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Assessment of patient safety from their perspective during the COVID-19 pandemic

Avaliação da segurança do paciente sob sua perspectiva na pandemia de COVID-19
Evaluación de la seguridad del paciente desde su perspectiva en la pandemia de COVID-19

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ABSTRACT

Objective: to assess patient safety, from their own perspective, during hospitalization for COVID-19 in a university hospital.
Method: cross-sectional study conducted in a university hospital in São Paulo, Brazil, involving patients hospitalized due to COVID-19. The sample included 129 participants hospitalized between March 2020 and June 2021 who responded to the Patient Measure of Safety instrument. Descriptive statistics and correlation tests were used to analyze sociodemographic factors, comorbidities, and symptomatology related to the total score and each domain of the instrument.
Results: the majority of participants were male (50.8%), aged 56 years or younger (51.9%), and white (43.8%). The overall mean score of Patient Measure of Safety was 3.8±0,4, with variations between 3.0±0,4, in the "equipment" domain, to 4.1±0,5, in the "communication and teamwork" domain. There were no statistically significant differences among sociodemographic variables and comorbidities regarding safety perception. Statistical significance results were observed among those with specific symptoms such as cough (p=0.018), nausea and vomiting (p=0.020) and diarrhea (p=0.013) reflecting less favorable perception of safety.
Conclusion: participants assessed the safety of care with the highest score in the "communication and teamwork" domain.
Descriptors: Patient Safety. Patient Participation. COVID-19. Patient-Centered Care.

RESUMO

Objetivo: avaliar a segurança do paciente, sob sua perspectiva, durante a internação por COVID-19 em um hospital universitário.
Método: estudo transversal, realizado em um hospital universitário, na cidade de São Paulo, com pacientes internados devido à COVID-19. A amostra incluiu 129 participantes, internados entre março de 2020 e junho de 2021, que responderam ao instrumento *Patient Measure of Safety*. Foram aplicados estatísticas descritivas e testes de correlação para verificar fatores sociodemográficos, comorbidades e sintomatologias relacionados ao escore total e a cada domínio do instrumento.
Resultados: a maioria era do sexo masculino (50,8%), tinha idade igual ou inferior a 56 anos (51,9%) e era branca (43,8%). O valor médio geral do *Patient Measure of Safety* foi de 3,8±0,4, com variações entre 3,0±0,4, no domínio "equipamento", e 4,1±0,5 no domínio "comunicação e trabalho em equipe". Não foram encontradas diferenças estatisticamente significativas entre as variáveis sociodemográficas e comorbidades em relação à percepção de segurança. Houve significância estatística na percepção em pacientes que apresentaram sintomas específicos como tosse (p=0,018), náuseas e vômito (p=0,020) e diarreia (p=0,013) refletindo percepção menos favorável de segurança.
Conclusão: os participantes avaliaram a segurança do cuidado com pontuação mais alta o domínio "comunicação e trabalho em equipe".
Descritores: Segurança do Paciente. Participação do Paciente. COVID-19. Assistência Centrada no Paciente.

RESUMEN

Objetivo: evaluar la seguridad del paciente, desde su propia perspectiva, durante la hospitalización por COVID-19 en un hospital universitario.
Método: estudio transversal, realizado en un hospital universitario en São Paulo, Brasil, con pacientes hospitalizados por COVID-19. La muestra incluyó a 129 participantes hospitalizados entre marzo de 2020 y junio de 2021 quienes respondieron al instrumento *Patient Measure of Safety*. Se utilizaron estadísticas descriptivas y testes de correlación para analizar los factores sociodemográficos, comorbilidades y sintomatología en relación con la puntuación total y de cada dominio del instrumento.
Resultados: la mayoría de los participantes eran hombres (50,8%), tenían 56 años o menos (51,9%) y eran de raza blanca (43,8%). La puntuación media global del *Patient Measure of Safety* fue de 3,8±0,4, con variaciones desde 3,0±0,4, en el dominio "equipamiento", hasta 4,1±0,5 en el dominio "comunicación y trabajo en equipo". No se encontraron diferencias estadísticamente significativas entre las variables sociodemográficas y las comorbilidades en relación con la percepción de seguridad. Se encontró significancia estadística entre aquellos con síntomas específicos como tos (p=0,018), náuseas y vómitos (p=0,020) y diarrea (p=0,013) lo que refleja una percepción menos favorable de la seguridad.
Conclusión: los participantes evaluaron la seguridad de la atención con la puntuación más alta en el dominio "comunicación y trabajo en equipo".
Descriptores: Seguridad del Paciente. Participación del Paciente. COVID-19. Atención Dirigida al Paciente.

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INTRODUCTION

Patient safety, despite having received attention from health managers and service providers for at least two decades, is currently a serious public health issue, according to alarming estimates released by the World Health Organization (WHO) regarding the occurrence of preventable harm associated with health care in high-income and least developed countries[1]. In its Global Action Plan for the current decade, until 2030, the WHO expands the concept of patient safety and challenges everyone to think about a structure of organized activities that creates cultures, processes, procedures, behaviors, technologies and environments in healthcare that reduce risks in a consistent and sustainable way, reducing the occurrence of preventable harm, making errors less likely and reducing the impact of harm when it occurs[1].

Among the strategic objectives proposed by the WHO, the focus is on the importance of involving and empowering patients and their families to participate in safer care, challenging everyone to learn from this experience to create more effective solutions in search of the necessary improvements in healthcare[1]. The participation of patients and their families in the assessment of the safety of healthcare services is essential to improve them, showing the importance of treating patients with dignity, compassion and respect, coordinating personalized care and enabling patients to develop their skills for independent assessment of their care, prioritizing the safety in the service[2].

Providing a positive experience for the patient, by associating safety practices and quality of care, includes physical, mental, spiritual and cultural aspects. Holistic care, clear and objective communication, shared decision-making regarding treatment and empathy are part of patient-centered care. Individual experience is associated with how patients perceive the individualization of their care, the quality of service provision and their safety within all care settings[2,3].

Patients' reports on their safety offer a valuable perspective for services, as they recognize situations of potential risk to which they are exposed[4]. In the context of the COVID-19 pandemic, new risks to care were observed, and other types of adverse events were reported, with significant implications for patient safety, due to the review of work processes, due to the severity of symptoms, presence of comorbidities, clinical instability, high mortality rates, scarcity of material and structural resources and work overload[5,6].

Regarding patients' perception of the care provided, a U.S. study showed that patients diagnosed with COVID-19 expressed more gratitude, when compared to patients with other diagnoses, associated with qualified care and the punctuality of the health team in meeting their demands, as they felt heard[7]. In this perspective, an English study concluded that, despite the adversities generated by the pandemic, patients felt safe, due to the sharing of information about their treatment, the guarantee of privacy, and attention to physical complaints[8].

Although the changes in care and environments that occurred in healthcare institutions due to the pandemic were necessary, they brought the challenge of understanding the patient's experience regarding this new type of care and, thus, adapting the service and seeking quality, safety, and satisfaction[2]. Patients' experience and knowledge about their care play a fundamental role in improving their safety, as they are stakeholders within the healthcare system[9].

In Brazil, the pandemic brought several challenges to healthcare services, but it also provided learning, significant achievements related to advances in science, research, and the adoption of innovative technologies that can generate new strategies for improving care and positively impact patient safety[10].

Considering that the patients' perspective is important and necessary to advance their involvement in the safety of the care process, as another safety barrier[4] the following research question is presented: how do patients hospitalized for COVID-19 assess the safety of care in a university hospital? This study aims to assess patient safety, from their perspective, during hospitalization for COVID-19 in a university hospital.

METHOD

Cross-sectional study, of the survey type, structured and reported according to the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

It was conducted at the *Hospital São Paulo - Hospital Universitário da Universidade Federal de São Paulo* (HU-UNIFESP) - in the COVID-19 Treatment Unit. This is a large, highly complex general hospital, predominantly serving the Unified Health System (*Sistema* Único *de Saúde* - SUS). It is a reference UH that provides healthcare services in emergency, inpatient, and outpatient care. In 2020/2021, the hospital had 745 beds and 110 adult Intensive Care Unit (ICU) beds, 73 of which were exclusive for COVID-19. After discharge from the ICU, patients were admitted to units designated for the hospitalization of adult patients until their discharge from the institution, with care exclusively provided to SUS patients.

The institution provided four lists containing the name, date of admission and discharge, and phone numbers of patients from March 2020 to June 2021, and data collection was linked to patient discharge, regardless of when it

occurred. The population considered for the study included the 1,139 patients discharged from the hospital inpatient units for COVID-19 during the study period.

The sample size was calculated to estimate an average, based on the absolute margin of error, using the WinPepi software, version 11.65. A 95% confidence level, a margin of error of 0.3 points, and a standard deviation (SD) of 1.28 were considered[11], defining the sample size of 136 patients.

The inclusion criteria were being over 18 years old, having a good understanding of Brazilian Portuguese, and a minimum hospital stay of 72 hours, to allow the patient to understand the dynamics of the institution and consequently respond to the questionnaire items. The exclusion criteria were being a patient with advanced disease or using sedation, having neurological or psychiatric alterations, and being debilitated or distressed, that is, having difficulty in discussing the topic.

The instrument used for data collection was divided into two parts. The first aimed to characterize the participants with the following exploratory variables: age; sex; ethnicity; education; family income; number of household members; smoking; length of hospital stay; length of ICU stay; use of mechanical ventilation; associated comorbidities; and symptoms presented during hospitalization. The second contained the Patient Measure of Safety (PMOS) questionnaire[12], developed by researchers from the Yorkshire Quality and Safety Research Group (YQSR Group) in England in 2011 and validated for Brazilian Portuguese[13]. The instrument allows an assessment of local and organizational factors that may contribute to patient safety.

The questionnaire contains 44 questions, distributed in nine domains, namely: 1: communication and teamwork (9 items); 2: organization and care planning (5 items); 3: access to resources (4 items); 4: type and layout of the ward (11 items); 5: information flow (3 items); 6: team roles and responsibilities (4 items); 7: team training (2 items); 8: equipment (design and operation) (2 items); and 9: delays (2 items). Item 1 (I have always been treated with dignity and respect) is not included in any of the domains, and item 25 (Others - please specify), although included in domain 4, "type and layout of the ward", is not counted in the total of items for this domain[13].

The responses used the Likert scale, which assesses the respondent's level of agreement with each question item on a scale of one to five, with 1 being "strongly disagree", 2, "disagree", 3, "neither agree nor disagree", 4, "agree", and 5, "strongly agree", with the option of "not applicable" (NA) and "prefer not to answer"[11-13].

The approach to the selected patients followed a script for remote surveys conducted by telephone along with the application of the instrument, recommended in the Data Collection Manual for Application of the Patient Measure of Safety (PMOS)[14]. The phone call was made from the educational institution linked to the university hospital and recorded in audio, with the support of a smartphone, and the recording was later sent to the research email (projetoCOVID19ufsc@gmail.com) and stored on its drive. A maximum of three contact attempts were made with all patients on the list.

The data collected for the analysis were tabulated in a Microsoft Office Excel® spreadsheet and checked by another researcher to confirm the correct insertion of the information and were later analyzed using the Statistical Package for the Social Sciences (SPSS®), software, version 25. Descriptive statistics analysis was performed, using measures of mean and standard deviation, median and interquartile range, in addition to the minimum and maximum of the PMOS scores, as well as relative and absolute frequencies of the exploratory variables that were analyzed as categorical.

The results considered the score of each domain of the questionnaire, obtained by calculating the mean of the responses of all items of the domain, with values between 1 and 5. High scores indicate a more positive response. They were coded as "missing data" when the scores were unavailable for at least two items within a domain. In the reverse questions, that is, for those in which the participant disagreed with the negatively worded item, but expressed their opinion positively, the calculation was performed with values ranging from 5 to 1[11,13].

The Shapiro-Wilk test was used to test the normality of continuous variables. Parametric and non-parametric tests were applied, such as Pearson's correlation (used to verify the correlation of PMOS data with continuous variables), Analysis of Variance (ANOVA) (for data with normal distribution in more than two groups) and Mann-Whitney and Kruskal-Wallis (used for non-normal data in two or more groups). When significant, the Tukey post-hoc test was used. In all tests, a value of $p \leq 0.05$ was considered statistically significant.

The research was approved by the Research Ethics Committee of UNIFESP, according to Opinion No. 4,381,848 and Certificate of Presentation for Ethical Review No. 38912820,3,2003,5505 and complied with the recommendations of Resolutions No. 466/2012 and No. 510/2016 of the National Health Council. Participants were informed about the objectives and methods of the research and as well as the confidentiality of the collected data, upon their agreement on the Informed Consent Form. To preserve the participant anonymity, the recorded responses were identified by the word "Questionnaire", followed by an Arabic numeral, in ascending order.

RESULTS

From the 1,139 patients, 627 were considered losses for the following reasons: phone number did not correspond to the patient (n=48); patient refused to participate (103); three unsuccessful attempts to contact the patient (n=466); withdrawals from participation (n=10). Thus, there were 512 patients. Once contacted, 376 did not meet the inclusion criteria. Exclusions were due to the patient being under 18 years old (n=28); having been hospitalized for less than 72 hours (n=183); patient death after discharge (n=55); patient not having COVID-19 (n=32); others related to the patient's conditions to participate (n=78). However, 129 patients formed the final sample, as seven interviews did not have responses to the items according to the requirements for PMOS analysis.

The participants were predominantly male (50.8%), aged 56 years or younger (51.9%), white (43.8%), with completed high school (38.7%), with a family income of up to R$2,090 (40.2%), whose household had three people (33.3%) and were non-smokers (59.7%). Regarding the variables of hospitalization due to COVID-19, it was observed that most patients were hospitalized for up to 14 days (55%), required ICU admission (51.2%) and did not use invasive mechanical ventilation (76.7%) (Table 1).

Considering the comorbidities and symptoms of COVID-19 among those affected by the disease, high blood pressure (59.7%), followed by diabetes mellitus (37.5%), were the most frequent comorbidities. Among the symptoms, the most notable were fatigue (74.4%), shortness of breath (72.9%), body pain (67.4%) and fever (61.2) (Table 2).

Table 1- Sociodemographic and clinical characteristics of participants (n=129). São Paulo, São Paulo, Brazil, 2023

Variables	n	%
Sex		
Male	65	50.8
Female	63	49.2
Age		
<=56	67	51.9
>56	62	48.1
Ethnicity		
White	56	43.8
Black	19	14.8
Brown	49	38.3
Indigenous	2	1.6
Asian	2	1.6
Education level		
Illiterate and incomplete elementary school	33	25.6
Complete elementary school	22	17
Complete high school	50	38.7
Complete higher education	24	18.7
Family income		
Up to 2,090 BRL	57	50.9
2,091 BRL to 5,225 BRL	29	25.9
More than 5,226 BRL	26	23.2
Number of residents (n=126)		
1	12	9.5
2	40	31.7
3	42	33.3
4 or more	32	25.4

Table 1- Cont.

Variables	n	%
Smoking Status		
Non-smoker	77	59.7
Smoker	9	7
Former smoker	43	33.3
Days hospitalized		
<=14 days	71	55
>14 days	58	45
Admitted to ICU *		
No	63	48.8
Yes	66	51.2
Use of invasive mechanical ventilation		
No	99	76.7
Yes	30	23.3

Source: research data.
Caption: *ICU = Intensive Care Unit.

Table 2 - Characterization of comorbidities and symptoms of participants (n=129). São Paulo, São Paulo, Brazil, 2023

Variables	Yes		No	
	n	%	n	%
Comorbidities				
Chronic respiratory disease	18	14	111	86
Systemic arterial hypertension	77	59.7	52	40.3
Cardiovascular diseases	26	20.2	103	79.8
Diabetes *mellitus*	48	37.5	80	62.5
Kidney diseases	34	26.4	95	73.6
Obesity	30	23.3	99	76.7
Cancer	10	7.8	119	92.2
Symptomatology				
Fever	79	61.2	50	38.8
Fatigue	96	74.4	33	25.6
Shortness of breath	94	72.9	35	27.1
Cough	69	53.5	60	46.5
Loss of smell and taste	63	48.8	66	51.2
Headache	60	46.5	69	53.5
Body pain (muscles and joints)	87	67.4	42	32.6
Nausea and vomiting	36	28.1	92	71.9
Diarrhea	49	38.3	79	61.7

Source: research data.

The mean PMOS score ranged from 3.0 to 4.1 across different domains, with an overall mean value of 3.8 (SD=0.4), with medians (P50) between 3.0 and 4.0 across domains. It was observed that the participants assessed domains 1, "communication and teamwork", and 4, "type and layout of the ward", more favorably, while domain 8, "equipment (design and operation)", was evaluated less favorably (Table 3).

Table 4 presents the correlation between mean PMOS scores and the participants' sociodemographic and clinical variables, and no statistically significant differences were found between them. It was observed that females, people aged >56, black ethnicity, having completed high school, income above 2,091 BRL, living with three people in the household, smokers, hospitalized for less than 14 days and who did not use invasive mechanical ventilation presented slightly more favorable averages to the mean score of the PMOS domains.

Table 5 presents the correlation between mean PMOS scores and the comorbidity and symptomatology variables of the participants. Those who reported having had cough, nausea and vomiting and diarrhea had less favorable scores compared to those who did not, with a statistically significant difference (p=0.018; p=0.020; p=0.013 respectively).

Table 3 - Patient Measure of Safety results by domains and overall (n=129). São Paulo, São Paulo, Brazil, 2023

Domains	Mean (SD*)	P50† [P25;P75]	Min-Max‡
1. Communication and teamwork	4.1 (0.5)	4.0 [3.9; 4.2]	2 – 5
2. Organization and care planning	3.9 (0.5)	4.0 [3.6; 4.2]	2 - 5
3. Access to resources	3.9 (0.5)	4.0 [3.5; 4.0]	2 - 5
4. Type and layout of the ward	4.0 (0.4)	4.0 [3.8; 4.1]	2 - 5
5. Information flow	3.6 (0.7)	3.7 [3.3; 4.0]	1 - 5
6. Team roles and responsibilities	3.7 (0.8)	4.0 [3.0; 4.0]	2 - 5
7. Team training	3.8 (0.9)	4.0 [4.0; 4.0]	2 - 5
8. Equipment (design and operation)	3.0 (0.4)	3.0 [3.0; 3.0]	1 - 5
9. Delays	3.8 (0.7)	4.0 [3.5; 4.0]	2 - 5
Total	3.8 (0.4)	3.8 [3.6; 3.9]	3 - 5

Source: research data.
Legend: *SD = standard deviation; †P = Percentile; ‡min-max = minimum score and maximum score

Table 4 – Correlation of mean scores of the Patient Measure of Safety with sociodemographic and clinical variables (n=129). São Paulo, São Paulo, Brazil, 2023

Variables	Patient Measure of Safety		
	n	Mean Score (SD*)	*p*-value
Sex			
Female	65	3.81 (0.38)	0.103†
Male	63	3.71 (0.34)	
Age			
≤56 years	67	3.75 (0.31)	0.844‡
>56 years	62	3.77 (0.42)	

Table 4 – Cont.

Variables	Patient Measure of Safety		
	n	Mean Score (SD*)	*p*-value
Ethnicity (n=128)			
White	56	3.75 (0.35)	0.419‡
Black	19	3.85 (0.31)	
Brown	49	3.77 (0.40)	
Indigenous	2	3.37 (0.32)	
Asian	2	3.58 (0.22)	
Education level			
Illiterate and incomplete elementary school	33	3.68 (0.28)	0.263‡
Complete elementary school	22	3.70 (0.28)	
Complete high school	50	3.83 (0.42)	
Complete higher education	24	3.79 (0.41)	
Family income			
Up to 2,090 BRL	57	3.75 (0.34)	0.757‡
2,091 BRL to 5,225 BRL	29	3.80 (0.39)	
More than 5,226 BRL	26	3.80 (0.37)	
Number of residents			
1	12	3.77 (0.45)	0.343‡
2	40	3.69 (0.35)	
3	42	3.83 (0.31)	
4 or more	32	3.73 (0.42)	
Smoking Status			
Non-smoker	77	3.74 (0.30)	0.462‡
Smoker	9	3.90 (0.42)	
Former smoker	43	3.75 (0.45)	
Days hospitalized			
≤14 days	71	3.77 (0.34)	0.652‡
>14 days	58	3.74 (0.40)	
Admitted to ICU§			
No	63	3.76 (0.34)	0.940‡
Yes	66	3.76 (0.39)	
Use of invasive mechanical ventilation			
No	99	3.78 (0.34)	0.166†
Yes	30	3.68 (0.43)	

Source: research data.
Legend: *SD = standard deviation; †t-test for independent samples. ‡Analysis of Variance (ANOVA); §ICU = Intensive Care Unit.

Table 5 – Correlation of the mean Patient Measure of Safety scores with comorbidity and symptomatology variables (n=129). São Paulo, São Paulo, Brazil, 2023

Comorbidities and Symptomatology	Patient Measure of Safety		
	n	Mean score (SD)	*p*-value†
Chronic respiratory disease			
No	111	3.74 (0.37)	0.283
Yes	18	3.84 (0.36)	
Systemic arterial hypertension			
No	52	3.77 (0.36)	0.775
Yes	77	3.75 (0.37)	
Cardiovascular diseases			
No	103	3.77 (0.37)	0.688
Yes	26	3.73 (0.33)	
Diabetes *mellitus*			
No	80	3.78 (0.38)	0.500
Yes	48	3.74 (0.33)	
Kidney diseases			
No	95	3.75 (0.38)	0.621
Yes	34	3.79 (0.32)	
Obesity			
No	99	3.78 (0.35)	0.175
Yes	30	3.68 (0.40)	
Cancer			
No	119	3.74 (0.35)	0.079
Yes	10	3.95 (0.48)	
Fever			
No	50	3.76 (0.42)	0.954
Yes	79	3.76 (0.32)	
Fatigue			
No	33	3.78 (0.39)	0.733
Yes	96	3.75 (0.36)	
Shortness of breath			
No	35	3.84 (0.41)	0.122
Yes	94	3.73 (0.35)	
Cough			
No	60	3.84 (0.37)	**0.018**
Yes	69	3.69 (0.35)	
Loss of smell and taste			
No	66	3.78 (0.35)	0.471
Yes	63	3.73 (0.38)	
Headache			
No	69	3.79 (0.36)	0.286
Yes	60	3.72 (0.37)	

Table 5 – Cont.

Comorbidities and Symptomatology	Patient Measure of Safety		
	n	Mean score (SD)	*p*-value†
Body pain (muscles and joints)			
No	42	3.82 (0.43)	0.175
Yes	87	3.73 (0.33)	
Nausea and vomiting			
No	92	3.81 (0.34)	**0.020**
Yes	36	3.64 (0.41)	
Diarrhea			
No	79	3.82 (0.36)	**0.013**
Yes	49	3.66 (0.35)	

Source: research data.
Legend: *SD = standard deviation; †t-test for independent samples.

DISCUSSION

This study presents the patient's assessment of the factors that contribute to their safety during their hospitalization for COVID-19 in a university hospital, obtaining an overall mean score of 3.8 through the application of the PMOS instrument. It is noteworthy that no studies were found that demonstrate the application of the PMOS in the Brazilian context, except for the one that led to the validation of the instrument, which demonstrated a similar overall mean[13]. However, the PMOS is internationally recognized as a valuable instrument for involving the patient in assessing the safety of the care received[15].

In the international scenario, studies that assessed patient perception of their safety did not mention the clinical motivation for hospitalization, for purposes of comparing the findings of this study, considering the pandemic period. However, an Australian study demonstrated a mean in the domains ranging from 3.89 to 4.44[16], higher than that found in this study. In contrast, an Italian study indicated means between 2.83 and 3.87[17] lower than the mean variation of the domains found in this study (3.0 a 4.1).

Regarding sociodemographic characteristics, the results obtained are similar to national and international studies conducted at the beginning of hospitalizations of confirmed cases of the disease[3,18,19]. However, it is important to emphasize the significance of access to health care for individuals in need of assistance, regardless of their ethnicity, financial condition, education, or other characteristics, as a crucial issue for health equity[19].

The challenge of collecting data by phone at a period of social isolation imposed by COVID-19 is also highlighted. To ensure a safe, ethical and high-quality process, it was necessary to think of a delicate and appropriate approach, with specific training, considering the possible physical and psychological suffering of people, to conduct a research with the individual who was hospitalized to respond to a lengthy instrument and with different technological devices[20].

A Spanish study with primary care patients assessed the impact of changes in patient safety during the pandemic, using the Patient Reported Experiences and Outcomes of Safety in Primary Care (PREOS-PC) and concluded that there was a decrease in the perceived safety among the patients. This reduction was reflected in an increase in the perception of safety problems, especially in greater harm caused by health care provided and/or omitted in health centers[21].

The domains that were most favorably evaluated were 1, "communication and teamwork", and 4, "type and layout of the ward", with results similar to the findings in the literature[13,16,17].

Communication involves the exchange of information and involves one or more transmitters and one or more recipients who receive, interpret, and send messages, and is important for communication between people, for teamwork in organizations and for society itself. During the COVID-19 pandemic, a lot of conflicting information and fake news were spread, increasing the stress factors caused by the public health crisis triggered by the pandemic, both for patients and professionals. Institutions experienced changes in their communication processes and these were adapted on an emergency basis to ensure effective work[22]. Some implemented digital tools, more humanized communication, uniformity of what was to be reported and the introduction of technologies, to adapt the process of care during the

isolation of patients who were concerned about their physical and emotional health[23].

In the research, there was no statistically significant difference in the sociodemographic characteristics of the participants and the domain that assesses communication and teamwork, inferring that the care team can build an adequate dialogue with all those in need of assistance. In this sense, a study indicates that working in a uniform manner to provide information about the pathology and treatment, clarify doubts, ensure cohesion in actions and provide assertive information contributing to recovery and discharge[21].

Domain 4, "type and layout of the ward," did not show any significant difference in the characteristics of the participants who gave a more favorable assessment. The structure and physical layout play an important role in the perception of patient safety. As a result of the pandemic, many structural aspects in institutions, including this research site, had to be modified to ensure safe care for patients (which required isolation), their families (with changes in the format of visits), and professionals (training in the sector and changes in work routines)[4,23]. A study that identifies initiatives related to patient-centered care highlights the importance of evaluating the infrastructure conditions and physical environment of inpatient units, with the aim of promoting diversity and inclusion, to obtain a positive patient experience and greater safety for professionals to provide their care, avoiding incidents during care[24].

Domain 8, "equipment (design and operation)," received the least favorable assessment in relation to the others, unlike what is found in the literature[13]. This domain represents the availability of materials for care and the ability of the team to use them. Several issues can contribute to this performance, and one of them is the knowledge that professionals have about the technologies and instruments available for use. Lack of knowledge about the use of devices, inappropriate use, device failures, lack of standardization of use processes, lack of proper training, and the increasing complexity of equipment influence the quality of care provided, constituting critical situations that were experienced by professionals during the pandemic. To improve patient safety, it is important to invest in proper design, preventive maintenance, standardization, training, and collaborative approaches that involve healthcare professionals, managers, and equipment suppliers[25].

Another domain that presented a less favorable perception was domain 5, "information flow". Unlike domain 1, which deals with communication with the patient, this is on the flow of information passed to another shift or to other professionals and its availability in a safe and appropriate manner. This result is similar to that found in the study validating the instrument for the Brazilian context[13], but differs from an Italian study in which this domain had the highest average score[17]. In situations of health emergencies, the importance of effective communication and the sharing of accurate information between the healthcare team and the patient is emphasized, with the transmission of accurate data and relevant clinical observations[8]. To improve the information flow, communication, optimization of resources and reduction of risks related to multidisciplinary care, a study suggests the Safety Huddle methodology, that is, a safety meeting, which increases safety awareness at the operational level and helps the institution to develop a culture of safety, an aspect that can be implemented at the research setting[26].

The participants assessed domains 2, "organization and planning of care", and 3, "access to resources", with equivalent ratings, meaning that the scores were close to the most favorable ones in this study. In many cases, patients knew who to approach with information about changes in treatment and care, with medications and professionals available. Studies show the complex and sometimes desperate situations experienced by healthcare professionals, including lack of material and physical resources and work overload[5,9]. The institution in question prioritized care for patients confirmed or suspected of having COVID-19, directing material resources, emergency hiring of professionals and providing continuous training for team adaptation. The Federal Nursing Council created a booklet of general recommendations for organizing health services and preparing nursing teams, due to the complexity of the situation[27].

Domains 7, "team training", and 8, "delays", also had similar perceptions, although slightly less favorable, compared to the previously mentioned. These domains deal with knowledge about the use of equipment or the performance of procedures and delays in patient care. Initially, the disease caused by COVID-19 raised many doubts regarding the best clinical and therapeutic procedures considering the complexity and severity of the patient, indicating changes in interventions and the use of new equipment[6,25]. A study points to the concern of patients regarding their safety, especially regarding the competence or knowledge of professionals, the need for adequate communication, coordination of care and fears regarding potential treatment errors[28]. In this study, most patients were admitted to the ICU, requiring specific interventions if their clinical condition worsened. The institution, a teaching hospital, training site for nursing and medical schools, played an important role in the development of new knowledge and training of professionals to deal with COVID-19.

In domain 6, "team roles and responsibilities", participants had a less favorable assessment, compromised by the lack of knowledge regarding the roles of the staff, who

as responsible for the teams or for their care. Such aspects can hinder the patient's participation in their own safety, as they are unable to identify the group of professionals who were responsible for their care and create connection with the team[2,8]. This domain delicately emphasizes the importance of professionals introducing themselves and informing their role during the hospitalization period, even during the pandemic, establishing proper communication[28]. However, it is known about the barriers and difficulties that existed in care, including at the research site, with the need for protection of professionals, use of personal protective equipment (masks, glasses, gloves, etc.), sometimes neglecting their identification and the time allocated for this presentation[1,27].

Participants who had comorbidities, such as high blood pressure, diabetes *mellitus*, kidney disease, among others, did not present statistically significant results compared to those without comorbidities. However, those who had respiratory symptoms, such as cough, and gastrointestinal symptoms, such as nausea, vomiting, and diarrhea, had significantly lower total PMOS scores, reflecting a general perception of lower patient safety.

Cough is a common symptom in several respiratory conditions and may be associated with issues of spread of infectious diseases and worsening of clinical conditions[16]. The presence of cough may be associated with more severe cases of COVID-19, which may compromise the perception of patient safety, due to the need for more intensive and complex interventions or stricter isolation measures. Furthermore, patients with persistent cough may experience fear and anxiety about the severity of their condition, which may have affected communication with the healthcare team. Anxiety may lead to an increased perception of insecurity or concerns about the quality of care received. Similarly, diarrhea, nausea, and vomiting are symptoms present in COVID-19 and require appropriate infection control measures, such as isolation and rigorous hand and environmental hygiene[24,29]. Patients with nausea and vomiting may have difficulty eating adequately, which can affect their nutrition and recovery. The presence of these symptoms can also increase patient anxiety and stress, especially if they are worried about the severity of their condition or associated symptoms[28]. This can negatively impact their perception of safety and psychological well-being.

Thus, patients who had these symptoms felt less safe in their care. This may be related to the uncertainties inherent in the initial lack of knowledge about COVID-19 and its management by the health team[22]. Interventions aimed at improving patient safety should consider not only the technical quality of care, but also the satisfaction and well-being of patients upon their complaints[28]. The perception of safety is a multidimensional and complex aspect, influenced by several factors, including the competence and communication of the healthcare team, the presence of safety measures, and the patient's involvement in the care process[16,28,30].

Given the historical context of this research, with the COVID-19 pandemic being an evet of global public health emergency, it was important to assess patient safety from its perspective, due to the various barriers to their safety. The literature points out to physical fragilities (lack of knowledge about the disease treatment), emotional (both of healthcare professionals and patients), social (difficult access to healthcare, disease characteristics) and material fragilities that were accentuated during this period[22,29,30].

Although the results of this research point to areas of strength and weaknesses related to the safety of the care provided, it is important to consider some limitations. The generalization of the results is limited by the sampling from a single healthcare center and the data collection via telephone may have compromised the full recovery of the participants' memories, which may have generated some inaccuracies.

Despite the limitations, this study presents contributions to management and care, by raising awareness among professionals to promote an adequate care environment reflecting on the importance of patient participation. As contributions to education and research, there is a need to seek the best evidence regarding appropriate strategies that encourage patient participation and involvement in their own care and to develop professionals in this process of transformation.

CONCLUSION

This study demonstrated that, during hospitalization for COVID-19, and in view of the constant changes resulting from the health crisis experienced in a Brazilian university hospital, participants assessed the local and organizational factors involving the safety of their care based on their perceptions.

The average PMOS score reached a mean of 3.8 (±0.4) on a scale of 1 to 5. It was observed that participants assessed "communication and teamwork" and "type and layout of the ward" more favorably, while "equipment (design and operation)" and "information flow" were evaluated less favorably, indicating the importance of investing in improving the processes that involve them to ensure safety and quality in patient care.

The sociodemographic factors and comorbidities reported by patients were analyzed, and no statistically significant differences were found in relation to the total means of the domains. Patients who had respiratory symptoms, such as cough, and gastrointestinal symptoms, such as nausea,

vomiting and diarrhea, associated with the total means, had significantly lower scores, reflecting a less favorable perception of patient safety.

The perception of patient safety is a multidimensional factor and encompasses clinical, physical, emotional and cultural aspects. Therefore, approaches aimed at improving patient safety should consider the technical aspects of care and effective communication, patient involvement and the promotion of a welcoming and empathetic environment.

The results of this study emphasize the importance of patients' perception of the factors that contribute to their safety and health care during the COVID-19 pandemic in a university hospital in the city of São Paulo, as experienced and observed by hospitalized patients.

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