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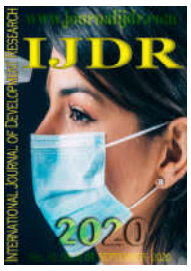

RESEARCH ARTICLE OPEN ACCESS

PATIENT SAFETY CLIMATE IN PUBLIC HOSPITALS IN NORTHEASTERN BRAZIL

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ABSTRACT

We conducted a cross-sectional, descriptive, and quantitative study to assess the patient safety climate from the perspective of nursing professionals from five public hospitals in the state of Maranhão, Brazil. We applied the Safety Attitudes Questionnaire to a sample of 390 participants. Data were processed using the Statistical Package for Social Science version 22.0 and examined by analytical statistics. We found that patient safety climate was below expectations in the studied hospitals. We also identified that professionals are exposed to fragile working conditions for quality. Moreover, using the instrument's domains, we identified areas that need to be strengthened. Therefore, we recommend that the state and institutional managers adopt strategies that end a model of healthcare that is prone to error. We also recommend that the nursing staff is more valued. These conditions are the minimum required to improve patient safety indexes, according to the reality of each institution.

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INTRODUCTION

In healthcare services, patient safety refers to the attempt to minimize the occurrence of adverse events to human health. These adverse events refer to incidents that occur during care and that result in unnecessary damage to health, causing at least increases in treatment costs and length of hospital stay, and comorbidities. Therefore, adverse events represent a global public health problem (Golle *et al*., 2018). Attention to patient safety has increased markedly in recent years, but progress in this area remains slow in many countries. In Brazil, the development of programs and protocols and the implementation of patient safety centers have occurred recently, and safe healthcare has not yet been consolidated in many health institutions. These factors prevent organizational learning and a nonpunitive approach, which are central to a successful culture that values patient safety (Lemos *et al*., 2018; Paixão *et al*., 2018). The term "safety climate" refers to the measurable component of an institution's organizational culture, and it is widely recognized as a reliable indicator to assess patient safety culture (Baratto *et al*., 2016). Among the instruments used to measure safety climate, the Safety Attitudes Questionnaire - Short Form (SAQ) is sensitive and widely used to assess the safety culture of healthcare organizations (Kolankiewicz *et al*., 2017). Maranhão is one of the poorest states in Brazil, ranking second lowest in the Human Development Index (IBGE, 2020). Regarding public health, Maranhão exhibits the second-lowest life expectancy and the lowest proportion of doctors per capita in the country (ORGANIZAÇÃO PAN-AMERICANA DA SAÚDE, 2016; ASSOCIAÇÃO MÉDICA BRASILEIRA, 2018). Maranhão is also among the states with a high relative number of patient safety centers established and a significant rate of adverse event reporting (BRASIL, 2019; BRASIL, 2020). All these features mean that the goals for the prevention of adverse events may be weakened, as these goals depend on the institution's maturity regarding the patient safety culture, which remains little known. Experienced patient safety researchers argue that the quality of health care can be achieved by strengthening and qualifying the nursing staff

(Bezerra, 2018). Thus, the nursing staff is a fundamental part of achieving safe work practices. The nursing staff encompasses the majority of healthcare workers and the one who devotes the most time to direct patient care. Consequently, the chances of them making mistakes during health care are greater (Lemos *et al*., 2018). Therefore, it is necessary to investigate the perception of the patient safety climate in hospitals (especially those with newly established patient safety centers) and among nursing professionals (due to their representativeness in the healthcare setting). Thus, this study analyzed the patient safety climate from the perspective of nursing professionals from public hospitals in the state of Maranhão, Brazil.

MATERIALS AND METHODS

We conducted a cross-sectional study with a quantitative and analytical approach in five intermediate- and high-complexity public hospitals in the state of Maranhão (northeastern Brazil), between October 2017 and June 2019. The evaluated hospitals were identified as follows: Alpha Hospital (located in Timon), Beta Hospital, and Delta Hospital (both located in Caxias), Gamma Hospital (located in Açailândia), and Zeta Hospital (located in Imperatriz). These hospitals were founded between 4 and 7 years ago; the Beta Hospital is the newest, and the Delta Hospital is the oldest. The Alpha and Beta hospitals are regional institutions of intermediate complexity administered by the state government; the Gamma and Zeta hospitals are intermediate and high-complexity institutions, respectively, administrated by the municipal government; and the Delta hospital is a high-complexity maternity hospital administered by the municipal government (CNES, 2020). All these hospitals belong to the Maranhão health system and serve more than 700.000 people (IBGE, 2020). Our sample had 390 participants distributed as follows**:** Alpha Hospital (N = 51), Beta Hospital (N = 155), Delta Hospital (N = 84), Gama Hospital (N = 33), and Zeta Hospital (N = 67). The sample was composed of professionals who (1) belonged to the nursing staff, (2) were employed for at least three months, 3) worked at least 20 hours a week, and (4) agreed to attend the qualification provided by the National Patient Safety Program (with a minimum 50% attendance). We did not include professionals who were on vacation or leave during data collection.

Initially, the approach to the study participants occurred in a qualification training on patient safety, which aimed to raise awareness among nursing professionals about patient safety protocols and expand their understanding of Ordinance No. 529, of April 1, 2013, which institutes the National Patient Safety Program in all Brazilian health services. This qualification was arranged around the participants' working hours, with an average of three meetings per group that addressed international patient safety goals through active teaching and learning methodologies. At the end of the training, the eligible participants answered the questionnaire for this study. Data collection followed Carvalho and Cassiane (2012), who adapted and culturally validated the Safety Attitudes Questionnaire (SAQ) - Short Form 2006 to the reality of Brazilian hospitals. After collection, the data were entered into an electronic database (Microsoft Excel) by double entry to validate the database. Data processing was performed using the Statistical Package for Social Science (SPSS), version 22.0. We used Cronbach's alpha to assess the consistency of the questionnaire responses. When needed, we also used the Student's *t*-test and Mann Whitney test, with significance assumed at $P < 0.05$. The study was approved by the local authorities and the Research Ethics Committee of the State University of Maranhão (approval number 2.325.226; CAAE: 71652117.0.0000.5554). All participants voluntarily agreed to participate in the study. All participants also read, signed two copies, and received a copy of the informed consent form. The study met the guidelines of Resolution No. 466/2012, which regulates research with human beings.

RESULTS

We recruited 390 nursing professionals in the five hospitals, including nurses, nursing technicians, and nursing assistants. The most represented professions were nursing assistants and nursing technicians (72.31%; Table 1).

Table 1. Profile of the 390 professionals from Alpha, Beta, Delta, Gamma, and Zeta hospitals (Maranhão, Brazil, 2019) who participated in the study

Variables	Sample size	Relative frequency (%)
Gender		
Male	31	7.95
Female	359	92.05
Profession		
Nurse	108	27.69
Nursing Assistant and Nursing Technician	282	72.31
Patient age group		
Adult	157	40.46
Pediatrics	35	9.02
Adult and Pediatrics	196	50.52
Time in specialty		
< 6 months	24	6.17
6–11 months	15	3.86
1–2 years	144	37.02
3–4 years	54	13.88
5–10 years	87	22.37
11–20 years	43	11.05
≥ 21 years	22	5.66
Clinical area where they work the most		
Surgery	113	28.97
Medical clinic	84	21.54
Surgery center	42	10.77
Predelivery	29	7.44
ICU	25	6.41
Neonatal ICU	24	6.15
Orthopedics	25	6.41
Obstetrics	24	6.15
Risk rating	8	2.05
UCINCA	4	1.03
UCINCO	4	1.03
CME	4	1.03
Urgency and emergency	3	0.77
Other	1	0.26

Source: authors' data.
ICU = Intensive care unit; UCINCA = Kangaroo Intermediate Care Unit; UCINCO = Conventional Intermediate Care Unit; CME = Material and Sterilization Center

Most participants were females (92.03%). Moreover, most participants attended both adult and child patients (50.52%), had between 1-2 years of experience (37.02%), and stayed longer in the surgical clinic (28.97%). The overall SAQ scores of the five hospitals were lower than the cutoff, as most domain scores were also less than 75.0 (Table 2). Delta Hospital had the lowest score, and Beta Hospital had the highest score, although below the cutoff. The job satisfaction domain was the only one to achieve scores above 75.0 in all hospitals. Cronbach's alpha revealed weaknesses and strengths among institutions.

Table 2. Distribution of scores by domains of the Safety Attitudes Questionnaire – Short Form for the Alpha, Beta, Delta, Gamma, and Zeta hospitals, Maranhão, Brazil, 2019

Domains	Alpha Hospital		Beta Hospital		Delta Hospital		Gamma Hospital		Zeta Hospital	
	Score	α	Score	α	Score	α	Score	α	Score	α
D1	68.1	0.468	76.6	0.380	73.5	0.342	62.5	0.677	69.4	0.475
D2	58.6	0.483	68.3	0.455	60.5	0.514	62.2	0.496	58.9	0.456
D3	80.1	0.808	90.4	0.636	81.6	0.670	81.7	0.409	80.6	0.720
D4	71.2	0.767	70.1	0.743	69.4	0.272	46.4	0.816	66.5	0.638
D5	58.4	0.508	71.6	0.716	52.9	0.700	56.8	0.687	54.9	0.700
D6	56.6	0.408	65.1	0.679	56.2	0.667	55.4	0.694	53.0	0.669
D7	62.7	0.410	75.9	0.597	53.6	0.706	56.8	0.701	54.5	0.776
D8	77.4	0.636	84.2	0.634	72.1	0.703	75.0	0.752	64.9	0.740
Item 36	35.6	-	42.9	-	40.7	-	74.2	-	69.0	-
Overall score	63.4	-	71.6	-	62.3	-	63.4	-	63.5	-

Source: authors' data.
D1 = teamwork climate; D2= safety climate; D3 = job satisfaction; D4= stress recognition; D5 = perception of unit management; D6 = perception of hospital management; D7 = working conditions; D8 = safe behavior; α = Cronbach's alpha.

Table 3. Score of the domains according to the professional category of the participants from the Alpha, Beta, Delta, Gamma, and Zeta hospitals, Maranhão, Brazil, 2019

Domains	Alpha Hospital			Beta Hospital			Delta Hospital			Gamma Hospital			Zeta Hospital		
	N	A/T	p	N	A/T	p	N	A/T	p	N	A/T	p	N	A/T	p
D1	70.8	66.7	0.439	68.2	78.8	0.000	70.2	74.9	0.199	68.5	59.5	0.629	67.7	70.2	0.605
D2	57.6	59.1	0.787	62.6	69.9	0.019	59.1	61.1	0.535	69.1	58.8	0.878	56.9	59.9	0.415
D3	79.1	80.5	0.665	84.2	92.1	0.006	75.0	84.2	0.033	84.1	80.4	0.000	77.6	82.1	0.506
D4	86.4	63.7	0.005	82.7	66.7	0.002	79.4	65.3	0.015	48.3	45.4	0.220	71.8	63.8	0.130
D5	60.3	57.4	0.394	67.9	72.6	0.385	54.6	52.3	0.774	58.3	56.1	0.160	53.4	55.8	0.569
D6	58.6	55.5	0.284	59.5	66.6	0.086	52.3	57.9	0.309	56.1	55.1	0.001	53.6	52.7	0.776
D7	58.3	64.8	0.404	68.7	77.9	0.035	51.3	54.5	0.629	64.4	53.0	0.282	57.9	52.6	0.628
D8	77.9	77.1	0.800	81.7	84.9	0.079	70.8	72.6	0.784	76.5	74.2	0.105	65.9	64.4	0.958
Item 36	30.8	38.3	0.395	35.9	44.8	0.285	40.6	40.7	0.984	77.3	72.7	0.001	72.8	67.1	0.546
Overall score	64.4	62.9	0.564	68.1	72.8	0.059	61.5	62.7	0.766	66.9	61.7	0.248	64.2	63.2	0.864

Source: authors' data.
D1 = teamwork climate; D2= safety climate; D3 = job satisfaction; D4= stress recognition; D5 = perception of unit management; D6 = perception of hospital management; D7 = working conditions; D8 = safe behavior; N = Nurse; A/T = Nursing Assistant and Nursing Technician; p = p-value (with significance assumed at $P < 0.05$).

The analysis of the domains per professional category revealed that the higher-education participants assessed the safety climate more accurately than the technical-level participants (Table 3).

DISCUSSION

In our analysis of the patient safety climate in public hospitals, we observed that the profile of our sample reflects the profile of nursing in Brazil, in which nursing professionals represent about 50% of all health workers, of which 85.1% are females and 75.8% are nursing assistants and nursing technicians (COFEN, 2018). The strong female presence in nursing derives from the construction of sexual roles that guide professional choices, influenced by a set of values since childhood that culminates in the predominance of females in this area (Toso *et al*., 2016). However, a recent study characterized the profile of nursing professionals in Brazil and detected a certain masculinization of the profession (COFEN, 2015). We found that the study participants believed that patient safety climate is below the cutoff. Previous studies using a similar approach and class of professionals conducted in Brazil have found similar results (Pavan *et al*., 2019; Silva *et al*., 2019; Alves *et al*., 2019; Magalhães *et al*., 2019; Carvalho *et al*., 2019; Santos *et al*., 2019). These observations highlight the need for Brazilian healthcare institutions to invest in strategies that improve patient safety rates and, consequently, the quality of their service. Among the domains with relevant Cronbach's alpha, we draw attention to job satisfaction, with a score higher than 75.0 in all hospitals and statistical significance for Alpha and Zeta hospitals. This finding is positive for these institutions, as it indicates quality and is related to several factors that culminate in the adoption of safer trends in healthcare provision (Pavan *et al*., 2019; Silva *et al*., 2019; Morais *et al*., 2016). The stress recognition domain (indicative of how much stressors can influence work performance) scored below 75.0 in all hospitals but relevance only in Alpha, Beta, and Gamma hospitals. Several studies have reported the harms of stress for health services and its prevalence among nursing professionals, given its relationship with high working demand, inadequate staffing, unhealthy working conditions, and poor human resource improvement. All these factors culminate in the occurrence of errors and poor health care (Rodrigues *et al*., 2017; Munhoz *et al*., 2018; Ribeiro *et al*., 2019). Nurses recognize stress better than nursing assistants and nursing technicians. This difference is related to the peculiarities of the education of each profession, as higher-education professionals (nurses) critically analyze their practice and work more often than technical-level professionals (Tondo *et al*., 2017; Gasparino *et al*., 2017). The perception of management domain is divided into the perception of unit management and perception of hospital management, and they often score the lowest in safety climate surveys (Silva *et al*., 2019; Pavan *et al*., 2019; Barradas *et al*., 2019). The same occurred in this study, with relevant Cronbach's alpha for the Beta, Delta, and Zeta hospitals. This suggests the existence of a nonconformity consensus among nursing professionals concerning the patient safety attitudes and actions adopted by the management, making them barely noticeable (Pavan *et al*., 2019; Barradas *et al*., 2019). This scenario occurs in health institutions where a vertical hierarchy prevails, thus weakening the healthy working relationships necessary to create a safe environment (Silva *et al*., 2019).

For the domain of working conditions, only the Beta Hospital scored above the cutoff; all other hospitals had assessments indicating weaknesses. This finding puts these hospitals on alert, as low scores for working conditions represent less adherence to safety protocols and greater risk of illness for professionals due to the persistent lack of resources and exhaustive workload (Nobre *et al*., 2019; Baldonedo-Mosteiro *et al*., 2019; Lim *et al*., 2019; Zhang *et al*., 2019; Sturm *et al*., 2019; Vaismoradi *et al*., 2020). The Cronbach's alpha identified that the municipal hospitals (Delta, Gamma, and Zeta hospitals) have more precarious working conditions. Some studies performed in Brazil suggest that the authority responsible for the management of the health institution influences the analysis of the safety climate (Carvalho *et al*., 2017; Andrade *et al*., 2018). In this sense, administrative failures need to be identified so that the quality of the service is not impaired. In this sense, managers need to make competent decisions that influence the quality of the service; they also need to reassess the conditions that limit or compromise the care of professionals. The low scores for the safe behavior domain and item 36 reveal little institutional commitment to improving interpersonal relationships and communication (Gasparino *et al*., 2017; Nazário and Gasparino, 2016). A good relationship among health personnel is fundamental for safety, as it reduces the chance of errors with the patient who is continuously cared for within a multidisciplinary dynamic (Gasparino *et al*., 2017; Tondo *et al*., 2017; Nazário and Gasparino, 2016).

We found statistically significant differences between the professional classes. In general, higher-education professionals critically assess the safety climate more accurately than technical-level professionals (Tondo *et al*., 2017; Carvalho *et al*., 2017). Although the level of education contributes to this result, some studies have shown that technical-level professionals feel the working conditions more intensely and often face devaluation from their co-workers. These characteristics lead to internal conflicts that may affect their job satisfaction and the way they are perceived (Scherer *et al*., 2016; Souza *et al*., 2016). Applying the SAQ from the perspective of nursing professionals, we identified an overall score below 75.0 in public hospitals, a finding that, according to the instrument, reflects insufficiency for a satisfactory patient safety climate. With the analysis of the domains, we notice areas in the institutions that need to be strengthened, make managers aware of the uniqueness of their service, and provide a starting point for improving quality. However, for a significant change to occur in the whole system, it is necessary to consider the economic and socio-political reality of the State and the maturation of institutional culture. That said, Maranhão needs to value patient safety more, as it plays an important role for the health of a poor population that has a high rate of morbidity and mortality, but that counts on precarious health institutions and overwhelmed professionals who perform their duties in conditions that facilitate their physical and mental illness. One limitation of our study is that, as it is a pilot study that used only the SAQ as a data collection instrument, we lack local comparisons to strengthen our discussion. Another limitation is that the high workload of the participants made it difficult for them to attend the qualifications. Finally, we recognize that our sample is far from being representative of Maranhão, but we highlight that our study should be seen as a starting point for future research that seeks to better understand the reality of the state.

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