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## Research Article

# Psychological Experience and Nighttime Sleep Quality of 7<sup>th</sup>-year Medical Students during Clinical Rotations in Senegal

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## Abstract

**Introduction:** Medical studies are unique in that they are both theoretical and practical. The main objective was to evaluate the psychological experience and quality of night-time sleep of medical science students during their clinical placements.

**Methodology:** We conducted a cross-sectional, descriptive, and analytic study of 7<sup>th</sup>-year medical students at El Hadj Ibrahima Niasse University. It took place from November 11, 2023, to March 21, 2024. Data were collected using a questionnaire based on Google Forms.

**Results:** A total of 108 students were enrolled. Females predominated, with a sex ratio of 0.33. Ninety-one percent were aged between 25 and 30. Empathy was the predominant feeling during the last clinical placement for 47% of the students. The nature of the emotions felt during their placement was related to the nature of the service. Seventy-six percent slept less than 7 hours during their last clinical placement. The quality of this sleep was judged unsatisfactory by 36% of students. Eighty-three percent did not feel their work was sufficiently recognized during their clinical placements. Sixty-seven percent felt exploited.

**Conclusion:** Clinical placements have a negative impact on sleep duration and quality. The many organizational and logistical constraints associated with our care structures, and the high expectations placed on our trainees, call for structured psychosocial support.



## Introduction

Medical studies are both theoretical and practical. The practical aspect is a very important part of medical training. During their years of hospital practice, students learn to acquire the diagnostic and therapeutic reasoning and approaches required for their future practice. They also become familiar with the adjustments needed to establish quality caregiver-patient or caregiver-caregiver relationships. In short, he or she strives to acquire professionalism [1].

Medical students are a special case. Because of their rapid integration into the hospital environment, they are confronted daily and repeatedly with pain, physical and psychological suffering, and death. They must quickly combine academic work with practical training, in which they take on increasing responsibility (both technical and relational). At the same time, they have to learn how to manage the emotional transference of patients and/or those accompanying them but also to be aware of their own counter-transference. Finally, they must avoid becoming subservient to senior doctors and internship supervisors [2].

In Senegal, law n°2011.05 of March 30, 2011, governs the organization of the Licence Master Doctorat system in higher education establishments [3]. General medical studies are no exception to this rule. They take place over eight years (three years of Licence, two years of Master's, and three years of Doctorate). Senegal has several public and private medical universities. Students enrolled in this program are exposed to the hospital environment from an early stage. In the 2nd year, they begin nursing internships while continuing their theoretical studies. From the 3<sup>rd</sup> to 6<sup>th</sup> year, students spend every morning in a wide range of departments, learning about pathology and semiology. The 7th year of medical school is devoted exclusively to "clinical" rotations. For three to four consecutive months, students rotate through clinical departments (surgery, gynecology-obstetrics, internal medicine, pediatrics, psychiatry, etc.) in different hospitals. These clinical internships are the final stage in their medical training. During their 7<sup>th</sup> year, they spend more time at the hospital (on-call duty is multiplied), and the volume of hours spent on placements is greater than in previous years. They are given more and more responsibilities. All this investment can have a psychological impact. The present study aimed to evaluate the psychological experiences of seventh-year medical students during clinical placements conducted in Senegal. We also aimed to identify the feelings prevalent in these students during clinical placements; and to assess the quality of sleep of these students.

## Methodology

### Study design and setting

We conducted a cross-sectional, descriptive, and analytical study. It took place from November 11, 2023, to March 21, 2024, at the El Hadj Ibrahima Niassé University (UEIN). This university was created in 2000 and inaugurated in 2003. It is in Dakar, Senegal's capital, in Point E, a wealthy district. Three

courses are available: Medicine, Pharmacy, and Dental Surgery. For the 2023-2024 academic year, 2039 students were enrolled: 1619 in medicine, 183 in pharmacy, and 237 in dental surgery.

### Data collection

Data collection was based on a digital self-questionnaire, designed using Google Forms. It took around ten minutes to administer. Pre-testing of the questionnaire was carried out with a sample of 14 UEIN 5<sup>th</sup>-year medical students. The questionnaire was organized in 2 parts. The first part concerned socio-demographic data (gender, age group, country of origin, marital status and regime, and number of children). The second part dealt with questions specific to the environment during clinical placements, positive and negative feelings experienced by students during their clinical placements, and the quality of their sleep). An "open comments" section completed the questionnaire.

The link to the questionnaire was sent repeatedly to the WhatsApp groups of the different classes of eligible students at UEIN. Representatives from each group volunteered to take care of the follow-up. Data were entered into Google Forms.

### Data analyses

Data were exported to Excel and analyzed using SPSS version 25. Graphs were produced using Microsoft Excel. Results are presented as averages for quantitative parameters and as proportions (%) for qualitative parameters. A  $p$ -value < 0.05 (Chi-square test) was used to determine significance.

### Ethical considerations

The University Dean's Office authorized the study. The research was conducted in accordance with the Helsinki Declaration. The survey was carried out among medical students who had completed the clinical placements and had freely consented to take part in the study. The collected data were anonymous.

## Results

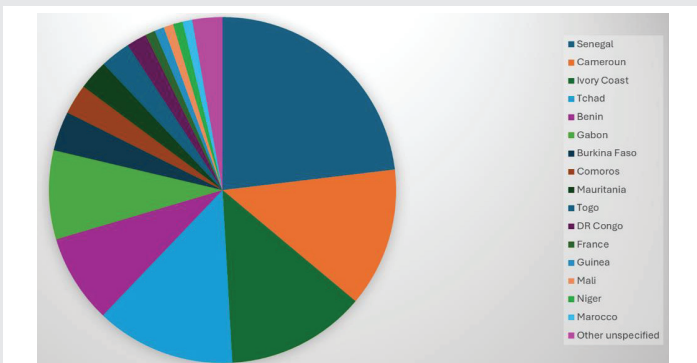
### Sample characteristics

108 students completed the questionnaire, including 81 women (75%) and 27 men (25%) (Table 1). The sex ratio (M/F) was 0.33. Ninety-one students (84.2%) were aged between 25 to 30 years old. Seven (6.5%) and 2 (1.9%) students were in the [20-25] and [30-35] age groups respectively. 25 participants (23.1%) were Senegalese, 14 students (13%) were Cameroonian; 14 (13%) were Ivorian and 14 (13%) Chadian, 9 (8.3%) were Beninese, 9 (8.3%) Gabonese, 4 (3.7%) were from Burkina Faso, 3 (2.8%) were from Comoros; 3 (2.8%) from Mauritania and 3 (2.8%) from Togo (Figure 1).

Eighty-nine participants (82%) were single. 12 (11%) were married, 6 (6%) were cohabiting and 1 (1%) divorced. Among the married students 10 (83.3%) were monogamous and 2 (16.7%) polygamous. Ninety-two participants (85%) had no children, 12 (11%) had one child and 4 (3%) had two children or more.

**Table 1:** Distribution of departments according to the number of students with the most positive feelings.

Services	Number (n)	Proportions (%)
Internal medicine	29	26.8
Pediatrics	27	25
Gynecology	16	14.8
General surgery	11	10.1
Sub-total (one choice)	83	76.7
General surgery and internal medicine	6	5.5
Internal medicine and pediatrics	5	4.6
Gynecology and internal medicine	3	2.8
Gynecology and pediatrics	3	2.8
General surgery and pediatrics	2	1.9
General surgery and gynecology	2	1.9
Sub-total (2 choices)	21	19.5
General surgery, gynecology and pediatrics	2	1.9
General surgery, gynecology, pediatrics, and internal medicine	2	1.9
Sub-total ( $\geq 3$ choices)	4	3.8
Total	108	100



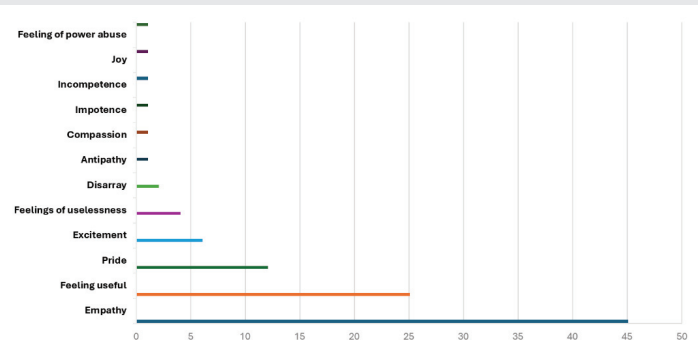
**Figure 1:** Breakdown of students by country.

positive feelings they had experienced. Among them, 29 (26%) had chosen internal medicine, 27 (25%) pediatrics, 16 (15%) gynecology-obstetrics and 11 (10%) surgery. 25 (23%) students had chosen a number of departments greater than or equal to 2 (Table 1).

Students were also given the opportunity to choose one or more services associated with the maximum number of negative feelings experienced. 103 (95%) students chose a single department. Of these, 39 (36%) had experienced the most negative feelings in gynecology, 25 (23%) in internal medicine, 22 (20%) in pediatrics and 17 (16%) in surgery (Table 2). Ninety students (83%) felt their work during clinical placements was insufficiently valued and recognized. 72 students (67%) felt exploited. 101 students (94%) wanted to be paid for clinical placements.

**Quality of sleep during clinical placement**

Eighty-two students (76%) reported that they slept less than 7 hours per night and average during their last clinical placement; 25 (23%) between 7 to 9 hours and 1 (3%) more than 9 hours. 7 (7%) reported high satisfaction concerning their sleep quality (very good to good), 62 (57%) reported acceptable sleep quality whereas 39 (36%) were unsatisfied (poor or very poor sleep quality). When they woke up, 96 (89%) felt tired and 12 (11%) felt fit (Figure 3).



**Figure 2:** Students' feelings about hospital services.

**Clinical placement characteristics**

The last clinical placement was less than three months before the questionnaire for 57 students (53%). For 30 (28%), it was 3 to 6 months before the study; for 10 (9%), it was 6 to 9 months before; for 6 (6%), it was 9 to 12 months before; and for 5 (4%), it was more than a year. Forty-eight students (45%) had completed their last clinical rotation in internal medicine. Thirty-nine (36%) did their clinical placement in surgery; 12 (11%) in pediatrics and 9 (8%) in gynecology-obstetrics.

**Emotional experiences of clinical placement: positive and negative feelings**

The predominant feeling expressed by students during this clinical placement was empathy (45%), followed by a sense of usefulness (25%) and pride (12%) (Figure 2).

Students were given the opportunity to choose one or more services associated with the maximum number of positive feelings they had experienced. Eighty-three (76%) students chose a department associated with a maximum number of

**Table 2:** Distribution of departments according to the number of students with the most negative feelings.

Services	Number (n)	Proportion (%)
Gynecology	39	36.2
Internal medicine	25	23.2
Pediatrics	22	20.4
General surgery	17	15.7
Sub-total (1 choice)	103	95.5
General surgery and gynecology	1	0.9
General surgery and internal medicine	1	0.9
General surgery and pediatrics	1	0.9
Gynecology and pediatrics	1	0.9
Internal medicine and pediatrics	1	0.9
Sub-total (2 choices)	5	4.5
Total	108	100

### Factors associated with sleep duration and quality during the last placement

**Factors associated with sleep duration:** Sleep duration was correlated with the nature of the department of the last clinical placement ( $p$ -value = 0.025). Indeed, among those with less than 7 hours' sleep at night, 38 (36%) were in internal medicine, 24 (22%) in surgery, 12 (11%) in pediatrics and 8 (7%) in gynecology (Table 3).

Sleep duration during the last clinical placement was not associated with gender ( $p$  = 0.436). However, female students accounted for 76.8% of the group who slept less than 7 hours per night. Sleep duration during the last clinical course was not correlated with age ( $p$  = 0.174). Insomnia was largely predominant in the 20–25 age group, with 87.8% of those having less than 7 hours' sleep per night. Sleep duration during the last clinical placement was not associated with marital status ( $p$  = 0.225).

Sleep duration during the last clinical placement was not correlated with the number of children ( $p$  = 0.472). Nevertheless, among the 82 people with a mean number of hours of nocturnal sleep < 7 during the last clinical placement, 67 had no children, corresponding to 72% of all childless students. 11 had one child, i.e. 91.7% of this sub-population. 3 had two children, i.e. 100% of this group. Finally, 1 student had more than three children, also 100% of this group.

**Factors associated with sleep quality:** Unsatisfactory sleep quality was associated with the nature of the department of the last clinical placement ( $p$  = 0.026) (Table 4). Indeed, 18 (46.15%) with unsatisfactory sleep quality were in internal medicine, 11 (28.20%) were in surgery, 7 (17.94%) in pediatrics and 3 (7.69%) in gynecology.

Unsatisfactory night-time sleep quality was statistically correlated with sleep duration during the last clinical placement ( $p$  = 0.026). Indeed, 33 students with unsatisfactory sleep quality during the last clinical placement had less than 7 hours of sleep (Table 5).

### Discussion

In our study, over 70% of respondents were women. This result bears witness to the growing feminization of medical training courses. It is in line with several studies, such as those by Danset A [2] in Tours and Paris, from Zou L [4] in Ile-de-France and Aboubaigi A [5] in Marrakech. They reported

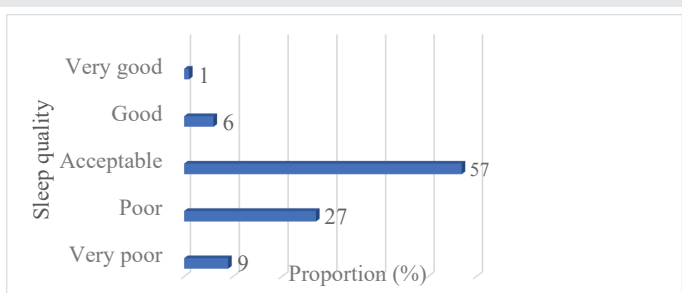


Figure 3: Students' self-assessment of sleep quality.

Table 3: Relationship between sleep duration and nature of service in the last clinical placement.

Services	< 7		> 7		p-value
	Number (n)	Proportion	Number	Proportion (%)	
Internal medicine	38	36	10	9	0.025
General surgery	24	22	15	14	
Pediatrics	12	11	0	0	
Gynecology	8	7	1	1	

Table 4: Relationship between quality of sleep at night and the nature of the service of the last clinical placement.

Services	Oui		Non		p-value
	Number (n)	Proportion (%)	Number (n)	Proportion (%)	
Internal medicine	18	17	30	28	0.026
General surgery	11	10	28	26	
Pediatrics	7	6	5	5	
Gynecology	3	3	6	5	

Table 5: Relationship between quality and duration of night sleep during last clinical rotation.

Average hours of sleep (hours)	Oui		Non		p-value
	Number (n)	Proportion (%)	Number (n)	Proportion (%)	
< 7	33	31	49	45	0.026
> 7	6	5	20	19	

proportions of female medical students of 63.8%, 66.2%, 60% and 59% respectively. This could be explained, on the one hand, by women's growing interest in medical studies. On the other hand, in our context, it could be related to the fact that men need to find work quickly to provide financial support to their families, which is often incompatible with long studies.

Concerning emotional experience, almost half of the students felt empathy during their clinical placements. Being capable of empathy is a major asset for a medical practice that respects the patient and is based on respect for ethical principles [1]. Hands-on learning from experienced, model senior clinicians is fundamental to developing such competence. Indeed, the quality of the doctor-patient relationship is the cornerstone of all medical practice. It is fundamentally based on the caregiver's ability to empathize with the patient and those around him or her. Indeed, empathy on the part of caregivers towards cancer patients, for example, prevents the onset of depressive disorders in these patients [6]. What's more, showing empathy increases patient satisfaction and improves outcomes [7]. In our context, there are as yet no modules dedicated to empathy training. This gap needs to be filled in the training of caregivers.

During their clinical placements, students also experienced negative emotional experiences. A majority of the students reported they felt exploited. The French National Association of Medical Students found a lower proportion of 56.82% out of 7,200 students [8]. This difference is probably explained by the absence of any financial or material support for hospital students in Senegal. There is a total lack of recognition of their



contribution to healthcare structures. Indeed, on-call duty, for example, relies essentially on them, in the absence of any real policy of seniorization in the care structures. In a previous study, we found that status in the department was associated with the risk of burnout syndrome [9]. A continuum is quickly established between the feeling of being exploited and that of doing work that is not properly recognized. Indeed, more than 80% of our respondents pointed to insufficient recognition of the work performed during their clinical placements. Our results are similar to those of the Rouen team in France [10] where 94% of the 494 Rouen externs surveyed expressed this feeling of lack of recognition.

Concerning sleep duration, more than 70% of the respondents had less than 7 hours of sleep during their last clinical placement. Similar proportions were found in Nepal, with 64.1% [11], and Rwanda with 70% [12]. Yet sleep is a physiological need. Sleep hygiene contributes to good physical and mental health. Insufficient sleep has a negative impact on cognitive functions, mental health, and cardiovascular health, among other things. It also reduces academic performance and judgment in emergency situations. As a result, it can be a risk factor for blood exposure accidents [13] or poor evaluation in medical practice [14]. This night-time sleep duration is under international recommendations. In fact, the National Sleep Foundation and the American Academy of Sleep Medicine recommend a daily night's sleep duration of between 7 and 9 hours for adults, and over 11 hours for school-age children [15].

These sleep alterations were not limited to duration but also concerned sleep quality. More than 35% had rated their sleep quality as unsatisfactory during their last clinical placement. A recent meta-analysis [13] and systematic review [16] found prevalences of 50% and 52% respectively. These proportions are significantly higher than ours, but this difference could be explained by the difference in the measurement instruments used, and by the context in which the studies included were carried out, namely the Covid-19 pandemic. The high prevalence of sleep disorders in clinical placements is probably linked to the high level of demands associated with these placements. In fact, sleep disorders were statistically correlated with the nature of the clinical department. Internal medicine, pediatric surgery, and pediatrics were the three departments most associated with sleep disorders. These are the hospital departments that receive the most emergency patients during on-call duty. As a result, students are often confronted with a great deal of stress during their shifts. Inadequate technical facilities, environmental conditions in the care facilities, and the lack of seniority on call are all factors contributing to this phenomenon [17].

Our study has some limitations. The sample size was small. While the study shows a correlation between sleep quality and department type, it cannot confirm if workload directly causes sleep disturbances. Potential reporting bias in self-assessed sleep and psychological experiences is possible. But to our knowledge, this study is the first to report data on this topic. Results will need to be confirmed in a larger sample. The cross-sectional design of the present study cannot provide

information on the causal direction. A longitudinal study should be conducted to better evaluate, in our context, the entire medical student training pathway. Future studies should also include an assessment of the pedagogical approaches used by supervisors in hospital settings, as well as all forms of harassment suffered by students at these sites, and exclude other factors influencing sleep (e.g. dietary habits, screen use habits).

## Conclusion

Medical studies are unique in that they involve early immersion in the hospital environment, with all its constraints. They are essential for acquiring the knowledge and reinforcing the interpersonal skills and know-how needed to practice the medical profession. During these clinical rotations, the future practitioner acquires firmly rooted ethical principles, reflected in a holistic, humanizing approach that respects the patient and those around him/her. The many organizational and logistical constraints associated with our care structures, and the high expectations placed on our trainees, call for structured psychosocial support. Clinical placements have a negative impact on sleep duration and quality. Future studies should focus on developing strategies to prevent this. Finally, the question of remuneration for placements needs to be discussed further with the medical and administrative authorities.

(Supplementary-Information)

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