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Lidia Sierpińska [1, 2], Anna Ksykiewicz – Dorota [2] Marian Jędrych [3]

PROVISION OF PATIENT SAFETY DURING HOSPITALIZATION AS A MEASURE OF QUALITY OF CARE

ZAPEWNIENIE BEZPIECZEŃSTWA CHOREMU W TRAKCIE HOSPITALIZACJI JAKO WYMIAR JAKOŚCI OPIEKI

[1] Chair and Department of Management in Nursing, Faculty of Nursing and Health Sciences, Medical University, Lublin
Head: Prof. Anna Ksykiewicz – Dorota

[2] Military Clinical Hospital No.1 with Polyclinic, Independent Public Health Unit, Lublin
Commander: Colonel Prof. Zbigniew Kędzierski

[2] Chair and Department of Management in Nursing, Faculty of Nursing and Health Sciences, Medical University, Lublin
Head: Prof. Anna Ksykiewicz – Dorota

[3] Chair and Department of Mathematics and Medical Biostatics, Medical University, Lublin
Head: Prof. Marian Jędrych

S u m m a r y

Introduction: The maintenance and development of hospitals in a market-based health care system is associated with an improvement in the quality of medical services. At the same time, there is a need for an objective evaluation of the level of nursing using various research methods and instruments. Among these instruments is a questionnaire for the assessment of the level of nursing care -BOHIPSZO.

Material and methods: The evaluation covered 640 patients, who constituted 19.2% of those who received treatment in 143 wards in 45 hospitals in Poland, where the studies were conducted during the period 2009 – 2012. The research instrument was a questionnaire form for the assessment of the level of nursing care BOHIPSZO according to H. Lenartowicz.

Results: Based on the analysis of the study material it was found that the quality of nursing care from the aspect of provision of patient safety during hospitalization is on a higher level in hospitals with accreditation or the ISO certificate, compared to those which do not possess quality certificates ($p<0.001$).

Conclusions: The preparation of a hospital for accreditation in accordance with the accreditation criteria, and for the certification audit according to the requirements of the standard PN EN ISO 9001:2009 has a motivating effect on the employees with respect to the provision of adequate conditions of the environment of patient care during hospitalization, which is a precondition for a higher level of patient care in hospitals with the quality certificate.

S t r e s z c z e n i e

Wstęp: Utrzymanie i rozwój szpitali w rynkowym systemie ochrony zdrowia wiąże się z doskonaleniem jakości świadczeń medycznych. Jednocześnie istnieje potrzeba obiektywnej oceny poziomu pielęgnowania przy pomocy różnych metod i narzędzi badawczych. Jednym z narzędzi jest arkusz oceny poziomu pielęgnowania – BOHIPSZO.

Materiał i metody: Ocenie poddano 640 pacjentów, co stanowiło 19,2% z tych, którzy byli leczeni w 143 oddziałach, w 45 szpitalach w Polsce, gdzie były prowadzone badania w latach 2009 - 2012. Narzędziem badawczym był kwestionariusz oceny poziomu pielęgnowania BOHIPSZO według H. Lenartowicz.

Wyniki: Na podstawie analizy materiału badawczego stwierdzono, że jakość opieki pielęgniarskiej w aspekcie zapewnienia bezpieczeństwa pacjenta podczas hospitalizacji jest na wyższym poziomie w szpitalach z akredytacją lub certyfikatem ISO, w porównaniu do tych, które nie posiadają certyfikatów jakości (p <0,001).

Wnioski: Przygotowanie szpitala do akredytacji zgodnie z kryteriami akredytacyjnymi oraz do audytu certyfikującego zgodnie z wymaganiami normy PN-EN ISO 9001:2009 ma wpływ na motywację pracowników w zakresie zapewnienia prawidłowych warunków środowiska opieki nad pacjentem podczas hospitalizacji, co determinuje wyższy poziomu opieki nad chorym w szpitalach z certyfikatem jakości.

Key words: quality of care, BOHIPSZO questionnaire, patient safety

Słowa kluczowe: jakość opieki, kwestionariusz BOHIPSZO, bezpieczeństwo pacjenta

INTRODUCTION:

Concern about the quality of nursing care is among the essential preconditions of successful treatment, improvement of the bio – psycho – social status of a patient, and is an evidence of good management of a health care facility.

An improvement of the quality of medical care results, among others, from the Ljubljana Charter on Reforming Health Care, adopted by all Member States in Ljubljana in 1996. In the Charter it was emphasized that the system of health care should 'aim at continuous improvements in the quality of care' [1]. An improvement of medical services in Polish hospital wards is associated with a constant monitoring, analysing, and improving clinical processes and the processes of management of the environment of care.

The managerial staff is responsible for the improvement of the quality of patient care by the provision of safety during hospitalization, implementation of the quality management systems and carrying out an objective evaluation of the services provided by means of standardized instruments with criteria for the evaluation of the quality of care. The implementation of the process of accreditation fulfils this condition because the accreditation criteria for Polish hospitals consider the provision of patient safety in hospital conditions. The Programme for Accreditation of Hospitals developed by the Centre for Quality Monitoring in Health Care includes the group of standards concerning 'Patient Safety'. The authors of accreditation standards emphasize that patient safety is a key measure of the quality of care and constitutes an integral element of the system of improvement of care. The institution should implement a system which would allow regular evaluation of patient safety and drawing conclusions from this evaluation [2].

The second system of improvement of the quality of health services, which is increasingly more common in Polish health care facilities, is the quality management system implemented according to the Polish standard PN – EN ISO 9001:2009. This system consists of the fulfilment of specified standards and procedures, and an objective assessment by an external organization [3]. The criteria of internal and external audits refer also to the observance of specified procedures handled in the Quality Book, and up-to-date regulations concerning the provision of patient safety during hospitalization.

Literature review concerning the assessment of the level of patient care, including the provision of patient safety during hospital treatment, shows that there is a continuous search for methods and instruments for the evaluation of the quality of medical services provided in various areas. One of the instruments for the assessment of the level of patient nursing in hospital wards is the BOHIPSZO questionnaire (acc. to H. Lenartowicz) which covers the criteria concerning safe hospital environment presented in Polish literature [4,5,6].

Considering the fact that the scope of problems pertaining to the provision of the quality of patient care, including the provision of safety during hospitalization, is important in the management of the nursing care subsystem, the following research problem was posed: ***Does the quality certificate differentiate from the aspect of safety of the patients hospitalized?***

MATERIAL AND METHODS:

The study was conducted during the period from September 2009 - June 2012 in 143 wards in 45 hospitals in the territory of Poland. It covered 85 wards from 24 hospitals possessing the quality certificate (accreditation or ISO) in the regions of: Katowice, Lublin, Łodź, Warsaw, Opole, Rzeszów, Gdańsk, Kielce, and Olsztyn – Group A, and 58 wards in 21 hospitals which did not possess the quality certificate (Group B) in the regions of: Wrocław, Bydgoszcz, Lublin, Łódź, Cracow, Warsaw, and Szczecin. A total number of 640 patients participated in the study which was 19.2% of the total number of patients treated in the wards covered by the study. In both groups patients were selected at random (Tab. I).

No.	Respondents	Group A		Group B		TOTAL	
		No.	%	No.	%	No.	%
1.	Patients treated in hospital wards	346	54.1	294	45.9	640	100.0

Table I. *Structure of the patients in the study (Groups A and B)*

The study was conducted by the method of a diagnostic survey, whereas the study technique was observation, interview, analysis of documentation and a questionnaire. The research instrument was a questionnaire for the assessment of the quality of nursing BOHIPSZO acc. to H. Lenartowicz, consisting of 8 groups of standards which are considered the most important in patient nursing. The main standards consists of 71 detailed criteria (each of them is ascribed a score value from 1 – 3 scores). The name of the questionnaire comes from the Polish acronym (BOHIPSZO), which means: Patient safety; Protection against infection;

Hotel services together with the fulfilment of existential needs; Informing; Subjectivity; Self-care; and Therapeutic-nursing procedures.

Bearing in mind the evaluation of the quality of patient care from the aspect of prevention of undesirable events, the results concerning main criterion No. 1 'Patient safety' were analyzed.

The material obtained was subjected to statistical analysis. The results of statistical calculations were compiled in Tables 2-8 (in percentages). Statistical hypotheses were verified based on the non-parametric chi-square test [7,8]. The p values $p<0.05$ were considered statistically significant. The results of the study were elaborated on the IBM PC computer, using the 'STATISTICA 10.0' software.

RESULTS:

Based on analysis of the research material concerning the observance of the standard for the provision of patients' safety in Polish hospital wards, it was found that in both research groups the patients were provided relatively good conditions with relation to the safe environment of care. However, it was evaluated that the global patient protection rate was higher in hospitals with the quality certificate (Group A – 97.0%), compared to the facilities without the certificate (Group B – 87.6%) (Fig.1).

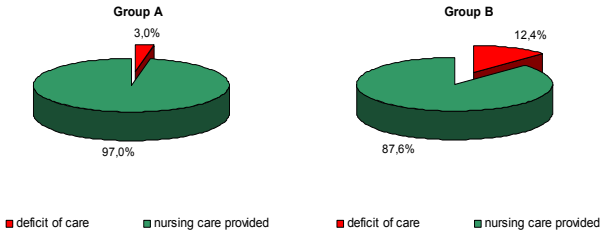

Figure 1. *Global indicator of patient safety provided in hospital (Groups A and B)*

During the subsequent analysis of the results of study, the percentage values were calculated for the level of care provided as well as deficit of care in individual criteria of provision of patient safety in a hospital. It is noteworthy that in all criteria for the assessment of the provision of safe hospital environment, the level of care provided was higher in all hospitals possessing the quality certificate, compared to hospitals in Group B.

A significant relationship was observed between the type of the examined hospital (with and without certificate) and the limited access of patients to the medicine cabinet in the ward, disinfectants, storage of drugs and infusion liquids in original packages, and in a specified place ($p<0.001$) (Tab. II).

Group examined	Procedure compatibility				TOTAL	
	Yes		No			
Group A	1007	97.77%	23	2.23%	1030	100.00%
Group B	825	93.54%	57	6.46%	882	100.00%
TOTAL	1832	95.82%	80	4.18%	1912	100.00%
Chi-square (df=1); 21.20, p<0.001						

Table II. *Limitation of patients' access to the medicine cabinet in the ward and to disinfectants; storage of drugs and infusion liquids in original packages and in a specified place (Group A and B)*

In hospitals with the certificate the vast majority of nurses (97.77%) ensured that the patients had no access to the medicine cabinet and disinfectants in the ward. At the same time, the same percentage of nurses in this group store drugs and infusion liquids in original packages and in specified places (the places correctly labelled), while in hospitals without the certificate a higher percentage of patients (6,46%) were not provided the safe hospital environment in this respect.

In the study material analyzed, a significant relationship was observed between the type of hospital (with or without the certificate) and safe conditions in the ward rooms, such as: patients' room, surgery, hall and other rooms in the ward ($p<0.001$) (Tab. III).

Group examined	Procedure compatibility				TOTAL	
	Yes		No			
Group A	1382	93.95%	89	6.05%	1471	100.00%
Group B	1088	80.89%	257	19.11%	1345	100.00%
TOTAL	2470	87.71%	346	12.29%	2816	100.00%
Chi-square (df=1);111.15, p<0.001						

Table III. *Provision of safe conditions in patient room, surgery, hall and other rooms in the ward (Groups A and B)*

Based on the results of the study, it was indicated that patients from hospitals with the quality certificate - Group A (93.95%) were provided safe conditions in the patients' room, surgery, hall, and other rooms in the hospital ward (tidy rooms, proper lighting at night, dry and properly cleaned floors, beds secured to side walls or in another way, secured windows and doors, when needed). In Group B, the above-mentioned procedures were observed in 80.89%.

Subsequent analysis also showed a significant relationship between the type of hospital (with or without the certificate) and effective signalling within a patient's grasp ($p<0.001$) (Tab. IV).

Group examined	Procedure compatibility				TOTAL	
	Yes		No			
Group A	1141	91.13%	111	8.87%	1252	100.00%
Group B	715	72.88%	266	27.12%	981	100.00%
TOTAL	1856	83.12%	377	16.88%	2233	100.00%
Chi-square (df=1); 130.54, p<0.001						

Table IV. *Effective signalling within reach, proper handles and rails installed, as well as efficient brakes on wheelchairs (Groups A and B)*

Based on analysis of the study material, it was found that in hospital wards with the quality certificate 91.13% of patients had an effective signalling within their reach (in patients' room, bathroom, toilet). Apart from this, in the rooms of the ward proper handles and rails were fixed and efficient brakes on the beds and wheelchairs, while a large group of patients in hospitals without the quality certificate (27.12%) did not have the above-mentioned standards fulfilled.

One of the detailed criteria of the provision of safe conditions for a patient in hospital is the knowledge of the procedures by nurses and auxiliary staff in the case of fire, the method of evacuation of patients, and placing fire equipment in a proper place.

While analyzing the research material collected in this respect, a significant relationship was also found between the type of hospital (with or without certificate) and the above-mentioned procedures ($p<0.001$) (Tab. V).

Group examined	Procedure compatibility				TOTAL	
	Yes		No			
Group A	1241	91.12%	121	8.88%	1362	100.00%
Group B	899	76.32%	279	23.68%	1178	100.00%
TOTAL	2140	84.25%	400	15.75%	2540	100.00%
Chi-square (df=1); 104.28, p<0.001						

Table V. *Fire emergency procedures and methods of evacuation of patients are known to nurses and auxiliary staff; fire equipment is placed in a proper place (Groups A and B)*

It is noteworthy that 91.12% of nurses and auxiliary hospital staff from hospitals with quality certificate declared the observance of procedures in the case of fire. Apart from this, fire equipment was placed in appropriate places. In hospitals of Group B it was reported that in 23.68% the above-mentioned procedures are not observed in patient care.

While considering the criterion 'Standards for calling a resuscitation team and emergency procedures are developed and known to the nurses and pharmacological agents prepared' a significant relationship was also noted (p<0.001) between this criterion and type of hospital (with or without certificate) (Tab.VI).

Group examined	Procedure compatibility				TOTAL	
	Yes		No			
Group A	1774	89.69%	204	10.31%	1978	100.00%
Group B	1248	73.07%	460	26.93%	1708	100.00%
TOTAL	3022	81.99%	664	18.01%	3686	100.00%
Chi-square (df=1); 171.39, p<0.001						

Table VI. *Standards for calling resuscitation team and emergency procedures are developed and known to the nurses, and proper equipment and pharmacological agents prepared (Groups A and B)*

The nurses employed in hospitals with the quality certificate considerably more frequently (89.69%) worked in the wards where the standards for calling a resuscitation team and emergency procedures were developed and, at the same time, known to them. Apart from this, the proper equipment and pharmacological agents were prepared in the case of life threatening states. In the group of hospitals without certificate these principles were observed in patient care in 73.07%.

While analysing the subsequent criterion, a significant relationship was noted between the type of hospital (with or without certificate) and the maintenance of patient safety from the aspect of electric, gas, and oxygen installations, as well as safety on the part of the medical equipment (p<0.001) (Tab. VII).

Group examined	Procedure compatibility				TOTAL	
	Yes		No			
Group A	1648	88.46%	215	11.54%	1863	100.00%
Group B	1297	80.71%	310	19.29%	1607	100.00%
TOTAL	2945	84.87%	525	15.13%	3470	100.00%
Chi-square (df=1); 40.36, p<0.001						

Table VII. *Electrical, gas, oxygen installations, and medical equipment do not create risk for patients (Groups A and B)*

In hospitals with the quality certificate, in 88.46% of electric, gas, and oxygen installations, and medical equipment did not create a risk for patients. In addition, patients were instructed about safe behaviour, and warning labels placed, whereas in hospitals without the certificate a large group of patients (19.29%) were not assured safe conditions in this respect.

In the course of further analysis of the research material, a significant relationship was observed between the type of hospital (with or without certificate) and the provision of identification bracelet wristbands for patients, information on the front page of the nursing records to what agents the patient is allergic; and placing the patient's name and surname on the bed (p<0.001) (Tab.VIII).

Group examined	Procedure compatibility				TOTAL	
	Yes		No			
Group A	961	64.58%	527	35.42%	1488	100.00%
Group B	634	45.19%	769	54.81%	1403	100.00%
TOTAL	1595	55.17%	1296	44.83%	2891	100.00%
Chi-square (df=1); 109.82, p<0.001						

Table VIII. *Provision of identification bracelet wristbands for patients, information on the front page of the nursing records to what agents the patient is allergic; and placing the patient's name and surname on the bed (Groups A and B)*

Results of the analysis showed that 64.58% of patients who received treatment in hospitals with the quality certificate had the identification bracelet wristbands provided. In addition, in this group of patients, information is provided on the front page of nursing records about which agents the patient is allergic to, and the patient's name and surname placed on the hospital bed. In hospitals without the certificate these procedures of patient identification were observed only in 45.19% of patients.

DISCUSSION:

Patient safety during hospitalization is an important element of the quality of nursing care. Analysis of the literature shows that in health care it is possible to prevent as many as 42.0% of undesirable, patient life-threatening events [9]. The American Nurses Association indicates that injuries and medical errors result from shortages of personnel, including the nursing staff [10].

Based on the studies conducted in Brazil among patients treated in intensive care wards, it was found that the most frequent undesirable events were those concerning the erroneous administration of a drug (51.4%), which was related with the method of administration, inappropriate documentation of orders, infusion pump system failure or lack of observance of nursing procedures [11].

The principles of management of drugs, including the conditions of their storage in Polish hospital wards, have been dealt with in the accreditation criteria for Polish hospitals. The Programme of Hospitals Accreditation imposes on medical entities the obligation in the area of the development and implementation of the procedure of surveillance over drugs stored in the wards, development of the system of labelling of the prepared drugs, elaboration and application of the preparation procedure, storage and administration, as well as transport of drugs which are related with a specified risk [12]. The results of own studies confirm that in the facilities with the quality certificate the principles of storage of drugs and disinfectants were significantly more frequently perceived in hospital wards, confirmed for hospitals without the certificate.

While analyzing the research material, it was observed that the provision of safe conditions in the patients' room, surgery, hall, and other rooms in the ward was significantly more often consistent with the principles

in hospitals with accreditation of the ISO certificate than in facilities without the certificate.

In the relevant literature, there are reports stating that the technology in medicine exerts an effect on the improvement of the quality of care, and simultaneously, brings about the risk of threat to patient safety. The abundance and complexity of new appliances at a patient's bed may be the cause of undesirable events [13].

Bearing in mind patients' protection in association with the use of electrical appliances and electro-medical devices, standards have been designed by the International Electrotechnical Commission (IEC 60601 -1), standards by the manufacturers of equipment and national standards. In Poland, the standard is PN – EN 60601 – 1:2011. This standard concerns safety and basic technical requirements with respect to medical-electrical appliances and medical- electrical systems. It specifies general requirements and serves as a basis for the development of detailed standards [14].

Own studies show that the electric, gas, and oxygen installations as well as medical-electrical appliances did not threaten a patient's safety significantly more often in hospitals with the certificate, compared to medical facilities which did not possess the certificate. At the same time, nurses in this group of hospitals significantly more often instructed patients concerning safe behaviour, and warning labels in place.

According to Jardin, health care facilities should possess an efficient alarm system in the case of fire risk, in order to quickly detect fire and provide instant assistance to extinguish the fire. In opinion of this author, a special exception in the alarm requirements for health care facilities should be the placing of instructions for using the alarm box in the nurses' stations. The alarm boxes should be visible and easily accessible. Apart from this, within the emergency first aid in case of fire, hospitals should be equipped with portable fire extinguishers of a proper size and type, located at sites, which are available for the staff at any time [15].

Fire protection in national hospital wards has also found its proper dimension in accreditation criteria for Polish hospitals. The Fire Brigade should confirm the fulfilment of fire protection requirements. While evaluating the fulfilment of the fire protection requirements, attention is also paid to the distribution and efficient function of fire hydrants, presence of smoke detectors, unblocked evacuation routes and emergency exits, and an appropriate labelling of evacuation routes [16].

Analysis of the research material showed that in hospitals with the quality certificate the nurses and auxiliary staff knew the procedures in case of fire and ways of evacuation of patients, also on a higher level compared to the facilities without the certificate. In addition, it was found that the fire equipment was located in the proper place, compared to the hospitals without accreditation, which was also statistically significant.

Based on the results of studies, it was also found that there was an effective signalling within reach, proper handles and rails installed as well as efficient brakes on wheelchairs were significantly more frequent in hospitals with the quality certificate, compared to those without the certificate.

Analysis of the relevant literature indicates that the medical staff should know the latest guidelines with respect to cardiopulmonary resuscitation [17].

According to the opinion of Baksh, all hospital staff who have contact with patients should undergo regular training in resuscitation [18]. The trainings should be in accordance with the programme of the European Resuscitation Council. Unified educational programmes will be a basis for the courses organized in basic and advanced cardiopulmonary resuscitation in adults and children/newborns [19, 20].

Own studies show that nurses in hospitals with the quality certificate significantly more often work in the wards where the standards for calling the resuscitation team and procedures in emergency states are known to them. Also, the proper equipment and pharmacological agents are prepared in case of life-threatening emergencies. In the group of hospitals without the certificate these principles were observed to a lesser extent.

Studies conducted in the United States showed that approximately 60% of medical errors are associated with an incorrect identification of a patient [21]. According to the researchers from New York employed in palliative care, hospital procedures for the identification of patients should be developed in order to improve the quality of care of severely ill patients [22].

Considering the fact that the lack of correct identification of a patient may result in unnecessary examinations and medical procedures, creates the risk of errors in medical records, and may even lead to death – in Poland, on 1 July 2011, by virtue of an Act, an obligation was imposed on hospital to implement coded identification cards for patients. The objective of the above-mentioned Act, among other things, is a quicker and error-free identification of patients, increase in safety, and facilitation of the work of medical staff [23].

The results of own studies carried out in the Polish hospital wards confirmed that nurses employed in hospitals with the quality certificate, while performing their occupational tasks, significantly more frequently provided the correct identification of patients. Based on the estimation data, it was indicated that approximately 70% of the material collected came from the period when in Poland there was no legal obligation in the area of identification of patients with coded identification cards, and the nurses, mainly in hospitals of Group A observed this principle.

CONCLUSIONS:

1. The global rate concerning the provision of patient safety in a hospital was higher in hospitals with accreditation certificate and the ISO certificate, compared to facilities without certificates, which indicates that the preparation of a hospital for the accreditation visit and certification audit mobilises the hospital staff to the implementation and observance of procedures preventing undesirable events.
2. In hospitals with the quality certificate the provision of patient safety during hospitalization was statistically more frequent ($p<0.001$) in all the criteria of Standard I: Patient safety – handled in the BOHIPSZO questionnaire.

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Address for correspondence:
Lidia Sierpińska
Military Clinical Hospital No.1 with Polyclinic,
Independent Public Health Unit,
Al. Racławickie 23, 20 - 049 Lublin
Tel. +48 (81) 718 32 97; 507 810 339;
fax: +48 (81) 718 32 77;
e- mail: sierpinska1@wp.pl

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