Patient safety atmosphere in a teaching hospital

Clima de segurança do paciente em um hospital de ensino

Clima de seguridad del paciente en un hospital de enseñanza

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ABSTRACT

Objective: Evaluate the perception of patient safety atmosphere for health professionals from the safety Attitudes questionnaire and investigate the association between scores and sociodemographic and professionals variables.

Method: This is a quantitative study conducted with 198 health professionals of a philanthropic hospital in Minas Gerais between March and June 2017. Data were collected using an instrument with sociodemographic and professional variables and the Safety Attitudes Questionnaire. Statistical analysis was performed with Student's t-test, Pearson correlation, Anova and multiple linear regression.

Results: The professionals presented a negative perception regarding the patient's safety amosphere (69,5). The domain Job Satisfaction scored the highest (81.98), while Management Perception did the worst (62.15). Doctors (p= 0.005), men and professionals with higher levels (p<0.001) presented better perception of the safety atmosphere.

Conclusion: The identification of predictor variables is an important tool for implementing a safety culture, favoring quality of care and reduction of adverse events.

Keywords: Patient safety. Safety management. Health personnel.

RESUMO

Objetivo: Avaliar a percepção do clima de segurança do paciente pelos profissionais de saúde a partir do Questionário de Atitudes de Segurança e investigar a associação entre os escores e variáveis sociodemográficas e profissionais.

Método: Estudo quantitativo realizado com 198 profissionais de saúde de hospital filantrópico de Minas Gerais, entre março e junho de 2017. Utilizou-se instrumento com variáveis sociodemográficas e profissionais e Questionário de Atitudes de Segurança. Realizou-se análise estatística com teste t de Student, correlação de Pearson, Anova e regressão linear múltipla.

Resultados: Profissionais apresentaram percepção negativa quanto ao clima de segurança do paciente (69,5). Domínio Satisfação no Trabalho obteve maior pontuação (81,98), enquanto Percepção da gerência a pior (62,15). Médicos (p=0,005), homens e profissionais de nível superior (p<0,001) apresentaram melhor percepção de segurança.

Conclusão: Identificação de variáveis preditoras é importante ferramenta para implementação de uma cultura de segurança, favorecendo qualidade da assistência e redução de eventos adversos.

Palavras-chave: Segurança do paciente. Gestão da segurança. Pessoal de saúde.

RESUMEN

Objetivo: Evaluar la percepción del clima de seguridad del paciente para profesionales de la salud del cuestionario de actitudes de seguridad e investigar la asociación entre los escores de seguridad y las variables sociodemográficas y profesionales.

Método: Estudio cuantitativo realizado con 198 profesionales de salud de un hospital filantrópico de Minas Gerais, entre marzo y junio de 2017. Se utilizó un instrumento con variables sociodemográficas y profesionales y Safety Attitudes Questionnaire. Análisis estadístico se realizó con los tests t de Student, correlación de Pearson, Anova y regresión lineal múltiple.

Resultados: Los profesionales presentaron una percepción negativa en cuanto al clima de seguridad del paciente (69,5). El dominio de satisfacción en el trabajo obtuvo mayor puntuación (81,98), mientras que la percepción de la gerencia peor (62,15). Médicos (p = 0,005), hombres y profesionales de nivel superior (p <0,001) presentaron mejor percepción de seguridad.

Conclusión: La identificación de variables predictoras es una importante herramienta para la implementación de una cultura de seguridad, favoreciendo calidad de la asistencia y reducción de eventos adversos.

Palabras clave: Seguridad del paciente. Gestión de la seguridad. Personal de salud.

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■ INTRODUCTION

Patient safety issues have become a priority to health organizations, since it is seen as something fundamental to the quality of assistance, client satisfaction, and harm-free health care[1].

However, unsafe practices, which present risks to the life of patients, are still very frequent in health institutions. A study based on notifications registered in the Brazilian Sanitary Surveillance Notification System (Notivisa) throughout two years found 63,933 adverse events (AE) related to health care, from which 417 led to the death of the patient[2]. AEs have negative implications that affect the patient, the professionals involved, and even society itself.

In this setting, the World Health Organization (WHO), through the World Alliance for Patient Safety, established guidelines to encourage countries to develop strategies targeted at the safety of patients. The priority was the execution of evidence-based researches discussing safety issues[3].

Among the strategies to improve safety in care are the risk management, the implementation of protocols that can give support to the planning of assistance, the effective communication between teams and the adoption of a culture of safety by the health institutions[1]. Therefore, the entire multiprofessional team must be committed to patient safety, which means that all the professionals involved are co-responsible for promoting safety in the actions targeted at the patients.

It stands out that one of the essential steps for the adoption of a culture of safety is the knowledge, by the organizations, of their own organization structures. There should be widespread awareness of their objectives and values, which must be transmitted clearly and horizontally to all its members, encouraging attitudes and behavior aimed a reaching its goals[4].

Thus, it is necessary to verify whether the institution has a culture of safety. From that point, it is possible to identify the aspects that need to be improved within the service, as to guarantee the safety of the patients, or yet, to determine organizational factors that may be preventing the establishment of the culture of safety.

Instruments have been used to evaluate the culture of safety of the patients, starting from the perception of the health professionals regarding the atmosphere of safety. The atmosphere of safety is the measurable aspect of the culture of safety, and can be evaluated from the perception of the professionals[5].

This atmosphere can reproduce the perceptions of the professionals in a specific moment in their place of work, while culture is a concept developed through time, longitudinally, reflecting a set of individual and group attitudes and values, related to issues concerning the safety of the patient within a health organization[5].

As a result, measuring the atmosphere of safety, allows one to identify its associated factors, which positively or negatively contribute to the adoption of safe practices within health services. One of the instruments to perform this evaluation is the Safety Attitudes Questionnaire (SAQ). Through its score, it is possible to verify warning signals related to the domains that need to be improved within the institution for the safety of the patient[6-7].

A study involving this team encourages researches to apply the SAQ as a way to evaluate and monitor whether the actions of an organization reflect a positive perception regarding the atmosphere of safety[8].

Other investigations reiterate that evaluating the atmosphere of institutional safety allows for the development of actions aimed at diminishing the number of AEs and promoting higher quality assistance. In addition, the results of such researches subsidize organizational plans for both the management of the services and the execution of practices of assistance[9-10].

Considering this, the perception of the members of an institution regarding different aspects of the safety atmosphere is an important tool to analyze the culture of safety within said institution.

Therefore, the objectives of this study were to evaluate the perception of the atmosphere of patient safety, according to health professionals from a university hospital, through the application of the Safety Attitudes Questionnaire, and to investigate the association between the scores found, and sociodemographic and professional variables.

■ METHOD

This is a non-experimental, sectional and quantitative study developed in a philantropic hospital, linked to a private higher education institution that offers medium and high complexity health services and is located in the countryside of the Minas Gerais state, in Brazil.

To calculate the sample, an a priori determination coefficient of $R^2=0.10$ was used, in a multiple linear regression model with five predictors, with a significance level of error type I of $a = 0.01$, and error type II of $ß = 0.1$, thus resulting in an a priori statistical power of 90%. Inserting the previously described values in the Power Analysis and Sample Size (PASS) software, version 13, a minimum sample size of 206 health professionals was calculated. The main outcome variable was the domain atmosphere of safety.

Data collection took place from March to July 2017, with the health professionals from the team who had been registered as workers in the institution for at least a month. Professionals on leave due to medical reasons or otherwise, as well as those who could not be reached after five attempts during the data collection period, were excluded from the investigation.

Two instruments were filled out by the participants during data collection: one of them had sociodemographic (age, sex, marital status) and professional variables (profession, type of formal education, years of formal education, time in the profession, time working in the institution, working shift, ward where they work in the institution, weekly workload, and whether or not they had another job); the other was the Safety Attitudes Questionnaire (SAQ)[7].

The SAQ has 41 items separated in six domains: Atmosphere of Teamwork, Atmosphere of Safety, Work Satisfaction, Stress Perception, Perception about the Management, and Work Conditions. The answers are given in a five-point Likert scale, with the options: A - Strongly disagree; B - Slightly disagree; C - Neutral; D - Slightly agree; E - Strongly agree; and X - Does not apply. The final score includes values from 0 (zero), the worst possible perception, to 100, the best possible perception. The SAQ authors consider scores equal or above 75 to indicate a positive perception.

It should be highlighted that the author of the SAQ was asked for the permission to use the instrument, and permitted its use for this research through e-mail.

Before data collection, a pilot test was conducted with 10 professionals, to analyze whether the instrument was applicable and adequate, but there was no need for changes. Researchers were submitted to the same training, so that the data collection process would happen similarly for all.

Data were analyzed through the use of the Statistical Package for the Social Sciences (SPSS) software for Windows, version 23. The analysis of categorical variables was made through absolute and relative frequency distribution, and that of quantitative variables was carried out through central tendency (median and mean) and measures of variability (amplitude and standard deviation). To verify the atmosphere of safety according to the general score of the instrument, the inverted items of the instrument (items 2, 11 and 36) were reversed. In the reversed items, the "strongly agree" answers, for instance, become "strongly disagree". Later, the following formula was used: m(q.1,q.2r,q.3,q.4,q.5,q.6,q.7,q.8 ,q.9,q.10,q.11r,q.12,q.13...q.41))-1) x 25). In it, "m" corresponds to the mean of the items of the instrument as a whole.

To calculate the scores per domain, the answers to the items of each domain were summed up, and the result was divided by the number of items which corresponded to each domain, based on the formula (m-1)x25, in which "m" is the mean of the items of the domain which is being considered, and can vary within the interval [0-100].

To verify the influence of sociodemographic and professional variables on the scores of the domains, when it comes to the SAQ perception of safety, a bivariate analysis was used, including Student's t test, Pearson's correlation, and the Anova. To analyze the simultaneous influence of all variables, a multiple linear regression analysis was executed. It should be mentioned that the only criterion for the insertion of the predictor variables was their conceptual relevance.

The inferential analysis were based on a significance level of 5% (α=0.05) This study was approved by the Research Ethics Committee of the University of Uberaba, under the Certificate of Submission for Ethical Appraisal (CAAE) 55463616.3.0000.5145, and protocol 1.569.711. All participants signed the Free and Informed Consent Form.

■ RESULTS

From the 206 professionals, eight refused participating in the study, to a total of 198 participants. From these, most were women (166; 83.8%), married (82; 41.4%), with a mean age of 35.13 (s=8.40), a minimum age of 20 and a maximum age of 57.

Most participants were from the nursing team (144; 72.7%), followed by physicians (12; 6.1%) and other professionals (42; 21.1%), category which included all the other professional categories, which were: social worker (2; 1.0%); medical biologist (5; 2,5%); pharmacist (2; 1.0%); physical therapist (4; 2.0%); speech-language therapist (1; 0.5%); pharmacy technicians (17; 8.6%), radiology technicians (1; 0.5%) and lab technicians (8; 4.0); dentist (1; 0.5), and biologist (1; 0.5%). The results showed that the minority of professionals had Stricto Sensu specializations (8; 4%). Most of them, however, only work in administrative functions (161; 81.3%) and did not have other registered jobs (137; 69.2%).

The average time the participants had in their profession was 95.6 (s=76.79) months, while the mean time they had been working in the institution was 48.22 (s=45.48) months. The minimum period for both questions was that of one month, while the maximum time in the profession was 468 months, and the maximum working in the institution was of 304. Regarding the working shifts, most participants worked in the morning shift (64; 32.3%), followed by those who work in the night shift (51; 25.8%) and those whose work is divided in morning and afternoon shifts (46; 23.2%).

The results in table 1 show the values resulting from the descriptive analysis of the general score and the score per SAQ domain.

Table 1 - Descriptive analysis of the general score and of the score per SAQ domain. Uberaba, Minas Gerais, Brazil, 2017

Domains	Minimum	Maximum	Mean	Median	Standard deviation	Alfa Cronbach
D*1 - Atmosphere of teamwork	0.00	100	71.71	75.00	18.25	0.60
D2 - Atmosphere of safety	3.57	100	70.12	71.42	18.32	0.72
D3 - Work satisfaction	0.00	100	81.98	90.00	19.62	0.76
D4 - Stress perception	0.00	100	68.03	75.00	25.32	0.70
D5 - Perception about the management of the unit and the hospital	0.00	100	62.15	63.63	20.95	0.84
D6 - Work conditions	0.00	100	71.14	75.00	26.50	0.75
General	8.33	97.37	69.54	70.78	14.98	0.91

Source: Research data, 2017.
*D = Domains

The general mean score was 69.5, indicating that the perception of the atmosphere of safety in the institution was negative. Among the six safety domains evaluated, the Work Satisfaction received the highest score (81.98), which indicates a positive perception of the workplace. In contrast, the domain regarding perceptions about the management had the lowest score (62.15).

Regarding sex, the mean scores of Domains 1 (Teamwork) and 2 (Atmosphere of Safety) were higher for men. Regarding the first one, the mean score for males was that of 78.91 (SD=15.86), while the mean score for females was that of 70.30 (SD=18.40). As for domain 2, its mean score for men was that of 75.53 (SD=16.90), while women for women, it was 69.08 (SD=18.45), with respectively statistically significant differences of p=0,01 and p=<0,001. Age showed no statistically significant difference in any domain.

The association between the general score and the domains of the SAQ, and the variables time in the profession and time in the institution showed no statistically significant correlation.

Regarding their education, professionals who had finished only high school had lower mean scores (63.43) than those who had higher education (74.54) in the domain 4 (Stress Perception), with a statistically significant difference (p=0.001). This result made it clear that professionals with higher education have a better perception when it comes to recognizing stressing factors.

The professional categories were divided in three groups: nursing group, medical group and other professionals group. Multiple comparisons, in fact, revealed that physicians had a higher perception of safety when compared to nursing professionals and to the other professionals group. Statistically significant associations were observed regarding the general score (p=0.003) and the domains Atmosphere of teamwork (p<0.001), Work satisfaction (p=0.02) and Stress Perception (p<0.001) (Table 2).

Table 2 - Comparing the means of the values of the general score variables and the domains of the SAQ, according to the professional category of the health workers in a university hospital, Uberaba, Minas Gerais, Brazil, 2017

Domain	Nurse		Physician		Others		
	Mean	SD	Mean	SD	Mean	SD	p
D*1 - Atmosphere of teamwork	65.15	16.31	90.62	8.35	72.15	18.30	**<0.001**
D2 - Atmosphere of safety	66.87	14.66	77.71	14.65	70.49	19.45	0.17
D3 - Work satisfaction	77.84	16.82	95.41	6.20	82.13	20.69	**0.02**
D4 - Stress perception	78.17	17.76	84.37	19.49	63.51	26.36	**<0.001**
D5 - Perception about the management of the unit and the hospital	61.14	22.04	75.56	18.00	61.34	20.58	0.07
D6 - Work conditions	66.85	26.64	86.11	16.02	71.21	26.84	0.08
General	67.34	13.20	82.97	8.87	69.08	14.38	**0.003**

Source: Research data, 2017.

Adjusting the results for potential confounding factors through the use of a multiple linear regression, it was found that only the medical category was statistically significant, indicating that it was the only predictor that impacted in the perception of safety (Table 3).

Table 3 - Multiple linear regression of the factors related to the general SAQ score of the professionals who participated in the study. Uberaba, Minas Gerais, Brazil, 2017

Variables	General Score	
	β	p
Physicians	0.207	0.005
Nurses	-0.058	0.417
Sex	0.124	0.08
Time working in the institution	0.014	0.851
Time in the profession	-0.047	0.538

Source: Research data, 2017.
β: regression coefficient; p: probability

■ DISCUSSION

In this study, most professionals were female (83.8%) and from the nursing group (72.7%), which corroborates results from other studies[9-11]. The nursing team is mostly made up of females, and represents most of the work force in health institutions[12], which justifies it being the category with the greatest participation in the research.

Most professionals (69.2%) did not have any other registered job, corroborating other results findings[11,13-14]. However, a study conducted in a private hospital in Minas Gerais found that 53.66% of professionals who participated had another registered job, but there was not a significant relation between this fact and the score regarding the atmosphere of safety[10]. The existence of only one registered job may be seen as a factor that contributes to the safety of the patients, since work overload negatively interferes in the assistance provided, favoring the occurrence of adverse events[15].

The mean score found was that of 69.5, indicating a low perception regarding the atmosphere of safety, since, in the literature, only scores above 75 are seen as representative of a positive perception. These results are not different from what other investigations found[6,10-11,14,16].

Considering the individual domains, the best score was in the work satisfaction domain, while the perceptions above the management of the unit and of the hospital had the worst results, showing that the professionals have a negative perception of the actions of the management when it comes to issues of patient safety. Similar results were found in Brazilian researches[6,10-11,14], as well as in an international study conducted in Australia[17]. In contrast, other investigations had their best scores in the domain teamwork, and the worst in the domain stress perception[9,16].

It stands out that the management of an institution is the main responsible for planing, elaborating, and monitoring organizational culture actions and strategies targeted at the safety of the patient, and need to be able to have the professionals be invested in working in favor of these measures. Also, the satisfaction at work contributes to a positive and trustworthy view of the work environment, which is associated to the quality of the assistance[10].

In this work, the variables seen as predictors of the atmosphere of patient safety were: sex (male and female), educational level (high school and higher education), and professional category (physicians, nurses, and other professionals).

The variable sex showed that males had a better perception of the teamwork and atmosphere of safety domains. A research conducted in the city of Curitiba, using the SAQ, found similar results, according to which males had a better perception of teamwork[18].

Other investigations also found significant differences for the variable sex, but in the stress perception domain. The results diverged. In the first investigation, women had a higher score in the domain, while in the second, men had a better perception of the score[11,19]. In contrast, another investigation conducted in a private hospital in Minas Gerais did not find significant differences when associating these variables[10].

Regarding the educational level and the stress perception domain, professionals with complete higher education had a better score than those who only had high school, showing that the higher the educational level, the better the recognition of stressing factors that can interfere

in the actions of assistance. Similar results were found by other researches[6,11].

Therefore, the educational level can be seen as a positive factor for the safety of the patient. A higher professional education contributes to a more coordinated assistance, articulated and with more quality, to minimize the risks that come from stressing factors that interfere in the care being provided[20].

Finally, the professional category was a predictor of the atmosphere of safety. Physicians were found to have the best perceptions of safety in the general score. The opposite was found in a research in three Brazilian public hospitals in the Ceará state, where the nursing team showed better perceptions regarding the culture of safety than the other groups[6].

For the domains of teamwork atmosphere, stress perception and work satisfaction, in this investigation, physicians also had the highest scores, corroborating other studies[6,14].

A study conducted in the Netherlands shows similar results, according to which the team of physicians had a better perception regarding the domains work conditions, teamwork atmosphere, atmosphere of safety, and work satisfaction[8].

Differences in the perception of patient safety between the professional categories in the same institution are factors that should be observed with care. The existence of professionals with a lower perception when compared to others may positively or negatively influence behaviors in the offering of safe care. It should also be highlighted that, for the promotion of a culture of safety, all members from a service must have the same discourse and show attitudes, values and competencies that go together in the direction of a safer assistance[5].

Therefore, it is valid for health institutions to conduct actions targeted at the safety of the patient, to raise the awareness of all professionals involved.

The results of this study are expected to contribute for the improvement of the health care service being offered. The applicability of the SAQ in clinical practice is a managerial tool for the nurse to make decisions to improve the quality of assistance and reduce possible adverse events. Therefore, other investigations are necessary to identify factors that may be improved in order to guarantee the safety of the patient.

■ CONCLUSION

The professionals who participated in this study had a negative perception of the atmosphere of safety of the patient. The domain work satisfaction had the highest scores, showing itself as a positive factor between workers and for safety of the patient. In contrast, the domain perception about the management of the unit and the hospital had the lowest score, a finding that indicates the need for improvement.

Regarding the identification of predictors of the scores of patient safety, the male sex had better perceptions regarding the domains teamwork atmosphere and atmosphere of safety.

The educational level showed that, the highest the educational level of the professional, the better their perception of stress, meaning that they recognize better the factors that can prejudice the offering of safe care.

The professional category was also observed to be an influence on the scores of patient safety, since the physicians had better perceptions regarding the general score of the instrument, and the domains teamwork atmosphere, stress perception, and work satisfaction, when compared to other professionals.

There were no statistically significant relations between the general score, the SAQ domains, and the variables age, time in the profession, and time in the institution.

A limitation of the study was its spectrum of analysis, since it was a cross-sectional cohort study, suggesting the need for longitudinal follow-up. In addition, the field of study was a private hospital, which may have influenced the number of professionals who were interested in participating in the research.

The results found show that the identification of factors that need to be improved, and that of factors seen as positive for the safety of the patient, are important managerial tools for the planning of actions targeted at implementing a culture of safety within the institutions. Additionally, the different actors in the health field, educators and professionals, have the responsibility of working in the promotion of health safety in all its dimensions, due to the impact of the occurrence of adverse events in the quality of assistance.

It can be concluded that the results of this study contribute to the field with evidences that allow for reflections about the current clinical practices, as well as subsidise the elaboration of strategies for the implantation of a culture of learning for the safety of the patient in health care settings.

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