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Knowledge of Nurses on Prevention of Nosocomial Infections in post-stroke Patients

Wiedza pielęgniarek na temat profilaktyki zakażeń szpitalnych u chorych po udarach mózgu

Danuta Sternal¹, Grażyna Franek², Dorota Pieńkus³

¹Faculty of Health Sciences at the University of Technology and Humanities in Bielsko-Biała, Poland

²Faculty of Health Sciences at the University of Technology and Humanities in Bielsko-Biała,
Faculty of Health Sciences at the Medical University of Silesia in Katowice, Poland

³Municipal Hospitals in Chorzow, Poland

Abstract

Introduction. Nosocomial infections are associated with daily functioning of a hospital and constitute one of major medical issues. The role and duty of the nurse is to prevent hospital infections in every hospitalized patient, especially in post-stroke patients. Only nursing staff that is educated and aware of their actions is able to minimize the risk of infection and thus reduce the suffering of the patient.

Aim. The purpose of the paper was to assess, quantitatively, nurses' knowledge about nosocomial infections and the procedures used most often in post-stroke patients.

Material and Methods. The research was conducted in a group of 80 nurses working in randomly selected stroke and neurological units in the territory of Silesia province. The research used diagnostic poll method and research tool was a questionnaire developed based on the literature.

Results. Analysis of the research material allowed concluding that investigated nurses have insufficient knowledge about the prevention of nosocomial infections and the procedures used most often in post-stroke patients. Knowledge of the surveyed nurses depends on education, age and seniority.

Conclusions. The results of our tests are not satisfactory and allowed to formulate following conclusions:

1. The nurses surveyed have insufficient knowledge on how to prevent nosocomial infections. Nurses do not know sufficiently basic procedures used at neurological wards, such as degumming the patient's airway and also bladder catheterization.
2. Self-assessment of nurses' knowledge is much higher than proved in the study performed.
3. The knowledge of the nurses surveyed depends mainly on age, seniority and education. The research showed that nurses with shorter seniority and younger have broader knowledge regarding prevention of nosocomial infections, they more often know the definition of nosocomial infection and more frequently use protective clothes and apply the procedure of washing hands than their older colleagues do. (JNNN 2014;3(2):58–63)

Key Words: nosocomial infections, prevention, nurse, stroke

Streszczenie

Wprowadzenie. Zakażenia szpitalne są związane z codziennym funkcjonowaniem szpitala i stanowią jeden z najważniejszych problemów medycznych. Rolą i obowiązkiem pielęgniarki jest zapobieganie zakażeniom szpitalnym u każdego hospitalizowanego pacjenta, a w szczególności u chorych po udarach mózgu. Tylko wykształcony i świadomy swojego postępowania personel pielęgniarski jest w stanie zminimalizować ryzyko wystąpienia zakażenia, a co za tym idzie zmniejszyć cierpienie pacjenta.

Cel. Celem pracy była ocena wiedzy pielęgniarek na temat zakażeń szpitalnych i procedur stosowanych najczęściej u chorych po udarach mózgu.

Materiał i metody. Badania przeprowadzono w grupie 80 pielęgniarek pracujących w losowo wybranych oddziałach udarowych i neurologicznych na terenie województwa śląskiego. Do badań wykorzystano metodę sondażu diagnostycznego, a narzędzie badawcze stanowił kwestionariusz ankiety, stworzony w oparciu o literaturę.

Wyniki. Analiza materiału badawczego pozwoliła stwierdzić, że badane pielęgniarki mają niewystarczającą wiedzę na temat zapobiegania zakażeniom szpitalnym oraz procedur stosowanych najczęściej u chorych po udarach mózgu. Wiedza badanych pielęgniarek jest uzależniona od wykształcenia, wieku i stażu pracy.

Wnioski. Wyniki badań własnych są niezadowolające i pozwoliły na wysunięcie następujących wniosków:

1. Badane pielęgniarki mają niewystarczającą wiedzę na temat zapobiegania zakażeniom szpitalnym. Pielęgniarki nie znają w zadowalającym stopniu podstawowych procedur stosowanych w oddziale neurologii, jak odśluzowywanie dróg oddechowych pacjenta, a także cewnikowanie pęcherza moczowego.
2. Samoocena wiedzy pielęgniarek jest o wiele wyższa niż pokazały to przeprowadzone badania.
3. Wiedza badanych pielęgniarek jest uzależniona głównie od wieku i stażu pracy oraz od wykształcenia. Badania wykazały, że osoby z niższym stażem pracy i młodsze wiekiem mają wyższą wiedzę na temat sposobów zapobiegania zakażeniom szpitalnym, częściej znają definicję zakażenia szpitalnego oraz częściej stosują odzież ochronną i procedurę mycia rąk niż starsze koleżanki. (PNN 2014;3(2):58–63)

Słowa kluczowe: zakażenia szpitalne, profilaktyka, pielęgniarka, udar mózgu

Introduction

Nosocomial infection is an infection which occurred in connection with health services performance in the case where the illness was not at the stage of incubation at the moment of health service performance or occurred after health services had been performed within a period not exceeding the longest period of its incubation [1].

In the broadest sense, the most important property of nosocomial infection is its connection with medical services performed in health care facilities 24 hours a day. Infections have different periods of incubation that is why the period of 48 hours after admission of the patient to hospital is adopted in most cases of infection as the time limit for the diagnosis of nosocomial infection [2].

The risk of infection occurrence depends on the general condition of the patient, type of the microbe and the procedures applied in the diagnostic and therapeutic process in the course of hospitalization.

The cheapest and at the same time most efficient way to prevent infection is compliance with hand hygiene procedures.

Patients hospitalized in the stroke wards are particularly vulnerable to infections. Most often there occurs pneumonia, which is very often connected with the serious condition of the patient [3]. However, the primary factor in the development of pneumonia in patients after stroke is immobilization and artificial ventilation. The role of nurses in preventing this infection is enormous. Washing and disinfection of hands, as well as use of disposable gloves are an essential element minimizing the risk of infection. Both suction of secretion from the bronchial tree in accordance with procedures as well as sterility control of ventilation equipment is another important factor in the prevention of pneumonia. Frequent change of patient's position, patting, and laying the head at an angle of 30°, with the face turned to the side is an important nursing intervention which prevents

pneumonia. The symptoms often accompanying stroke patients are disorders in swallowing; therefore, in order to prevent aspiration, in the event of a necessity, it is advisable to set a gastric probe in accordance with procedures [4,5].

At the early stage of stroke there may occur retention of urine, which often requires introduction of a catheter into the bladder, in order to control diuresis. That is the main reason for most cases of urinary system infections. Due the possible consequences, urinary system infection is a serious clinical problem in the case of patients after stroke [6]. Each application of catheter should be clinically justified, and the catheter should remain in the urinary system, as long as it is required by the clinical situation, and never for the convenience of staff. In order to reduce the number of microorganisms that colonize the skin around the mouth of the urethra, the hygiene of the perineum is very important. Preserving the drainage system tightness is another factor reducing the risk of infection.

Treatment of nosocomial infection is complicated, costly and time-consuming, therefore prevention in which nurses play a very significant role is so important.

This study aimed at the assessment of nurses' knowledge regarding nosocomial infection as well as procedures most often applied in the case of post-stroke patients.

Material and Methods

Tests were carried out in the group of 80 nurses working at stroke and neurological wards within the period from April to May 2011 and from October to November 2013. Places were selected randomly in Silesia Province.

The method of diagnostic survey was used in the study and a developed questionnaire based on the literature was the research tool. It consisted of 38 questions, three

of which regarded age, seniority and education of the respondents. Seven questions regarded self-assessment of the respondents' knowledge on nosocomial infection and procedures applied in neurological and stroke wards and the remaining questions were closed questions, assessing respondents' knowledge regarding infections and the procedures applied.

In order to test the frequency of answers to selected questions within age groups according to seniority, education as well as dependence a nonparametric Chi-square test was used. As statistically significant level $p < 0.05$ was adopted.

Results

Respondents' age varied from 22 to 56 years, whereas their seniority from 3 months to 34 years. The biggest group were nurses aged over 40 — 35 nurses (43.75%) and with seniority longer than 20 years — 32 nurses (40%).

Analysing respondents' level of education — only 6 persons completed medical studies and were at similar age (38-39 years old) just as the nurses who graduated from medical school, for that reason the two groups were combined in further analysis. For the same reason there was one group made for people who completed higher nursing education of I and II degree. Nearly a half of the respondents — 39 (48.75%) are nurses who completed medical school. The respondents who completed undergraduate studies — 31 constitute (38.75%).

The level of knowledge on nosocomial infection was calculated based on respondents' answers to questions included in the survey (6-25, 28-31, 35-36). For each correct answer or statement 'yes' the respondent received one point. The maximum number of points was 44.

The nurses surveyed received: from 18 (40.9%) to 43 (97.7%) points, 32.37 points on average. According to the figure below, none of the person surveyed achieved the maximum number of points (figure 1). All respondents confirmed that they dealt with nosocomial infections at work, had been trained in the scope of infection prevention; also, 100% of nurses maintain that there should be more training regarding this problem. All respondents replied that they knew the definition of nosocomial infection, and at the same time as many as 42.5% gave incorrect answer regarding the definition of infection.

According to the nurses surveyed the most important factor of infection occurrence risk is related to the use of urinary catheter and to the same degree of catheters for cannulation of blood vessels (95.06%) as well as to the lack of knowledge of standards and procedures. Only 45% of respondent claimed that patient's age is also a factor of infection risk whereas 10% mentioned patient's sex.

All respondents said that they knew the procedure of patient's air passages degumming The analysis of the results showed that 42.5% of respondents did not know that procedure and that 67.5% of respondents did not know the procedures of dealing with catheter for air passages degumming.

All nurses surveyed replied that they knew the bladder catheterization procedure, at the same time 36.25% do not know how the urine tank should be changed, 27.5% do not know how often it should be emptied, and 31.25% do not know what the urinary catheter balloon should be sealed with.

The correlation between the level of knowledge and age, senioraty and education of the nurses surveyed was assessed. The youngest persons had statistically

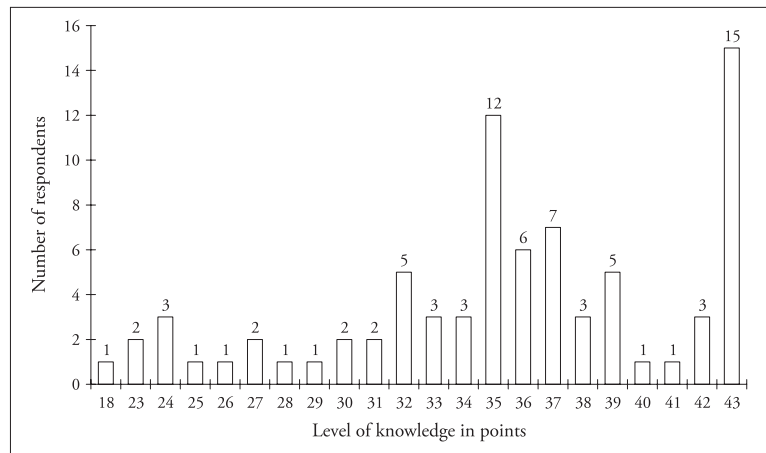


Fig. 1. The level of knowledge of the nurses surveyed about nosocomial infections and medical procedures

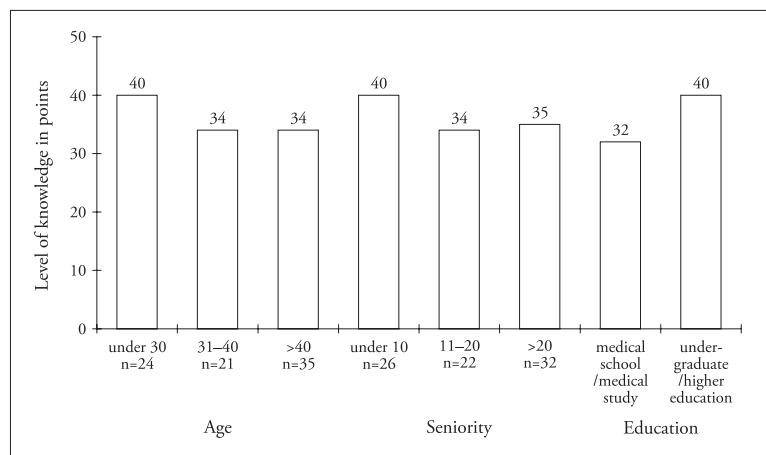


Fig. 2. The level of knowledge and age, seniority and level of education of the respondents

higher level of knowledge ($p=0.001$) than their older colleagues. Nurses with higher education had a higher level of knowledge than their colleagues with secondary education ($p=0.001$) (figure 2).

96.25% of respondents claim, that hands are the most important vector of infection transmission in hospitals, 3.75% of respondents thought, it was reusable equipment. 25% of nurses admit that they not always follow procedure of washing hands, despite the fact that they have been trained in the scope regarding hygienic hand washing. As regards the question referring to situations in which hands should be hygienically washed, the frequency of responses that before and after the operations in every patient as well as after taking off disposable gloves was similar in age groups. The answer that before putting on disposable gloves hands should be hygienically washed was more rarely chosen by nurses aged 31–40 than by their younger and older colleagues. As regards the question whether the procedure of hygienic hands washing should be applied after each case of using a nose tissue, the positive answer was chosen by the youngest nurses (under thirty) than those surveyed from remaining age groups.

Nurses with high education more often, statistically significant, more often than their colleagues with secondary education chose the answer that hands should be washed after every single use of a disposable tissue ($p=0.003$). The percentage of answers that hands should be washed before putting on disposable gloves as well as before and after a surgery in every patient and also after taking off disposable gloves did not result, in the case of both groups, in any statistically significant correlations.

Analysis of the results concerning work equipment showed that 26.2% of respondents states the insufficiency of appropriate disposable equipment, and 13.7% reports the lack of disinfectants. According to the respondents there are mostly missing catheters for degumming (27.5%) and equally disposable gloves. 22.5% of respondents do not use protective clothes at work. In the group of respondents, nurses most often use protective clothes in the case of the isolated patient (31.3%), next — (25%) during the procedure of degumming the air passages.

As regards the question referring to the use of protective gloves, 61.3% of respondents say they should be changed before the contact with another patient and before performance of various procedures on the same patient, at the same time 38.7% of respondents claimed that it should be enough to change gloves before contact with another patient. The correct answer to the question regarding the use of protective gloves was, statistically significantly, more often chosen by the youngest nurses (under 30) ($p=0.03$) than by those from the two remaining age groups. Similarly, the correct answer was more often chosen by nurses with lower seniority (under 10

years) ($p=0.001$) than by the colleagues with longer seniority. No statistically significant correlation between the variables related to nurse's education was observed.

Discussion

The level of nurses' knowledge on nosocomial infection is an important element affecting health as well as life of patients hospitalized at stroke and neurological wards due to serious health condition of those patients.

The most important vector of infection are hands of the medical staff. The procedure of hand hygiene performed by nurses in the care of a patient in serious condition should be of primary importance. Protective gloves should be the main tool in nurse's work. It is unacceptable to use a single pair of gloves for contact with more than one patient [7].

Legal acts impose on the medical staff the obligation to prevent nosocomial infection [1], as well as the duty of continuous training [8].

In the aforementioned publications nurses' knowledge regarding infections was assessed, mainly in the context of work at intensive care units or surgical wards.

Our tests proved, that the level of nurses' knowledge regarding prevention of nosocomial infection is different and depends on age, seniority and the level of education. The nurses with higher education and shorter seniority have better knowledge. This indicates appropriate education of nurses regarding nosocomial infections, in particular during studies at undergraduate level, entering the health care system. Research carried out by Książek and partners proved that seniority as well as respondents' level of education did not significantly affect the level of their knowledge [9]. Garus-Pakowska and Szatko in their observations proved, that nurses with seniority of 16–25 years obtained the highest level of knowledge, however, they did not state a significant difference between respondents' education and knowledge [10].

Our research proved that despite the fact that 100% of nurses declared the knowledge of nosocomial infections, 42.5% of them gave incorrect answers. In the research carried out by Laskowska and partners in 2007 fewer respondents, only 19.6%, could not provide the correct definition [11]. In the research carried out by Rolka and partners only 7.5% of respondents could not correctly define nosocomial infections [12].

Verification of our tests showed that 96.25% of respondents recognised hands as the most important vector of infection transmission and 3.75% claimed that it was reusable equipment. In tests carried out by Kosonóg i Gotlip fewer respondents gave the correct answer as only 69% of the nurses surveyed recognised hands as the main vector of infections, and according to 19% of respondents it is reusable equipment [13],

whereas in the research by Garus-Pakowskiej and Szatko 71.5% of respondents recognized hands as the most important vector of infections [10].

According to our tests 25% respondents not always apply the procedure of hygienic hand washing. Similarly, in the research carried out by Garus-Pakowska and Szatko hygienic hand washing procedures are not applied by 27.9% of nurses [10]. The analysis of our research showed that as many as 38.7% of respondents considered the necessity of changing protective gloves only before contact with another patient, whereas 61.3% claimed that they ought to be changed before contact with another patient as well as at the performance of various procedure on the same patient. Also, in the observation made by Kosonóg and Gotlib, 34% of respondents were of the opinion that gloves should be changed before next contact with another patient, and 65% of respondents said that it should be done also at performing various procedures on the same patient [13].

Providing disposable equipment and disinfectants is the duty of the employer. It should be a matter of concern that 26.2% of the nurses surveyed admitted that the quantity of disposable equipment was insufficient. In Budek's studies 36.7% of respondents said that the quantity of disposable equipment is insufficient to carry out all procedures compliant with standard [14].

Precautions should be applied to all patients. Therefore, it is quite puzzling why as many as 22.5% of the nurses surveyed reported that they did not apply protective clothing. In Budek's research 31.7% of the nurses surveyed not always apply precautions [14].

Conclusions

The results of our tests are not satisfactory and allowed to formulate following conclusions:

1. The nurses surveyed have insufficient knowledge on how to prevent nosocomial infections. Nurses do not know sufficiently basic procedures used at neurological wards, such as degumming the patient's airway and also bladder catheterization.
2. Self-assessment of nurses' knowledge is much higher than proved in the study performed.
3. The knowledge of the nurses surveyed depends mainly on age, seniority and education. The research showed that nurses with shorter seniority and younger have broader knowledge regarding prevention of nosocomial infections, they more often know the definition of nosocomial infection and more frequently use protective clothes and apply the procedure of washing hands than their older colleagues do.

The nurses with higher education have the general knowledge regarding prevention of nosocomial infections and their definitions than the nurses with the secondary education.

Implications for Nursing Practice

Treatment of nosocomial infections is very expensive and time-consuming and for that reason prevention, where nurses play significant role, is extremely important. Not applying medical procedures may be harmful to patient's health and life and it exposes nurses to possible prosecution by the patients and their families.

The studies performed showed that the knowledge of the nurses tested depends on age, seniority and to some degree on education. They defined areas where nurses have the largest deficits in knowledge and skills. As that regarded mainly older nurses with secondary education, those factors are worth being considered when developing plans of internal and external hospital training, postgraduate education programmes as well as in constructing the system of motivating, appropriately adjusted to employees for the purpose of obtaining the desired behaviour.

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Corresponding Author:

Danuta Sternal
Wydział Nauk o Zdrowiu
Akademii Techniczno-Humanistycznej w Bielsku-Białej,
ul. Willowa 2, 43-300 Bielsko-Biała
e-mail: dsternal@ath.bielsko.pl

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Author Contributions: Danuta Sternal^{B, C, D, E}, Grażyna Franek^{A, E, G, H}, Dorota Pieńkus^{A, B, C, D, F}

(A — Concept and design of research, B — Collection and/or compilation of data, C — Analysis and interpretation of data, D — Statistical Analysis, E — Writing an article, F — Search of the literature, G — Critical article analysis, H — Approval of the final version of the article)

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