

**PREVENTION OF HEALTHCARE-ASSOCIATED INFECTIONS IN THE PROCESS OF  
HIGHER MEDICAL SCHOOL EDUCATION**

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**Abstract**

Healthcare-associated infections affect the health and lives of a large proportion of patients worldwide. The responsibilities and good professional training related to the prevention of these infections are instilled in health care professionals during their training in medical school. Students' practical training is acquired during clinical practice and internship in a real hospital setting with the help of faculty at the hospital training facilities. Quality training of future health care professionals is a prerequisite for responsible action on the prevention and avoidance of nosocomial infections. **Purpose:** The purpose of this analysis is to uncover and delineate the prevention of healthcare-associated infections in the training of healthcare professionals in a higher medical school. **Materials and methods:** documentary method - literature analysis. **Results:** The prevention of healthcare associated infections in the training of healthcare professionals in higher education is a sufficiently theoretically covered subject that enhances the quality of training; despite the theoretical training of students, there are some gaps regarding the prevention of nosocomial infections in a real hospital setting; good organization of practical training, as well as the personal example of the lecturers in clinical practice are a prerequisite for responsible actions by students related to the prevention of nosocomial infections;

**Key words:** nosocomial, infections, wards, students, training

**Introduction**

Healthcare-associated infections are a growing problem in modern medicine. Their impact includes prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, huge additional financial burden, high costs for patients and their families, and excessive death [21,25,27]. They are a significant cause of mortality worldwide. The annual cost of treating these infections has been estimated at €7 billion in Europe and \$6.8 billion in the USA [19,20]. In Europe, about 4 million patients are affected each year, of which 37 000 are fatal [24].

The purpose of this analysis is to uncover and outline the prevention of healthcare associated infections in the process of training healthcare professionals in a tertiary medical school. **Aims:** To reveal the role of prevention in the training of health care professionals in higher education. To make a direct link between health care related activities and innovative conditions and factors in the preparation of students in learning the curriculum content necessary for the formation of skills and competencies and their application in practice. To determine the level of student satisfaction with the use of prevention in learning activities leading to independent clinical problem solving. **Materials and methods:** documentary method - literature analysis. **The object of the study** is the prevention of infections associated with medical care in the training of health care professionals in higher medical school, as a consequence in the training of students of specialty - "nurse" and "midwife". **The subject of the study** is the process and conditions under which the prevention of healthcare-associated infections in the training of healthcare professionals in higher education is an innovative condition and factor for the formation of professional competencies.

**Results**

The prevention and control of nosocomial infections (HAIs) is the responsibility of all medical and non-medical professionals in any healthcare facility, including students in training [10]. The allocation of responsibilities to different categories of professionals is essential for the quality of hospital hygiene [15]. Health professionals' knowledge of (HAIs) problems is a peculiar factor related to their prevention [26].

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Zhelyazkova M points out that public health in general depends on the development of the health care system, and practical training is important for medical professionals [4].

Nurse and midwife students are active practitioners in healthcare institutions and are at risk of acquiring infections as they are in direct contact with potentially infected patients as well as blood and body fluids. Studies in this regard have shown that students are 40% more at risk of infection than other staff [23,30,33].

It is of particular importance that trainees acquire knowledge related to the risks of healthcare-associated infections, skills related to the use of established precautions, and the importance of their own role in reducing HAIs in a timely manner [22]. Often the role of students as part of the team caring for patients is neglected, while they actually, through their participation in various medical activities, form part of the staff and are practically related to safety in their application [6].

Clinical practice is a teaching discipline that takes place in a real hospital environment and provides an optimal opportunity to build the professional competencies of trainees, but there is also a real threat of transmission of infection if the measures and the imposed work prescriptions are not followed. This requires extra attention, strict compliance with the rules of asepsis, antisepsis, disinfection, the formation of responsibility for the protection of the patient's health, own health and the health of relatives [11]. Issues related to HAIs and disinfection in future health care professionals are studied in disciplines such as epidemiology, surgery, microbiology, nursing and others [14].

Student training also continues during a pre-degree internship with the acquisition of specific practical skills. Once in a real healthcare setting, the young professional must have the necessary competencies to provide safe medical care [1]. According to Paunov C, the students' knowledge is not applied qualitatively during clinical practice, and in some cases the disinfection program in the wards is not followed. Despite good theoretical training, a real setting and conditions are needed to consolidate knowledge, as well as the need to improve the organization of teaching practice so that the disinfection program of the wards is followed [14].

Ninova M points out that students are aware that problems relating to HAIs are a reality and pose a risk in their work, yet they also perceive it as information they should rather know - in more modern methods or as a daily professional reflex in applying precautions [12]. According to Monov D, trainees are aware of the need to use personal protective equipment, but have gaps regarding the norms established in this area. Their lack of experience with needles and cutting instruments makes them risky in terms of infection [9]. Simeonova G points out that students have knowledge about hand disinfection, but the application of this method is not effective during the teaching practice, and the disinfection program of the wards is not followed [16]. Paunov C also reported that the available awareness of disinfection issues is not applied in practical work, and the study on students' hand disinfection during practical training in a hospital setting is ineffective, which in turn is related to the lack of practical experience [14].

In studies conducted, high knowledge by students pertaining to precautions is reported. However, the results show a lack of awareness of the importance of using gloves when handling a patient, with the belief of prospective nurses that this type of protective equipment is for self-protection rather than to prevent HAIs [22,32].

According to Ivanova P, effective work with educational institutions is needed to improve the interaction between the higher medical school and the clinical training base [5].

The practical training received during clinical practice and pre-doctoral internship in a hospital setting and the theoretical knowledge acquired are prerequisites for good professional training and successful professional realization and provision of quality health care to patients [8]. Academic awareness and preparation of students is a prerequisite for responsible work and adequate care, as well as motivation to preserve one's own health [7].

During clinical practice and pre-doctoral internship, with the help of personal example of lecturers, mentors and medical staff in the wards, students develop professional behaviour, which is

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a prerequisite for taking responsibilities related to training and future work in the hospital environment [18].

Trainees are often neglected by patients and therefore sometimes adopt wrong practices and behaviours on the part of the acting team, which is a prerequisite for safety violations in patient care. A large number of students attested to faulty practices pertaining to disinfection measures, asepsis and non-use of personal protective equipment [6].

Clinical educators play an important role in the practical training of students in a real-world setting, primarily by their own example regarding safety compliance [29,31].

Zheleva E points out that practice teachers, through their excellent knowledge and skills, help to permanently master professional habits in students and motivate their conscious application during their practical training in a hospital environment [3]. Kircheva A notes that motivation and awareness of the importance of the problem and its impact on the part of students is due to a good approach and knowledge on the part of the teacher [6].

According to Dimitrova E, clinical training starts too early. She points out that the period from the 1st to the 12th week of training is suitable for building on theoretical material and working on practical exercises [2]. In general, trainees spend less time on hospital wards, which in practice means that the view of the overall organisation of events and measures to limit the risks of HAI is not in full [17]. They themselves report updating their knowledge of HAIs after completing their professional education [13]. Zheleva E points to the high responsibility of future medical professionals as the basis for building professional competencies related to health care in practice [3].

## Conclusions

The results of the scientific review allowed to draw the following conclusions:

1. The prevention of healthcare associated infections in the training of healthcare professionals in higher education is a matter sufficiently covered in theory to enhance the quality of training. Professional knowledge, skills and competences are acquired through it, professionally significant personal qualities are formed, which are necessary for health care professionals in their professional realization;
2. Despite students' theoretical training, there are some gaps regarding the prevention of nosocomial infections in a real hospital setting.
3. The good organization of the practical training as well as the personal example of the lecturers in clinical practice are a prerequisite for responsible actions by the students related to the prevention of nosocomial infections.
4. The lecturer inspires students to realize the meaning of the acquired skills and competences in the field of health care, imposes the need for feedback on the obtained success and reported difficulties in the formation of professional competences in students, requires a reasoned presentation of problems in the field of health care, as well as objective and adequate evaluation of the obtained results.

## Final conclusion

Healthcare-associated infections are sufficiently covered in the theoretical training of healthcare students, but insufficient practical experience is a risk factor for prevention in clinical training settings. The practice teachers in the hospitals, with their high professionalism and personal example, represent a motivating factor for the development of professional skills and habits in the future health care professionals.

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