ABSTRACT

Healthcare-associated infections remain a significant challenge in modern medicine. The most important factor that can affect the interruption of the chain of infections and the protection of patients is the proper hand hygiene of healthcare workers. Doctors, in particular, neglect hand hygiene to a large extent. The reasons for this include insufficient knowledge, poor organization of workplaces, inadequate staffing, overcrowding of hospital wards, fatigue and workload, and burnout. It seems that introducing good habits among medical students, who have not yet acquired bad habits, and raising their awareness of the importance of hand hygiene in preventing healthcare-associated infections at an early stage of education, may be one of the ways to solve this global problem.

In view of the above, the aim of the study was:
1. To determine the level of knowledge of medical students at the Medical University of Bialystok on hand hygiene in the context of hospital-acquired infections.

2. Prospective evaluation of the effects of teaching medical students about hand hygiene guidelines.

3. Assessment of the consistency of knowledge on hand hygiene with self-assessment and practical performance of hygiene procedures.

A cross-sectional cohort study was conducted between 2014 and 2019 and consisted of three stages. In total, 1,514 medical students from the Medical University of Bialystok participated in the study. In the academic year 2014/2015, during stage one, a questionnaire survey was conducted among students of all years of study regarding knowledge of hand hygiene, self-assessment of knowledge, evaluation of education and teaching methods, attitudes of students towards education on hand hygiene, and individual evaluation of the importance of using various interventions to increase compliance with hand hygiene by medical professionals. In the second stage of the study, which was a prospective part, in the academic year 2017/2018, fourth and sixth-year students participated, who filled out the same questionnaire again, while in the first stage they were respectively in their first and third year of study. The third stage of the study concerned sixth-year students in the academic year 2018/2019, who completed a shortened version of the questionnaire and were evaluated for their preparedness for the procedure and the correctness of hand disinfection using a UV lamp. In total, 1,438 questionnaires were analyzed in all stages.
On most questions regarding general issues related to hand hygiene, sixth-year students answered better than first-year students. Older students also attributed greater importance to all nterventions aimed at improving hand hygiene in medical facilities. Despite greater knowledge, students of older cohorts tended to underestimate their self-assessment, unlike younger cohorts who overestimated their knowledge. The consistency of self-assessment with actual knowledge was low, with the highest among sixth-year students (35.6%).The survey also identified numerous misconceptions and gaps in the knowledge of students in each year group. Only 38.9% of first-year students knew that staff hands are the main route of pathogen transmission in the hospital. The remaining students answered this question correctly with more than 70%.

Less than half of all students knew the minimum time for effective disinfection. Only every 5th student was able to correctly indicate the preferred method of hand hygiene (disinfection or hand washing) in 4 out of 5 example clinical situations. Less than 50% of all students correctly indicated situations in which hand hygiene protects the clinician and in which it protects the patient. Students of all years were well aware of most of the risk factors for microbial hand contamination (more than 75% of correct answers).

The average of correct answers to all the questions included in the questionnaire was 65.5% and ranged from 58.8% in the first year to 70.4% in the sixth year.

Only half of the students (53.4%) stated that assistants during clinical classes are a good example for them and observe hand hygiene.

Half of the surveyed students believed that theoretical and practical training in the field of hand hygiene procedures should be mandatory before starting clinical classes. Less than one-third of the respondents (31.1%) felt that they were well prepared in hand hygiene when starting clinical classes.

In the second stage of the study, an improvement in overall hand hygiene knowledge was observed after 3 years of education, but the level was still moderate (not exceeding 75%). Furthermore, in some questions, the percentage of correct answers decreased significantly or still remained low (e.g. with regard to risk factors for hand contamination or preferred hand hygiene method).

Less than 50 % of the students performed hand disinfection correctly (bright areas in the UV lamp). The chance of correct disinfection increased when the procedure was carried out according to the Ayliffe scheme, the student was introduced to hand hygiene during the classes, demonstrated knowledge of ≥75% in the study. The presence of 4 or more deviations in the preparation of hands for the procedure, painted nails and the false belief that the respondent was familiar with the Ayliffe scheme were associated with incorrectly performed hand disinfection.