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Original Article

Perception of medical-surgical wards' patients from safety culture: A cross-sectional and multicenter study

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Abstract

Background and aims: Identifying the strengths and weaknesses of safety culture in hospitals can be the basis for developing plans to improve the safety status of patients. This study aimed to determine the level of patient safety culture (PSC) from their view in medical-surgical wards of five teaching hospitals in Zanjan.

Methods: This cross-sectional study was performed on 245 patients admitted to medical-surgical wards of five teaching hospitals in the Zanjan, Iran, from 2020-Agust-22 to 2020-November-21. Poisson time sampling method was used. Data collection was performed using a demographic information questionnaire and PSC scale. The data were analyzed using SPSS 18 and descriptive statistics, independent *t* test, and one-way analysis of variance.

Results: The mean of total PSC was 3.63 ± 0.60 out of 5. The highest mean of PSC was related to organizing and planning for care (3.87 ± 0.71) and communication and teamwork (3.80 ± 0.70). The lowest mean was related to information dissemination (3.31 ± 0.60).

Conclusion: Safety culture or, in other words, patients' perception of the safety situation prevailing in studied wards and hospitals was moderate. Therefore, it needs to be upgraded and improved. Among the various dimensions of patient-perceived safety, the manner and extent of information sharing was worse. It is suggested that plans be made to direct actions to improve the patient's safety culture in general and in the field of information dissemination in particular.

Keywords: Patient safety, Patient care, Medical-surgical wards, Health and safety

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Introduction

One of the global challenges in the field of patient care that the health systems are grappling with is medical and care errors. The World Health Organization (WHO) reports that approximately 134 million accidents and 2.6 million deaths globally occur each year due to non-compliance with hospital safety principles (1). Accordingly, Patient Safety is now an essential and vital component in health care that health researchers increasingly consider (2). After the publication of the first report by the Institute of Medicine (IOM) in 1999 entitled '*To Err Is Human*', patient safety became a priority in health care systems (3). Patient safety is a subset of organizational culture. It is defined as a set of individual and organizational priorities, values, and behaviors that seek to minimize errors and harm in patient care (4). On the other hand, patient safety culture (PSC) can be defined as accepting patient safety as a common priority and value of the hospital organization, which integrates staff performance to reduce care-related injuries (5).

Studies showed that PSC is associated with fewer side effects (6,7) and positive patient experiences (8). A systematic review (9) showed that positive workplace culture worldwide is associated with several favorable outcomes for the patient, such as reduced falls and fewer infections, reduced mortality, and increased patient satisfaction.

Despite the importance of safety culture in patient care organizations, PSC has been repeatedly reported low in many institutions, and its levels are not homogeneous worldwide. Developed countries such as Norway, and the Netherlands have been shown to have high scores on PSC in various aspects of safety culture (10,11). However, in developing countries, the overall level of PSC is often low (12-14). A recent study showed that the level of PSC in Iran is low and needs the special attention of managers and health care providers (15).

Assessing the patient's safety culture was evaluated primarily from the perspective of health care providers (16). Measuring the patient's safety culture from the staff's perspective in various dimensions (such as organizational learning, respect for teamwork, open communication, feedback and non-punitive response to errors and error analysis, safety management support, safe patient transfer to/in the hospital and the exchange of information between wards, etc) can allow hospital managers to identify the

strengths and weaknesses of their organizations and conduct the necessary interventions to improve (17). However, some health researchers and experts believe that patients can also provide feedback on their care/treatment safety and provide important information for managers' reflection, planning, and action to manage security in hospitals (18,19). Some researchers even argue that patients' perceptions of safety are more accurate than care providers (16,20). Awareness of patients' perceptions of safety in the hospital environment can lead to first, increase the commitment of senior managers and hospital management and thus increase the quality of care (21); and second, developing programs to involve the various groups of patient care providers in implementing the principles of patient safety protection and reducing errors and adverse events (22).

Despite increasing concern about the quality of care and patient safety, most studies have been conducted in the United States (23). and information on PSC is scarce in Asian countries, especially in the Middle East. Besides that, most studies on patient safety have been conducted from caregivers' perspectives. One of the important limitations of the studies with care providers as participants could be the socially desirable response due to the importance of the subject under investigation. Therefore, the need for more research on PSC from their point of view seems to help improve and develop more targeted interventions. In this study, we pursued two goals: First, to determine the status of safety culture in the medical-surgical wards of the five Iranian teaching hospitals from the patients 'point of view, and second, to determine whether patients' perceptions of the safety culture are different based on their personal characteristics?

Methods

Study design

The present study was a cross-sectional study performed from 2020-Agust-22 to 2020-November-21.

Participants and Setting

In this study a group of patients in the medicine-surgical wards of five teaching hospitals in the Zanjan province, Iran. The studied hospitals were Mousavi, Wali Asr, Emdadi, Al-Ghadir and Bou Ali Sina.

We used formula 1 (with an unknown population) to determine the sample size. According to the Lawton et al study (18), SD = 7.7, Z = 1.96, Power = 80%, $\alpha = 0.05$, and d = 1, the minimum number of patients was estimated at 227.

$$n = (Z^2S^2 \div d^2) \quad (1)$$

Two hundred fifty patients were invited to participate in the study. Two hundred forty-five patients completed the questionnaire and entered the analysis stage. Five questionnaires were excluded from the study due to the patient's lack of response to a significant number of the instrument questions. Inclusion criteria included being over 18 years old, being literate hospitalization in medical-surgical wards for at least one day, and willingness to participate in the study.

Procedure

At the time of the study conduction, 35 medical-surgical wards in five teaching hospitals in northwestern Iran were active and serving patients. Out of 35 wards, 22 wards were randomly (simple) selected. A list of these 22 ward was prepared. Based on the Poisson distribution from days of three months of study conduction, 22 working days were chosen by simple random sampling, and each selected day (date) was placed in front of the ward's name in the selected wards list. Accordingly, the researcher referred to the relevant ward on the selected day. The researcher evaluated patients for eligibility. If they had inclusion criteria, after stating the study's objectives and obtaining informed consent, a questionnaire was presented to them to complete.

Instruments

In this study, two questionnaires were used to collect information. (a) Demographic and occupational characteristics questionnaire (age, sex, marriage, education level, length of hospitalization, reason for hospitalization, and name of ward/unit). (b) Patient Measure of Safety (PMOS). PMOS is the first questionnaire based on the patient perspective used to assess hospital safety factors. This scale has 41 questions on a Likert scale (strongly agree; Score = 5 to strongly disagree; Score = 1). PMOS included nine subscales: 'Communication and team working,' 'Organization and care planning,' 'Access to resources,' 'Ward type and layout,' 'Information flow,' 'Staff roles and responsibilities,' 'Staff training,' 'Equipment (design and functioning),' and 'Delays'. To judge the PMOS sores in total and its nine dimensions, we calculated the mean score of the scale and each subscale by dividing the patient's score from that subscale by the number of questions on that. Their scores ranged from 1 to 5. Sarvi et al translated PMOS into Persian and confirmed its psychometric properties. They introduced it as appropriate for Iranian population (20). To measure the instrument's internal consistency, we used Cronbach's alpha (α) coefficient and calculated the alpha value of 0.929, which indicates the good internal stability of this instrument.

Data analysis

Data were analyzed using SPSS version 18. Descriptive statistics (frequency, percentage, mean and standard deviation) we used to introduce the research units based on demographic characteristics and describe the results of the safety culture scale. Independent *t* test was used to compare the score of the safety culture scale with qualitative variables. We used a one-way analysis of variance test to compare the safety culture scale score based on multi-dimension demographic variables. We

used the Pearson correlation coefficient to examine the relationship between the safety culture scale score and two quantitative variables (age and length of hospital stay).

Results

Participants' characteristics

According to Table 1, out of 245 participants, most were from the internal wards (36.33%). Due to the prevalence of COVID-19, most of the participants (37.96%) were admitted to the wards with COVID-19 disease. Most of the participants were married (86.53%), and more (50.61%) were women. They were hospitalized in a large hospital with more than two hundred beds (75.51%). In terms of education, most of them had a diploma (38.78%). The average age of participating patients was 42.31, and the average length of their hospitalization was 5.64 days.

Patients' perceptions of the safety culture prevailing in the hospital settings

The results showed that the single question related to dignity and respect had the highest mean (4.29 ± 0.932). Among the nine dimensions of PSC, the highest average was obtained for care organization and planning (3.87 ± 0.71) followed by communication and team-working (3.80 ± 0.70). The lowest average was the share of information dissemination dimension (3.31 ± 0.60). The total mean of the patient's immune culture was (3.61 ± 0.54) (Table 2).

Relationship between demographic variables with dimensions of patient's safety culture

According to Table 3, the independent *t* test showed that only the mean of the dimensions of the type of departments and designs was different for gender, and the mean of this dimension was higher in women. The difference between the average total safety culture and its dimensions for marital status was insignificant. The average dimensions of communication and teamwork, information dissemination, staff roles and responsibilities, and staff training were different for the size of the hospital.

the analysis of variance also showed that the mean dimensions of communication and teamwork, organization and planning of care, dissemination of information, and the whole culture of patient safety were significantly different at different levels of education. The LSD post hoc test showed that this difference was related to the difference in the mean values of these dimensions and the total safety culture of people with a master's degree and others. Pearson's correlation test also showed a significant relationship between the information dissemination dimension score and age (Table 3).

Relationship between ward type and length of hospitalization with dimensions of patient's safety culture

In Table 4, the analysis of variance test showed a significant difference only in the average dimension of equipment (design and function) in hospitalized patients in different departments. According to the LSD post hoc test, this difference was the average difference between the urology department and obstetrics, surgery, internal medicine, infectious diseases and urology departments.

This table also shows that only the access score to resources had a significant relationship with the length of hospitalization (Table 4).

Discussion

This study aimed to determine the PSC in five teaching hospitals in Zanjan. The mean of patients' perception of safety culture was 3.61 ± 0.54 out of 5. In other words, the

Table 1. Participants' characteristics

Variables		No.	%
Gender	Male	121	49.39
	Female	124	50.61
Marital Status	Single	33	13.47
	Married	212	86.53
Hospital	Small	60	24.49
	Big	185	75.51
Education	Illiterate	16	6.53
	Low literate	81	33.06
	Diploma	95	38.78
	Undergraduate	45	18.37
	Postgraduate	8	3.27
Wards	Obstetrics and gynecology	11	4.49
	Surgical	88	35.92
	Medical	89	36.33
	Oncology	12	4.90
	ENT	9	3.67
	Infection (corona)	24	9.79
	Orology	12	4.90
		Mean (SD)	**Min-Max**
Age		42.31 (14.70)	18 - 80
Duration of hospitalization		5.64 (5.25)	1-60

Table 2. Describing the nine dimensions of patient safety culture (scores range from 1 to 5)

Variables	Mean (SD)	Min	Max
Dignity and respect	4.29 (0.93)	1	5
Communication and team working	3.80 (0.70)	1.67	5
Organization and care planning	3.87 (0.71)	1.50	5
Access to resources	3.51 (0.77)	1.75	5
Ward type and layout	3.40 (0.97)	1	5
Information flow	3.31 (0.60)	1.67	5
Staff roles and responsibilities	3.77 (0.79)	1	5
Staff training	3.70 (1.05)	1	5
Equipment (design and functioning)	3.67 (0.90)	1	5
Delays	3.67 (0.97)	1	5
Total	**3.61 (0.54)**	**2**	**5**

Table 3. Relationship between demographic variables and dimensions of patient's safety culture

Variable		Communication and team working		Organization and care planning		Access to resources		Ward type and layout		Information flow		Staff roles and responsibilities		Staff training		Equipment (design and functioning)		Delays		Total	
		Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.	Mean (SD)	Sig.
Gender	Female	3.80 (0.71)	t=-0.052 *P*=0.959	3.86 (0.75)	t=-0.22 *P*=0.820	3.52 (0.77)	t=0.25 *P*=0.768	3.53 (0.99)	t=2.14 *P*=0.033*	3.37 (0.59)	t=1.81 *P*=0.710	3.75 (0.77)	t=-1.29 *P*=0.897	3.75 (1.07)	t=0.70 *P*=0.483	3.71 (0.94)	t=0.61 *P*=0.545	3.69 (0.99)	t=0.29 *P*=0.769	3.63 (0.56)	t=0.66 *P*=0.510
	Male	3.80 (0.70)		3.88 (0.67)		3.49 (0.76)		3.27 (0.93)		3.23 (0.59)		3.76 (0.80)		3.65 (1.01)		3.64 (0.85)		3.65 (0.95)		3.59 (0.53)	
Marital Status	Single	3.69 (0.87)	t=-0.89 *P*=0.37	3.82 (0.76)	t=-0.40 *P*=0.686	3.66 (0.85)	t=1.28 *P*=0.201	3.17 (1.09)	t=-1.48 *P*=0.138	3.34 (0.69)	t=0.41 *P*=0.677	3.84 (0.87)	t=0.612 *P*=0.541	3.77 (1.15)	t=0.407 *P*=0.684)	3.77 (0.80)	t=0.64 *P*=0.523	3.72 (1.09)	t=0.33 *P*=0.738	3.55 (0.63)	t=-0.67 *P*=0.505
	Married	3.81 (0.67)		3.87 (0.70)		3.48 (0.74)		3.44 (0.95)		3.30 (0.58)		3.75 (0.77)		3.69 (1.03)		3.66 (0.91)		3.66 (0.95)		3.62 (0.53)	
Hospital	Small	4.00 (0.56)	t=2.63 *P*=0.009*	3.97 (0.70)	t=1.34 *P*=0.179	3.66 (0.71)	t=1.86 *P*=0.64	3.43 (0.88)	t=0.258 *P*=0.797	3.53 (0.53)	t=3.51 *P*=0.001*	3.99 (0.66)	t=2.700 *P*=0.007*	4.08 (0.86)	t=3.298 *P*=0.001*	3.94 (0.81)	t=2.66 *P*=0.008)	3.70 (0.87)	t=0.23 *P*=0.816	3.73 (0.46)	t=1.95 *P*=0.520
	Big	3.73 (0.73)		3.83 (0.71)		3.45 (0.77)		3.39 (1.00)		3.23 (0.60)		3.68 (0.81)		3.58 (1.07)		3.59 (0.91)		3.73 (0.46)		3.57 (0.56)	
Education	Illiterate	3.96 (0.32)		3.93 (0.55)		3.70 (0.72)		3.17 (1.12)		3.10 (0.61)		3.73 (0.61)		3.37 (1.14)		3.53 (0.95)		3.31 (0.87)		3.59 (0.42)	
	Low literate	3.78 (0.62)		3.77 (0.66)		3.37 (0.75)		3.44 (0.87)		3.32 (0.48)		3.67 (0.74)		3.81 (0.93)		3.59 (0.86)		3.79 (0.86)		3.61 (0.48)	
	Diploma	3.80 (0.75)	F=4.01 *P*=0.004*	3.98 (0.68)	F=3.98 *P*=0.005*	3.60 (0.76)	F=2.31 *P*=0.058	3.53 (1.02)	F=1.86 *P*=0.117	3.37 (0.63)	F=2.53 *P*=0.041*	3.81 (0.84)	F=2.333 *P*=0.056	3.75 (1.08)	F=2.378 *P*=0.053	3.79 (0.92)	F=1.95 *P*=0.103)	3.76 ((1.03)	F=2.02 *P*=0.093	3.68 (0.59)	F=2.57 *P*=0.039*
	Undergraduate	3.92 (0.72)		3.93 (0.77)		3.56 (0.78)		3.27 (0.94)		3.31 (0.63)		3.93 (0.81)		3.68 (1.06)		3.77 (0.91)		3.51 (1.00)		3.57 (0.53)	
	Postgraduate	2.90 (0.84)		3.03 (0.77)		2.96 (0.63)		2.73 (0.96)		2.75 (0.77)		3.09 (0.32)		2.75 (0.96)		3.00 (0.59)		3.12 (0.95)		3.05 (0.65)	
Age	r	0.099		-0.081		-.040		-0.104		-0.170*		-0.002		-0.083		-0.101		-0.017		-0.045	
	P-value	0.124		0.208		0.105		0.104		0.008		0.979		0.194		0.115		0.795		0.481	

* $P<0.05$.

Table 4. Comparison of patient safety culture and its dimensions by clinical characteristics

Variables	Inpatient department							F (*P* value)	Duration of hospitalization	
	Obstetrics and Gynecology Mean (SD)	Surgical Mean (SD)	Medical Mean (SD)	Oncology Mean (SD)	ENT Mean (SD)	Infection (Corona) Mean (SD)	Orology Mean (SD)		r	*P* value
Communication and team working	3.96(0.74)	3.82(0.76)	3.79(0.58)	3.75(0.73)	3.34(1.06)	3.94(0.80)	3.65(0.46)	0.983 (0.437)	0.049	0.449
Organization and care planning	4.28(0.59)	3.95(0.67)	3.77(0.71)	3.68(0.84)	3.77(0.722)	3.97(0.82)	3.62(0.54)	1.567 (0.158)	-0.020	0.751
Access to resources	3.52(0.96)	3.58(0.79)	3.41(0.67)	3.58(0.87)	3.41(0.82)	3.690.84 ()	3.27(0.66)	0.838 (0.542)	0.147*	0.022*
Ward type and layout	4.01(0.92)	3.43(0.96)	3.34(1.00)	3.48(1.02)	3.13(1.04)	3.46(0.916)	3.09(0.70)	1.147 (0.336)	-0.077	0.231
Information flow	3.54(0.26)	3.32(0.66)	3.30(0.59)	3.44(0.32)	3.22(0.37)	3.36(0.59)	2.80(0.55)	1.901 (0.081)	-0.018	0.778
Staff roles and responsibilities	3.73(0.73)	3.80(0.81)	3.78(0.64)	3.70(0.95)	3.37(0.98)	3.90(1.05)	3.36(0.67)	1.054 (0.391)	0.068	0.287
Staff training	4.19(0.74)	3.78(1.00)	3.64(1.06)	3.41(1.16)	3.50(1.29)	3.80(1.22)	3.33(0.68)	1.048 (0.395)	-0.024	0.706
Equipment (design and functioning)	4.00(0.94)	3.68(0.84)	3.73(0.90)	3.62(0.85)	3.05(0.91)	3.93(0.93)	2.96(0.88)	2.675 (0.016)*	0.054	0.403
Delays	3.96(0.71)	3.58(1.02)	3.70(0.91)	3.75(0.96)	3.93(1.20)	3.70(1.06)	3.50(0.95)	0.482 (0.821)	0.038	0.557
Total	3.69(0.48)	3.67(0.55)	3.57(0.49)	3.60(0.64)	3.65(0.73)	3.65(0.71)	3.33(0.37)	0.798 (0.572)	0.023	0.720

* $P<0.05$.

patients' perception of the safety culture was moderate. In addition, the patient's perception of safety culture is related to patient satisfaction with the quality of service (24), satisfaction and increased treatment adherence in patients (25). Therefore, a moderate level of safety culture alone is not desirable. Consistent with our study, McEachan in the UK (26) and Lawton and colleagues' study in the UK (27) reported moderate patient perception of safety culture. While our findings were significantly lower than the other study in the UK by Baxter et al (28). The inconsistency in the results of different studies, even studies conducted in one country, indicates the dependence of the patient's safety culture on the context.

The results showed that the single question related to Dignity and respect had the highest mean (4.29 ± 0.932); this result was in line with the study of Schiavone et al in Italy, who in their research using 30 PMOS questionnaires, examined patients' understanding (21). Also, this finding was consistent with the study of Taylor et al (29). Patients in these studies believed they were consistently treated with respect and competence.

Among the nine dimensions of safety culture in the present study, the highest mean of dimensions was related to organization and care planning 3.87 ± 0.71 and then associated with communication and teamwork dimension 3.80 ± 0.70. Because planning is part of a set of patient care delivery processes that includes assessing, setting goals, making decisions, and ensuring access to resources (30), and communication is an essential part of health care. These two domains can play an essential role in the quality of providing safe care to patients (31). This result is consistent with Taylor et al study in Australia (32) and McEachan et al study in the United Kingdom (26). It should be noted that in the past there has been a significant relationship between communication and team working with the organization and planning of care and overall understanding of safety in New et al study in Canada (33). In the study by Schiavone et al in Italy, among the eight dimensions, the highest mean was related to the dimension of employee training (3.98) and then to the dimension of information (3.87) (21). It was inconsistent with the present study in terms of dimensions.

In our study, the lowest mean was related to information flow. Due to the importance of continuity of optimal patient care at the end of each shift, patient information is transferred from one nurse to the next nurse, so it can be said that the correct and complete delivery of patient information is one of the criteria for maintaining safety (34). While the lowest mean in the study of Schiavone et al in Italy related to the role of employees (21), in the study of Wright et al in England related to postponement and delay in providing care (35). In the study of McEachan in the UK it was access to resources (26). In the study by Taylor 2016 in Australia, it was roles and responsibilities (36). The difference can be due to the relationships between service providers with patients, the variety of care programs, the lack of nursing staff in the organization, and different facilities and conditions that help understand the PSC in hospitals. In our study, patients also believed they were always treated with respect and merit, which was in line with the Taylor 2020 study in Australia (29).

The findings also showed that the average PSC had no significant relationship with the gender variable. Although the average dimension of the ward type and layout was

different for gender, the average value of this dimension was higher in women. In the New 2020 study in Canada, the average total safety culture was not significantly related to gender (33).

The average PSC and dimensions had no significant relationship with marital status. This finding contradicts the study of Movahed Kor and colleagues in Tehran (31). In a consolidated study, unmarried patients gave a lower score to the safety of the hospital. Movahed Kor and colleagues' justification was that people in a better position in terms of marriage compared to people who had problems in their family life (divorced and widowed) evaluated the patient's safety better.

The average dimensions of communication and team working, information flow, staff roles and responsibilities, and staff training were different for the size of the hospital. This difference can be due to increased expectations in extensive and advanced hospitals.

The total mean of safety culture and the dimensions of communication and team working, organization and care planning, and dissemination of information flow were statistically different for education level. Our study showed that the average total safety culture varies statistically based on education; the lowest mean PSC was related to graduates who perceived safety culture at an unfavorable level. This finding is consistent with the 2012 Tehran study. This finding may be due to the higher awareness of people with higher education, especially about their right to participate in clinical decisions. We showed this element is not a priority in our study environment. It should be noted that whether or not individuals participate in their own treatment decisions plays an important role in patients' understanding of safety culture (31). This finding, however, contradicted the study of New et al in Canada (33). This difference can be due to different cultural factors in communities and each organization.

There was a significant difference in the mean of the equipment (design and functioning) dimension in hospitalized patients in different wards. According to the LSD post hoc test, this was the average difference between the urology ward and obstetrics, surgery, internal medicine, and infectious diseases wards. In McEachen study in the UK (26) and the Movahed Kor et al study in Tehran (31), the safety culture differed in different departments. They considered this difference justified due to the impact of disease conditions or organizational cultures governing each hospital and department.

Conclusion

The results of this study help to better understand aspects of patient care safety and provide important information from parts of the patient's safety culture that need improvement. The results showed that patients understand the safety culture of the wards of the studied hospitals as moderate. Therefore, it needs to be upgraded and improved. It is suggested to use new monitoring technologies. New technologies in the field of monitoring can help care providers to confirm that they are always following the right procedure for the right patient and meeting the needs of each patient. It is necessary to ensure the patient's awareness and understanding of their treatment. It should not be forgotten that ensuring that patients are informed about their care is vital to avoid errors. Finally, it seems that by promoting teamwork, it is possible to help improve the safety atmosphere of patients; if care teams are formed in the hospital, the possibility of sharing errors and omissions among the personnel increases, which can become a factor in creating an acceptable culture to prevent future mistakes.

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Conflict of Interests

The authors have no conflicts of interest to declare. All co-authors have seen and agree with the manuscript's contents, and there is no financial interest to report.

Ethical Approval

The Biomedical Research Ethics Committee of the Zanjan University of Medical Sciences approved the study plan (Ethic Code: IR.ZUMS.REC.1399-202). We obtained oral informed consent from patients to participate in the study. We observed the principle of anonymity of the participants throughout the study.

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