nurses. It is concluded that the student nurses who had high knowledge scores had better practice as compared to those with poorer scores.

Hand washing is the simplest and the basic procedure taught in nursing course, yet it is one thing they often disregard in clinical setting. The hand hygiene compliance continues to be low in non-ICU settings, compliance ranging from 16 to 60 percent and in ICUs 28 to 81 percent (Rumbold, 2005). In addition, health professionals mistakenly believe they wash their hands more than they usually do. Evidence that the value nursing students place on hand hygiene declines from the first to the third year of training, probably as a result of their clinical experiences. So it is crucial that the infection control message should be reinforced throughout (Malgaldi et al, 2010).

Florence Nightingale wrote in her book 'Notes on Nursing' that the very first requirement in a hospital is that it should do the sick no harm. Nosocomial infections constitute serious threat to all people who are admitted in the hospital. The hands of health care providers are the primary mode of transmission of these microorganisms from one patient to the other. Measures of hand hygiene are aimed to break this chain of infection (Mandel et al, 2008).

According to the US-based Centers for Disease Control and Prevention, there has been an increase in nosocomial infections by 36 percent in the last 20 years (Iyer, 2011); 80,000 patients die from these infections each year. The impact of healthcare-associated infection may imply prolonged stays in hos-

pital, long-term disability, massive additional financial burden and deaths. Nurses as primary care givers can reduce these consequences by compliance with recommended hand hygiene procedure. Proper practice and implementation of hand hygiene is a part of good quality of care and safety during the treatment (Silvennoinen, 2003). Hand hygiene practice is the responsibility of each individual who is working in the healthcare settings (Rumbold, 2005).

Objectives

The objectives of the study were to: (i) determine the level of knowledge on hand hygiene among student nurses, (ii) find the association between level of knowledge, practice and selected demographic variables such as age, gender, type of nursing course and year of study, and (iii) find the relationship between level of knowledge and practice on hand hygiene among student nurses.

Conceptual framework

The conceptual framework of present study is based on Benner's Novice to Expert (2001) Model in Clinical Practice (Fig 1) that represents the clinical ladder the student nurses would climb from unskilled novice to fully fledged nurse.

Novice: No previous experience with situation; these groups acquire basic theoretical knowledge on hand hygiene and practice in clinical setting and hand hygiene beliefs start to develop during this period.

Advanced beginners: Advanced beginners demonstrate marginally accepted performance. Students

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in second year of nursing course fall into this category. Advanced theoretical knowledge, influence of peer group, role models help them to climb the clinical ladder.

Competent: These groups should be aware of relevant aspects of clinical situation. Students in third year of nursing course fall into this category. Integration of theory and practice of hand hygiene occurs in this stage. Students perceive and internalise hand hygiene benefits.

Proficient: It is a transition stage that usually leads to expertise. Students in internship fall into this category. They attain thorough knowledge on hand hygiene guidelines and should have optimal hand hygiene practices.

Expert: Expert nurses use deliberate rationality to reflect on certain actions to achieve goals. They develop sophisticated maxims for practice. By the end of internship the students should attain this level.

Review of Literature

A descriptive study by Department of Surgical Nursing, Zonguldak School of Nursing, Turkey on medical hand washing among 430 nursing students using a questionnaire found that students wash their hands before and after each clinical procedure at a rate of 80.2 percent. The student's answers showed that the nursing education programme, including hand washing is updated but they hardly practiced

what they learned (Lucardi, 2007).

A descriptive study conducted in Kolkata to assess staff nurses' knowledge and skill regarding hand washing technique among 50 staff nurses using self administered questionnaire and observational checklist showed knowledge on hand washing to be very good (72.5%), skill regarding hand washing fair (50.58%); also knowledge and skill had no significant association with selected demographic variables and no correlation between knowledge and practice of hand washing technique was found (0.111, $p=0.34$) (Celik & Kocasli, 2008).

In another study to assess hand washing technique in healthcare institutions in the City of Sao Paulo among 113 BSc nursing students using direct observation technique, Felix & Miyadahira (2009) noted that compliance with the steps of the hand hygiene technique by the students was very low; the average number of students who executed all the steps of the technique correctly was just 8.8 percent.

Methodology

In this descriptive (survey approach) study using non-experimental descriptive design was conducted in Regional Advanced Paediatric Care Centre, Mangalore (RAPCC), 60 student nurses posted in RAPCC were included.

Since duration of data collection period was short, student nurses available in the wards had to be selected for the study.

Hence convenience sampling technique was chosen.

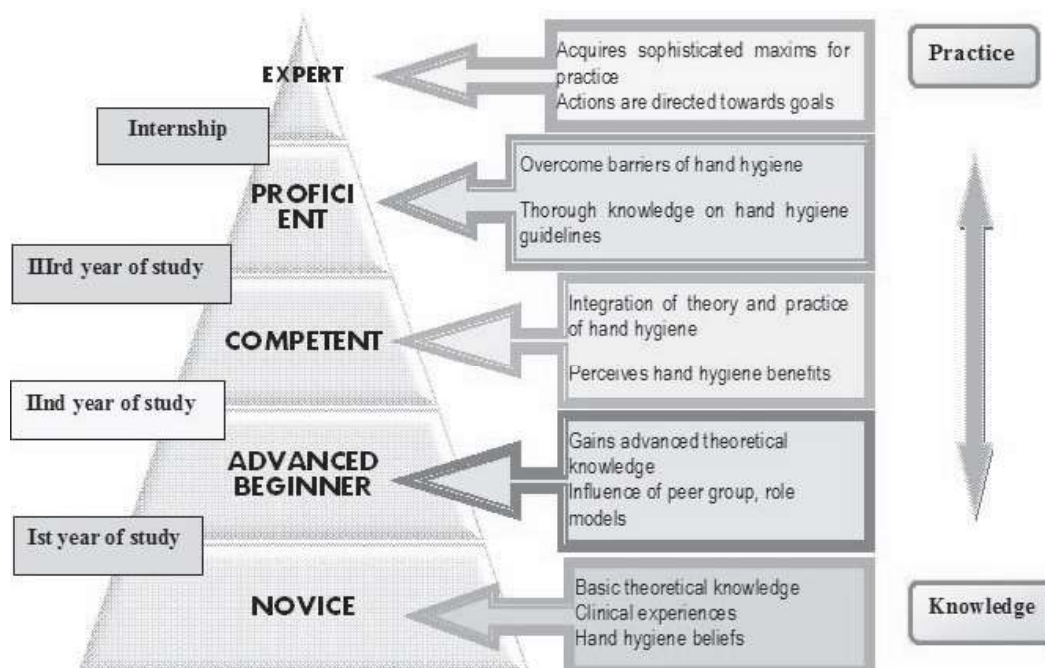
Data collection tool and technique

Based on review of research and non-research literature and opinion and suggestion from experts the following tools were developed.

Tool 1: Demographic Proforma

Data regarding age, gender, year of study, type of nursing course having attended continuing nursing education on hand hygiene was collected.

Fig 1: Conceptual Framework on Knowledge and Practice on Hand Hygiene among Student Nurses based on Patricia Benner's Model of Novice to Expert (2001) in Clinical Practice



Tool 2: Modified Hand Hygiene Knowledge Assessment Questionnaire

The WHO hand hygiene questionnaire for health workers, which consists of 15 questions, was taken as it is. Questions on hand hygiene, basic terminology and importance of hand hygiene were added following WHO hand hygiene guidelines. Researchers developed the tool consisting of 30 items hereafter referred as Modified Hand Hygiene Knowledge Assessment Questionnaire. The maximum score was 30. The scores were divided arbitrarily as good knowledge level (21-30), average knowledge level (10 - 20) and poor knowledge level (0-9) pertaining to four content areas. Content areas were divided into questions pertaining to basic hand hygiene terminologies, importance of hand hygiene, indications of hand hygiene and techniques of hand hygiene.

Tool 3: Modified Hand hygiene observation checklist

The structured observation checklist was prepared; the checklist consisted of five content areas namely indications of hand hygiene, preparation of articles preliminary assessment, technique of hand hygiene and after procedure. The total score was 20. The scores were arbitrarily labelled as good practice level (14-20), average practice level (7-13) and poor practice level (0-6) respectively.

Self-report was used to collect data regarding knowledge on hand hygiene and structured non-participant observation was used to collect data regarding practice of hand hygiene among student nurses.

The constructed tools were subjected to content validity by giving to the experts in Paediatric nursing, Medical Surgical nursing, Microbiology, Surgery and Medicine. The tools along with the blue print, objectives and criteria checklist were given to 13 experts to ensure content validity and the items were modified accordingly.

Pre-testing of the tool was conducted among 10 third year Diploma nursing student nurses in RAPCC. No difficulties were found in executing the tool for observation for observing hand hygiene.

Reliability: To ascertain reliability of structured knowledge questionnaire split half method, it was administered to 20 student nurses at RAPCC. The test scores were divided into two equal halves (split half method) and correlation for the half test was calculated using Karl Pearson's correlation coefficient formula. The reliability coefficient of the whole test was then estimated using Spearman brown prophecy formula. The reliability was found to be 0.9, hence the tool was considered as reliable.

Inter observer rating was used to ascertain reliability for observation checklist. Each sample's scores were calculated. Spearman's rank correlation coefficient was used to ensure reliability of observational checklist. The coefficient being 0.98, the tool was found reliable.

The pilot study was conducted at RAPCC, Mangalore. Ten student nurses who had posting in PICU were selected to find the feasibility of the study.

Data collection procedure: For collecting data, administrative permission was obtained. Informed consent was also obtained from the participants before filling the questionnaire.

Self report was used to collect data regarding knowledge on hand hygiene. Data was collected using Hand Hygiene Knowledge Assessment Questionnaire. Structured nonparticipant observation was used to collect data regarding practice of hand hygiene and data was collected using Hand Hygiene Observation checklist. Observation of hand hygiene practice was unrevealed to the participants as it will modify the hand hygiene behaviour.

Results

Demographic characteristics of the sample: Maximum student nurses (46.7%) belonged to the age group of 19-21 years and majority (85%) of them were female. Highest percentage (68.3%) of student nurses belonged to IIIrd year. As per the type of nursing course, maximum student nurses (56.7%) were in BSc nursing. Majority (80%) had not attended continuing nursing programme on hand hygiene and majority; 70 percent of student nurses preferred hand washing as a hand hygiene measure than use of hand rubs.

Knowledge of the student nurses on hand hygiene: Table 1 reveals that 53.3 percent of the students had good level of knowledge and 46.7 percent had average level of knowledge on hand hygiene and none had poor level of knowledge on hand hygiene.

Area wise analysis of knowledge scores (Fig 2) shows that student nurses had highest mean percentage (99.17) of knowledge score in the importance of hand hygiene which had a mean percentage score in the area terminologies on hand hygiene (87.5) whereas the mean percentage score was 67.22 in the area of indications of hand hygiene. The least mean percentage score (60.71) was in the area of techniques of hand hygiene.

Level of practice of the student nurses on hand hygiene: Figure 3 reveals that 60 percent of the

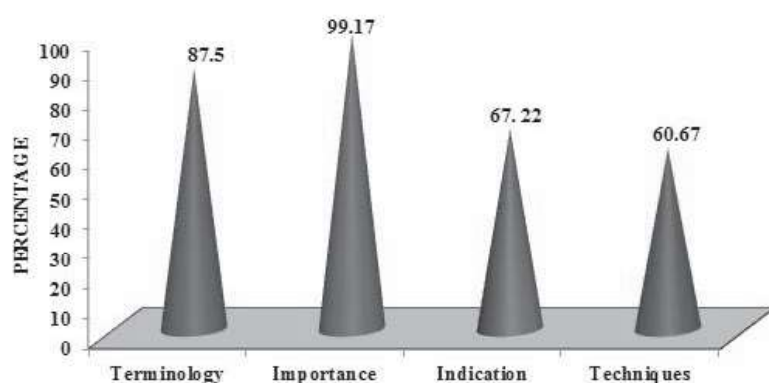
Table 1: Frequency and percentage distribution of student nurses according to their level (n=60)

S. No.	Level of knowledge	Frequency (f)	Percentage (%)
1	Good	32	53.3
2	Average	28	46.7
3	Poor	0	0

student nurses had an average level of practice and 25 percent of the student nurses had good level of practice regarding hand hygiene and 15 percent had poor level of practice on hand hygiene.

Area-wise analysis of practice scores (Table 2) shows that student nurses had highest mean percentage score of 84.17 in the preliminary assessment of hand hygiene. Mean percentage in the techniques

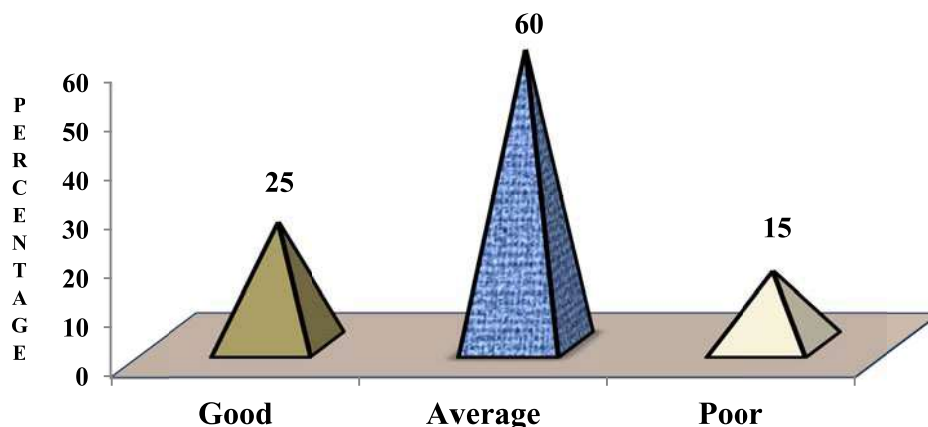
Fig 2: Mean percentage score of various knowledge areas on Hand hygiene among Student Nurses



on hand hygiene was 57 whereas the mean percentage score in the area of indications of hand hygiene was 52.33. Mean percentage was 51.67 on preparation of articles and the least mean percentage 41.67 in the after procedure of hand hygiene.

Level of knowledge and practice and selected demographic variables: The student nurses' knowledge and practice on hand hygiene had no signifi-

Fig 3: Pyramid diagram showing the level of practice score on hand hygiene among student nurses



cant association with selected demographic variables. So all the demographic variables such as age of the student, gender, year of study, type of nursing course and having attended continuing education programme student nurses were found to be independent of their knowledge and practice scores of hand hygiene.

Level of knowledge and practice on hand hygiene among student nurses: There was a significant positive correlation between the level of knowledge and level of practice scores of hand hygiene among student nurses (Table 3). Hence the null hypothesis was rejected and research hypothesis was accepted and it was concluded that there is significant relationship between level of knowledge and practice on hand hygiene among student nurses.

Discussion

The present study revealed that 53.3 percent student nurses had good knowledge and 46.7 percent had average practice regarding hand hygiene. These findings are supported by Uma (2011) who found knowledge on hand washing to be very good (72.5%) and their skill, fair (50.58%). No significant association was found between knowledge and skill with the selected demographic variables.

In another study, Mandal et al (2008) reported that knowledge on hand was 40.8 percent in doctors, 39.6 percent in parents and 21 percent in nurses, thus they concluded that overall practice was low and the nurses were least compliant.

Our findings are supported by Snow et al (2009) who showed that students in their II and III year adopted better hand washing technique, with a statistically significant difference compared to the IV year. The overall technique was poor at 8.8 percent.

The present study revealed that 60 percent of the student nurses had an average practice and 15 percent had poor practice on hand hygiene and there is a significant positive correlation between knowledge and practice scores of hand hygiene among student nurses. Stutz et al (2009) found that the knowledge of hand washing procedures was higher when compared to observed clinical practice in medical and nursing students.

Table 2: Area wise range of score, mean, SD and mean percentage of level of practice scores on hand hygiene among student nurses (n=60)

S. No.	Areas	Max score	Mean score	SD	Mean (%)
1	Indications	5	2.62	1.07	52.33
2	Preparation of articles	2	1.03	0.84	51.67
3	Preliminary assessment	2	1.68	0.46	84.17
4	Techniques	10	5.70	1.87	57.00
5	After procedure	1	0.42	0.49	41.67
Total		20	11.45	3.23	57.25

Table 3: Level of knowledge vs practice regarding hand hygiene among student nurses

Sl. No.	Scores	Mean	S.D	df	Correlation coefficient	Significance
1.	Level of knowledge	20.30	3.74	58	0.377	Significant
2.	Level of practice	11.45	3.24			

$r(58) = 0.236$; $p < 0.05$

Study Implications

Nursing Education: Nurse educators can observe the student nurses, hand hygiene behaviour and can give regular feedback. The study also pointed to the greater need for performance feedback and need of clinical teaching on hand hygiene procedure to improve their practice.

Nursing Practice: Our study was an eye opener for those nursing personnel who are careless or doing clinical procedures, not following infection control protocols and unaware about the recent guidelines of infection prevention.

Nursing Administration: The nurse administrators should be able to motivate and initiate the student nurses on organising, conducting and participating in various educational programmes such as workshops on hand hygiene and infection control that would improve the health care delivery system. It is also the responsibilities of the nursing administrators to provide appropriate facilities for hand hygiene.

Recommendations

A comparative study to determine the practice and attitude of hand hygiene among physicians and nurses; an exploratory study on predictors of hand washing behaviour among student nurses in a teaching hospital; a study to assess self-reported practices of hand hygiene versus direct observation among the student nurses of a teaching hospital; an exploratory study to assess the factors associated with poor hand hygiene practices; and a cross-cultural comparison of student nurses' hand hygiene

knowledge, beliefs and practices may be conducted.

Conclusion

The maximum of student nurses had good knowledge and an average practice on hand hygiene. Hence, student nurses need to be made to understand the importance of hand hygiene from the first year of their study and they are to be insisted to make a habit of hand washing in clinical practice. The student nurses should be given performance feedback and continuous monitoring of their hand hygiene procedure to improve their practice. More student nurses preferred hand washing as a hand hygiene measure to use of hand rubs. Since student nurses who had high knowledge scores had better practice as compared to those with poorer scores, it is essential to ensure imparting adequate knowledge so that it will bring improvement in their hand hygiene practice.

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