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Prevalence and associated factors of discomfort in surgical intensive care unit in Mahajanga (Madagascar)

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Abstract

Introduction: Hospitalization in intensive care units is a demanding experience, exposing patients to multiple sources of discomfort related to care, invasive devices, and the hospital environment. In a local context where data remain limited, this study aimed to assess the frequency of discomfort experienced in a surgical intensive care unit at Hospital University of Professor Zafisaona Gabriel in Mahajanga, to identify its main sources, and to analyze associated factors.

Methods: This was a prospective descriptive and analytical study conducted over 22 months, including 173 conscious patients hospitalized for at least 24 hours. Data were collected through direct interviews and analyzed using Pearson's Chi-square test, with a significance threshold set at $p < 0.05$.

Results: The prevalence of discomfort was 57.8%. The main sources were dominated by thirst and pain. In addition to these classical factors, specific environmental elements were identified, particularly the presence of mosquitoes. Repercussions were frequent, mainly insomnia, fatigue, and stress. Statistical analysis showed a significant association between discomfort and young age ($p = 0.001$), female sex ($p = 0.003$), low educational level ($p < 0.001$), and short length of hospital stay ($p < 0.001$).

Conclusion: These findings highlight that discomfort is frequent, multifactorial, and influenced by both individual and contextual factors. They emphasize the need to improve not only medical care but also environmental and organizational conditions in intensive care units, particularly in resource-limited settings.

Keywords: Intensive Care Units; Patient Comfort; Pain; Thirst; Hospital Environment

1. Introduction

Hospitalization in an intensive care unit (ICU) is a particularly distressing experience for patients. Beyond the severity of the underlying conditions being managed, admission to intensive care exposes patients to multiple sources of

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discomfort related to medical care, invasive devices, and the hospital environment. Pain, thirst, noise, and sleep disturbances are among the most frequently reported discomforts in the literature [1,2]. These factors may impair patient well-being, compromise rest quality, and delay the recovery process. They also appear to contribute to psychological and functional consequences after ICU discharge. In order to improve the patient experience, several architectural and organizational measures have progressively been implemented in ICUs in high-income countries [3]. However, in resource-limited settings, these recommendations remain difficult to apply due to structural, material, and organizational constraints. In Madagascar, limited data are available regarding the ICU experience of hospitalized patients. In this context, the aim of our study was to assess the frequency of discomforts experienced by patients admitted to the surgical intensive care unit of Hospital University of Professor Zafisaona Gabriel (HU PZaGa) in Mahajanga, to identify their main sources, and to analyze the associated factors.

2. Methods

2.1. Study design, setting, and period

We conducted a prospective descriptive and analytical study in the surgical intensive care unit of HU PZaGa in Mahajanga. The study was carried out over a 22-month period, from May 2019 to February 2021.

2.2. Study population

All patients aged 6 years and older, hospitalized for at least 24 hours, conscious, and able to respond to the interview were included. Patients with severe impairment of consciousness, major behavioral disorders, or inability to communicate were excluded. Patients who died early during hospitalization were not included in the analysis.

2.3. Data collection

Data were collected using a pre-established questionnaire administered directly to patients during hospitalization. For pediatric patients, information was obtained from parents or legal guardians after verbal consent was obtained.

2.4. Variables studied

The variables analyzed included sociodemographic characteristics (age, sex, educational level), clinical and hospital data (length of stay, emergency admission context or not), as well as the different discomforts reported.

Care-related discomforts included thirst, pain, intravenous devices, number of procedures performed, and care provided by students. Environmental discomforts mainly included noise, presence of mosquitoes, unpleasant odors, lighting, lack of privacy, bed discomfort, and overcrowding in the ward.

The outcomes studied included fatigue, insomnia, stress, mood disturbances, and reduced communication.

2.5. Statistical analysis

Data were entered and analyzed using SPSS® version 25 and Microsoft Excel 2016 software. Categorical variables were expressed as frequencies and percentages, while continuous variables were described using means and standard deviations.

Factors associated with the occurrence of at least one discomfort were analyzed using Pearson's Chi-square test. A p-value < 0.05 was considered statistically significant.

3. Results

After exclusion of four patients, 173 patients admitted to the intensive care unit were included in the analysis. In-hospital discomfort during the ICU stay was reported in 100 patients, corresponding to a hospital prevalence of 57.8%. The mean age was 35.13 years (range: 6 to 83 years). Patients aged under 25 years represented the most frequent age group (37%), followed by patients aged 45 years and older (26%). A female predominance was observed (57%), with a sex ratio of 0.75. Moreover, the majority of patients underwent emergency surgery (76%). The mean length of ICU stay was 3.5 ± 0.4 days.

3.1. Types of discomfort observed

Care-related discomforts were mainly dominated by thirst, reported by 71% of patients. Discomfort related to intravenous devices was also a major source (51%), as well as pain related to care procedures or surgery (37%) (Table 1). Other complaints included hunger (26%), the frequency of care interventions (23%), and care provided by medical students (18%). Regarding environmental factors, the presence of mosquitoes was the most frequently reported discomfort (37%) (Table 1).

Table 1 Distribution of patients according to the frequency of care-related and environmental discomforts

	Number (n)	**Percentage (%)**
Care-related discomforts		
Thirst	71	71.0
Perfusion	51	51.0
Pain	37	37.0
Hunger	26	26.0
Fréquency of care interventions	23	23.0
Care provided by student	18	180
Environmental discomforts		
Presence of mosquitoes	37	37.0
Noise	28	28.0
Uncomfortable bed	20	20.0
Lack of privacy	20	20.0
Overcrowding	12	12.0
Lighting	5	5.0
Unpleasant odor	5	5.0

Note: A patient may experience one or more sources of discomfort.

3.2. Consequences of discomfort

Among patients who experienced discomfort, 73% reported at least one functional or psychological consequence. Insomnia was the most frequent manifestation (46.57%), followed by fatigue (38.35%). Stress affected 21.91% of patients, while mood disorders and reduced communication were less frequently reported. Approximately one quarter of patients reported no notable consequences (Table 2).

Table 2 Consequences of discomfort among patients (n=73)

	Number (n) n=73	**Percentage (%)**
Insomnia	34	46.6
Fatigue	28	38.3
Stress	16	21.9
Mood disturbance	10	13.7
Reduced communication	4	11.0

Note: A patient may present one or more consequences.

3.3. Factors associated with the occurrence of discomfort

Bivariate analysis identified several factors significantly associated with the occurrence of discomfort.Age was significantly associated with discomfort (p = 0.001), with a higher frequency observed in younger patients under 25 years. A significant association was also found with female sex (p = 0.003) and a length of ICU stay of less than three days (p < 0.001). Furthermore, patients with a higher level of education reported more discomforts (p < 0.001) (Table 3).

Table 3 Associated factors according to the presence or absence of discomfort

	Discomfort « YES » n=100n (%)	**Discomfort « NO » n=73 n (%)**	**p**
Age			
< 25 years	37(37.0)	14(19.2)	
25-34 years	25(25.0)	10(13.7)	
35-44 years	12(12.0)	23(31.5)	p = 0.001
≥ 44 years	26(26.0)	26(35.6)	
Sex			
Male	43(43.0)	15(20.5)	
Female	57(57.0)	58(79.5)	p = 0.003
Education level			
Illiterate	5(5.0)	21(288)	
Primary	34(34.0)	18(24.7)	
Secondary	38(38.0)	20(27.4)	
University	23(23.0)	14(19.2)	p < 0.001
Length of hospital stay			
< 3 days	74(74.0)	21(28.8)	
3-6 days	20(20.0)	39(53.4)	p < 0.001
≥ 6 days	6(6.0)	13(17.8)	

4. Discussion

Our study highlights a high frequency of discomfort among patients admitted to the surgical intensive care unit in Mahajanga [4]. More than half of the patients reported at least one source of discomfort during their ICU stay. The main complaints were thirst, pain, and care-related constraints. In addition to these classical factors, several more specific environmental issues were identified, notably the presence of mosquitoes, unpleasant odors, and the involvement of medical students in patient care.

These findings underline the multifactorial nature of the ICU experience, particularly in resource-limited settings. The prevalence observed in our study is consistent with international literature, where more than one in two ICU patients reports at least one form of discomfort during their stay in intensive care units [1].

In high-income countries, the most commonly reported discomforts include pain, thirst, noise, and sleep disturbances [2,4]. In our series, thirst was the most prominent complaint. This finding is in agreement with several studies showing that thirst remains frequent and often insufficiently managed in intensive care settings [5]. Some multicenter studies even suggest that thirst may be perceived as more distressing than pain by certain patients [6].

Pain also represented a major complaint despite advances in analgesic management. This situation appears particularly pronounced in environments where material resources and standardized protocols remain limited [7]. Overall, our

results confirm that care-related and device-related discomforts remain highly prevalent in intensive care, although they are sometimes underestimated in daily clinical practice.

In developed countries, ICU organization is now based on architectural and environmental standards aimed at improving patient comfort. Noise reduction, light control, improved privacy, and enhanced environmental safety have progressively contributed to better hospitalization conditions [8]. The hospital environment is now recognized as an important determinant of recovery in intensive care, particularly by reducing sleep disturbances, sensory fatigue, and delirium [9]. In contrast, resource-limited settings appear to expose patients to a wider range of discomforts due to structural, organizational, and environmental constraints [10]. Our study clearly illustrates this reality.

The involvement of medical students in patient care is rarely identified as a direct source of discomfort in studies from high-income countries [11,12]. This may be explained by better structured teaching activities, stricter supervision, and more systematic patient information before procedures. In our context, this perception appears different and likely deserves further attention.

One of the most original findings of this study is the high frequency of discomfort related to mosquitoes. This factor is virtually absent from studies conducted in developed countries. Hospital standards in high-income settings generally include strict environmental hygiene measures and enclosed infrastructures that limit vector entry and reduce healthcare-associated infections [13,14].

Regarding consequences, nearly three-quarters of patients experienced at least one functional or psychological impact related to discomfort, mainly insomnia and fatigue. These results are consistent with literature showing that sleep disturbances in intensive care are multifactorial and closely linked to the care environment. Excessive noise, frequently reported in ICUs, is notably associated with anxiety, sleep disorders, and delirium.

Stress and emotional disturbances observed in our study further confirm the significant psychological impact of ICU hospitalization. Moreover, patients hospitalized for less than three days appeared more exposed to discomfort. This may reflect a lack of initial adaptation to ICU conditions, especially since emergency surgery was predominant in our series. Some studies have reported that early ICU experiences may contribute to the later development of Post-Intensive Care Syndrome (PICS) [15].

Finally, several factors associated with discomfort were identified, including young age, female sex, educational level, and short length of hospital stay. These findings are broadly consistent with the literature, which often reports a higher perception of hospital-related constraints among young female patients.

Regarding educational level, less educated patients reported discomfort less frequently, which contrasts with commonly reported data in the literature [16]. This discrepancy may be explained by underreporting of complaints, different perceptions of hospitalization conditions, or reduced verbalization of experienced symptoms.

5. Conclusion

Discomfort in the surgical intensive care unit at HU PZaGa in Mahajanga appears to be frequent and multifactorial. It is mainly related to classical factors such as thirst, pain, and intravenous devices, along with more specific environmental factors, particularly the presence of mosquitoes. In terms of consequences, these discomforts have a significant impact on patients' experiences, mainly manifested by insomnia, fatigue, and to a lesser extent, stress. Furthermore, certain patient profiles appear to be more exposed. Young age, female sex, higher educational level, and short duration of hospitalization were significantly associated with the occurrence of discomfort. Overall, these findings suggest that improving comfort in intensive care cannot be limited to medical aspects alone. It also requires particular attention to environmental conditions and the overall organization of care, in order to optimize the experience of patients admitted to intensive care units.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of informed consent

The study was conducted in accordance with informed consent obtained from patients or their legal representatives.

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