

# Hand Hygiene Training and Its Impact on the Knowledge of Undergraduate Nursing Students in Kosovo

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Received: February 8, 2017 Accepted: February 23, 2017 Online Published: March 8, 2017

doi:10.5539/gjhs.v9n4p142

URL: <https://doi.org/10.5539/gjhs.v9n4p142>

## Abstract

**Background:** Hand hygiene (HH) performing is a must in health care settings because it affects the human lives. Health Care Workers (HCW) must be aware and be trained continuously as regards hand hygiene.

**Aim:** The aim of this article was to evaluate and compare the knowledge before and after an educational training of undergraduate nursing students at an educational institution in Pristine, Kosovo.

**Methods:** A pre- post survey was conducted in February 2016 at an educational institution in Pristine, Kosovo. The World Health Organization (WHO) questionnaire for hand hygiene knowledge of Health Care Workers (HCW) was used to collect the data.

**Results:** From a total of 100 students, only 13 (13 %) were men and 87 (87%) were women. Their ages ranged between 18-23 years old. Only 55 (55 %) had poor knowledge level, 42 (42%) had moderate knowledge level and only 3 (3%) had good knowledge about HH practices before the training and after the training only 1 (1%) participant was found with poor knowledge, 61 (61%) moderate knowledge and 38 (38 %) good knowledge. The training had a significant impact on the acquisition of HH' knowledge. This was shown by the significant difference between the total points before and after the training ( $p < 0.001$ ).

**Conclusion:** The training should be done consistently and be part of the nursing school curriculum, maintaining a satisfactory level of knowledge about hand hygiene as these students in a near future will face with Hand Hygiene (HH) issues in their daily clinical work.

**Keywords:** hand hygiene, undergraduate nursing students, WHO Multimodal Strategy, hand hygiene training

## 1. Introduction

Hand hygiene (HH) remains a very sensitive topic for the importance it possess. HH affects people's lives, so health care workers (HCW) should be aware about it and adopt the HH culture in their daily work. The HCW's compliance with HH guideline vary between 5%–89%, but in most cases with an average value below 50%. (WHO, 2009; Lankford et al., 2003; Pittet et al., 2000) The undergraduate nursing students were the focus of this study who must possess the necessary professional knowledge before they put it into practice. For the implementation of training tool, the study was based on WHO campaign “Clean Care is Safer Care and Save Lives”. One of the WHO multimodal strategies to increase awareness and knowledge about HH is the training about HH understanding and practices (WHO, 2009). Numerous authors have conducted studies to assess the HH knowledge of undergraduate students and their level of knowledge was rather low (Nair et al., 2014; Van de Mortel et al., 2010; Herbert et al., 2013; Feather et al., 2000; Thakker&Jadhav, 2015; Garcia-Zapata et al., 2009; Kelcikova et al., 2012). Therefore, the inclusion of HH in the undergraduate curriculum is considered an emergency issue (Chatterjee et al., 2015). On the other hand, by enriching the undergraduate curriculum, the formal training is considered a key component in generating and improving knowledge, therefore it must be offered on an ongoing basis (Sopjani, 2016a; 2016b). Due to poor existing literature in Kosovo, it was necessary to conduct a study of this nature around the hand hygiene concept and practices. This study was conducted to measure the level of knowledge pre and post training for a group of nursing students at an educational institution in Pristine,

Kosovo.

## 2. Methods

### 2.1 Study Design

The design of this study consists of a pre-post survey. The research was based in the adoption of the WHO multimodal strategy “training tool” of the WHO campaign “Clean Care is Safer Care and Save Lives”. The training was conducted in February of 2016. A total of 100 students underwent the training. The participants were informed about the purpose of training, they were required to complete the questionnaire before the training and the same questionnaire after the training. The training lasted 5 hours.

### 2.2 Data Collection

The WHO questionnaire for hand hygiene knowledge of HCW was used to collect the data. The questionnaire was accessed from the WHO guideline materials online that are accessible for all researchers. The questionnaire carried a set of questions with answers yes or no, true or false. The correct answers were marked by 1 point while the wrong answers by zero points. Maximum points were 25. The level of knowledge was categorized as follows: poor knowledge, moderate knowledge and good knowledge. The participants, whose scores were less than 50%, were considered to have a poor knowledge; those with scores between 50-74% had moderate knowledge and those with more than 75% of correct answers had a good knowledge about hand hygiene.

### 2.3 Data Analysis

The data analysis was run in the statistical program SPSS version 20. The data were presented with their average values, standard deviations and percentages. Also, to evaluate the statistical significance of the training in improving the knowledge of undergraduate nursing students, it was extracted paired t-test.  $P < 0.05$  was considered statistically significant.

### 2.4 Ethical Issues

The permission to conduct the training was undertaken by the competent authorities and the ethics committee.

## 3. Results

From a total of 100 students, only 13 (13 %) were men and 87 (87%) were women. Their ages ranged between 18-23 years old.

Pre-post Hand Hygiene Knowledge has been summarized in the Table 1. Before the training, only 66 (66 %) knew that HCW hands when not clean are the main route of cross-transmission of potentially harmful germs between patients in a health care facility and 76 (78.4 %) knew the correct answer after the training. In general, from the Table 1, it can be noticed an overall increased percentage of correct answers after the training. To better explain this improvement in other words, there was summarized in the Table 2 the level of knowledge pre and post training for all undergraduate nursing students. The training completely reversed the initial categorization of student's knowledge. From a poor knowledge level, students passed in a moderate level of knowledge after the training. Thus, the training had a significant impact on the acquisition of HH' knowledge. This is shown by the significant difference between the total points before and after the training ( $p < 0.001$ ) (Table 3).

Table 1. Pre-Post Hand Hygiene knowledge of undergraduate nursing students

<b>Knowledge statements (correct answers)</b>	<b>Pre-training N (%)</b>	<b>Post-training N (%)</b>
Which of the following is the main route of cross-transmission of potentially harmful germs between patients in a health-care facility? ( <i>HCW hands when not clean</i> )	66 (66%)	76 (78.4%)
What is the most frequent source of germs responsible for health care-associated infections? ( <i>germs already present on or within the patient</i> )	54 (55.7 %)	70 (70.7 %)
Hand hygiene actions that prevent the transmission of germs to the patients?		
a) Before touching a patient ( <i>yes</i> )	88 (88%)	93 (93%)
b) Immediately after a risk of body fluid exposure ( <i>no</i> )	37 (37.4 %)	48 (48 %)
c) After exposure to the immediate surroundings of a patient ( <i>no</i> )	42 (42.9 %)	48 (48 %)
d) Immediately before a clean/aseptic procedure ( <i>yes</i> )	74 (78.7%)	91 (91%)
Hand hygiene actions that prevent the transmission of germs to the health care worker?		
a) After touching a patient ( <i>yes</i> )	79 (81.4%)	94 (94%)
b) Immediately after a risk of body fluid exposure ( <i>yes</i> )	72 (73.5%)	91 (91.9%)
c) Immediately before a clean/aseptic procedure ( <i>no</i> )	27 (29.3 %)	35 (35%)
d) After exposure to the immediate surroundings of a patient ( <i>yes</i> )	54 (56.3%)	85 (85.9%)
Which of the following statements on alcohol-based hand rub and hand washing with soap and water are true?		
a) Hand rubbing is more rapid for hand cleansing than hand washing ( <i>true</i> )	55 (59.1 %)	80 (80 %)
b) Hand rubbing causes skin dryness more than hand washing ( <i>false</i> )	30 (30.6 %)	63 (63 %)
c) Hand rubbing is more effective against germs than hand washing ( <i>true</i> )	40 (41.2 %)	63 (63.6 %)
d) Hand washing and hand rubbing are recommended to be performed in sequence ( <i>false</i> )	16 (17.2 %)	42 (42 %)
What is the minimal time needed for alcohol-based hand rub to kill most germs on your hands? ( <i>20 s</i> )	38 (40 %)	71 (71 %)
Which type of hand hygiene method is required in the following situations?		
a) Before palpation of the abdomen ( <i>rubbing</i> )	34 (34.7 %)	61 (61 %)
b) Before giving an injection ( <i>rubbing</i> )	33 (36.3 %)	59 (59 %)
c) After emptying a bedpan ( <i>rubbing</i> )	19 (20 %)	57 (57%)
d) After removing examination gloves ( <i>rubbing</i> )	22 (22.2 %)	56 (56 %)
e) After making a patient's bed ( <i>rubbing</i> )	30 (30 %)	72 (72 %)
f) After visible exposure to blood ( <i>washing</i> )	77 (80.2 %)	95 (96 %)
Which of the following should be avoided, as associated with increased likelihood of colonization of hands with harmful germs?		
Wearing jewellery( <i>yes</i> )	84 (84.8 %)	93 (93 %)
Damaged skin ( <i>yes</i> )	92 (92 %)	94 (94 %)
Artificial fingernails ( <i>yes</i> )	85 (90.4 %)	93 (93.9 %)
Regular use of a hand cream ( <i>no</i> )	42 (42 %)	64 (64 %)

Table 2. Pre-Post level of knowledge of Hand Hygiene of undergraduate nursing students

	Pre Training	Post Training
<b>Poor</b>	55 (55 %)	1 (1 %)
<b>Moderate</b>	42 (42 %)	61 (61 %)
<b>Good</b>	3 (3 %)	38 (38 %)

Table 3. Pre-Post comparison of knowledge score

	Mean ± SD	N	P
<b>Pre Score</b>	12.65 ± 2.6	100	< 0.001*
<b>Post Score</b>	17.73 ± 2.7	100	

#### 4. Discussion

The overall scores before the training were low and after the training were moderate similar to other studies (Thakker&Jadhav, 2015; Ariyaratne et al., 2013). Thakker and Jadhav (2015) conducted a similar study to this and documented poor knowledge. Out of 40 nursing students, only 37.5% knew that unclean hands were the main route of transmission of potentially harmful germs (Thakker&Jadhav, 2015). While in this study 66 (66%) knew the correct answer before the training that unclean hands were the main route of transmission of potentially harmful germs and 76 (78.4%) after the training. According to a similar study, only 14 (35%) had poor knowledge, 24 (60%) moderate knowledge and only 2 (5 %) had good knowledge (Thakker&Jadhav, 2015). While in this study, 55 (55%) had poor knowledge level, 42 (42%) had moderate knowledge level and only 3 (3%) had good knowledge about HH practices before the training and after the training only 1 (1%) participant was found with poor knowledge, 61 (61%) moderate knowledge and 38 (38 %) good knowledge. Another study assessed hand hygiene knowledge among medical students at a teaching hospital in India and found moderate knowledge similar to this study (Chatterjee et al., 2015). Thus, out of 191, 145 (75 %) had moderate knowledge, 15 (8%) had good knowledge and the rest 31 (16 %) had poor knowledge (Chatterjee et al., 2015). Many other authors who conducted comparison study of HH knowledge among medical and nursing students, have found that in general nursing students had significantly higher knowledge than medical students (Nair et al., 2014; Van de Mortel et al., 2010; Chatterjee et al., 2015; Ariyaratne et al., 2013). A poor knowledge level was stated before the training. This may be linked to the lack of attention of the educational institutions for the inclusion of hand hygiene topics in the nursing school curriculum. WHO guideline recommendations regarding HH are included in the school curriculum of many countries. Therefore, the nursing school curriculum in educational institutions in Kosovo must be enriched and updated with WHO materials about HH. An effective educational program, in the context of formal training and the nursing school curriculum, is very important due to the fact that the poor knowledge and low HH practical skills among students may have a significant negative impact in the HH compliance later in their daily clinical work (Kelcikova et al., 2012). Similar to this study, Huang et al., (2012) assessed the impact of an educational program and found a significant increase of knowledge ( $p < 0.001$ ) but for a longer period of time (4 months) and with two groups (experimental and control). While Goud & Chamberlain (1997) found no significant impact of the 3-month educational program. The improve of training programs appears to be necessary in order to address gaps of knowledge, attitudes and practices of students as well as the establishment of best practice conditions that are eligible for future nurses (Ariyaratne et al., 2013).

#### 5. Conclusion

This study was conducted with a limited sample size. A potential future study may consider a larger number of participants or a comparative study may be conducted between nursing students with other students of medical sciences. The pre and post overall scores stated a critical role of trainings in shaping students knowledge despite what they receive in the nursing school curriculum. Thus, the training should be done consistently and be part of the nursing school curriculum, maintaining a satisfactory level of knowledge about hand hygiene as these students in a near future will face with HH issues in their clinical daily work.

#### Funding Sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Competing Interests Statement

All authors report no conflicts of interest relevant to this article.

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