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Comprehension of undergraduate students in nursing and medicine on patient safety

Compreensão de alunos de cursos de graduação em enfermagem e medicina sobre segurança do paciente

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Abstract

Objective: Identify the understanding of graduate students in nursing and medicine at a public university in São Paulo on human error and patient safety.

Methods: Prospective and exploratory study in which were investigated variables related with the characterization of students and attitudinal and conceptual aspects about the theme. The sample consisted of 109 students who responded to a research electronic form.

Results: Most students received formal training on the subject and had attitudes that demonstrated uncertainty in what would be correct for some practices.

Conclusion: Students demonstrated being able to relate some of the aspects surveyed about patient safety with the experience they had during internship programs.

Resumo

Objetivo: Identificar a compreensão de alunos de graduação em enfermagem e medicina de uma universidade pública do Município de São Paulo sobre erro humano e segurança do paciente.

Métodos: Estudo prospectivo e exploratório no qual foram investigadas variáveis relativas à caracterização dos alunos e aos aspectos atitudinais e conceituais sobre o tema. A amostra constituiu-se de 109 alunos que responderam ao formulário eletrônico.

Resultados: A maior parte dos alunos obteve aprendizado formal sobre esse tema e apresentou atitudes que demonstraram incerteza no que seria correto em relação a algumas práticas.

Conclusão: Os alunos demonstraram serem capazes de relacionar alguns dos aspectos pesquisados sobre segurança do paciente com a experiência vivida nos estágios curriculares.

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Introduction

Human error and patient safety in the health system have been the themes of several studies, among which stands out the publication of the *Institute of Medicine* (IOM) from the United States, showing that the number of deaths due to errors during healthcare is greater than those related to automobile accidents, breast cancer and Acquired Immune Deficiency Syndrome combined. It estimates that in the US 98 thousand people die every year due to failures in healthcare assistance.⁽¹⁾

In several aspects in healthcare, human error can happen due to isolated factors or due to multiple factors associated whether inherent to the patient himself, of institutional and financial order and also of structural resources such as architectural design, materials or equipment, as well as, lack of knowledge and skills.⁽²⁾ The first step for understanding and preventing human error is to know the possibility of its occurrence, besides the types, causes and consequences.⁽³⁾

The academic education of healthcare professionals whether in the universities or in technical courses reinforces the premise of the development of work without errors, generating the culture that they are totally unacceptable and related only to the lack of care, attention, effort, responsibility and knowledge, which contributes decisively with the occurrence of errors.⁽⁴⁾

Many times during their training, healthcare professionals are not introduced to the topic of patient safety, generating situations of crisis both in the universities and in healthcare settings, challenging education institutions in search of a new conceptual standard for the practice and teaching of these professionals.^(2,5,6) In medical schools, teaching is totally focused on the diagnosis and management of the disease, thus having little attention dedicated to patient safety and a system of error analysis.⁽⁷⁾

For a change to occur in the safety culture of healthcare institutions, new professionals have to show knowledge and skills to identify and realize what do when they witness or commit an error. Undergraduate courses in the health field

may play an important role in the promotion of concepts and skills about human error and patient safety for its students. Studies show that, when introduced to this theme, students demonstrate motivation and recognize the relevance of the subject for their training, besides being identified a high impact on the assistance provided to patients.^(8,9)

Thus, the objective of the study was to identify the comprehension of undergraduate students in nursing and medicine at a public university of São Paulo on human error and patient safety.

Methods

A prospective exploratory research in which the term 'comprehension' was used to include the meaning of understanding concepts related to patient safety, as well as its expression in attitudes observed and experienced in academic learning scenarios.

The population of the study was composed of undergraduate students in nursing of the third and fourth year and undergraduate students in medicine of the fourth and fifth year at the Federal University of São Paulo. The choice of the years was due to the fact that in the periods selected, students had already had contact with patients because of the compulsory internship program.

The data collection instrument was composed of variables related to the characterization of students (gender, age, course, year, experience in healthcare and formal learning about patient safety), and assertions concerning attitudinal and conceptual aspects on human error and patient safety. Such variables were measured through scales of the Likert type.

For the analysis of the proposed questionnaire and assessment of the assertions' understanding, the Delphi technique was used by a group of three experts on patient safety. It was established as concordance if two or more raters responded "agree" for the assertion and disagreement if two or more raters evaluated the assertions with "neither agree nor disagree" or "disagree", in these cases it was re-

quested a suggestion for change. After two rounds of the Delphi technique abovementioned, the instrument was deemed suitable for application. The initial draft of the questionnaire was created based in the researcher's expertise in the theme and literature of the area.⁽⁹⁾

Data collection occurred between April fourth and May fourth, 2011, after the agreement of the coordination of the undergraduate courses and approval of the research project by the Research Ethics Committee of the selected university, being conducted with the inclusion of the questionnaire in the program *LimeSurvey*®, which consists of a tool for the creation and application of questionnaires on web platform through an interface that is of easy and intuitive administration and provides higher security for information and the access of respondents. After the inclusion of the questionnaires in the specified program, the instrument was sent to research participants who agreed to participate providing their electronic mail. The data collected were submitted to a descriptive and statistical analysis and the categorical variables were analyzed according to absolute and relative frequency.

The study complied with national and international ethical standards in research involving humans.

Results

Among the 417 students enrolled in nursing and medicine in the grades (years) investigated in 2011, 399 (95.7%) provided their email address. Among these, the sample of the study comprised 109 (27.3%) students who replied to the electronic form that contained the study variables during the period of data collection, being 23 (21.1%) of the third year and 52 (47.7%) of the fourth year in nursing, and 24 (22.0%) of the fourth year and 10 (9.2%) of the fifth year in medicine.

Regarding the variables of characterization of students, the majority of respondents was female, aged between 19 and 34 years old and had already obtained formal learning on patient safety.

A minority (10.1%) already worked in the health field, mostly developing activities in the area of care (81.8%) (Table 1).

The group of students of the two courses strongly agreed that in the presence of an error all the involved should discuss its occurrence (70; 64.2%). They agreed or strongly agreed that, for the analysis of human error it is important to know what are the individual characteristics of the professional who made the mistake (70; 64.2%), that after an error occurs, an effective prevention strategy is to work more carefully (85; 78.0%), that professionals should not tolerate working in places that do not offer suitable conditions for work (91; 83.5%), that to implement preventive measures a systemic analysis of the facts should always be established (101; 92.7%) and that preventive measures should be adopted whenever someone is injured (93; 85.3%) (Table 2).

Regarding the attitudinal aspects, in the occurrence of errors the majority of the respondents (95; 87.2%) communicate the professors about the presence of conditions that can lead to the occurrence of errors in the training settings and notify the professor, manager or person in charge of the training site (81; 74.3%) and the colleagues when an error occurs (82; 75.2%), however many agree (43; 39.4%) and many disagree (37; 33.9%) with the attitude of communicating the error occurrence to the patient and family, and if there is no damage to the patient the answers show no consensus on the agreement (38; 34.8%) nor on the disagreement (52; 47.7%) of reporting the error to the patient and family in the same way as the adoption of corrective measures by the professors so that students do not make new mistakes.

Most students disagreed or strongly disagreed (100; 91.7%) that systems to report errors make little difference in reducing future errors, that only doctors can determine the cause of the occurrence of errors (102; 93.6%), that they (students) always perform internship activities in locations that promote good practices (79; 72.5%) and that whenever they identify situations that require improvements, they get the support of the institution for implementing safety measures (68; 62.4%).

Table 1. Conceptual aspects related to human error and patient safety, according to the comprehension of undergraduate students in nursing and medicine

Conceptual aspects	SA		A		NO		D		SD	
	NG	MG	NG	MG	NG	MG	NG	MG	NG	MG
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Making mistakes in healthcare is inevitable.	2 (2.6)	6 (17.7)	23 (30.6)	16 (47.1)	4 (5.3)	1 (2.9)	29 (38.9)	8 (23.5)	17 (22.6)	3 (8.8)
There is a big difference between what the professionals know, what is right and what is seen in day-to-day healthcare.	33 (44.0)	9 (26.5)	37 (49.5)	21 (61.8)	2 (2.6)	1 (2.9)	2 (2.6)	1 (2.9)	1 (1.3)	2 (5.9)
Competent professionals do not make errors that harm the patients.	5 (6.6)	-	12 (16.0)	4 (11.8)	3 (4.0)	1 (2.9)	43 (57.4)	19 (55.9)	12 (16.0)	10 (29.4)
Committed students do not make mistakes that harm the patients.	3 (4.0)	-	11 (14.6)	4 (11.8)	3 (4.0)	-	45 (60.1)	20 (58.8)	13 (17.3)	10 (29.4)
In the presence of an error, all the involved (professionals, students, managers, patient and family) should discuss its occurrence.	46 (61.5)	24 (70.6)	23 (30.6)	7 (20.6)	4 (5.3)	-	1 (1.3)	-	1 (1.3)	3 (8.8)
For the analysis of human error it is important to know the individual characteristics of the professional who made the error.	19 (13.3)	2 (5.9)	39 (52.2)	19 (55.8)	10 (13.3)	4 (11.8)	14 (18.6)	6 (17.7)	2 (2.6)	3 (8.8)
After an error occurs, an effective prevention strategy is to work more carefully.	27 (36.0)	13 (38.3)	30 (40.0)	15 (44.1)	2 (2.6)	3 (8.8)	15 (20.1)	3 (8.8)	1 (1.3)	-

Legend: A – Agree; SA – Strongly Agree; NO – Neither agree nor disagree (No Opinion); D – Disagree; SD – Strongly Disagree; NG – Nursing Group; MG – Medicine Group

Table 2. Attitudinal aspects related to human error and patient safety, according to the comprehension of undergraduate students in nursing and medicine

Attitudinal aspects	A		SA		NO		D		SD	
	NG	MG	NG	MG	NG	MG	NG	MG	NG	MG
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Professionals should not tolerate working in places that do not offer suitable conditions for patient care.	30 (40.0)	19 (55.9)	33 (44.1)	9 (26.5)	9 (12.0)	3 (8.8)	2 (2.6)	3 (8.8)	1 (1.3)	-
To implement measures of human error prevention, a systemic analysis of the facts should always be established.	42 (56.1)	12 (35.3)	30 (44.0)	17 (50.0)	2 (2.6)	5 (14.7)	-	-	1 (1.3)	-
It is necessary to implement a systemic analysis of errors in healthcare but preventive measures must be adopted whenever someone is injured.	30 (40.0)	13 (38.2)	31 (41.3)	19 (55.9)	2 (2.6)	-	8 (10.8)	2 (5.9)	4 (5.3)	-
I always communicate my professor about the presence of conditions in the training settings that can lead to the occurrence of errors.	38 (50.7)	11 (32.4)	33 (44.1)	13 (38.2)	2 (2.6)	5 (14.7)	2 (2.6)	5 (14.7)	-	-
I always communicate the professor/manager/person in charge of the training site about the occurrence an error.	31 (41.3)	3 (8.8)	32 (42.7)	15 (44.1)	2 (2.6)	7 (20.6)	8 (10.8)	7 (20.6)	2 (2.6)	2 (5.9)
I always communicate my colleague about the occurrence of an error.	26 (34.6)	8 (23.5)	31 (41.3)	17 (50.0)	10 (13.3)	5 (14.7)	8 (10.8)	4 (11.8)	-	-
I always communicate patients and their families about the occurrence of an error.	9 (12.0)	1 (2.9)	27 (36.0)	6 (17.7)	17 (22.6)	12 (35.3)	20 (26.8)	13 (38.2)	2 (2.6)	2 (5.9)
If no damage occurs to the patient, it should be considered whether it is necessary to report the occurrence of the error to the patient and the family.	6 (8.0)	5 (14.7)	18 (24.0)	9 (26.5)	15 (20.1)	4 (11.8)	23 (30.6)	14 (41.1)	13 (17.3)	2 (5.9)
The professors always take corrective measures with the student in order to avoid that he makes new mistakes.	10 (13.3)	2 (5.9)	27 (36.0)	8 (23.5)	11 (14.8)	5 (14.7)	23 (30.6)	16 (47.1)	4 (5.3)	3 (8.8)
Systems to report the occurrence of errors make little difference in reducing future errors.	1 (1.3)	-	2 (2.6)	-	5 (6.6)	1 (2.9)	20 (26.8)	10 (29.4)	47 (62.7)	23 (67.7)
Only doctors can determine the cause of the occurrence of errors.	-	1 (2.9)	-	2 (5.9)	1 (1.3)	3 (8.8)	18 (24.0)	17 (50.0)	56 (74.7)	11 (32.4)
I always perform the internship activities in locations that promote good practices for patient safety.	4 (5.3)	3 (8.8)	9 (12.0)	5 (14.7)	6 (7.9)	3 (8.8)	46 (61.5)	20 (58.9)	10 (13.3)	3 (8.8)
Whenever I identify situations that require improvements I get support from the institution to implement measures that promote safe practices.	1 (1.3)	1 (2.9)	7 (9.3)	1 (2.9)	20 (26.6)	11 (32.4)	37 (49.5)	16 (47.1)	10 (13.3)	5 (14.7)

Legend: A – Agree; SA – Strongly Agree; NO – Neither agree nor disagree (No Opinion); D – Disagree; SD – Strongly Disagree; NG – Nursing Group; MG – Medicine Group

Discussion

The publication by IOM “*To Err is Human: Building a better health system*” and the creation of the World Alliance for Patient Safety by the World Health Organization have contributed to the patient safety issue to be addressed and considered a challenge for the health system, influencing countries and considerably raising the importance of presenting the concepts and principles of this topic in training courses for health professionals.⁽¹⁾

Knowing that most of the students responded to have already had a formal learning on the subject investigated we can interpret the results obtained based in a more rigorous theoretical reference, since the students are not lay on the topic.

Regarding the conceptual aspects investigated the statement “Making mistakes in healthcare is inevitable” presented higher percentage of discordant responses among the nursing students. On the other hand, most medical students (64.7%) agreed or strongly agreed with the statement. Thus, it was evaluated that the comprehension of the possibilities to prevent the occurrence of errors in healthcare based on the implementation of strategies and barriers that promote patient safety are not yet seen as a reality by both groups. Medical students identified the real possibility of error occurrence in healthcare as in any other area of human activity, and nursing students believe in the possibility of prevention based in the adoption of measures and changes in the system.

Most students disagreed with the assertions which addressed that competent professionals and students do not make mistakes that harm the patients. These perceptions show that undergraduate students are aware that the error analysis cannot be individual but systemic, and increasingly healthcare is developed in dynamic and specialized environments where complex interactions occur among pathophysiology, diseases, staff, infrastructure, equipments, processes, standards and procedures.

As for prevention, most students agree that after an error occurs, an effective prevention strategy is to work more carefully, which reflects

a point of view focused on the individual and not on the culture of safety that includes the system as a whole and not just the wrong act of a professional hence the prevention of errors occurrence is not exclusively related with changes in the behavior of professionals.

In the presence of error the best strategy is that all involved discuss its occurrence in order to determine ways to prevent it. In accordance with the above concept, most students stated to always communicate the colleagues, professor/manager/person in charge of the internship location about the occurrence of errors and in majority disagreed with the assertion “Systems to report occurrence of errors make little difference in reducing future errors” and also in majority disagreed with “Only doctors can determine the cause of the occurrence of errors”. Besides the discussion of the error among the people involved, all professionals, managers and patients should participate because it is a moment in which experiences can be shared to clarify how the error happened and how it could be prevented because it was not imminently resultant of an isolated act of a professional, but of a system designed to generate human errors.

The statement “For the analysis of human error it is important to know the individual characteristics of the professional who made the mistake” showed the highest percentage of concordant answers, reflecting the comprehension of the students on the importance of studying the causes for occurrence of errors. These results reflect a cultural shift of thought in how to deal with errors, since the constructive and supportive approaches promote a learning environment and encourage the reports that are essential to identify and solve the problems that lead to errors.⁽¹⁰⁾

This cultural shift in the thinking of university students is also demonstrated in the statement “It is necessary to implement systemic analysis of errors in healthcare, but preventive measures need to be taken whenever someone is injured” which had the highest percentage of concordant answers. However, depending on the philosophy of the health institution, the isolated identification of the individual characteristics of the

professional who made the error will keep the focus on the individual and not on the system which may have faults that contribute with the occurrence of errors, perpetuating the practice of removing the professional with certain features from the work environment, without analyzing the system as a whole.

A study conducted with nurses in an intensive care unit verified that the majority of professionals (74.3%) reports the existence of punishment in the occurrence of adverse events, contradicting the recommendations of a systemic analysis of error and implementation of a culture of safety in health institutions which should evaluate the flaws in the system, and not identify the guilty to be punished.⁽¹¹⁾

In this sense, it is worth noting that the statement “Professors always perform corrective measures with the student so that he will not make new mistakes” showed difference between the responses of students of the two investigated courses, suggesting that the adoption of corrective measures is more common with the professors of the undergraduate course in nursing when compared with the undergraduate course of medicine.

Most students agreed that professionals should not tolerate working in places that do not offer suitable conditions for labor nor perform internship activities in locations that do not support good practices for the promotion of patient safety. This perception explains the fact that the undergraduate students understand that the poor infrastructure of the workplace is responsible for adverse events caused to patients. Likewise, the majority of the students agreed that in order to implement measures to prevent human errors, a systemic analysis of the facts should always be established. This highlights what safety experts affirm, that human beings can fail and that errors show latent faults in the system, including precarious conditions in the workplace, tasks poorly designed, inefficient team work and failures in preventing errors.⁽¹²⁾

Regarding attitudinal aspects in the presence of errors, the majority of respondents notify the

professor about the existence of conditions that can lead to the occurrence of errors in the internship location. The fact of communicating the presence of inappropriate structural conditions in the internship locations shows that students have a good perception of failures in the healthcare system with regard to the occurrence of future errors, however, it is explicit that whenever a situation that needs improvements is identified, students do not have the support of the institution for the implementation of safety measures, what can lead to the reflection that the professionals should correct their mistakes because the system does not change, it just accuses the professionals who are blamed for errors resultant of a system with faults. This shows that in the national health system the errors have been attributed to the individual rather than the system, being necessary a change of the reality experienced in order to ensure the quality of care provided to the population.⁽¹³⁾

The majority of students disagreed with the assertion which states that every time they identify situations that need improvements, students receive support from the institution to implement measures that promote safe practices. According to the primary data of the research, among these 68 students, 49 (72.1%) were undergraduate students in nursing. These prospective nurses should work in an environment that has infrastructure, professionals in adequate quantity and with appropriate qualification for a professional of this kind, being able to perform nursing practices in a broad and solid way, based on evidences and to continuously seek new evidences capable of changing the results identified nowadays related to patient safety. Among all the professions in health, nursing is the most capable of promoting practices focused on protection due to its stability and proximity with patients and family.⁽¹⁴⁾

It is identified a doubt of the students in relation to the attitude of reporting the occurrence of errors to the patients and their families especially when there is no harm to the patient. It is known by students that one of the main responsibilities of health professionals, when an error

occurs is to inform the patient. The patients and their families have the right to know the truth and this information is essential to maintain their confidence in the work of the team.⁽¹⁵⁾ However, a study on medication errors in hospitalized children in a pediatric intensive care unit for treatment of cancer patients identified that 95.5% of the patients victims of errors and their families were not notified of its occurrence by the health team.⁽¹⁶⁾

The fact that 100 students (91.6%) agree that there is a great difference between what professionals know, what is right and what is seen in daily healthcare explains the fact that the consistent interconnection between theory and practice is not something experienced in Brazilian health institutions. More trained health professionals producing better outcomes in patient care, increasing satisfaction and confidence of the user with the system of assistance, but above all, reducing morbidity and mortality, as evidenced in large studies conducted abroad, are not yet a reality seen by students, what could also difficult the assimilation of theoretical contents presented by the lack of correlation with practice.⁽¹⁴⁾

The awareness of doctors and nurses that errors are inevitable companions of the human condition, even in conscious and qualified professionals, is perhaps the first and most important step for the beginning of necessary changes. Errors must be accepted as evidences of a system failure and viewed as an opportunity to review the system and improve the care provided to patients.⁽⁵⁾ Hence the importance of assessing the perception and knowledge of undergraduate students in nursing and medicine in the sphere of patient safety because they will be the future professionals working in healthcare to the population.

Conclusion

The students demonstrated to be able to relate some of the aspects surveyed on the topic of patient safety with the experience during their internship programs.

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Collaborations

Yoshikawa JM; Sousa BEC; Peterlini MAS and Kusahara DM declare to have contributed with drafting the article, relevant critical review of intellectual content and final approval of the version to be published. Pedreira MLG and Avelar AFM collaborated with the stages of study conception, analysis, interpreting data, drafting the article, relevant critical review of intellectual content and final approval of the version to be published.

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