CLINICAL PRACTICE

Safety culture in the context of operating room: Nurses' perception regarding notification of errors/adverse events

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ABSTRACT

The notification of errors/adverse events is one of the central aspects for the quality of care and patient safety. The purpose of this pilot study is to analyse the safety culture of the operating room in relation to the errors/adverse events and their notification, in the nurses' perception. It is a quantitative, descriptive-exploratory pilot study. A survey "Nurses' Perception regarding Notification of Errors/Adverse Events" was applied, consisting of 8 closed questions to an intentional non-probabilistic sample consisting of 43 nurses working in the operating room of a private hospital in Lisbon. The results showed that only 51.2% of the adverse events that caused damage to patients were always notified by the nurses. Of the various adverse events occurred, 60.5% were not reported, justified by "lack of time". There was also a negative correlation between professional experience and the frequency of error notification ($p < .05$). The factors referred as those that contributed most to the occurrence of errors were, pressure to work quickly (100.0%), lack of human resources (86.0%), demotivation (86.0%), professional inexperience and hourly overload (83.7%), lack of knowledge (74.4%) and communication failures (65.1%). The perception of Patient Safety was assessed by the majority of participants as "acceptable". In conclusion, it was evident the reduced notification of adverse events in the operation room so it becomes crucial to focus on the continuous training of health professionals, as well as work on the error, to increase a safety culture with quality.

Key Words: Nursing, Safety culture, Operating room, Notification, Errors, Adverse events

1. INTRODUCTION

In the quest for the quality of care provided, ensuring patient safety is a commitment of health institutions and professionals. In this sense, the reduction of the risks associated to care delivery is related to changes in the culture and working methods, insofar as health care results from a set of interventions that can lead to the occurrence of errors/adverse effects on the care process.[1]

Errors/adverse events are one of the major causes of morbidity and mortality worldwide, and may also increase hospitalization time, care costs and legal charges,[2,3] and its notification is one of the most important strategies to achieve an effective safety culture.[4] Safety culture is a desirable asset and is characterized by the sum of values, experiences, attitudes and practices that guide the behaviour of a group.[5]

In Portugal, the available data on errors/adverse events are scarce. It is known that despite occurring frequently in the hospital environment, 95% of errors occurred have no ef-

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fect on the health of patients.[6] Most significant are adverse events occurring in the context of an operating room, corresponding to 48% of the total occurring at the hospital level.[6] This way, the government's growing concern with patient safety is understood as a priority and a national strategy to ensure the quality of health care, and it is therefore considered fundamental to create a robust safety culture in health institutions.[7]

There are thousands of errors every day in the health area, errors that occur in any part of the care process, which can cause harm to the patient and may even lead to death.[2,8] Errors are involuntary and constitute a failure to perform a planned action according to the desired or the incorrect development of a plan, which may lead to incidents or adverse events.[9] Its notification emerges as one of the crucial strategies for an efficient and effective safety culture, as it enables analysis, enables learning and change in behaviours considered to be incorrect and unsafe as well as minimizes the risk of a new occurrence.[10–12]

The Operating room, due to the high level of technology it presents and the specific functions it requires, is a privileged place for the appearance of moments of confusion, stress, emotional and relational tensions. These moments of tension and increased stress, potentiate the occurrence of errors, and it is fundamental to define strategies to avoid them.[13]

The error reporting system emerges as an important strategy to allow the reduction of morbidity and mortality worldwide, particularly in the operating rooms. Several authors,[14–16] believe that an error notification system associated with a non-punitive culture, considerably reduces the occurrence of adverse events in health institutions, and that the frequency of error reporting, feedback about and learning from errors are widely considered important for improving safety. It is important to establish goals, involving health professionals, because it is through the relationship between quality and safety of care, the behaviour of professionals and the support of the institution, which will have a safe care.[11,12]

It is critical to raise the awareness of health professionals about the importance of errors notification in nursing and their positive impact on safety culture in health institutions, not only in pre-graduate and post-graduate education, but also at the level of continuous education.[12]

Due to the importance and necessity of the involvement of nurses in establishing a safety culture in health institutions in general and in the operating room in particular, regarding the occurrence of errors/adverse events, the following research questions are defined: "What is the frequency of notification of errors in the operating room?", "What are the factors associated with the occurrence of errors in the operating room?", "What are the factors associated with refusal for notification of errors?" and "What is the perception of nurses regarding the safety culture in the operating room?"

2. METHODS

2.1 Aims

Thus, it is defined as a general objective for this study: To analyse the safety culture of the operating room regarding the errors/adverse events and their notification, in the nurses' perception and as specific objectives: know the frequency of notification of errors in the operating room; identify the factors associated with the occurrence of errors in the operating room; identify the factors associated with refusing notification of errors; to know the nurses' perception about the safety culture in the operating room.

It is hoped, therefore, that the study may contribute to the improvement of the care provided, and above all, to guarantee patient safety in the context of an operating room.

2.2 Design

This research was a quantitative, descriptive-exploratory pilot study. The choice was made based on the nature of the problem and the proposed objectives. It is intended to quantify through a survey the frequency of notification of errors/adverse events, factors associated with the occurrence of errors/adverse events, factors associated with refusal for notification of errors/adverse events, and nurses' perception of the culture safety in this context.

As variables in this study, we defined the notification of errors as a dependent variable, and the professional experience of nurses as an independent variable.

2.3 Participants

The sampling technique used was intentional probabilistic, since it was based on the conscious choice to include or exclude elements in function of their characteristics.

The study population consisted of 66 nurses working in the operating room of a private hospital in Lisbon. The sample consisted of 43 nurses (65.1%). The inclusion criteria were: to be a resident nurse and not to be absent for any reason during the data collection period. All participants were invited and voluntary to join this pilot study.

For the accomplishment of this study, the ethical principles of the investigation were respected, through the free and informed consent, guaranteeing the anonymity of the participants. Sensibilization was carried out to all the unit nurses individually, where the objectives of the study were explained and a questionnaire was given with an indication that, when

filled, it was placed in a box with a single hole that would stay for one week in the Nursing room. After that week only 43 nurses (65.1%) had delivered, which corresponds to a sample error of 7% and a confidence level of 90%. This value is considered high for research that involves the need to return the previously provided questionnaire.[17]

2.4 Settings

Based on the objectives of the study, the data collection instrument "Nurses' Perception of Error Notification" was based on the study objectives, on the results of a study carried out in Portugal on a similar population[18] and a review of the literature.[4]

Thus, for the purpose of obtaining quantitative information, the questionnaire survey was used with a confidential and anonymous nature, since some of the questions were sensitive and could give rise to some discomfort on the part of the respondents in their daily professional practice or in some way prejudice their fundamental rights. Therefore, in order to guarantee the anonymity and confidentiality of the participants, we do not mention their names, so the questionnaire does not present identification, it is anonymous and voluntary.

The data collection instrument consisted of eight closed questions and resulted from the refinement of a version that was previously tested in order to test the comprehension and adequacy of the items, the clarity of the instructions and the scale of the answers. There was a need to perform a pre-test of the completed questionnaire. In this way, we selected ten elements with characteristics similar to the target population. By analysing the results of the application of these instruments, small adjustments were necessary, not only in content but also in form.

A total of 66 questionnaires were distributed by all the nurses in the team, and requested that they be filled in a sealed box with a single hole in the Nursing room. The box remained for a week and later, when the box was opened, there were 43 questionnaires, fully completed, with free and informed consent duly signed, making up a 65.1% sample.

The information included in the data collection instrument was divided into two parts, a first part consisting of the sociodemographic characterization of the sample and professional experience, and a second part consisting of seven issues concerning the occurrence of adverse events/errors and their notification.

2.5 Data collection

The data collection took place during the month of November 2017. During this period, the questionnaire was delivered to the participants, along with an explanation of the objectives of the study, free and informed consent and an envelope. After filling in the questionnaire, the participants were asked to place the questionnaire in the envelope inside a sealed box in the Nursing room, thus ensuring the confidentiality of participants' responses.

2.6 Data analysis

For the treatment of quantitative data - descriptive statistics, we used the Statistical Package for the Social Sciences (SPSS) version 24.0 for Windows. A descriptive analysis was performed using absolute and relative frequency distributions of the nominal/quantitative variables.

It was also used the measures of dispersion and central tendency to study the quantitative variables, as well as the correlation of Spearman. This last one had as variables the years of professional experience of the nurses and the frequency of the notification of the errors, obtaining a Spearman's Rho, that allowed to evaluate the correlation between the same ones.

2.7 Ethical considerations

The collection of this data took place in 2017, during the month of November, with the approval of the Ethics Committee. A favourable opinion was issued, thus respecting all the ethical and legal precepts.

3. Results

3.1 Sociodemographic characterization and professional experience

The sample consisted of 43 nurses working in the operating room of a private hospital in Lisbon, being mostly female (75%) and less than 36 years old (55%). With regard to professional experience, 39% of nurses had an experience between 11 and 15 years, 22% between 21 and 25 years, 17% between 6 and 10 years, equalling 9% the nurses with experience between 1 and 5 years and nurses with more than 25 years of experience, and finally with 4% nurses with less than 1 year of experience.

3.2 Occurrence of errors/adverse events and their notification

When applying the non-parametric Spearman Rho statistical test, there was a negative correlation (-0.288) between the professional experience and the frequency of notification of errors, with differences being statistically significant ($p <$ .05).

Regarding the occurrence of adverse events/errors described, the results revealed that 35.6% of the described errors occurred in this operating room, and 55.6% of the cases occurred were not reported.

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Table 1. Distribution of responses regarding the frequency with which errors/adverse events were reported

Notification of errors/adverse events	A n (%)	MT n (%)	ST n (%)	R n (%)	N n (%)
If the error was detected and corrected before it affected the patient	8 (18.6)	10 (23.2)	10 (23.2)	8 (18.6)	7 (16.3)
If the error had no potential danger to the patient	0 (0.0)	8 (18.6)	17 (39.5)	16 (37.2)	2 (4.6)
If the error could have caused harm to the patient but it did not	2 (4.6)	16 (37.2)	16 (37.2)	8 (18.6)	1 (2.3)
If the error cause harm to the patient	22 (51.2)	2 (4.6)	2 (4.6)	12 (27.9)	5 (11.5)

Note. A – Always; MT – most times; ST – some times; R – rarely; N – never

Table 2. Distribution of the responses regarding the perception of the most frequent errors/adverse events in the operating room and their notification

More frequent errors/adverse events in the operating room and their notification	Error/Adverse event	n	%
Most frequent adverse events in the operating room	Patient identification	25	58.1
	Identification of surgical parts	25	58.1
	Anesthesia	7	16.3
	Blood administration	7	16.3
	Drug administration	17	39.5
	Location to operate	21	48.8
	Inadequate filling of surgical checklist	9	20.9
	Presence of foreign object retained after surgery	21	48.8
	Incorrect counting of compresses	19	44.2
	Transmission of wrong medical information	19	44.2
	Patient fall	2	4.6
Factors that contribute to the occurrence of errors/adverse events in the operating room	Lack of knowledge	32	74.4
	Professional inexperience	36	83.7
	Lack of supervision	11	25.6
	Lack of standards	17	39.5
	Communication failures	28	65.1
	Lack of teamwork	19	44.2
	Lack of trust in management	13	30.2
	Lack of human resources	37	86.0
	Work overload	36	83.7
	Demotivation	37	86.0
	Pressure to work quickly	43	100.0
Reason for non-notification of errors/adverse events	Fear of disciplinary proceedings	2	4.6
	Fear of legal proceedings	4	8.4
	Fear that affects my credibility	4	8.4
	Lack of registration support by peers	2	4.6
	Lack of time to notify	26	60.5
	Forgetfulness	15	34.9
	Notification contributes little to the quality of care	18	41.8
	Provided that one learns from the error, it is not necessary to discuss it further	9	20.9
	Lack of feedback afterward	6	13.0
	Unaware of incidents to be registered	4	8.4

When applying the non-parametric Spearman Rho statistical test, a positive correlation (+0.127) was obtained between the professional experience and the absence of notification of the errors, except for the adverse event: "patient fall", in which the Spearman Rho is negative (-0.142), and both differences were statistically significant ($p < .05$).

When questioned about the feedback obtained after reporting an error, 67% of respondents reported receiving feedback,

and all respondents reported that they had no punishment for the error reported.

Finally, the results on the safety culture in the operating room were acceptable, as 48% of the participants reported that patient safety in the operating room is "acceptable", 44% "very good", 4% said it is "excellent", equating with another 4% who said it was "weak" (see Tables 1 and 2).

4. Discussion

Of the 43 nurses who participated in the present study, 75% were women, young adults, which corroborates the literature and the history of the profession, which associates the woman's figure with care.[19]

Table 1 shows that the notification of errors occurred in the operating room is not yet performed by all nurses in a systematic way. In fact, it was found that none of the respondents assiduously made the notification of errors that could have caused harm to the patient, but that for some reason it did not cause. On the contrary, it was found that in cases of errors that caused injury to the patient, more than half of the participants reported having notified them.

These findings corroborate the research carried out in this area, since studies have shown that only 2% to 3% of major errors are reported through information systems and that health professionals often report only what they do not can hide.[5] Health professionals more frequently report when the error is serious and tragic, although more frequent adverse events occur that do not harm the patient. This may lead to underreporting of less serious situations.[20]

The error is still very much associated to the feeling of guilt, associating the errors with the health professional and not with the system itself. It is urgent to change this mentality. It is crucial to train health professionals to make them realize that as human beings who are, they make mistakes and they always will, and that all health institutions, even those of safety excellence, will live daily at a certain rate of errors.[21] The most important thing will be to always notify the errors, in order to be able to perceive what the factors that were in its origin, so that in the future one will avoid similar errors.[8] The specialists reinforce that it is crucial to change the system, rather than to change the human conditions being that nurse managers are in process of shifting their approach to error from a person approach to a system approach.[22]

International authors stress that it is crucial to create a safety culture in health institutions, based on an open and true environment, and with supportive relationships, pointing out that only in this way will health professionals be able to report and learn from mistakes. It is crucial to involve all health professionals in this process of error notification, modelling the vulnerability of both leaders and health professionals working at the front line, learning publicly through sharing their own setbacks.[21]

Another interesting aspect was a negative correlation and statistically significant ($p < .05$) between professional experience and frequency of notification of errors/adverse events. One of the hypotheses to justify these results may be related to the recent preoccupation with the subject of patient safety, having been introduced, a few years ago, in the programmatic contents of the Schools of Health.[23] Thus, in order to reduce this existing correlation, it is fundamental to increase the initial and ongoing training of health professionals about patient safety, in particular by reinforcing the importance of notification of errors/adverse events.

Training is one of the main contributory factors to a growing notification of errors.[24] Experts emphasize the need to develop educational programs that elucidate health errors by discussing scenarios to understand the causes of problems and proposals for improvement.[25]

Regarding the occurrence of the adverse events/errors described, 35.6% of them occurred in the operating room, being that the most frequent errors were the incorrect identification of the patient and the incorrect identification of the surgical parts. Of these 35.6%, more than half of the adverse events were not reported, evidencing an underreporting. There was also a positive correlation between work experience and underreporting of errors, as was seen in the previous question. However, there is one exception in this question: "patient fall" and when this occurred, more experienced nurses report the incident more assiduously, compared to less experienced nurses. These data are possibly related to the concern of the Direção-Geral de Saúde since 2005, with this type of adverse events, which has made the nurses more experienced have been trained on this subject, being more aware of the importance of their notification.[26]

Upon notification of an adverse event/error, the feedback provided is critical. In this context, more than half of the participants (67%) reported receiving feedback after reporting errors. These data have proven to be quite satisfactory, being the feedback to professionals who are at the forefront of health care alone, an important strategy for an effective safety culture.[4, 15, 27]

The fact that the entire sample reported not having received any punishment for the error was shown to be quite positive, and complies with the recommendations of the World Health Organization,[9] since, building a non-punitive environment and developing nurse's initiative to report adverse events

voluntarily is necessary.[14]

Regarding the underreporting of the error, most participants associated this fact with lack of time, however, in the literature consulted there was no correlation between both variables. Instead, other studies associate this underreporting with guilt and a punitive work environment. In a study conducted in Florianopolis, Brazil, 89.8% of the participants considered that their errors can be used against themselves, and 82.5% believe that when an error occurs the focus is the person who made the mistake, not the error in itself.[27] Another study, conducted in China, revealed that most nurses feel that "the person is being written up not a problem when an event is reported" as well as "their mistakes are held against them", preferring not to report the errors.[14]

In this context, all the nurses stated that the pressure to work quickly increases the occurrence of errors in the operating room, with significant percentages referring to lack of human resources, lack of motivation, work overload, professional inexperience, lack of knowledge and/or communication failures. In a study carried out in an operating room in Cape Verde, communication failures emerged as the main error enablers in this type of service unit,[13] whereas in a study carried out in several hospitals in India, 76% of respondents reported overtime as one of the causes of the occurrence of errors.[28] Other authors in Portugal report that the main causes for the occurrence of undesirable events are aspects inherent to the healthcare team, such as issues related to communication, leadership and supervision.[6,20] Communication is a key element in the quality of care and patient safety, since important information is often omitted, notably in shift changeovers, dialogue with patients and their families, transfer of the patient to other services, clinical information among the multidisciplinary team, among others.[20]

Finally, referring to the perception about the safety culture in the operating room, most of the nurses said that it was acceptable. It should be noted that the safety principles in this service have the potential to improve the existing safety culture, so that continuous training is crucial as an important means to avoid adverse health events.[4,27]

5. Conclusion

The error is an inevitable characteristic of the human being so it is essential that health professionals assume this condition. Its notification is an important strategy to ensure the quality of healthcare and, above all, patient safety. The present study demonstrated that there is still an underreporting of the errors/adverse events in this operating room, and the professional experience is inversely proportional to the notification of the same. It was also verified that the nurses report the errors/adverse events mainly if they caused some type of harm to the patient, and the most frequent errors/adverse events are related to the identification of the patient and surgical parts, being the predisposing factors mostly related to the pressure to work quickly. The main reason referred to not notify the errors, as reported by the majority of participants, is that they do not have time to notify.

The operating room is a place with greater propensity for error, due to the inherent characteristics of the service unit itself. Thus, it is considered fundamental to develop educational programs that elucidate what are the errors / adverse events, discussing scenarios for the causes of problems with proposals for improvement. Continuous education of health professionals should be mandatory as well as work on the error, transforming it into a learning opportunity to prevent new errors associated with the same cause. In addition, the support of the institution can mean a stimulus so that the errors can be notified, analysed and corrected, thus preventing their repetition.

It should also be noted that the evaluation of the results should take into account some limitations of the research carried out, in particular the small number of participants. The reality of the context of action gave rise to results that, according to the literature, are transversal to other care contexts, and allow to affirm that to move from knowledge to action is a fundamental condition for intervention. It is suggested that new studies and new research should be carried out, with different methodological approaches and/or research objects, such as qualitative studies aimed at uncovering taboos related to errors and adverse events.

The aim of this study is to propose a notification system that meets the needs of the context and is based on a logic of learning and change and not on a persecutory or penalizing perspective.

The development of Nursing knowledge itself emerges through research, always seeking excellence in nursing professional practice and nursing training, as the results of the studies contribute to a reflective and integrative dimension of the theory-practice relationship.

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Conflicts of Interest Disclosure

The authors declare that there is no conflict of interest.

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