Neuroendocrinology Letters Volume 36 Suppl. 2 2015
ISSN: 0172-780X; ISSN-L: 0172-780X; Electronic/Online ISSN: 2354-4716
Web of Knowledge / Web of Science: Neuroendocrinol Lett
Pub Med / Medline: Neuro Endocrinol Lett

Patient misidentification in nursing care

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Submitted: 2015-07-08 Accepted: 2015-10-22 Published online: 2015-12-12

Key words: **safety; patient misidentification; nurse; identification; clinical practice**

Neuroendocrinol Lett 2015; **36**(Suppl. 2):17–22 **PMID:** 26748522 NEL361015A03

Abstract

GOAL: The goal of the study was to assess the opinions of nurses regarding patient safety associated with patient misidentification. The investigation was focused on actual patient misidentification as well as loss of patient materials (e.g., blood samples, X-rays, etc.). These are problems often associated with patient identification methods and/or confusing patients with the same surname assigned to the same ward. The risks of misidentification incidents pose a considerable threat to patient health especially when the confusion extends to the operating room. Our objective was to identify the potential causes of patient misidentification and offers solutions to correct the issue.

METHODS: A survey as part of a sociological investigation was carried out through the use of questionnaires. The selected sample included, in accordance with the needs of the project and methodology of the Institute for Health Care Information and Statistics of the Czech Republic, registered nurses working shifts on inpatient wards. The study took place across the Czech Republic between Sept. 15 and 30, 2013. The sample consisted of 772 registered nurses.

RESULTS: The potential for patient misidentification (PM) was described as negligible by 73.8% of respondents. Only 9.1% of nurses admitted problems associated with patient misidentification. Respondents reported that the greatest potential for patient misidentification was associated with patients having the same surname staying on the same ward. An absolute majority of nurses responded that patient identification wristbands were the most frequently used method to prevent PM. Over 90% (90.6%) of nurses reported that patient ID wristbands were used for all patients. Almost 80% (77.4%) reported the use of positive verbal identification in addition to ID wrist bands. Respondents reported (76.2%) that the most frequently used method to avoid PM in the operating room involved a review of patient documentation. Almost the same number of repondents (74.1%) reported the use of verbal confirmation as a method to avoid PM. Another mechanism included verification of the surgical procedure. ID wristbands and completion of an 'identification protocol' rank among other options mentioned most frequently by respondents.

CONCLUSION: The study shows that registered nurses regard patient misidentification as a very rare and unlikely event. Nonetheless, statistics suggest otherwise and education, changes in protocols, and new technologies are needed to improve the precision of patient identification.

ORIGINAL ARTICLE

INTRODUCTION

Worldwide, health care faces a wide range of safety problems. The traditional medical oath – First do no harm! – is seldom broken deliberately by medical, nursing and other health care professionals. While it may be an inconvenient truth, every day, patients all over the world are nearly injured, injured, or killed while receiving health care (WHO 2007) due to patient misidentification (PM).

The success of all treatments and procedures in health care facilities depends on correct patient identification. Patient identification is a critical step in the care process and errors associated with this step can have serious or even fatal consequences. Clinical errors are often irreversible, and, therefore, the risk of these errors must be maximally reduced (Paparella 2012). The administration of the wrong drug can have consequences that range from none to death and everything in between. Therefore, methods have been introduced to provide accurate patient identification prior to medical or pharmacological interventions. In the Czech Republic, each health care facility has chosen their preferred method of patient identification, which is used by all staff and on all wards (MZ CR 2010).

The Ministry of Health of the Czech Republic announced a program called 'Resort Safety Goals' which offers guidelines to ensure greater patient safety and higher quality health care. By fulfilling the Resort Safety Goals health care facilities strive to reduce the most common risk factors associated with health care delivery (MZ CR 2010).

Because of their frequent contact with patients, nurses are well positioned to increase patient safety through enhanced diligence during nursing care (Reid and Catchpole 2011; Vaismoradi *et al.* 2013).

The goal of this study was to assess the opinions of registered nurses with regard to patient safety associated with patient misidentification. To this end the study focused on not only actual PM but also mislabeling and loss of patient materials such as blood samples, X-rays, lab results, etc. Additionally the study focused on misidentification of patients with the same surname staying on the same ward. The potential causes and solutions for PM as well as insufficient identification were also studied.

MATERIAL AND METHODS

The main goal of the study was to assess risk from the point of view of hospital nursing staff with the focus on patient identification related to high risk nursing processes and the prevention of incidents that compromise patient safety. Additionally, the goal was to identify those processes that presented the greatest risk as well as the staff associated with these processes. The nurse respondents were informed about the goals of the study and the study questionnaire. Participation in the study was voluntary and respondents provided informed consent prior to completing the questionnaire. The questionnaire did not contain any ethical questions. The investigation included 216 people, from across the Czech Republic, who assisted with giving the questionnaire, all of whom had been informed about the objectives of the study, in great detail, prior to participating. The data were processed using SASD 1.4.10 and SPSS 16.1 statistical analysis software. The field research was carried out between Sept. 15 and Sept. 30, 2013. In the selected sample, included registered nurses, working in shifts, on inpatient wards. The sample consisted of 772 registered nurses.

Registered nurses from all regions of the Czech Republic were included if their representation corresponded with the structure of the basic sample. The survey conclusions are representative of registered nurses from across the Czech Republic. The average age was another feature that was determined to be fairly representative. 17.6% nurses were between 18 and 29 years, 54.7% nurses were between 30 and 49 years, and 27.7% nurses were 50 years old or older. Other features studied were not determined to be representative because no other data regarding the basic sample of registered nurses were recorded in the information system of the Czech Republic. Nevertheless, the characteristics of the sample are given in the following text because they enable a better description of the sample. However, statistically significant connections, which were identified by the study, must be interpreted only as trends.

The sex of the respondents was among the basic demographic characteristics of the sample. The sample included 3.6% men and 96.4% women. The prevalence of women in this profession in the Czech Republic is evident.

A great deal of attention was paid to the professional characteristics of the sample. It examined the role of nurses as a profession, how long they had been performing their job, how long they had been working on their ward, the type of hospital, and the ward on which they worked.

More than 50% of respondents reported professional secondary education as the highest achieved education; 27.5% of nurses achieved higher education, 16.3% of nurses had a bachelor degree education, and 5.1% of nurses had a master's degree. The extent of specialized education was identified using a separate independent question and revealed that 36.5% of respondents had some type of specialized education.

Another stability indicator, which also measured the degree of occupational turn-over, was the length of the time spent at the current workplace. Almost one third of nurses had been employed on their current ward for more than 10 years. This group can be regarded as the most stable and is naturally associated with older ages and greater experience.

The type of the health care facility and the particular ward represented another important professional

feature. These characteristics were also studied. The largest part of the sample included registered nurses employed by university or regional hospitals. District and municipal hospitals employed about 1/3 of the respondents, while less than 1/5 of respondents work in the private sector. The sample included nurses working in shifts in all types of departments, with most of them working in internal and surgical hospital departments.

RESULTS

73.8% of respondents viewed the overall potential of PM and related issues to be negligible. Another 21.3% regarded the potential risk to be low. Only 4.5% of the surveyed nurses (the sum of answers "maybe", "expected" and "certain") indicated that the potential for PM was an issue. I tiny fraction (0.3%) answered, "I don't know" with regard to the potential for PM. The study shows that the potential risk of PM was considered small by the vast majority of surveyed nurses. The significance tests applied within the bounds of the second degree of classification did not identify any statistically significant connection between the feature studied and demographic characteristics. Therefore, the opinions of nurses appear to be uniform with regard to this question.

PM of biological material represents another risk factor that can significantly influence patient safety and nursing care. In the scope of this survey, nurses were asked to assess the potential for this type of PM on their ward. More than 50% (52.6%) of respondents regarded the potential to be negligible; a further 35.1% described it as low.

The potential for loss of patient biological materials was assessed to be more than "low" by 14.0% of surveyed nurses (the sum of items "maybe", "expected" and "sure"). The remaining respondents regarded the potential for loss of patient biological materials to be negligible or low (53.6% or 32.4%, respectively).

The potential for PM was assessed to be greater than "low" by 9.1% of respondents (the sum of items "maybe", "expected" and "certain"). The potential was regarded as "negligible" or "low" by 63.0% and 27.1% respondents, respectively.

The study shows that, in general, nurses regard the potential of PM to be very unlikely. The study did not find any statistically significant deviation concerning the connection between this indicator and any sociodemographic features; this indicates that nurse opinions regarding this risk were uniform.

The survey revealed that nurses considered PM involving patients with the same surname staying on the same ward to be more probable than other types of PM. This type of PM was assessed as a potential risk by 32.7% of nurses (the sum of the answers "maybe", "expected" and "certain"). 31.3% respondents described the potential for this type of PM as "negligible" and 34.5% respondents assessed it as "low".

The potential of PM involving patients with same surname staying on the same ward was most often viewed as a concern by nurses between the ages of 18–29 years. The chi-square test of independence (χ^2) relative to age was 17.447 with 8 degrees of freedom, $P < 0.05$. This concern was also significantly more common among nurses working in university and regional hospitals. The chi-square test for independence (χ^2) relative to work setting was 26.998 with 16 degrees of freedom, $P < 0.05$. These results support the following summary, the perceived risk of PM associated with patients having the same surname on the same ward is significantly influenced by age (younger ages) and work setting (i.e., hospitals vs. other settings).

To compare the degree of risk of individual factors relative to PM or inadequate patient identification, the medium values were used (modus, median, arithmetic mean). The extreme value of the scale "I don't know" had to be removed so that medium values could be used. Therefore, five basic items, i.e., the items characterizing a particular respondent's opinion, were used for the calculation. As a result, the higher the value of the weighed arithmetic mean ($\bar{x}$), the more risky the factor was considered to be (Table 1).

Nurses working on inpatient wards rated PM or inadequate patient identification to be the least risky factor. The low degree of other items (dispersion, standard deviation) also reflects very high uniformity in this respect.

On the other hand, the potential for PM involving patients with the same surname was unambiguously rated as the most risky. Additionally, this factor had the highest variability of opinions, which reflects more varied conditions on the wards with regard to this factor.

The safeguards on inpatient wards, with regard to patient identification or prevention of PM, was monitored using several indicators. The study sought to

Tab. 1. Comparison of factors characterizing the potential of patient misidentification or inadequate patient identification.

ITEM	*N*	Mo	Me	$\bar{x}$	s^2	s
Patient **misidentification**	766	**1**	**0**	**1.317**	**0.365**	**0.605**
Biological material **misidentification**	770	1	0	1.603	0.523	0.723
Loss of patient biological materials	768	1	0	1.604	0.541	0.736
Inadequate patient identification	764	1	0	1.479	0.530	0.728
Patient **misidentification** involving patients with the same surname	757	2	2	**2.157**	**1.118**	**1.057**

Caption: *N* = number of observations; Mo = modus; Me = median; $\bar{x}$ = arithmetic mean; s^2 = dispersion; s = standard deviation

identify whether, and in which way, ID wristbands were used, whether positive verbal confirmation took place, and under what conditions were personal documents checked using data from patient documentation.

Identification wristbands were, according to 90.6% of nurses, used for all patients. Only 4.6% of respondents reported that ID wristbands were not used on their wards. The remaining respondents reported sporadic use. The analyses implemented at the second degree of classification did not identify any statistically significant connections between this indicator and sociodemographic features. Therefore, the study shows that the practice of using identification wristbands is similar in all types of hospitals and on all wards monitored and there were no differences relative to nurse sex, age, education, or the years of practical experience.

Positive verbal identification was reported to be used for all patients by 77.4% of nurses. The association with hospital type was analyzed and found to be statistically significant. Nurses employed by district hospitals use positive verbal identification for selected groups of patients, while nurses from regional hospitals use positive verbal identification for all patients significantly more often than other settings. The chi-square test for independence (χ^2) relative to hospital type was 38.762 with 16 degrees of freedom, $P < 0.01$.

Patient identification by checking personal documents was significantly more common in university hospitals; on the other hand, it was also significantly common in private hospitals. The chi-square test for independence (χ^2) relative to hospital type was 29.973 with 16 degrees of freedom, $P < 0.05$.

The last of the methods studied was verification of patient identity based on data documentation supplied by patients. Almost 3/4 (74.7%) of nurses reported that this method was used for all patients. Only 1.7% respondents state that this method is not used by their clinics, apporximately 1/10 (10.2%) of nurses reported using this type of documentation only at admission. Statistically significant differences relative to this indicator were found for nurses employed by private hospitals. They reported significantly more frequently that this type of pateint indentification was use only at admission. It is worth noting that nurses working in internal departments use this method significantly more often, but only in specific situations.

To compare the frequency of the methods used to avoid/prevent PM, the medium values were used (modus, median, arithmetic mean). The extreme value of the scale "I don't know" had to be removed. Thus, the calculation was performed using 5 basic items from the scale used to characterize respondent opinions. Results show that the lower the value of the weighed arithmetic mean ($\bar{x}$), the more frequently the method was used (Table 2).

The most frequent method used to prevent PM was, according to respondents, the use of identification wristbands. Verification of personal patient documents represented the method that was used least frequently.

Tab. 2. Comparison of the frequency of methods used to avoid/prevent patient misidentification.

ITEM	*N*	Mo	Me	$\bar{x}$	s^2	s
ID wristbands	764	1	0	**1.251**	0.793	0.890
Positive verbal identification	760	1	0	1.328	**0.539**	**0.734**
Verification using personal documents	763	1	0	2.093	1.791	1.338
Verification documented data	762	1	0	1.547	1.164	1.079

Caption: *N* = number of observations; Mo = modus; Me = median; $\bar{x}$ = arithmetic mean; s^2 = dispersion; s = standard deviation

Verification of personal patient documents had the highest variability among respondents, which reflects greater variability relative to individual clinics.

When assessing the risks associated with PM the risk of wrong patient surgery in the operating room must be addressed. All nurses were asked; however, only those nurses who were aquainted with or had experience with preventive measures related to surgical PM, were assessed. This explains the large number of nurses who appeared to have not answered this question.

The question used to assess this issue was a semi-open multiple choice question. The respondents were offered the following options regarding PM prevention: (1) verification of the surgical procedure, (2) verbal confirmation from the patient, (3) verification of pateint documentation, or (4) other (where nurse could write in answers).

The respondents most frequently reported that PM prevention took the form of documentation verification (76.2%). Verbal confirmation was used almost as frequently (74.1%). Verification of the surgical procedure was also included among prevention methods. ID wristbands or labels, and completion of an identification protocol represented other options that were mentioned frequently.

An additional health risks includes wrong side surgery (WSS). This study also addressed this issue as part of its survey. The question regarding WSS took the form of a closed question, however, respondents could mark more than one option.

Study results show that the most frequent type of WSS prevention during surgery was patient identification in the operating room using medical documentation (79.8%). Repeated verification of the correct side, based on marks on the patient's skin with a felt-tipped pen was also frequently reported. Other methods, (verbal questioning of the patient to verify the location, regular verification by an anestesiologist, an anestesiology nurse, a surgeon and a perioperative nurse) were mentioned by about 1/2 of respondents.

DISCUSSION

Patient safety has become an important global issue (Battles and Lilford 2003; Singh *et al.* 2014). It's obvious that the consequences of PM and WSS are signifi-

cant, undesirable and unacceptable in modern health care systems. It is not surprising that PM errors occur most frequently during emergency care. Errors associated with PM were the topic of a survey performed by Henneman *et al.* (2010a). The goal of their study was to evaluate verification frequency and precision by health care staff prior to the performance of common health care-related tasks. The study used prospective simulated scenarios with patients and an instrument that could monitor eye movement, which allowed them to determine what the health care workers were looking at during the scenarios. The scenarios involved (1) nurses administering an intravenous drug, (2) technicians marking a blood sample, and (3) clerks applying an ID wristband. The participants were asked to perform the assigned tasks on three simulated patients with one patient having a different date of birth and a different number than that which appeared on their medical documentation and identity information supplied to the study participants. The study participants were not aware that the study was focused on patient identity. In 183 scenarios, 61 subjects took part – 28 nurses, 16 laboratory technicians, and 17 clerks. 61% (37/61) participants realized the identity error (61% nurses, 94% laboratory technicians and 29% clerks). 39% (24/61) of the tested health care workers performed the task on the wrong patient, 39% nurses, 6% laboratory technicians, and 71% clerks. The data from eye movement monitoring was available for 73% of the scenarios (133/183). 74% (74/100) of the health care workers failed to check the patient's identity using the wristband (87% nurses, 49% laboratory technicians); before performing the task. 27% of tested health care professionals did not compare whether the instruction for the task corresponded with the correct patient based on the wristband identification (33% nurses, 9% laboratory technicians, 33% clerks). 15% (5/33) of health participants who made mistakes with regard to patient identification refused to admit their mistake.

Similar research was also performed by Westbrook *et al.* (2011). They found that errors in intravenous drug applications were often associated with a lack of verification of patient identity.

There are several mechanisms in the health care practice to prevent PM. They include positive verbal identification, the use of personal documents (personal identity card, insurance card, passport), the use of ID wristbands, wristbands with a radiofrequency chip, and photos. WSS can be prevented by marking the surgical site, with a felt-tip pen, directly on the patient. Initially, patient personal documents can used to check patient identity at admission; however, once admitted, other forms of identification are preferred.

Our survey showed that the most common method for prevention of PM was the use of ID wristbands. Hospitals should have specific internal protocols for proper identification of all patients. These protocols should describe obligatory procedures for all hospital staff who take part in patient health care, yet the protocols need to be flexible enough to still provide proper identification even under the most unusual situations. Current hospital protocols in the Czech Republic demand two methods of patient identification. However, these protocols do not include the denoting patient rooms or description of the patient's location within the hospital. Patient identification should always be performed before administration of drugs, blood and transfusion agents, before sample collections for laboratory examination, etc. Patient identification should also always be performed before diagnostic and therapeutic interventions.

Wristband data is one of the basic means of ensuring quality care and patient safety during hospitalization. Patients receive wristbands immediately on admission and must wear them during their entire period of hospitalization. If any health care providers remove a wristband, it becomes their responsibility to see that it is replaced (National Patient Safety Agency 2005). Although nurses and patients are aware of the importance and necessity of identity verification, observance of this obligation can be diminished by many factors (Phipps *et al.* 2012; Hoffmeister and de Moura 2015). Effective feedback from systems that record undesirable incidents is essential for the support of the best health care practices (Benn *et al.* 2009).

Education regarding best practices for avoiding PM and WSS plays an important role in the training of future nurses (Maeda *et al.* 2011; Vaismoradi 2012; Bowling 2015). Therefore, the WHO has provided Instructions for the curriculum on patient safety: a multi-professional publication aimed at accelerating the inclusion of patient safety into the curriculum of higher education. Education and training of health care providers represents one of the most effective ways of making improvements in the field of patient safety (WHO 2011). Education (Moskowitz and Nash 2009; Henneman *et al.* 2010b; Leotsakos *et al.* 2014), protocol changes (Sevdalis *et al.* 2009) and use of new technologies (Koppell *et al.* 2008) are necessary for improving the frequency and accuracy of patient identification procedures.

Another way to prevent PM and contribute to greater safety for hospitalized patients is to increase the active involvement of patients in their health care (Bártlová *et al.* 2014; Prokešová *et al.* 2014). Patients can play a considerable role in increasing their own safety during hospitalization and this has been documented e.g. by Vaismoradi *et al.* (2011, 2015) and Brabcová *et al.* (2014).

CONCLUSION

The process of identity verification, i.e. patient identification, is a prerequisite for providing successful and safe health care. Our results show that PM on hospital

wards was not considered to be a particularly high risk by most respondents to our survey. The potential for PM of patients with the same surname on the same hospital ward was regarded by respondents as more likely compared to other types of PM, but was still regarded as a low risk. The use of identification wristbands represents the most common method of preventing PM. Our survey of nurses shows that the most frequently used methods to avoid PM in the operating room were verification of documentation and the verbal confirmation by the patient, which were used with almost equal frequency. Verification of the surgical procedure also ranked high among preventive methods. Other preventive methods that were also reported included identification wristbands and the completion of an identification protocol.

Proper patient identification currently represents a critical factor that significantly impacts treatment quality. Proper patient identification should be an integral part of all diagnostic and therapeutic processes. The use of a combination of several identification methods should be viewed as the ideal approach to reducing PM. Lastly, education, regarding the best strategies for elimination of PM, must play an essential part in the future training of health care professionals.

Conflict of interest

The authors report no conflicts of interest.

ACKNOWLEDGEMENT

The research was conducted with the support of the Internal Grant Agency of the Ministry of Health of the Czech Republic within the project reg. no. NT 14133 with the title "Increasing of nursing care safety".

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