

Are we teaching patient safety to our academics? The experience of a course in the countryside of São Paulo

Aniz Kassis Neto (neto_kassis@hotmail.com;
ORCID iD: <https://orcid.org/0000-0001-9848-9024>)
Resident Medical in Ophthalmology
Suel Abujamra Institute
São Paulo / SP, Brazil.

Juliane Bibiano Ferreira (juliane_pharma@hotmail.com;
ORCID iD: <https://orcid.org/0000-0003-4131-1131>)
Medical - Primary Care,
Pereira Barreto / SP, Brazil.

Rôksanny Carneiro Carrijo (roksanny34@gmail.com;
ORCID iD: <https://orcid.org/0000-0002-8860-1446>)
Medical - Primary Care,
Fernandópolis / SP, Brazil.

Emerson Roberto dos Santos (emerson.rs1984@hotmail.com;
ORCID iD: <https://orcid.org/0000-0002-9513-1083>)
Postgraduate Student in Posgraduation Program in Nursing, Medical School of Medicine of São José do
Rio Preto - FAMERP / SP, Brazil.

Patrícia da Silva Fucuta (patriciafucuta@gmail.com;
ORCID iD: <https://orcid.org/0000-0002-8342-4970>)
Gastro-Hepatology Service at Hospital de Base of São José do Rio Preto - HB/FUNFARME / SP, Brazil.

Júlio César André (julio.andre@famerp.br;
ORCID iD: <https://orcid.org/0000-0002-0549-4527>)
Center for the Study and Development of Health Education – CEDES, Medical School of Medicine of
São José do Rio Preto - FAMERP / SP, Brazil.

Alba Regina de Abreu Lima (Corresponding author) (alba.lima09@gmail.com;
ORCID iD: <https://orcid.org/0000-0003-4765-2340>)
Center for the Study and Development of Health Education – CEDES, Medical School of Medicine of
São José do Rio Preto - FAMERP / SP, Brazil.

Abstract

Nowadays, one of the biggest concerns in the health care field is centered on patient safety with a primary focus on the errors of the medical team. In 2009, WHO created a guide for universities aimed at patient safety in which it suggests new ways of approaching patients, thus improving the quality of trained professionals and dramatically reducing adverse events. There is a consensus that there is a restructuring of a system that currently presents serious failures that result in permanent harm to the objective of the medical team, which is the well-being of the patient, as well as an efficient inspection of the Decree Number 529/13 in Brazilian universities. It is in this context that the present work proposes to highlight the gap currently existing in Brazilian universities, based on the sampling of one of them, located in the countryside of São Paulo. Prospective intervention study using a quantitative and qualitative methodology, carried out in two stages: analysis of teaching plans and application of the quantitative and qualitative perception instrument to professors. Was not found in the teaching plans of the modules of the medical course at Universidade Brasil the concept of patient safety. Semi-structured questionnaire was answered by 47 teachers, 11 (23.4%) of the basic cycle and 36 (76.6%) of the clinical cycle and internship. Professors at Universidade Brasil consider that the themes are extensively addressed in their classes, although they are not described in most of the modules' teaching plans. Medical education in Brazil needs a qualitative leap, and that leap is certainly in the area of patient safety. In the context of implementation, the multiprofessional edition of the World Health Organization (WHO) patient safety curriculum guide can be used as guidance and a current and very promising development in relation to the acquisition and examination of the skills necessary for safe care for the patient is the establishment of interprofessional training wards. Considering that medical students are the future driving force of change in health care, it is necessary to encourage quality improvement and patient safety education to offer the patient-centered. The graduation, at any time and since day one, is the moment of formation, therefore favorable to the teaching of this topic for students in the health care field, and all teachers should be involved with these contents.

Keywords: Patient safety, Medical education, Curriculum, Undergraduate, Teaching

1. Introduction

1.1 Patient safety historic background

The concept of Patient Safety (PS) has been built throughout history. The literature presents from more remote references such as the philosopher Hippocrates, going through the nineteenth century in the experiences of Florence Nightingale (Carraro, 2013) or the works of Semmelweis, Codman and Donabedian (Trindade & Lage, 2014; Nascimento & Draganov, 2015). However, its peak was in the twentieth century after 1986 with what happened in Chernobyl (Flin et al., 2006; Neto, 2006; Bueno & Fassarella, 2012; Paese & Dal Sasso, 2013; Corona & Peniche, 2015). All these facts have stimulated numerous researches which presented alarming data regarding PS. The reports of the Institute of Medicine (IOM), in the United States, with the publication "To Err is Human", and that of the International Consultative Group on Nuclear Safety (INSAG) were fundamental to create the concept of PS and also to

guarantee worldwide visibility (Neto, 2006; Bates, 2007; Bohomol & Ramos, 2007; Daud-Gallotti et al., 2011; Grigoletto et al., 2011; Rigobello et al., 2012; Paese & Dal Sasso, 2013; Oliveira et al., 2014; Corona & Peniche, 2015) so that in 1980, the Pan American Health Organization (PAHO) instituted measures to improve the assistance provided to patients (Bueno & Fassarella, 2012 ; Corona & Peniche, 2015) and in 2004 the World Health Organization (WHO) created the program The World Alliance for Patient Safety, with the objective to develop global policies to improve patient care (Scott et al., 2003; Neto, 2006; Grigoletto et al., 2011; Rigobello et al., 2012; Corona & Peniche, 2015). Soon after Brazil, founded in 2011, the Brazilian Institute of Patient Safety (IBSP), with the purpose of cultivating this concept, and since then has been developing numerous modifications such as the National Patient Safety Program (Ministério da Saúde, 2013), which in 2013 won the approval of the Patient Safety Protocols, which are being used until now (Miasso et al., 2006; Neto, 2006; Silva et al., 2007; Mendes et al., 2009; Reis et al., 2010; Vituri et al., 2011; Victora et al., 2011; de Faria & Cassiani, 2011; Bueno & Fassarella, 2012; Rigobello et al., 2012; Bathke et al., 2013; Ministério da Saúde, 2014; Nascimento & Draganov, 2015; Corona & Peniche, 2015; Barbosa et al., 2016).

1.2 Patient safety in the context of medical training

Nowadays, one of the biggest concerns in the health care field is centered on patient safety with a primary focus on the errors of the medical team, fundamentally on the figure of the doctor. According to the Code of Medical Ethics (Conselho Federal de Medicina, 2018) the causes of medical errors are based on three classic principles: that of malpractice, negligence and imprudence. However, studies like Cassiani's (2005) demonstrate that the range of errors that lead to impaired patient safety is much greater than imagined, pointing out numerous causes of failures that range from the wrong prescription to the patient's and/or doctor's lack of compliance to the indicated protocol.

Reason's "Swiss cheese" model (2000) discusses how the failure of the entire medical team leads to harm to the patient even though there is a common sense of promoting a cure. Reason's model clearly demonstrates this by making an analogy to Swiss cheese, which when viewed as a whole is smooth and linear, but when sliced it is possible to observe the holes, alluding to the existing failure in the system. These problems, as previously mentioned, are part of a domino effect and include the lack of attention to the patient, excessive workload, lack of communication between the team, problems in the work infrastructure, among others. In this context, Watcher (2013) reaffirms Reason's theory by reflecting on the need for a systematization of the health model, in which each one plays his part and function appropriately, reducing the number of medical errors.

Patient safety is a widely discussed subject and in order to understand how the errors mentioned above occur and what their outcomes are, it is necessary to understand some concepts proposed by WHO, in 2008, and reaffirmed by studies such as Neto's (2006), fundamental in the science of patient safety: incident is the event or circumstance that could have resulted, or did result, in unnecessary harm to the patient; risk is the likelihood of an incident occurring; near accident or near miss is the incident that did not reach the patient; incident without injury is the incident that reached the patient, but did not cause harm; adverse event is the incident that results in harm to the patient.

The patient's lack of security not only reflects harm to him but also to his family, in which two events

can be catastrophic: the psychological trauma of the adverse event and its sequels in that individual's life. Error is an innate characteristic of every human being, so prevention is necessary to reduce the rate of harm to the patient (Vincent, 2002).

In his text, Berwick (2009) questions medical care by giving simple examples of changes in conduct in situations where professional's empathy towards a patient can avoid adverse events. And although it is one of the biggest causes of harm to the patient, the failures of the medical team could be avoided if patient safety protocols were applied and, not less important, these themes were introduced in the universities in health care field courses.

Based on this premise, WHO, in 2009, proposed a guide for universities aiming at patient safety in which it suggests new ways of approaching the patient, thus improving the quality of trained professionals, drastically reducing adverse events. In this guide we find the themes that should be addressed in medical courses and the area of study in which they should be addressed, such as: the concept of patient safety, infection control, medication safety, teamwork and safe surgery, being inserted in areas such as ethics and bioethics, training in clinical skills and procedures, training in communication skills, microbiology, infectious diseases, pharmacology, interprofessional communication skills and urgency and emergency. Walton (2010) makes an excellent analysis of the WHO guide mentioned above, warning about the need for changes in medical education and the importance of having a booklet in which it explains the paths that universities around the world should follow in order to reduce the harm to the patient as much as possible.

In Brazil, in 2013, the federal government Decree Number 529 was established (Brasil, 2013), implementing the National Patient Safety Program, which discusses measures that must be adopted aiming at the well-being and protection of the patient. Among these measures, the implementation of patient safety in the curriculum of academic students in the health care field is included. From this Decree, in 2014, the Reference Document for the National Patient Safety Program of the Ministry of Health originated, containing all epidemiological data as well as protocols and guidelines that must be followed by Brazilian health centers and universities was originated.

The concern on PS also involves the training policy in medical residency. Since 2011, the Accreditation Council for Graduate Medical Education (ACGME) has implemented workload restrictions for residents as it understands the effects of work overload on residents' education, residents' quality of life, cost and, most importantly, on patient safety (Lee, 2015).

Therefore, it is a consensus that there is a restructuring of a system that currently presents serious failures that result in permanent harm to the objective of the medical team, which is the well-being of the patient, as well as an efficient inspection of the Decree Number 529/13 in Brazilian universities. It is in this context that the present work proposes to highlight the gap currently existing in Brazilian universities, based on the sampling of one of them, located in the countryside of São Paulo.

2. Methodology

2.1 Design Study

This is a prospective intervention study using a quantitative and qualitative methodology.

2.2 Data collection and Study participants

Study was carried out in two stages.

2.2.1 Analysis of Teaching Plans

The teaching plans for undergraduate medicine at the Universidade Brasil, Campus Fernandópolis were analyzed, seeking to identify the presence of a module called "Patient Safety". We also sought to find out if the other modules had topics related to patient safety, such as: concept of patient safety, infection control, medication safety, teamwork and safe surgery.

2.2.2 Application of the quantitative and qualitative perception instrument

Semi-structured questionnaire developed by the researchers. applied to 47 of the 82 professors at Universidade Brasil, to assess the presence of patient safety contents taught in class and their absence in the teaching plan and the knowledge about them. The professors were informed about the research objectives and those who agreed, signed the Free and Informed Consent Form.

2.3 Survey instruments

Developed based on the topics that should be addressed in the curriculum of the WHO medical student (2009), with cultural adaptation, involving dimensions (domains) to be investigated, such as: concept of patient safety, infection control, medication safety, teamwork, safe surgery. The instrument was built on the Likert model. The teacher responded to the assertions on a scale that ranged from "strongly agree" to "strongly disagree". In addition to responding to assertions, the teacher could comment if he wanted.

2.4 Data analysis

The exploratory analysis of the data included mean, median, standard deviation and variation for continuous variables and number and proportion for categorical variables. The normal distribution of continuous variables was assessed by asymmetry, kurtosis and the Kolmogorov-Smirnov test. Comparison of the score of statements related to patient safety, on a Likert type scale, between two groups (basic and clinical cycle) was performed using the Mann-Whitney test. Correlation analysis between statements was performed using Spearman's correlation coefficient. Statistical analysis was performed using IBM-SPSS Statistics version 24 (IBM Corporation, NY, USA). All tests were two-tailed and P values <0.05 were considered significant.

2.4 Ethical considerations

Approved by the Research Ethics Committee of the Universidade Brasil (CEP-UB), under CAAE n. 67265717.7.0000.5494.

3. Results

3.1 Analysis of Teaching Plans

The analysis of the teaching plans that make up the curricular matrix of the medical course at Universidade

Brasil revealed the lack of a module entitled “Patient Safety”. 24 teaching plans of the modules that make up the curricular matrix of the medicine course at the Universidade Brasil were analyzed. The topics sought were: concept of patient safety, infection control, medication safety, teamwork and safe surgery. The results found are described in Table 1.

Table 1. Topics on the theme of Patient Safety, found in the teaching plans of the modules that make up the curricular matrix of Universidade Brasil, 2018.

Topics	Subject	Found modules	Semester
Concept of Patient safety	Not found	Not found	Not found
Infection control	<ul style="list-style-type: none"> ü Hand Hygiene ü Equipments for individual safety ü Asepsis and antisepsis ü Disinfection ü Waste management ü Infection handling 	<ul style="list-style-type: none"> ü Fundamentals of Nursing I and II ü Integrated clinical case study I 	<ul style="list-style-type: none"> ü 1st semester ü 2nd semester ü 7th semester
Medication safety	<ul style="list-style-type: none"> ü Preparation of medications ü Administration of medications ü Abilities to apply medications ü Safe medication ü Medication routes 	<ul style="list-style-type: none"> ü Fundamentals of Nursing II ü Basis of therapy 	<ul style="list-style-type: none"> ü 2nd semester ü 6th semester
Teamwork	Teamwork	Collective Health	4th semester
Safe Surgery	<ul style="list-style-type: none"> ü Surgical team ü Surgical technique ü Organization of surgical materials ü Safe surgery 	<ul style="list-style-type: none"> ü Surgical technique I and II ü Surgery 	<ul style="list-style-type: none"> ü 5th semester ü 6th semester ü 9th semester ü 12th semester

Of the five topics described above by the WHO and the Ministry of Health, only one was not found in the teaching plans of the modules of the medical course at Universidade Brasil, which is related to the concept of patient safety. All other topics were found in the teaching plans of the curricular matrix that make up the course sequentially from the first to the last semester. It is worth mentioning that the proposed topics were addressed in a range of subjects as seen in Table 1. The data from the same confirm that even though there

is no module called “Patient safety”, the vast majority of themes were addressed in the classroom and that the number of modules that describe subjects related to the theme of patient safety is still small, which does not mean that they are not addressed, but that the theme is not the main subject of the classes.

3.2 Analysis of the Results of the Perception Instrument Applied to Professors

3.2.2 Quantitative data

Overall, 47 teachers answered the semi-structured questionnaire and were included in the study. Of these, 11 (23.4%) were teachers of the basic cycle and 36 (76.6%) of the clinical cycle and internship. Table 2 shows the demographic data of the included participants.

Table 2. Demographic data of the research participants, Universidade Brasil, 2018.

	N = 47
Age	38.5 (26 – 63)
Gender, n (%)	
Male	32 (68.1)
Female	15 (31.9)
Cycle, n (%)	
Basic	11 (23.4)
Clinical + internship	36 (76.6)

Continuous variables are described in median (variation); categorical variables are described in number (percentage).

The statements regarding patient safety were answered by the professors participating in the study on a Likert-type scale, with the following score: 1 (strongly disagree); 2 (disagree); 3 (neutral); 4 (agree) and 5 (strongly agree). The general results of the 15 statements are shown in Table 3.

Table 3. General results of responses to statements (A) from 1 to 15, on a Likert-type scale. n = 47, Universidade Brasil, 2018.

Assertions	Mean	Median	Standard deviation	Variation
In my classes, I address questions about ...				
A1: ... the concept of patient safety.	4.47	5.0	1.09	1 – 5
A2: ... infection control.	4.53	5.0	0.95	1 – 5
A3: ... medication safety.	4.38	5.0	0.99	1 – 5
A4: ... safe surgery.	3.94	5.0	1.27	1 – 5
A5: ... teamwork.	4.66	5.0	0.73	1 – 5
A6: In my classes, I offer students complementary reference on patient safety.	3.43	4.0	1.25	1 – 5
A7: Patient safety is a difficult theme to address.	2.51	2.0	1.40	1 – 5

A8: Patient safety is a difficult theme for students to accept.	2.49	2.0	1.41	1 – 5
A9: In my evaluations there are subjects related to patient safety.	3.49	4.0	1.38	1 – 5
A10: I should address the theme of patient safety more often in my classes.	3.89	4.0	1.06	1 – 5
A11: I know the WHO guide for health care field academic students on patient safety.	3.02	3.0	1.42	1 – 5
A12: I know the federal government Decree Number 529/13 on the National Patient Safety Program.	2.91	2.0	1.37	1 – 5
A13: It is extremely important for medical students to learn about patient safety.	4.96	5.0	0.20	4 – 5
A14: There is a dearth of literature available in the area of patient safety.	2.83	3.0	1.26	1 – 5
A15: The university should offer me workshops or courses to improve my knowledge about patient safety.	3.53	4.0	1.25	1 – 5

The first five statements of the questionnaire referred to the five themes proposed by the World Health Organization (WHO) on patient safety: concept of patient safety; infection control; medication safety; safe surgery and teamwork. In order to verify the approach of these themes among teachers, the answers were initially grouped into “address” (4 and 5) and “do not address” (1 and 2), excluding neutral responses. Figure 1 demonstrates the teachers' approach to the five themes.

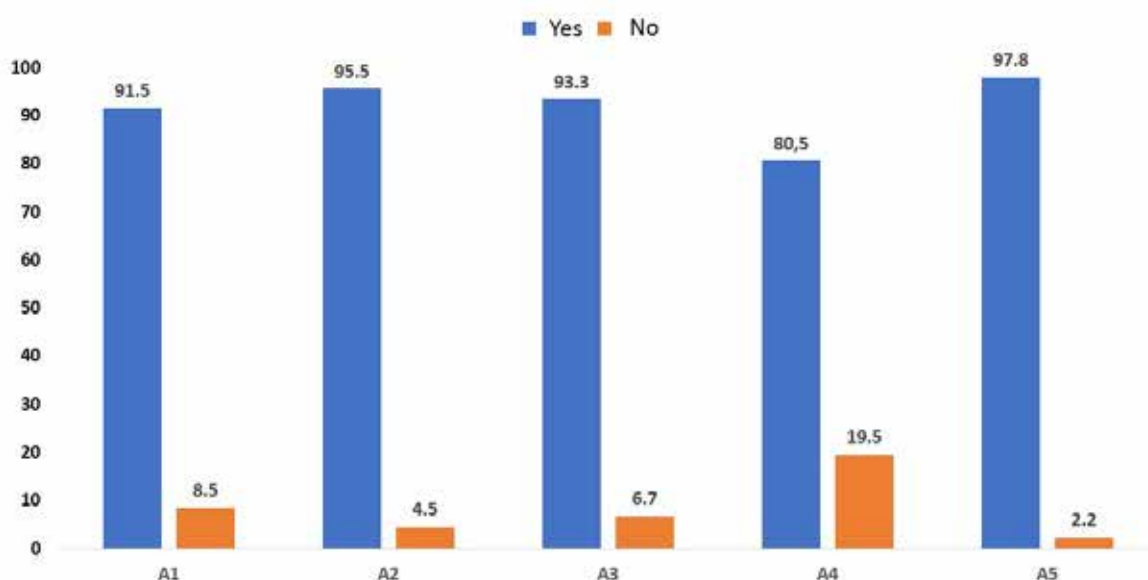


Figure 1. Distribution of the approach to the five themes proposed by WHO on Patient Safety.

WHO, World Health Organization; A1: Concept of patient safety; A2: infection control; A3: medication safety; A4: safe surgery; A5: teamwork

Thus, professors at Universidade Brasil consider that the themes are extensively addressed in their classes, although they are not described in most of the modules' teaching plans.

It was investigated whether the approach to the theme in class (A1) was associated with self-perceived need for a greater approach (A10) and there was no association between the two variables ($p = 0.43$).

Two statements addressed the teacher's degree of knowledge about the WHO guide for academic students in the health care field and about federal government Decree Number 529/13 on the National Patient Safety Program. The answers are shown in Figures 2 and 3.

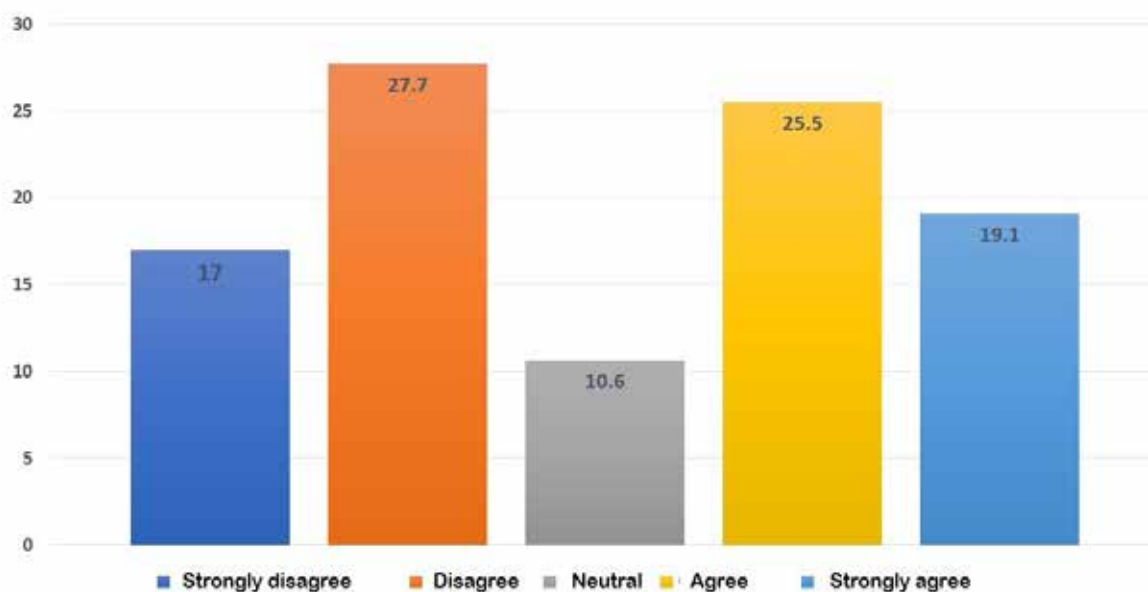


Figure 2. Distribution of responses to the statement related to the teacher's knowledge about the WHO guide for health care field academic students on Patient Safety.
WHO, World Health Organization

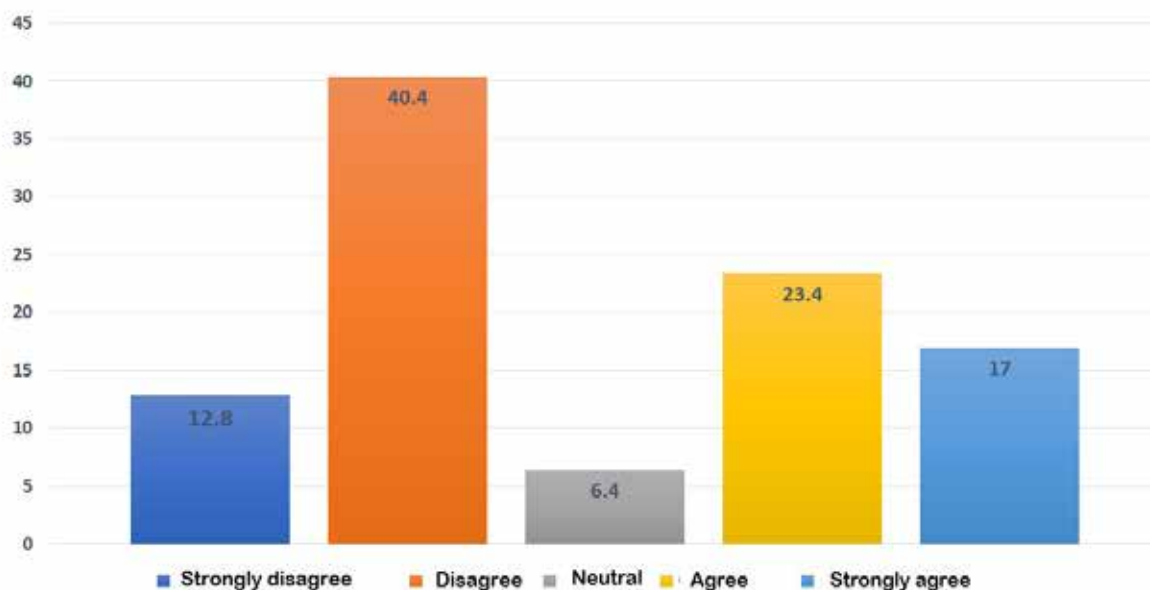


Figure 3. Distribution of responses to the statement related to the teacher's knowledge about federal government Decree Number 529/13 on the National Patient Safety Program.

When investigating a possible correlation between the approach of the theme in classes (A1) and the approach in tests (A9), by the teacher, a positive correlation was found between the two questions. Likewise, a positive correlation was found between the dearth of literature and the need to offer courses at the University on the theme of patient safety (statements 14 and 15), as shown in Table 4.

Table 4. Analysis of correlation of statements related to the dearth of literature and the need for courses to be offered by the University, in the theme of Patient Safety.

	Coefficient ρ *	P-value
A1 and A9	0.378	0.009
A14 and A15	0.379	0.009

* Spearman correlation.

Hereafter, the results were compared between professors of the basic and clinical cycle / internship for the five themes proposed by WHO. There was a significant difference in statement 4, obtaining a lower score on the Likert-type scale for professors of the basic cycle, showing more disagreement with the statement“ in my classes I address questions about safe surgery” (Table 5).

Table 5. Comparative analysis of responses between professors in the basic and clinical cycle/internship.

	Ciclo		P value
	Basic N = 11	Clinical/Internship N = 36	
A1 (concept of patient safety)	4.27 ± 1.42	4.53 ± 0.97	0.99
A2 (infection control)	4.36 ± 1.29	4.58 ± 0.84	0.91
A3 (medication safety)	4.36 ± 1.02	4.39 ± 0.99	0.95
A4 (safe surgery)	3.09 ± 1.51	4.19 ± 1.24	0.03
A5 (teamwork)	4.82 ± 0.40	4.61 ± 0.80	0.61

Continuous variables are described in mean ± standard deviation.

Items related to the difficulty of approaching by the professor, acceptance by students and the professors' behavior in including subjects of patient safety in the assessments, as well as in providing complementary references in classes (statements 6 to 9) were also evaluated. There was a tendency to perceive that the theme of patient safety is a difficult theme for professors of the basic cycle, although the difference has not reached statistical significance ($p = 0.08$), as well as for the other items.

The last statements in the questionnaire were related to the behavior of the professor in relation to the theme, the relevance of the theme and available literature, as well as the role of the university in providing workshops or courses to professor's improvement in patient safety. The results showed that there was no difference in responses between professors in the basic and clinic/internships.

4. Discussion

The lack of a module entitled "Patient Safety" is no different from most medical courses in Brazil. In a search of 75 resumes available on the internet, in none of them was found a discipline and/or module with that name. This does not mean that the contents are not taught, but that they are not grouped in a single discipline. The results shown in Figure 1 reinforce the great importance that the aforementioned themes have in a medical course and due to the multiprofessional approach in that course, which includes several professionals such as nurses, psychologists, physiotherapists, technicians and nursing assistants, among others. For this reason, a major approach to the subject in medical training is necessary. On the other hand, the theme of safe surgery appears as the least mentioned since it is a more specific area of medicine where only a portion of the modules go deeper.

Although the theme teamwork is the subject most exposed by professors among the topics of patient safety, it does not help much since, despite teaching what a team is, concepts of what successful teams are lacking, since, in medicine, emergency situations are experienced, with a high level of stress and which require good results, where the skills that allow professionals to satisfactorily manage the entire work process, especially the decision-making process, are so that the resulting decisions are appropriate and timely in terms of safety and precision (Vincent & Coulter, 2002).

From the data presented in Figure 3, it is clear that there is a need for greater disclosure of these

regulations to professors. The positive correlation between the dearth of literature and the need for courses offered by the University on the theme of patient safety (Table 4) show that the availability of adequate literature, per se, would already be a great stimulus to professors and one of the ways of training professors to address the themes of patient safety that the university could offer, although most professors agree that there is enough literature, but reiterated that what is missing is a deepening and detailing of professors on the subject. The ability of health professors to design, teach, evaluate and improve relevant curricula is vital for teaching any skill (Ray et al, 2019) and the patient safety policy is no different,

The significant difference between the approach of the theme in classes and in the evaluations (Table 4), raises the question of the role of evaluations as a resource to provide greater dedication of students to the theme. Inadequate feedback and communication about errors and lack of open communication are the main challenges for patient safety in the provision of care and since academic life this has been important in order to meet the need for a modified approach and attention to context, designing interventions aimed at improving the safety culture (Zhong et al., 2019).

Medical education in Brazil needs a qualitative leap, and that leap is certainly in the area of patient safety. In general, in teaching hospitals, where students of different levels and courses are learning, adverse error rates may be higher, but these hospitals play a social role, within the context of education and health care, of inestimable relevance. For this reason, an intensive approach to patient safety themes during graduation is extremely important. In the national literature, of the 1021 articles published in the Brazilian Journal of Medical Education (RBEM) (Scielo, 2019), the most important Brazilian magazine that deals with medical education, divided into 54 editions from 2006 (Volume 30, issue 1) until 2019 (Volume 43, issue 3), none addresses the theme “Patient Safety” in a specific way or as a main theme. We found 5 articles related to patient safety, 4 of which having medical error as the main thematic, however the term “patient safety” is not mentioned in these texts. Only the article “Medical Education in Modern Times” (Lobo, 2015) mentions “patient safety” on one occasion when referring to the hospital as a professional training field also inserted in the context of medical error. In the international scenario, in recent years, teaching initiatives on patient safety have increased significantly, however, they are not yet widely distributed in German-speaking countries or in Europe (Opitz et al., 2020).

In the context of implementation, the multiprofessional edition of the World Health Organization (WHO) patient safety curriculum guide can be used as guidance and a current and very promising development in relation to the acquisition and examination of the skills necessary for safe care for the patient is the establishment of interprofessional training wards. Meanwhile, there are clearly defined strategies for integrating the topic of patient safety in the curricula of health professionals. On the way to a successful restructuring of curricula, including the necessary skills and behavioral changes of students, however, relevant support from the administration of colleges and teaching hospitals is essential.

Considering that medical students are the future driving force of change in health care, it is necessary to encourage quality improvement and patient safety education to offer the patient-centered, safe, evidence-based, and high-value care patients deserve, offering medical students the opportunity to obtain the knowledge and experience necessary to participate meaningfully in this profession, now and throughout their careers (Bartlett & Huerta, 2018).

5. Conclusion

Teaching about patient safety is still given in a fragmented way, valuing the clinical skills such as diagnosis and treatment of the disease, post-treatment, surgical procedures and monitoring. As a recent movement, teaching about patient safety is confronted with training proposals based on traditional structures, centered on disciplines and specific training, and it is still undervalued.

Present studies recommend that teaching on patient safety is included in a transversal axis, allowing an interdisciplinary and transdisciplinary approach, since some successful experiences point to the success in the development of interprofessional skills for students of different undergraduate courses in the health care field, using quality improvement methods to improve patient-centered care (Davis et al., 2020, Sanko et al, 2020).

No distinction should be made in relation to the timing of the course for teaching this subject. For the student just starting a higher education course in the health care field, no specific knowledge of the professional skills that make up the expected profile of this professional is recommended. Thus, graduation, at any time and since day one, is the moment of formation, therefore favorable to the teaching of this topic for students in the health care field, and all teachers should be involved with these contents.

6. Final considerations

It is necessary to invest tirelessly on the undergraduate student, so that, during their training, they acquire competence to perform an expected procedure in their professional practice, but without forgetting the necessary emphasis on the practice of patient safety, promoting a change in teaching: from the action paradigm, which determines to adopt this or that patient safety measure, according to the procedure or diagnosis in question, for the “philosophy of health practices” paradigm, which presupposes the performance of any procedure from the adoption of these measures.

Interprofessional education in systems-level approaches can improve patient safety and curricular efforts in interprofessional education, collaborative practice and patient safety should be guided by these results.

Documentary analysis was the strategy chosen, based on the content written in the formal curriculum, described in the teaching plans, and this presents itself as a limitation, since the real and hidden curricula, also used by teachers, were not studied.

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