

TRAINING OF GENERAL NURSES IN THE CONTEXT OF DECONTAMINATION OF REUSABLE MEDICAL DEVICES AND SURFACES

ŠKOLENÍ VŠEOBECNÝCH SESTER V KONTEXTU DEKONTAMINACE OPAKOVANĚ POUŽÍVANÝCH ZDRAVOTNICKÝCH PROSTŘEDKŮ A PLOCH

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Abstract

Background: Prevention of healthcare associated infections is still an actual issue. Decontamination is one of the most basic activities of general nurses in the provision of health services. An important role in the decontamination process is also the training of general nurses about the observance of principles related to the chemical disinfection.

Aim: To find out the current state of training of general nurses in the issue of decontamination of repeatedly used medical devices and surfaces in clinical practice.

Methods: The research was realized by a quantitative method using a questionnaire technique. The research was carried out in a selected regional hospital. The research group consisted of general nurses working in standard departments.

Results: The research found out that respondents were trained in the last 2 years most often in the use of personal protective equipment (88.0% of respondents), the use of cleaning and disinfecting agents (81.5% of respondents). Furthermore, it was found out that 77.8% of respondents always emphasize the disinfection of reusable medical devices and surfaces.

Discussion: The results of the research brought interesting findings and correspond to some realized researches. Based on the results, it can be recommended to increase the effectiveness of training and implement new aspects of decontamination and prevention of infection transmission, for example, using simulation training for provision of effective feedback.

Conclusion: Training of general nurses about sanitary-epidemiological measures is an important part of preventing the transmission of healthcare associated infections.

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Keywords

decontamination, disinfection, training, general nurse, medical device

Abstrakt

Východiska: Prevence infekcí spojených se zdravotní péčí je stále aktuálním tématem. Dekontaminace patří mezi nejzákladnější činnosti všeobecných sester při poskytování zdravotních služeb. Důležitou úlohu v procesu dekontaminace představuje také školení všeobecných sester o dodržování zásad souvisejících s chemickou dezinfekcí.

Cíl: Zjistit současný stav školení všeobecných sester v problematice dekontaminace opakovaně používaných zdravotnických prostředků a ploch v klinické praxi.

Metody: Výzkum byl realizován kvantitativní metodou s využitím techniky dotazníku. Výzkum byl realizován ve vybrané nemocnici krajského typu. Výzkumný soubor tvořily všeobecné sestry pracující na standardních odděleních.

Výsledky: Výzkumem bylo zjištěno, že respondenti byli v posledních 2 letech školeni nejčastěji v problematice používání osobních ochranných pracovních prostředků (88,0% respondentů), používání čisticích a dezinfekčních prostředků (81,5% respondentů). Dále bylo zjištěno, že 77,8% respondentů vždy klade důraz na provedení dezinfekce opakovaně používaných zdravotnických prostředků a ploch.

Diskuze: Výsledky výzkumu přinesly zajímavá zjištění a odpovídají některým realizovaným výzkumům. Na základě výsledků lze doporučit zvýšit efektivitu školení a implementovat nové aspekty dekontaminace a prevence přenosu infekcí, například s využitím simulační výuky pro poskytnutí efektivní zpětné vazby.

Závěr: Školení všeobecných sester o hygienicko-epidemiologických opatření je důležitou součástí prevence přenosu infekcí spojených se zdravotní péčí.

Klíčová slova

dekontaminace, dezinfekce, školení, všeobecná sestra, zdravotnický prostředek

INTRODUCTION

Healthcare associated infections are one of the adverse events that occur at national and international health care providers (Slawomirski et al., 2017). The World Health Organization (WHO) reports that healthcare associated infections account for approximately 12.2% of all adverse events (WHO, 2017). Healthcare associated infections significantly affect the safety of care provided to patients (WHO, 2016a). It is important to mention that healthcare associated infections can be prevented by a variety of preventive measures. These aspects are, in particular, compliance with hygienic hand disinfection, decontamination of used medical devices and surfaces in nursing care and education of health professionals, as stated by WHO (2018) or Haque et al. (2018). Prevention of infections also includes patient's education and involvement, as reported by the Royal College of Nursing (2017), or student's education, as reported by Korhonen et al. (2019). General nurses' education and training are an effective source of the latest requirements for infection prevention and control (Luebbert and Chinnes, 2015). The World Health Organization mentions that the training contributes significantly to the development of prevention of healthcare associated infections and also to the awareness of the importance of the identified deficiencies for their subsequent minimization (WHO, 2016b). One aspect of the training focus is the issue of decontamination of reusable medical devices and surfaces, which can be stethoscopes, tonometer cuffs and more (Suleyman et al., 2018). Training in this area should be realized at the beginning of the employment relationship and also during the exercise of the profession (PIDAC, 2018).

THE AIM OF THE RESEARCH

By the main aim of the research was to find out the current state in the issue of general nurses' training about the decontamination of reusable medical devices and surfaces in the context of prevention of healthcare associated infections.

METHODOLOGY

The research was carried out using a quantitative research method using the technique of a non-standardized questionnaire. The construction of the questionnaire was based on the current state of relevant sources, recommendations of international organizations, legislation of the Czech Republic and also on the implementation of other stages of research. The questionnaire contained two basic parts, namely demographic questions and questions focusing on the researched problematics. The research was carried out in a selected regional hospital from March to June 2020. Before starting the research itself, a preliminary research was conducted on 15 respondents. The questionnaire was anonymous and respondents' participation in the research was voluntary. The research was conducted with the consent of the health service provider. The research group

consisted of general nurses and the selection of the research group was intentional. A total of 184 (100.0%) general nurses participated in the research. The obtained data were processed using descriptive statistics with relevant and absolute frequencies. For some questionnaire questions, the form of answer using the Likert scale was chosen. The Likert scale was used for the question dealing with compliance with the exposure time, as well as the evaluation of knowledge in the field of medical devices disinfection, the use of disinfectant wipes etc. The presented results are one of the parts of more extensive research in this problematics.

RESULTS

A total of 184 (100.0%) general nurses took part in the questionnaire survey, when 94 (51.1%) respondents were from standard internal medicine departments and 90 (48.9%) respondents were from standard surgical departments. The most common age range was 40–49 years, which was stated by 68 (37.0%) respondents. The most frequent period of experience was 21 or more years, which was chosen by 77 (41.9%) respondents. The most frequently achieved qualification education was the medical high school variant, which was mentioned by 114 (62.0%) respondents.

In the area of importance for compliance with the disinfection of reusable medical devices and other tools and surfaces, it was found that 143 (77.8%) respondents always emphasize disinfection, almost always 40 (21.7%) respondents and sometimes 1 (0.5%) respondent. No (0.0%) respondent chose variant almost never and variant never.

Furthermore, the respondents were asked how they would evaluate their knowledge about the decontamination of medical devices and surfaces using the answer by the form of the Likert scale (1 excellent and 5 insufficient). It was found out that 35 (19.0%) respondents would rate their knowledge with a mark of 1, 119 (64.7%) respondents would rate their knowledge with a mark of 2, 29 (15.8%) respondents would rate their knowledge with a mark of 3 and 1 (0.5%) respondent would rate his knowledge with a grade of 4. No (0.0%) respondent chose that he would rate his knowledge with a grade of 5.

In the next part, it was being found out whether the respondents had been trained in the last two years in some areas of prevention of healthcare associated infections, including the principles of decontamination. By the research was found out that respondents were most often trained in the use of personal protective equipment in the last two years, 162 (88.0%) respondents, and in the use of cleaning and disinfecting agents, 150 (81.5%) respondents, see Tab. 1.

Tab. 1 Training in various areas in the last two years

In what areas have you been trained in the last two years?	yes		no		don't know		Σ	
	n _i [-]	f _i [%]	n _i [-]	f _i [%]	n _i [-]	f _i [%]	n _i [-]	f _i [%]
healthcare associated infections	111	60.3	27	14.7	46	25.0	184	100.0
principles of mechanical cleaning of medical devices and surfaces	115	62.5	34	18.5	35	19.0	184	100.0
principles of chemical disinfection of medical devices and surfaces	127	69.0	20	10.9	37	20.1	184	100.0
use of cleaning and disinfecting agents	150	81.5	11	6.0	23	12.5	184	100.0
use of personal protective equipment	162	88.0	3	1.6	19	10.4	184	100.0
disinfection control issues	114	62.0	32	17.4	38	20.6	184	100.0
principles for the use of reusable medical devices	108	58.7	23	12.5	53	28.8	184	100.0

In the area of compliance with the disinfectant exposure time according to the manufacturer's instructions, it was found out that 131 (71.2%) respondents always follow the exposure time, almost always 44 (23.9%) respondents, sometimes 6 (3.3%) respondents and almost never 3 (1.6%) respondents. No respondent chose variant never (0.0%). The results for surgical and internal medicine departments, see Tab. 2.

Tab. 2 Compliance with the exposure time of disinfectant

Do you observe the exposure time of disinfectant according to the manufacturer's instructions?	Surgical departments		Internal medicine departments		All departments	
	n _i [-]	f _i [%]	n _i [-]	f _i [%]	n _i [-]	f _i [%]
yes always	59	65.5	72	76.5	131	71.2
almost always	24	26.7	20	21.3	44	23.9
sometimes	5	5.6	1	1.1	6	3.3
almost never	2	2.2	1	1.1	3	1.6
never	0	0.0	0	0.0	0	0.0
Σ	90	100.0	94	100.0	184	100.0

The area of whether respondents use personal protective equipment when preparing disinfectant solutions was also examined. It was found out that 153 (83.2%) respondents will use safety glasses or a face shield, 128 (69.6%) respondents will wear a coat or protective apron, 177 (96.2%) respondents will wear gloves and 145 (78.8%) respondents will use face mask, see Tab. 3.

Tab. 3 Use of personal protective equipment in the preparation of disinfectant solutions

What personal protective equipment do you use in the preparation of disinfectant solutions?	yes		no		Σ	
	n_i [-]	f_i [%]	n_i [-]	f_i [%]	n_i [-]	f_i [%]
safety glasses or face shield	153	83.2	31	16.8	184	100.0
coat or protective apron	128	69.6	56	30.4	184	100.0
gloves	177	96.2	7	3.8	184	100.0
face mask	145	78.8	39	21.2	184	100.0

Next interesting area is the result of a question that dealt with the use of single-use medical devices repeatedly. The results for surgical and internal medicine departments, see Tab. 4.

Tab. 4 Use of personal protective equipment in the preparation of disinfectant solutions

Do you repeatedly use medical devices that are intended for single use?	Surgical departments		Internal medicine departments		All departments	
	n_i [-]	f_i [%]	n_i [-]	f_i [%]	n_i [-]	f_i [%]
yes always	0	0.0	2	2.1	2	1.1
almost always	1	1.1	1	1.1	2	1.1
sometimes	7	7.8	5	5.3	12	6.5
almost never	7	7.8	7	7.4	14	7.6
never	75	83.3	79	84.1	154	83.7
Σ	90	100.0	94	100.0	184	100.0

DISCUSSION

The results of the research brought interesting findings. General nurses who use reusable medical devices and surfaces in clinical practice should have the knowledge and should be regularly trained in the prevention of healthcare associated infections. Continuous training of health professionals is a key component for providing quality and safe nursing care (WHO, 2016b).

Effective decontamination of reusable medical devices (for example tools, instruments etc.) and surfaces requires compliance of several principles. Above all, these are the principles of mechanical cleaning of medical devices and surfaces and chemical disinfection of medical devices and surfaces. The key task is above all the choice of a suitable procedure, the implementation of the procedure and the use of personal protective equipment (Vyhlaška č. 306/2012 Sb, 2012). By the research was positively found out that 150 (81.5%) general nurses have been trained in the use of cleaning and disinfecting agents in the last two years. The aspect of the correct use of the selected disinfectant is very important, as the wrong disinfectant can damage the disinfected material or the health of the nurse (PIDAC, 2018). The training should also focus on ensuring the safety of healthcare professionals, i.e. on the selection of adequate personal protective equipment. The main personal protective equipment are gloves, plastic apron, face shield or safety glasses and a face mask (WHO, 2018). By the research was found out that 7 (3.8%) respondents do not wear gloves, 31 (16.8%) respondents do not use safety glasses or a face shield, or 56 (30.4%) respondents do not use a protective coat or apron. However, in the context of the training, it was found out that 162 (88.0%) respondents were trained in the last two years about the principles of using personal protective equipment. The use of a protective apron minimizes the risk of skin damage or safety glasses minimize the risk of eyes damage by the chemical solutions (WHO, 2018). It is also important to mention that the choice of the selected personal protective equipment is also related to the use of a disinfectant, which is used for preparation of decontamination solutions.

The research also provided further recommendations for practice. Above all, it is important to increase the effectiveness of training of general nurses in the issue of healthcare associated infections, the principles of mechanical cleaning and chemical disinfection of medical devices and surfaces, the principles of using reusable medical devices and, last but not least, of disinfection control. Current recommendations state that control is very important to provide effective feedback and may be evidence of the setting of further preventive measures. The efficiency of the training and also the observance of the principles of decontamination can be increased with the use of a face-to-face training, e-learning, simulation teaching and practical training, with use of multimedia support (WHO, 2018). Another research found out that 95.9% of general nurses reported that the provided training contributed to compliance with infection control measures (Erdek et al., 2017).

Another important aspect is also training in the use of reusable medical devices. Respondents were asked whether in clinical practice they use single-use medical devices,

which are intended for single use. An example is a needle one-use holder. It is interesting that 154 (83.7%) respondents answered the variant never, variant almost never 14 (7.6%) respondents and variant sometimes 12 (6.5%) respondents. However, the use of a single-use medical device, such as a needle one-use holder, is prohibited according to the legislation and instructions of the manufacturer (Vyhláška č. 306/2012 Sb, 2012). It is important to note that the data were found out using a questionnaire, where the variants of answers could be subjectively influenced, and thus may be different in connection with clinical practice. The analysis was also interesting in terms of comparing surgical and internal medicine departments. It was found out that of 90 (100.0%) respondents working in surgical departments, 75 (83.3%) respondents never use a single-use medical device. Similar results were obtained for respondents working in internal medicine departments. Of the 94 (100.0%) respondents, 79 (84.1%) respondents never use the single-use medical device.

As part of the training, it is important to pay attention to the timeliness of the provided information. An example is the use of disinfectant wipes. E.g. the Royal College of Nursing (2017) states that there is currently minimal evidence to support the widespread use of disinfectant wipes. Sattar et al. (2015) state that the use of disinfectant wipes is not recommended, as they are often used on more than one surface at a time. This can occur to the transmission of healthcare associated infections. In Ireland, disinfectant wipes are not recommended at all (Lemass et al., 2013). By this research was found out that disinfectant wipes are always used by 31 (16.8%) respondents, almost always by 43 (23.4%) respondents or sometimes by 67 (36.5%) respondents.

As part of the training, it is also important to focus on compliance with the exposure time of disinfectant. By the detailed analysis were also found out the differences between the departments. It was interesting that 59 (65.5%) respondents out of 90 (100.0%) respondents working in surgical departments always adhere to the disinfectant exposure time. On the other hand, out of 94 (100.0%) respondents working on internal medicine departments, 72 (76.5%) respondents always adhere to the disinfectant exposure time. Last but not least, it is important to look for new ways of prevention of healthcare associated infections transmission. One of the possibilities is the use of antimicrobial surfaces or the use of nanomaterials, which can reduce the presence of microorganisms (bacteria, viruses etc.) on surfaces (WHO, 2018). The research results apply only to this research.

CONCLUSION

Training in the prevention of healthcare associated infections is very important for setting up and maintaining effective sanitary-epidemiological measures. Within the training, it is necessary to actively approach new knowledge so that the provided information is understandable and effective. It is also important to take into account the fact that the healthcare professional participates in various trainings. It is necessary to focus on the daily activities of general nurses, including decontamination and prevention of healthcare

associated infections. The results of the research brought interesting findings, which can be further followed, for example, by the effectiveness of training of general nurses in the decontamination of medical devices or the principles of safe provision of nursing care in the context of prevention of healthcare associated infections.

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