Training as an Effective Tool to Increase the Knowledge About Hand Hygiene Actions. An Evaluation Study of Training Effectiveness in Kosovo

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ABSTRACT
Introduction: Hand hygiene (HH) compliance with World Health Organization (WHO) guidelines is essential to prevent bacterial transmission and infections acquired from hospital settings. Aim: The aim of this study was to evaluate the impact of training tool of World Health Organization’s (WHO’s) Hand Hygiene multi modal campaign at all public hospitals and at the University Clinical Center in Kosovo (UCCK). Method: During February 2016, 691 questionnaires were distributed to health care workers. The data collection was conducted through a questionnaire distributed before and after training. Measurement of questions was realized through a 5 point Likert scale. Results: The gender structure of participants turned out to be greater for women (n=571, 85%). The knowledge of health care workers differed significantly before and after the training (p<0.001), emphasizing that the impact of the training was important to improve the knowledge of participants. Thus, the average value of improvement of HCW’ knowledge was about 41.66 %. Conclusion: The findings emphasized the role of the training to improve the knowledge of participants about hand hygiene as well as prevention from infection.

Keywords: Hand hygiene, educational training, multi modal intervention, WHO Hand Hygiene campaign.

1. INTRODUCTION
Hand hygiene (HH) compliance with World Health Organization (WHO) guidelines is essential to prevent bacterial transmission and infections acquired from hospital settings. Although many factors contribute to the development of Healthcare Associated Infections (HAIs), the consistent performance of hand hygiene prior to physical contact with patients, has been reported to be the single most effective preventive strategy of these infections (1). Compliance with HH can be associated with at least a 20% reduction in the risk of developing HAIs (2).

Education and training, the tool adapted for this paper, is important and critical for success. At the same time, it is an essential component of WHO multi modal HH’ improvement strategy together with other elements since an educational program aims to increase awareness, knowledge, and helps with critical issues and to focus on them (3).

According to WHO guideline, factors of non HH’ compliance are lack of access to HH facilities at points of care; time constraints; skin irritation from frequent hand washing; lack of knowledge about the potential risk of the microorganisms transmission to patients, etc (3). In Kosovo, the communicable diseases are a major problem and the main challenges in this field are the financial and political aspect, inadequate number of trained personnel and insufficient equipments (4). A study of hand hygiene’ compliance in Intensive Care

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doi: 10.5455/medarh.2017.71.16-19
Med Arch. 2017 Feb; 71(1): 16-19
Received: DEC 11, 2016 | Accepted: JAN 26, 2017
Published online:05/02/2017 Published print:02/2017
Unit (ICU) in Kosovo, showed the alarming rate of only 19% (5). A similar study was conducted in Albania and it was concluded that for effective control of NI is needed infection control personnel for the implementation of appropriate procedures, and microbiologists to advise on antibiotics policy (6). Through different methods, many other authors, tried to evaluate the impact of implementing the updated World Health Organization (WHO) multi modal HH guidelines on HH compliance and HAIs (7-11).

The aim of this study was to evaluate the impact of training tool of World Health Organization's (WHOs) Hand Hygiene multi modal campaign at all public hospitals and at the University Clinical Center in Kosovo (UCCK).

2. METHODS

The study design was focused on the training in the entire population of the public health care delivery. The data collection was conducted through a questionnaire distributed before and after training.

During February, 691 HCW underwent the training in February 2016, for one week. Training to health care workers was provided through the theoretical part (lectures), visual (video) and practical (cleaning hands with antimicrobial soap and rubbing them with alcohol solutions) for all seven hospitals in Kosovo and UCCK, in eight cities of Kosovo: Priztine, Gjakova, Peja, Mitrovica, Prizren, Vushtri, Gjilan, and Ferizaj.

Construction of the questionnaire is largely inspired from WHO guidelines. The questionnaire consists of many questions regarding evaluation of HCW' knowledge. Initially, before collecting the data required to analysis, the first part of the questionnaire focuses on a collection of general demographic information about HCW profession, gender, age and so on. The main structure of the questionnaire was focused on: measurement of knowledge of health care workers about hand hygiene. For the measurement of knowledge before and after, to each employee have been distributed two questionnaires before training and after training. Cronbach alpha resulted 0.653. In consultation with the chairman of the Chamber of nurses in Kosovo, we have compiled a strategy for initiating the delivery of hand hygiene training for healthcare workers. Also, there were distributed posters and leaflets for hand hygiene as a mean of information to healthcare workers. Also, there were distributed posters and leaflets for hand hygiene as a mean of information to provide hand hygiene training and in the same time as a reminder for health care workers for the application of hand hygiene in their workplace.

The approval request for research within Kosovo hospitals was taken by the ethical committees of the respective hospitals after research context was reviewed in the Ministry of Health of Kosovo from the National Ethics Committee. Health care workers were informed about the research aim and given time to be able to decide whether to participate in the research study or not. They were ensured that the data will remain anonymous.

Measurement of questions was realized through a 5 point Likert scale. The questions were encoded in binary variables and then for the whole group of coded questions, it was created a new variable “Total index Score”, which took into account only the correct answers (coded by 1) and incorrect (coded by 0). This new variable helped to compare the HCW knowledge before and after training.

Statistical analysis

Data were presented as mean ± SD or proportions (% of patients). A significant difference was defined as P value <0.05 (2-tailed). Continuous data were compared with paired t-test. Statistical analysis was performed with SPSS (Version 21).

3. RESULTS

The overall geographic distribution of health care workers who underwent training was: 243 (43.1 %) participants from Priztine, 27 (4.8 %) from Gjakova, 60 (10.6 %) from Peja, 75 (13.3 %) from Mitrovica, 41 (7.3 %) from Prizren, 89 (15.8 %) from Gjilan and 29 (5.1 %) from Ferizaj (Table 1).

| Cities      | n (%)       |
|-------------|-------------|
| Priztine    | 243 (43.1 %)|
| Gjakova     | 27 (4.8 %)  |
| Peja        | 60 (10.6 %) |
| Mitrovica   | 75 (13.3 %) |
| Prizren     | 41 (7.3 %)  |
| Gjilan      | 89 (15.8 %) |
| Ferizaj     | 29 (5.1 %)  |

Table 1. The geographic distribution of health care workers

Only 66 (10.6 %) aged between 18-25 years; 207 (33.2 %) aged between 26-35 years; 176 (28.2%) aged between 36-45 years; 135 (21.6 %) aged between 46-55 years and 40 (6.4 %) aged more than 56 years. The gender structure of participation turned out to be greater for women. Women participated with 571 (85%) respondents. The structure of the profession of respondents consists of a majority of 431 (68.5%) nurses, 43 (6.8 %) midwife, 53 (8.4 %) anesthesia technician and 102 (16.3%) other profession (Table 2).

| Profession of participants | n (%)       |
|----------------------------|-------------|
| Nurse                      | 431 (68.5%) |
| Midwife                    | 43 (6.8 %)  |
| Anesthesia technician      | 53 (8.4 %)  |
| Other profession           | 102 (16.3%) |

Table 2. The structure of the profession of respondents

Regarding the formal training received in hand hygiene in the last three years, 312 (45.4%) answered yes while 375 (54.6 %) didn’t received formal training in the last three years. From the analysis it was reported that 475 (73.5%) used an alcohol-based hand rub for hand hygiene while 171 (26.5%) respondents didn’t use.

When HCW were asked about the main route of germs transmission in a health-care settings, 492 (73.2%) gave the right answer before training, HCWs’s hands when not clean, and 550 (83.2%) after training. Meanwhile regarding the most frequent source of germs, 359 (54.5%) answered correctly on germs already within the patient, before training and 464 (69.5%) after training. In the Table 3, it is shown the comparison before and after training.
of correct answers given for hand hygiene actions that prevent transmission of germs to the patient.

Table 3. Hand hygiene actions which prevents transmission of germs to the patient

| Hand hygiene actions                          | Before training N (%) | After training N (%) | P value |
|----------------------------------------------|-----------------------|---------------------|---------|
| Before touching a patient (yes)              | 603 (89.9)            | 655 (96.2)          |         |
| Immediately after a risk of body fluid exposure (no) | 245 (36.4)            | 333 (48.5)          |         |
| After exposure to the immediate surroundings of a patient (no) | 292 (43.5)            | 336 (48.9)          |         |
| Immediately before a clean/ aseptic procedure (yes) | 521 (79.2)            | 614 (90.3)          |         |

Table 4. Which type of hand hygiene method is required in the following situations?

| Variable                                      | Before training Mean (SD) | After training Mean (SD) | P value |
|-----------------------------------------------|---------------------------|--------------------------|---------|
| Total score                                    | 12.65±2.47                | 17.91±2.59               | <0.001  |

Table 5. T-test for the variable Total Score Pre and Post training

Only 301 (46.1%) gave the right answer (20 seconds) regarding the minimal time needed for alcohol-based hand rub to kill most germs on hands before training and 495 (72.9%) after training. Improvement of knowledge on hand rubbing and washing was rather high. 369 (56.6%) gave the right answer (true) before training agreeing that hand rubbing is more rapid than hand washing to clean hands and 529 (78%) after training; 233 (35.6%) gave the right answer (false) before training related to the statement hand rubbing causes skin dryness more than hand washing and 372 (54.7%) after; 219 (33.5%) gave the right answer (true) before training agreeing that hand rubbing is more effective than hand washing against germs and 424 (62.4%) after; 88 (13.7%) gave the right answer (false) before training as regards the statement hand washing and hand rubbing are recommended to be performed in sequence, while 314 (46.6%) after training. In the Table 4, it is given the comparison before- after training of the correct answers about the type of HH method required in each of the following situations.

4. DISCUSSION

From the analysis was understood that improve on the level of knowledge for each question made before and after training was rather high. Definitely, training was an effective intervention since the level of knowledge of HCW raised on average about 41.66%. A low level of knowledge on hand washing techniques was demonstrated by a low HH compliance (51.3%) and one recommendation was that education of nurses should be implemented continuously on an annual basis in order to promote HH among HCW (12).

HCWs compliance improved substantially and AHR consumption increased after an educational campaign of hand hygiene emphasizing the influential role on improved knowledge (13). Similarly, another study reported high scores on the baseline hand hygiene questionnaire (data were not shown) (14). While, Thakker & Jadhav, (2015) evaluated the knowledge regarding hand hygiene and documented an unsatisfactory level of knowledge (15). Less than 50% undergraduate participants knew that unhygienic hands of HCW were the main route of transmission of potential harmful germs while in our study 73.2% knew it. Less than 35% participants were aware that the main source of germs in HAI was from patients, while in this study 54.5% knew that germs already present on or within the patient were the source of germs. Only a few (32.5%) knew that 20s is the minimum time required for effective AHR, while in our study 46.1% in pre-training knew the right answer and 72.9% after training. A similar survey through questionnaire concluded that many (65%) had a good knowledge of indications and 67% perceived hand hygiene as difficult task (16). Improvement of the knowledge of HCW about HAI and HH principles contributes to achievement of best practices (17). From our statistical analysis was shown that doesn’t exist any difference as regards the gender (1.65% difference between males and females was not significant, p>0.05) similar to other studies (18). According to Hynes (2015) HCW knowledge was improved in
a modest way by educational program (19). In his study 10% participants had not previously received mandatory training while in our study 54.6% had not received any formal training for the last three years. The pre training assessment showed that 17 % of participants did not routinely used hand rub while in our study 26.5 % didn’t use AHR. Poor hand hygiene performance is related with lack of knowledge. Education and training, itself is a key constituent of effective hand hygiene performance (19).

5. CONCLUSIONS
These findings emphasized the role of the training to improve the knowledge of participants about hand hygiene as well as prevention from infection. It was registered a high improve in the knowledge of health care workers after the training (p<0.001), emphasizing the critical role of trainings on improving the knowledge and education of health care workers in order that they adhere with guidelines. That’s why it is important to develop a successful strategy to ensure that health care workers are aware of the guidelines and their use.

Despite the novelties that study brought, it is accompanied with some limitations. This study was designed only on the basis of an experimental group where the focus was the development of training and assessment of its effect on the same group. In the future, studies may be extended further into the private sector, to gain a full perspective about hand hygiene culture or it can be undertaken a comparative study with neighboring countries in this field.

Clinical implication: Training hygiene for hands increased the quality of medical work due to protect the patients from the infection.

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