ORIGINAL ARTICLE

# Assessing Patient Safety Culture: Insights from a Neurological Institute

## Évaluation de la culture de sécurité des patients: Réflexions d'un institut neurologique

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**Abstract**

**Introduction-Aim**: Assessment of patient safety culture is important for enhancing hospital service quality and clinical outcomes. This study aimed to evaluate the safety of patient culture among health professionals in a neurological institute, in order to identify areas of improvement. The second objective of our study was to determine the influence of the sociodemographic data of the participants on the awareness of patient safety.
**Methods**: A cross-sectional descriptive study was conducted among healthcare workers exercising at a neurological institution using a validated Hospital Survey of Patient Safety Culture questionnaire containing ten safety care dimensions.
**Results**: A total of 123 responses to the questionnaire were analyzed, accounting for 34.5% of the total (Cronbach's alpha=0.677). Among the participants, 61.8% considered the level of awareness regarding patient safety to be acceptable. The dimensions considered as strengths were "Organizational learning and continuous improvement" with the highest positive response (60.3%) "Relationship patient-staff member" (58.9%) and "Teamwork within units" (58.9%). However, the dimensions considered as weaknesses were "Management support for patient safety" with 28.5% of positive responses and "Communication openness and non-punitive response to error" (40%).
**Conclusion**: Patient safety culture among healthcare professionals is at an average with "Organizational learning and continuous improvement" being a positive aspect. However, improvements should be made in all dimensions to enhance and promote patient safety within the institution

**Key words**: Patient safety – Safety management – Organizational Culture - quality of health care – Tunisia

**Résumé**

**Introduction**: L'évaluation de la culture de sécurité des patients est importante pour améliorer la qualité des services hospitaliers et les résultats cliniques. L'objectif était d'évaluer la culture de la sécurité des patients parmi les professionnels de santé de l'Institut neurologique, afin d'identifier les domaines nécessitant des améliorations. Le second objectif de notre étude était d'examiner l'influence des données socioprofessionnelles des participants sur leur perception à la sécurité des patients.
**Méthodes**: Une étude descriptive transversale a été menée auprès des personnels de santé exerçant à un institut spécialisé en Neurologie à l'aide d'un questionnaire validé sur la culture de sécurité des patients.
**Résultats**: Un total de 123 membres ont participé avec un taux de réponse de 34,5 %. Parmi les participants, 61,8% ont jugé acceptable leur niveau de sensibilisation à la sécurité des patients. Les dimensions considérées comme des points forts étaient "l'organisation apprenante et l'amélioration continue" avec la réponse positive la plus élevée (60,3%), "la relation patient-personnel" (58,9%) et "le travail d'équipe au sein des unités" (58,9%). Toutefois, les dimensions considérées comme des faiblesses sont "le soutien du management pour la sécurité des soins", avec 28,5% de réponses positives, et "la liberté d'expression et réponse non punitive à l'erreur" (40%).
**Conclusion**: La culture de la sécurité des patients parmi les professionnels de santé est à un niveau moyen, avec « l'apprentissage organisationnel et l'amélioration continue » étant un aspect positif. Cependant, des améliorations doivent être apportées dans toutes les dimensions afin de renforcer et promouvoir la sécurité des patients au sein de l'institution.

**Mots clés**: sécurité des patients – Gestion de la sécurité - Culture organisationnelle - qualité des soins de santé - Tunisie

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## Introduction

Patient safety culture (PSC) refers to the collective attitudes, beliefs, and values that shape the conduct of healthcare professionals and organizations in relation to patient safety (1). Despite substantial efforts over the past decade to enhance patient safety, the healthcare system remains prone to errors. According to the World Health Organization (WHO), unsafe care leading to adverse events ranks among the top ten causes of death and disability worldwide. The WHO also reported that in low- and middle-income countries, adverse events result in 2.6 million deaths annually (2). Furthermore, approximately 60% of the harm in primary and ambulatory care in low- and middle-income countries is preventable (3). Several studies have shown that working in a positive patient safety culture is essential for better care assistance and lower risk of medical errors (4). This entails a commitment to safety, willingness to report errors and near misses, and effective communication among healthcare members (5). However, the implementation of these foundational measures remains a persistent challenge in developing countries. This is compounded by poor infrastructure, inadequate technology, and lack of official statistics on adverse events.

As a first step, the assessment of PSC is important to enhance hospital service quality and clinical outcomes. In Tunisia, patient safety culture is emerging as a vital concern in the healthcare system.

Therefore, previous studies have assessed PS culture, such as a multicenter study in primary healthcare centers in Sousse, Kasserine and Kairouan (6,7). However, it has not yet been studied in an institution specializes in the treatment of neurological diseases. Errors can manifest at different levels in a critical and complex environment. Consequently, implementing an integrated quality and a risk management system for patient safety is of paramount importance along with the WHO initiative « Patient security » that engages our hospital to make health care services safer.

The aim of this study was to evaluate the safety of patient culture among health professionals and non-health professionals in a neurological institute to identify areas of improvement. The second objective of our study was to determine the impact of the socio-professional data of the participants on their awareness of PSC.

## Methods

### Study Design

A cross-sectional descriptive study was conducted in 2021 at an institution of Neurology. The study protocol received approval from the institution's ethical committee.

### Participants

The sample included all hospital staff members including physicians, pharmacists, nurses, technicians, and others. However, trainees, retirees or those temporarily absent were not included in our study. The exclusion criteria were participants who did not complete more than five items.

### Instruments

The perception of PS culture was assessed using a questionnaire inspired by the Hospital Survey of Patient Safety Culture (HSOPSC), which was initially developed, tested, revised, and subsequently released by the Agency for Healthcare Research and Quality (AHRQ) in November 2004 (7). This questionnaire was translated into French and validated by the coordinating committee for clinical evaluation and quality in Aquitaine (8). Our study employed the French HSOPSC questionnaire, which is considered a valid and reliable tool with psychometric properties similar to other European and non-European translations of the HSOPSC questionnaire (9).

The French HSOPSC questionnaire contained 10 composite measures of patient safety culture.

Each composite or dimension includes 2 to 13 items, resulting in a total of 55 items.

The patient safety culture assessment includes ten composites and associates items as follows:

1) Overall perception of safety (items 1-7)
2) Frequency of events reported (items 8-21)
3) Supervisor/Manager expectations and actions promoting patient safety (items 22-24)
4) Teamwork within units (items 25-28)
5) Teamwork across units (items 29-33)
6) Staffing (items 34-35)
7) Communication openness and no punitive response to error (items 36-40)
8) Management support for patient safety (items 41-42)
9) Relationship between healthcare professional and patient (items 43-49)
10) Organizational learning and continuous improvement (items 50-55)

Responses were recorded using a five-point Likert scale ranging agreement from "Strongly disagree" to "Strongly agree," or frequency from "Never" to "Always." The instrument also incorporates two additional questions; one is about the number of incidents the respondent reported in the past 12 months, and the other one is about an overall rating of patient safety in the workplace, between "poor" and "excellent." The final section of the questionnaire aimed to gather information about the participants' characteristics, including professional background, duration of employment in primary healthcare services, tenure in the current hospital unit, and the specific department of work.

The Hospital's senior administration distributed a paper based version of the survey to each department. Moreover, members of the hospital's Patient Safety Committee sent reminders to the workers' corporate email to inform them of the aims of this study. Responses to the questionnaire were voluntary and participants' consent was obtained verbally.

### Data analysis

The internal consistency of the instrument was determined by calculating the Cronbach's alpha for the 10 dimensions. According to the HSOPSC user's guide, a Cronbach's alpha > 0.6 is acceptable (9).

The global percentage and the percentage of positive and negative responses were calculated. For the five-point Likert scale ranging from "Strongly disagree" to "Strongly agree", percentages ranging from (0% to 100%) were assigned. The percentage of positive responses indicated the participants who selected "Agree" or "Strongly agree," while the percentage of negative responses represented those who chose "Strongly disagree" or "Disagree". To derive the global percentage for each dimension, the average percentage of all items associated with that specific dimension was calculated. The average positive response was obtained by calculating the mean of the percentages of positive responses for each category or dimension. Similarly, the average negative response is the mean of the percentages of negative responses. This provides a global view of participants' perceptions within each dimension of patient safety culture.

Furthermore, the chi-square test was employed to explore statistical associations between patient safety level awareness and the socio-professional data of healthcare workers. After testing the data normality using the Kolmogorov-Smirnov test, the Kruskal-Wallis Test was employed to assess the association between professional background variables and the level of awareness of various dimensions. A significance level of $p < 0.05$ was applied to all tests.

The Data were analyzed using Excel 2013 version 2309 and the PSPP software.

## Results

A total of 123 members completed the questionnaire, resulting in a response rate of 34.5%: Approximately 44 % were nurses, and technicians accounted for nearly 27 % of the sample. Among the respondents, 46.3% had more than ten years of experience at the hospital. The sociodemographic characteristics of the surveyed staff members are described in table I.

The questionnaire demonstrated acceptable overall internal consistency, with a Cronbach's alpha of 0.677.

In general, the study revealed that 61.8% of the staff members assessed the level of awareness of patient safety as acceptable.

Table II provides the percentages of positive and negative responses across the ten dimensions.

The average positive response rate across all dimensions was 49.7%. The highest global percentage of positive responses was observed in the "Organizational learning and continuous improvement" (60.3%) followed by the dimensions of "Teamwork within units" and "Relationship patient-staff members" (58.9%). In contrast, the lowest percentage was found in the dimension of "Management support for patient safety" dimension.

**Table 1.** socio-professional data of participants' characteristics

| Characteristics | Frequency (N) | Percentage (%) |
|---|---|---|
| **Professional background** | | |
| Nurses | 54 | 43.9 |
| Physicians | 7 | 5.7 |
| Pharmacists | 3 | 2.4 |
| Workers | 7 | 5.7 |
| Technicians | 33 | 26.8 |
| Others[1] | 19 | 15.4 |
| **Number of years working in healthcenter (years)** | | |
| <1 | 1 | 0.81 |
| 1-5 | 37 | 30.08 |
| 6-10 | 15 | 12.20 |
| 11-15 | 25 | 20.33 |
| 16-20 | 16 | 13.01 |
| >20 | 16 | 13.01 |
| Missing | 13 | |
| **Work unit/ Department** | | |
| Laboratory | 11 | 8.9 |
| Neurosurgery[2] | 34 | 27.6 |
| Neurology | 18 | 14.6 |
| Neuropediatrics | 21 | 17.1 |
| Pharmacy | 8 | 6.5 |
| Anesthesiology and intensive care unit | 5 | 4.1 |
| Others | 23 | 18.7 |
| Missing | 3 | |

**(1)** Include general services and administrative frameworks.
**(2)** Include the neurosurgery department, postoperative unit, and operating room.

**Table 2.** Patient Safety Culture Dimensions score and Cronbach's Alpha

| Dimensions | Score (%) | | | Cronbach's alpha[1] |
|---|---|---|---|---|
| | Global | Positivity | Negativity | |
| 1-Overall perception of safety | 57.6 | 52.8 | 30.8 | 0.677 |
| 2-Frequency of events reported | 54.2 | 54.8 | 25.2 | 0.641 |
| 3-Manager expectations and actions promoting patient safety | 53.0 | 47.2 | 39.0 | 0.677 |
| 4-Teamwork within units | 62.3 | 58.9 | 26.4 | 0.677 |
| 5-Teamwork across units | 58.1 | 50.2 | 27.2 | 0.677 |
| 6-Staffing | 48.3 | 45.1 | 44.3 | 0.677 |
| 7-Communication openness and non-punitive response to error | 50.2 | 40.0 | 36.7 | 0.677 |
| 8-Management support for patient safety | 39.7 | 28.5 | 50.4 | 0.677 |
| 9-Relationship patient-staff members | 62.6 | 58.9 | 24.4 | 0.677 |
| 10-Organizational learning and continuous improvement | 65.3 | 60.3 | 20.6 | 0.677 |
| Average | 55.1 | 49.7 | 32.5 | 0.677 |

(1) >0.6, acceptable; 0.7, good; 0.8, excellent

Furthermore, the results revealed no difference between patient safety awareness and participants' characteristics including professional background ($p = 0.48$), number of years working in the health center ($p = 0.58$), and work unit ($p = 0.149$). However, as presented in Table III, when

the association was assessed between professional background and level of awareness of each of the various dimensions, the results showed a statistically significant difference only for the "teamwork within units" dimension (p-value=0.041). Further analysis revealed that the significant difference was specifically between nurses and technicians (p =0.032).

**Table 3.** Association between professional background variable and level of Awareness of the various dimensions

| Dimensions | Score (%) | | | | | p-value |
|---|---|---|---|---|---|---|
| | Physicians | Pharmacists | Nurses | Technicians | Others | |
| 1-Overall perception of safety | 54.8 | 47.6 | 61.5 | 55.3 | 54.8 | 0.111 |
| 2-Frequency of events reported | 46.3 | 49.1 | 53.0 | 56.5 | 56.3 | 0.399 |
| 3-Manager expectations and actions promoting patient safety | 53.6 | 63.9 | 55.3 | 53.4 | 46.2 | 0.250 |
| 4-Teamwork within units | 58.9 | 83.3 | 58.1 | 69.5 | 60.3 | 0.041 |
| 5-Teamwork across units | 60 | 41.7 | 58.5 | 58.6 | 58.1 | 0.266 |
| 6-Staffing | 44.6 | 83.3 | 49.5 | 47.3 | 44.2 | 0.133 |
| 7-Communication openness and non- punitive response to error | 49.3 | 58.3 | 52.9 | 48.9 | 45.7 | 0.136 |
| 8-Management support for patient safety | 41.1 | 50.0 | 33.2 | 39.0 | 51.9 | 0.152 |
| 9-Relationship patient-staff members | 65.3 | 48.8 | 60.5 | 65.9 | 63.5 | 0.265 |
| 10-Organizational learning and continuous improvement | 67.3 | 72.2 | 62.3 | 69.6 | 64.6 | 0.452 |
| Average | 54.1 | 59.8 | 56.4 | 54.5 | 54.6 | - |

Among the 123 respondents, only 15 indicated the presence of a register or an adverse event declaration form in their respective units. Additionally, 23.6% of the participants reported having observed at least one error that was made, but subsequently detected and corrected before it could affect the patient within the past 12 months. Most respondents (62.1%) stated that such events were never or rarely reported. Table IV and figure 1 illustrate the different types of errors, along with their occurrence frequencies and the corresponding reporting scores by healthcare providers.

**Table 4.** Frequency and Reporting Scores of Errors by Healthcare Workers

| | Percentage of respondents who observed at least one event (%) | Positive score of reported events (%) | Negative score of reported events (%) |
|---|---|---|---|
| Error made, detected, and corrected before it has impacted the patient | 23.6 | 10.3 | 62.1 |
| Error made, but has no potential to harm the patient | 17.1 | 33.3 | 52.4 |
| Error made, could potentially harm the patient, but it ultimately has no effect | 18.7 | 34.8 | 34.8 |
| Error made with consequences for the patient | 14.6 | 55.6 | 33.3 |

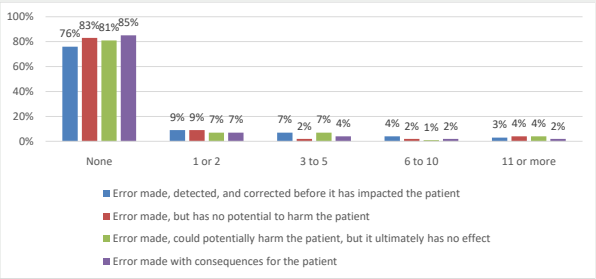


**Figure 1.** Percentage of respondents observing events in the past 12 months.

## Discussion

This study describes patient safety culture among healthcare workers in our institution. This is the first study in Tunisia to collect data from all hospital medical units within a neurological institution.

Our work aligns with the WHO initiative, which focuses on implementing quality systems in public hospitals, where patient safety is a key aspect under scrutiny. Assessing the perceptions of healthcare workers is crucial for determining the potential of implementing a sufficient patient safety program and improving the overall quality system (11).

Overall, participants assessed patient safety at an acceptable level (61.8%), and their perception of patient safety was moderately positive, with a dimension positivity score of 52.8%. These findings are consistent with those reported in other studies on Muscat, Oman (55%), Sousse, Tunisia (63.8%), and Kuwait (60.6%) (12–14). However, it is crucial to highlight the correlation between the hospital size and patient safety culture outcomes. Smaller hospitals tend to exhibit better patient safety grades and dimension scores, which contrasts with our study's findings (15).

In our study, 49.7% of healthcare workers responded positively. Given the low daily hospitalization rates in our hospital, we initially anticipated a more positive culture. However, the patient safety culture was relatively low compared to other studies conducted in Saudi Arabia (61%), Lebanon (61.5%), the US (62%), Sri Lanka (62.7%),

and China (65%) (16–18). This contrast highlights a clear need for improvement.

Moreover, a potential lack of information and awareness regarding various aspects of patient safety among our hospital staff and disparities in infrastructure and economic conditions between our setting and other regions may also contribute to explaining these outcomes.

Our Research showed that the area of strengths was the dimension “organizational learning and continuous improvement.” Similarly, in other studies, the dimension “organizational learning and continuous improvement” consistently received high scores, with varying positivity rates. For instance, in Sousse, Tunisia, it scored 67.9% (11), in Oman, it reached 84% (12), and in the USA, it was reported to be 72% (18). It is worth noting that initial and continuous training, along with ongoing professional skill development, are crucial factors in healthcare quality and safety (19). Moreover, it is evident that the majority of the respondents (83%) recognized the importance of incorporating a patient safety module into the university curriculum. This recognition serves as the starting point for promoting a culture of safety (20). Furthermore, a significant majority (73%) of respondents believed that standardizing care procedures, including treatment protocols, contributes to enhanced patient safety. Numerous studies have consistently shown that clinical guidelines and algorithms offer an effective approach to streamlining decision-making, reducing the risk of errors, and ultimately enhancing patient safety (21). The " teamwork within units" dimension achieved the second highest positive score at 58.9%. This result is in line with findings from most published studies (13,14,17), where " teamwork within units was frequently reported as more developed when compared to " teamwork across units," which received a score of 50.2% in our study. This highlights a common issue in healthcare: the critical importance of positive communication across units.

Patient care often necessitates the involvement of multiple units owing to the diverse practices and specialties involved. Hence, communication problems pose significant challenges. These communication issues not only increase the risk of medical errors, but can also potentially escalate into life-threatening complications (22,23).

Another aspect that underscores the serious need for enhancing communication is the low percentage observed in the dimension of "Communication openness and non-punitive response to error," which recorded a score of 40%. It is widely acknowledged that significant improvement occurs when errors are acknowledged, and efforts to rectify them are made within an environment characterized by trust rather than one driven by punitive measures. Research has consistently shown that fear of punishment tends to reduce the frequency of reporting errors (24).

Furthermore, 45.1% of respondents reported inadequate staffing. Comparable scores were reported in Kuwait (39.9%), whereas lower percentages were observed in Lebanon (36.8%) and Oman (33%). In our study, a significant majority (70%) believed that there were insufficient personnel to handle the workload and 67% expressed that excessive working hours could potentially affect patient safety. Numerous studies have demonstrated that heavy workload and long working hours are associated with suboptimal patient care and higher patient mortality rates (25). Consequently, it is imperative to optimize the distribution of healthcare workers by reducing working hours and enhancing care organizations. However, it is crucial to highlight that in our study, "management support for patient safety" received the lowest positive score (28.5%).

Management support plays a significant role in creating a conducive environment to sustain a patient’s safety culture. This involves ensuring optimal working conditions, providing adequate resources, offering staff training, and promoting open communication with shared responsibilities (11).

As our work revealed no significant differences in the level of awareness of PSC among healthcare workers, the safety environment appears to be independent of socio-professional attributes.

Interestingly, our research identified an association between professional background and “teamwork within the units” dimension. This was specifically observed between nurses and technicians (p =0.032). Technicians scored a significantly higher positive response than nurses for “teamwork within the units” dimension. One potential explanation for these findings could be that nurses are less inclined to collaborate with other units, often facing heavy workloads and experiencing stress owing to understaffing. However, no significant differences were observed in any of the other dimensions among various professions. This implies that hospital staff’s perception of patient safety is consistent and not influenced by their specific professions. In another Tunisian study, it was observed that physicians exhibited significantly higher overall scores than
paramedics in the domains of "Expectations and actions of superiors regarding care safety" and "Healthcare professional-patient relationship and safety culture." (26). This can be attributed to variations in the working environment, as well as differences in inter-hospital policies and protocols that vary from one facility to another.

Another weakness and aspect of patient safety that needs to be improved is the low level of error reporting.

In fact, our results showed clear underreporting of errors when comparing the positive and negative scores of reported events. These low results could be attributed to the absence of protocols for reporting adverse events and the lack of a culture of transparency that ensures individuals are not held accountable for their actions (27). Similarly, our study illustrates a clear trend: when errors carry a higher potential for harm, the observed percentage of errors decreases. Therefore, errors are more likely to be reported in such situations.

Finally, our study has several limitations. First, the response rate was low (34.5%). The self- administered questionnaire was distributed to healthcare workers and collected via the administrative framework, which partially explains the low response rate.

The use of a self-administered questionnaire could have also influenced the manner in which participants responded, potentially leading to opinions that may not fully reflect reality. Second, although the French version has been validated and adopted in various countries, it is crucial to customize the tool to each country's unique local culture and perspectives (9).

## Conclusion

Our study allowed us to provide valuable results regarding healthcare professionals' perceptions of patient safety. It revealed that the overall patient safety culture among healthcare workers is at an average level, with "Organizational learning and continuous improvement" being a positive aspect. However, urgent attention is required in the areas of weakness. To effectively address these findings, hospital managers and healthcare leaders are recommended to improve the weaknesses identified in the current patient safety culture. Enhancing training, clear communication strategies, a culture of trust, and open reporting are some interventions that can be implemented. In particular, the concept of reporting and documenting medication errors needs to be explored, along with significant efforts to promote a culture of reporting and documentation without fear.
In terms of future research, potential avenues for exploring additional dimensions of patient safety culture that were not covered in this study could provide further insights to guide future improvement efforts.

**Abbreviations list**

**PSC**: Patient safety culture
**WHO**: World Health Organization
**AHRQ**: Agency for Healthcare Research and Quality
**HSOPSC**: Hospital Survey of Patient Safety Culture

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