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Perceived workload and associated organizational factors among healthcare professionals in emergency departments of referral hospitals in Conakry, Guinea: a multicenter cross-sectional study

Houssainatou BAH

housbi2011@gmail.com

Institut National de Santé Publique

Abdoulaye Fodé TOURE

Institut National de Santé Publique

Amadou WANN

Institut National de Santé Publique

Jean Séllé BAVOGUI

Institut National de Santé Publique

Thierno Ibrahima DIALLO

Institut National de Santé Publique

Almamy Amara TOURE

Maferinyah Training and Research Center in Rural Health

Dumiel Chérigan Précieux Adéyèmi KOSSOKO

Philippe Mimtiri COMPAORE

Belgian Development Agency

Sidikiba SIDIBE

Gamal Abdel Nasser University of Conakry

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Perceived workload and associated organizational factors among healthcare professionals in emergency departments of referral hospitals in Conakry, Guinea: a multicenter cross-sectional study

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Authors

Houssainatou BAH[1], Abdoulaye Fodé TOURE[1], Amadou WANN[2], Jean Séllé BAVOGUI[1], Thierno Ibrahima DIALLO[1], Almamy Amara TOURE[2], KOSSOKO Dumiel Chérigan Précieux Adéyèmi[1], Mimtiri Philippe COMPAORÉ[4], Sidikiba SIDIBE[3]

Affiliations

[1] National Institute of Public Health, Conakry, Guinea

[2] Maferinyah Training and Research Center in Rural Health, Maferinyah, Guinea

[3] Faculty of Health Sciences and Techniques, Gamal Abdel Nasser University of Conakry, Conakry, Guinea

[4] Belgian Development Agency (Enabel), Guinea

Corresponding author

Houssainatou BAH

National Institute of Public Health, Conakry, Guinea

Email: housbi2011@gmail.com

Phone: +224 620 66 51 98

Abstract

Background: Workload affects occupational health, staff well-being and quality of care. Emergency departments are particularly demanding, especially in resource-limited settings. This study assessed perceived workload and associated organizational and professional factors among healthcare professionals working in referral hospital emergency departments in Conakry, Guinea.

Methods: We conducted a multicenter analytical cross-sectional study from March 2 to June 2, 2026, in the emergency departments of Donka University Hospital, Ignace Deen University Hospital and the Sino-Guinean Hospital. Eligible physicians and nurses were exhaustively recruited. Perceived workload was measured using the NASA Task Load Index, and associated factors were examined using bivariate analyses and multiple linear regression.

Results: A total of 146 healthcare professionals were included; the median age was 32 years, and nurses represented 58.9% of participants. The median weekly working time was 56 hours. The overall NASA-TLX score indicated a high perceived workload, mainly driven by mental demand, physical demand and overall effort. In multivariable analysis, being aged 30–39 years was associated with a higher workload score, whereas perceived adequate staffing was associated with a lower score. A moderate work atmosphere was also associated with increased workload compared with a good work atmosphere.

Conclusions: Perceived workload among emergency department healthcare professionals in Conakry was high and was mainly associated with organizational determinants, particularly staffing adequacy and work atmosphere. Interventions should strengthen human resources, improve the work environment and help prevent psychosocial risks.

Trial registration: Not applicable. This study was an observational cross-sectional survey and did not evaluate a health care intervention on human participants.

Keywords

Workload; Occupational health; Health personnel; Emergency department; Referral hospitals; Guinea

Background

Emergency departments are an essential component of health systems, ensuring the rapid management of acute and potentially life-threatening conditions, according to the World Health Organization (WHO) [1]. However, their functioning depends on healthcare professionals who are exposed to substantial organizational and clinical constraints. Workload refers to all physical, mental and time-related demands imposed on healthcare workers in the performance of their duties [2]. When excessive, it promotes occupational stress, burnout, reduced quality of care and an increased risk of medical errors [3].

Globally, work overload is a growing concern in emergency departments. The systematic review by Jachmann et al. [4] highlighted high levels of stress, burnout and workload among physicians and nurses working in emergency departments. Similarly, the meta-analysis by Alanazy and Alruwaili [5] reported a global burnout prevalence of 43% among emergency department healthcare workers. In resource-limited countries, particularly in sub-Saharan Africa, this situation is aggravated by insufficient human resources and the continuous increase in demand for care [6].

In West Africa, Konlan et al. [7] showed in Ghana that long working hours, night shifts and organizational constraints were significantly associated with burnout among healthcare professionals. Several studies have also identified increased patient volume, insufficient staffing, time pressure and the high frequency of shifts as the main determinants of high workload in emergency departments [7].

Workload is now recognized as a multidimensional concept that incorporates the mental, physical and temporal dimensions of work. In this regard, Hart and Staveland (1988) [8] developed the NASA Task Load Index (NASA-TLX), a tool widely used to assess perceived

workload. Hart (2006) [8] subsequently confirmed its relevance in high-intensity work environments such as emergency departments.

In Guinea, emergency departments operate in a context marked by high demand for care and organizational constraints that may increase the workload of healthcare staff [9]. Despite the importance of this issue, data on factors associated with workload in Guinean emergency departments remain limited.

This lack of local data limits the development of targeted strategies to improve working conditions for healthcare staff, quality of care and emergency department performance in Conakry. To address this evidence gap, this study examined perceived workload among healthcare professionals working in the emergency departments of referral hospitals in Conakry and identified the sociodemographic, professional and organizational factors associated with higher workload scores.

Methods

Study setting

By focusing on referral hospital emergency departments, the study provides context-specific evidence from high-demand settings where organizational constraints are likely to shape perceived workload.

The study was conducted in the emergency departments of Donka National Hospital, Ignace Deen University Hospital and the Sino-Guinean Hospital. These institutions are among the country's main referral hospitals and provide a substantial share of medical, surgical and trauma emergency care. They receive patients from Conakry and other regions of Guinea, exposing them to high attendance and sustained clinical activity. Their selection made it possible to examine workload in high-demand emergency departments that reflect key features of Guinea's referral hospital system.

Study design and duration

This was a multicenter analytical cross-sectional study conducted among healthcare professionals working in the emergency departments of the three referral hospitals in Conakry from March 2 to June 2, 2026. The study aimed to measure perceived workload using the NASA-TLX score and to identify associated sociodemographic, professional and organizational factors.

Study population

The study population consisted of all healthcare professionals working in the emergency departments of the three national public referral hospitals in Conakry.

Source population

The source population included all professionals working in the emergency departments of Donka University Hospital, Ignace Deen University Hospital and the Sino-Guinean Hospital who met the eligibility criteria during the survey period. These professionals consisted of physicians and nurses who fulfilled the eligibility criteria defined for the study.

Selection criteria

Inclusion criteria: The study included physicians and nurses working in the emergency departments of referral hospitals in Conakry for at least six months, who were present during the data collection period and who provided free and informed consent to participate in the study.

Non-inclusion criteria: Temporary staff, professionals on extended leave at the time of the survey and individuals who refused to participate in the study were not included.

Sampling

Exhaustive recruitment was conducted among all professionals who met the inclusion criteria. In total, 146 healthcare professionals were surveyed and included in the analysis.

Data collection tool

Data were collected using a structured, anonymous, self-administered questionnaire available in paper and digital formats through the KoboCollect platform. The questionnaire included a section on participants' sociodemographic characteristics, a section on professional characteristics, a section on organizational characteristics of work, and the NASA Task Load Index (NASA-TLX) scale for assessing perceived workload [8].

Study variables

Dependent variable: The dependent variable of the study was perceived workload. It was assessed using the overall NASA Task Load Index (NASA-TLX) score, a validated tool for assessing workload across six complementary dimensions: mental demand, physical demand, temporal demand, overall effort, frustration and perceived performance.

In accordance with the methodological recommendations of the NASA-TLX, the perceived performance score was reversed before calculating the overall score to ensure directional consistency across the different dimensions. The reversal was performed using the following formula: reversed performance = 10 − perceived performance.

The overall NASA-TLX score was calculated as the mean of the six dimensions after reversing the perceived performance score: NASA-TLX = [(mental demand + physical demand + temporal demand + overall effort + frustration + reversed performance) × 10] / 6.

The overall score ranged from 0 to 100, with higher values indicating higher perceived workload. For descriptive interpretation, scores were categorized as low (0–29), moderate (30–49), high (50–69) and very high or overload (≥ 70).

Independent variables: The independent variables included sociodemographic, professional and organizational characteristics likely to influence perceived workload. Sociodemographic variables included age in years, age group (< 30 years, 30–39 years and ≥ 40 years), sex and marital status. Professional variables included occupation, professional experience, length of

service in the emergency department, number of weekly working hours, number of shifts performed per month, average number of patients managed per shift and work schedule. Organizational variables included the frequency of work interruptions, perceived staffing adequacy, availability of the equipment required for patient care, perceived level of managerial support, work atmosphere and hospital facility.

Statistical analysis

Data were entered, cleaned and analyzed using R software version 4.4.1. A descriptive analysis was first performed to characterize the study population. Quantitative variables were described using the median and the first and third quartiles, given their distribution. Qualitative variables were summarized using frequencies and percentages.

Second, bivariate analysis was performed to explore the relationships between perceived workload and the different explanatory variables. The normality of the overall NASA-TLX score distribution was assessed by inspecting the histogram and quantile-quantile plot (Q-Q plot), and using the Shapiro-Wilk test. As the NASA-TLX score was not normally distributed ($p = 0.033$), non-parametric tests were used. The Wilcoxon-Mann-Whitney test was applied to compare scores between groups with two categories, while the Kruskal-Wallis test was used for variables with more than two categories. Associations between quantitative variables and the NASA-TLX score were assessed using Spearman's rank correlation coefficient.

Multivariable analysis was then performed to identify factors independently associated with perceived workload. A multiple linear regression model was constructed by including sociodemographic, professional and organizational variables considered relevant. The final model was selected using a stepwise procedure based on the Akaike information criterion (AIC). Results were presented as regression coefficients (β), with their 95% confidence intervals and corresponding p-values. The statistical significance threshold was set at 5%.

Assessment of model assumptions

The main assumptions of multiple linear regression were assessed before interpreting the final model. Residual normality was examined graphically using a quantile-quantile plot (Q-Q plot) and statistically using the Shapiro-Wilk test.

Homoscedasticity of residuals was assessed by examining the plot of residuals versus fitted values and the Scale-Location plot. These graphical representations were used to check for the absence of major heteroscedasticity.

Potential multicollinearity among explanatory variables was assessed using the variance inflation factor (VIF). A VIF value below 5 was considered to indicate the absence of concerning collinearity.

Finally, several conceptually plausible interactions were explored, including interactions between perceived staffing adequacy and the number of patients managed per shift, between work atmosphere and the number of patients per shift, and between work atmosphere and staffing adequacy. None of these interactions showed a statistically significant association and they were therefore not retained in the final model.

Ethical considerations

The study was approved by the Ethics Committee of the National Institute of Public Health (Comité d'éthique de l'INSP), under approval reference 001/INSP/CE/2026. It was conducted in accordance with the ethical principles applicable to research involving human participants and with the principles of the Declaration of Helsinki. The necessary administrative authorizations were obtained from the management of the participating hospitals before data collection. Written informed consent was obtained from each participant before the survey. The study guaranteed anonymity and confidentiality throughout the research process.

Results

Table 1 presents the sociodemographic characteristics of the participants. Among the 146 healthcare professionals included in the study, the median age was 32 years (IQR: 29–37 years). Women represented 51% of participants and men 49%. Most participants were married (62%), followed by single participants (34%) and widowed participants (3.4%).

Regarding participants' professional characteristics, nurses represented 59% of participants and physicians 41%. The median professional experience was 6 years (IQR: 4–8 years), and the median length of service in emergency departments was 3 years (IQR: 2–3 years). Participants came from Donka University Hospital (37%), Ignace Deen University Hospital (36%), and the Sino-Guinean Hospital (27%). The median weekly working hours were 56 (IQR: 56–71), the median monthly shifts were 6 (IQR: 5–7), and the median patients managed per shift were 8 (IQR: 7–9).

Table 1. Sociodemographic and professional characteristics

Characteristic	**N = 146**
Age, years, median (IQR)	32.0 (29.0–37.0)
Sex	
Female	75 (51.4)
Male	71 (48.6)
Marital status	
Single	50 (34.2)
Married	91 (62.3)
Widowed	5 (3.4)
Occupation	
Nurse	86 (58.9)
Physician	60 (41.1)
Professional experience, years, median (IQR)	6.0 (4.0–8.0)
Length of service in emergency departments, years, median (IQR)	3.0 (2.0–3.0)
Hospital facility	
Donka University Hospital	54 (37.0)
Ignace Deen University Hospital	53 (36.3)
Sino-Guinean Hospital	39 (26.7)
Weekly working hours, median (IQR)	56.0 (56.0–71.0)
Number of shifts per month, median (IQR)	6.0 (5.0–7.0)

Characteristic	N = 146
Patients per shift, median (IQR)	8.0 (7.0–9.0)

Values are presented as n (%) unless otherwise indicated. IQR, interquartile range.

Table 2 presents the organizational characteristics of the participants. Most participants worked under a mixed work schedule (97%). Work interruptions were reported as frequent by 50% of participants and occasional by 45%. Two-thirds of participants perceived staffing as adequate (66%), and 57% reported that equipment was available. Managerial support was perceived as high by 49% of participants and moderate by 48%. The work atmosphere was rated as good by 73% of participants and moderate by 27%.

Table 2. Organizational characteristics

Characteristic	N = 146
Work schedule	
Mixed	141 (96.6)
Day duty	5 (3.4)
Frequency of interruptions	
Frequently	73 (50.0)
Sometimes	65 (44.5)
Rarely	8 (5.5)
Perceived staffing adequacy	
No	50 (34.2)
Yes	96 (65.8)
Equipment availability	
No	63 (43.2)
Yes	83 (56.8)
Managerial support	
High	71 (48.6)
Moderate	70 (47.9)
Low	5 (3.4)
Work atmosphere	
Good	106 (72.6)
Moderate	39 (26.7)
Poor	1 (0.7)

Values are presented as n (%).

Table 3 presents the different dimensions of perceived workload assessed using the NASA-TLX scale. The median mental demand score was 8 (IQR: 7–8), the median physical demand score was 8 (IQR: 7–8), the median temporal demand score was 7 (IQR: 7–8), and the median overall effort score was 8 (IQR: 7–8). Frustration had a median score of 6 (IQR: 5–8), while reversed performance had a median score of 2 (IQR: 1–3).

Table 3. NASA-TLX workload dimensions

NASA-TLX dimension	Median (IQR)
Mental demand	8.0 (7.0–8.0)
Physical demand	8.0 (7.0–8.0)
Temporal demand	7.0 (7.0–8.0)
Overall effort	8.0 (7.0–8.0)
Frustration	6.0 (5.0–8.0)
Reversed performance	2.0 (1.0–3.0)

Scores range from 0 to 10 for each dimension. IQR, interquartile range; NASA-TLX, National Aeronautics and Space Administration Task Load Index.

Table 4 presents the results of the bivariate analysis between qualitative variables and the perceived workload score (NASA-TLX). A statistically significant association was observed between perceived workload and work schedule ($p = 0.031$), perceived staffing adequacy ($p < 0.001$), managerial support ($p = 0.005$) and work atmosphere ($p = 0.002$). In contrast, no statistically significant association was found with sex ($p = 0.478$), marital status ($p = 0.617$), occupation ($p = 0.542$), frequency of work interruptions ($p = 0.318$), equipment availability ($p = 0.144$) or age group ($p = 0.378$).

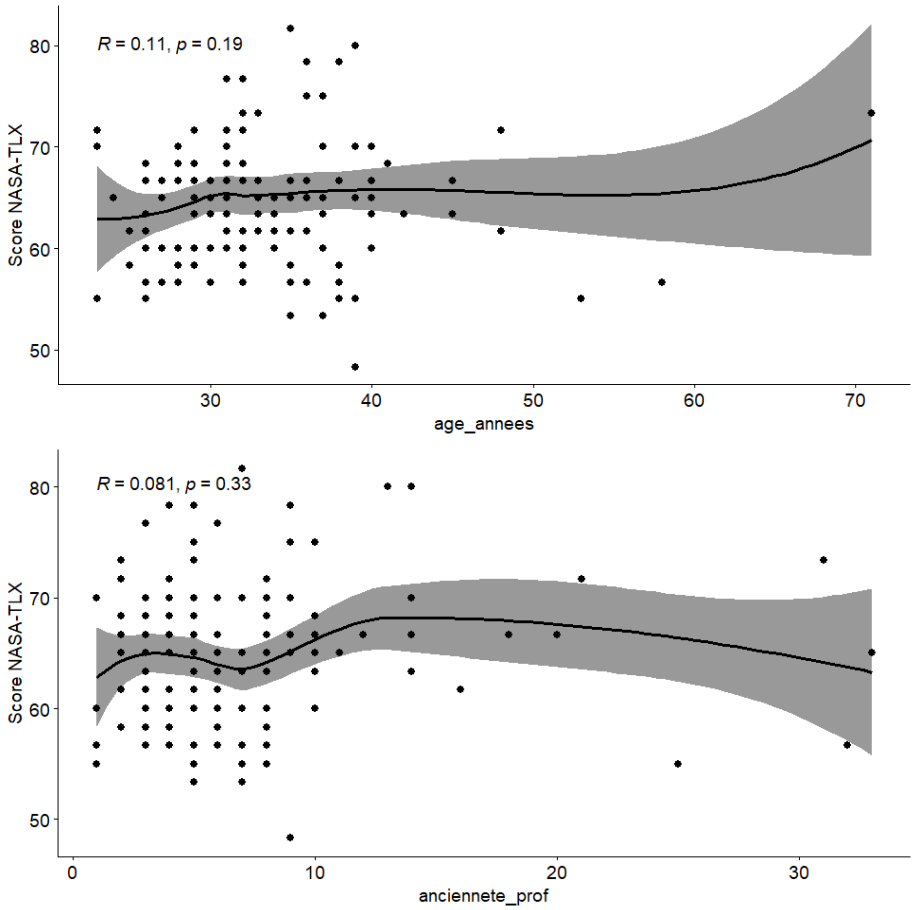
Table 4. Bivariate analysis of factors associated with NASA-TLX score

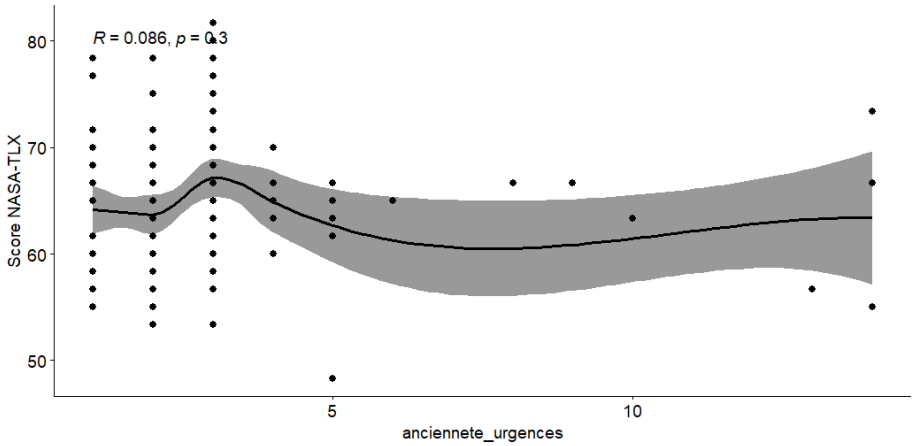
Variable	Test statistic	p-value
Sex	$W = 2481.5$	0.478
Marital status	$\chi^2 = 0.97$	0.617
Occupation	$\chi^2 = 0.37$	0.542
Work schedule	$W = 553.0$	0.031
Frequency of interruptions	$\chi^2 = 2.29$	0.318
Perceived staffing adequacy	$W = 3288.0$	< 0.001

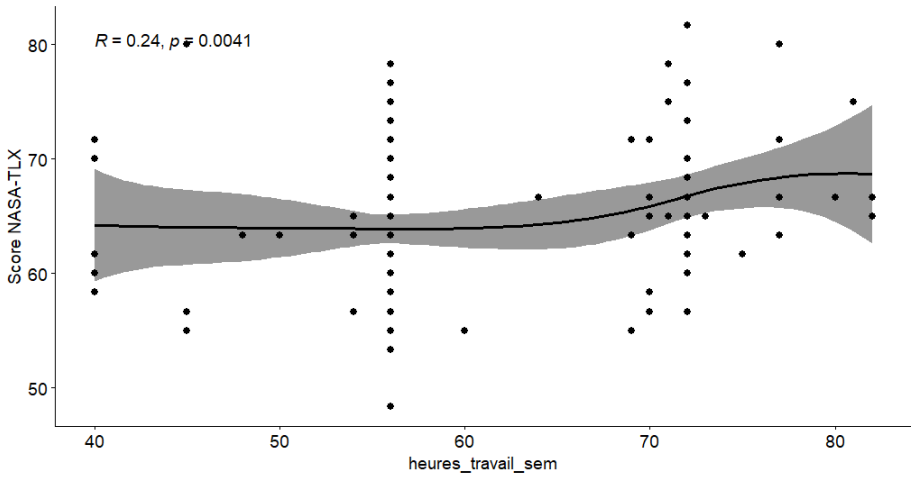
Variable	Test statistic	p-value
Equipment availability	W = 2983.5	0.144
Managerial support	$\chi^2 = 10.78$	0.005
Work atmosphere	$\chi^2 = 12.79$	0.002
Age group	$\chi^2 = 1.95$	0.378

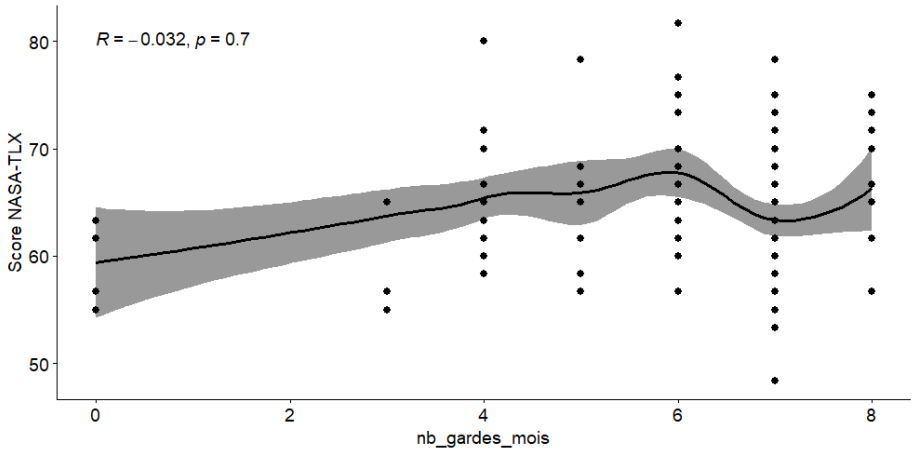
W, Wilcoxon-Mann-Whitney test statistic; χ^2, Kruskal-Wallis chi-square statistic.

Figure 1 presents the results of the bivariate analysis between quantitative variables and the perceived workload score (NASA-TLX). A statistically significant positive correlation was observed between the number of weekly working hours and the NASA-TLX score ($\rho = 0.236$; $p = 0.004$). No statistically significant correlation was observed between the NASA-TLX score and age in years ($\rho = 0.108$; $p = 0.194$), professional experience ($\rho = 0.081$; $p = 0.329$), length of service in emergency departments ($\rho = 0.086$; $p = 0.303$), number of monthly shifts ($\rho = -0.032$; $p = 0.700$) or number of patients managed per shift ($\rho = 0.077$; $p = 0.358$).




R = 0.086, p = 0.3
Score NASA-TLX
80
70
60
50
5
10
anciennete_urgences


R = 0.24, p = 0.0041
Score NASA-TLX
80
70
60
50
40
50
60
70
80
heures_travail_sem


R = −0.032, p = 0.7
Score NASA-TLX
80
70
60
50
0
2
4
6
8
nb_gardes_mois

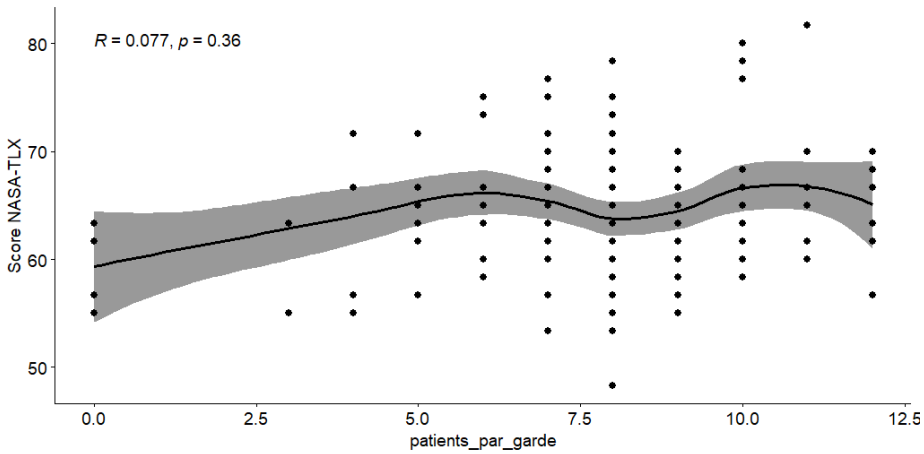

R = 0.077, p = 0.36
Score NASA-TLX
80
70
60
50
0.0
2.5
5.0
7.5
10.0
12.5
patients_par_garde

Figure 1. Correlation between quantitative characteristics of healthcare professionals and NASA-TLX workload score

Table 5 presents the factors associated with perceived workload in the multiple linear regression model. Professionals aged 30–39 years had a higher workload score than those aged under 30 years (β = 2.19; 95% CI: 0.08 to 4.31; p = 0.042). Perceived adequate staffing was associated with a decrease in workload score (β = -3.72; 95% CI: -5.81 to -1.62; p < 0.001). A moderate work atmosphere was associated with an increase in workload score compared with a good work atmosphere (β = 2.63; 95% CI: 0.49 to 4.76; p = 0.016). No statistically significant association was observed for the number of patients managed per shift, work schedule, age 40 years or older, or poor work atmosphere.

Table 5. Multivariable analysis of factors associated with NASA-TLX score

Variable	β	Standard error	95% CI	p-value
Age group				
< 30 years	Reference	—	—	—
30–39 years	2.19	1.07	0.08 to 4.31	0.042
≥ 40 years	2.41	1.84	-1.24 to 6.05	0.194
Patients per shift	0.39	0.24	-0.08 to 0.86	0.104
Work schedule				
Mixed	Reference	—	—	—
Day duty	-4.64	3.31	-11.19 to 1.91	0.164
Perceived staffing adequacy				
No	Reference	—	—	—
Yes	-3.72	1.06	-5.81 to -1.62	< 0.001
Work atmosphere				
Good	Reference	—	—	—
Poor	8.00	5.71	-3.29 to 19.28	0.163
Moderate	2.63	1.08	0.49 to 4.76	0.016

β, regression coefficient; CI, confidence interval. Reference indicates the reference category used in the regression model.

Discussion

This study aimed to identify factors associated with perceived workload among healthcare professionals working in the emergency departments of referral hospitals in Conakry. The findings showed a high perceived workload, mainly driven by mental demand, physical demand and overall effort, and highlighted the importance of organizational determinants such as staffing adequacy and work atmosphere.

This study has several strengths. It used the NASA-TLX, a validated multidimensional workload assessment tool, and included the three main referral hospitals in Conakry, which strengthens the relevance of the findings for emergency departments in the capital city. Several limitations should also be considered. The cross-sectional design precludes causal inference, and self-reported information may have been influenced by individual perception or social desirability bias. In addition, potentially important workload determinants, including patient severity, burnout level and detailed task allocation during shifts, were not assessed.

The median age of participants was 32 years and slightly more than half were women. This profile is consistent with studies conducted in emergency departments, where staff often include early- and mid-career professionals exposed to substantial organizational, clinical and emotional demands [10,11].

Participants reported sustained professional activity, with a median of 56 working hours per week, six on-call shifts per month and eight patients managed per shift. This pattern is consistent with international observations in emergency departments, where increasing care demand, service saturation and resource constraints are recognized as major contributors to work overload [12,13].

The analysis of NASA-TLX dimensions showed that mental demand, physical demand and overall effort had the highest scores. These results are consistent with Park et al. [14], who used the NASA-TLX among emergency department nurses and reported high mental demand related to unpredictable clinical situations and frequent work interruptions. Similarly, Bakhoum et al.

[15] showed that emergency department nurses spent a substantial portion of their time on administrative tasks and electronic documentation, which increased the mental demand and effort dimensions of the NASA-TLX.

Bivariate analysis showed that work schedule, perceived staffing adequacy, managerial support, work atmosphere and weekly working hours were associated with perceived workload. These findings support the central role of organizational factors in perceived workload among emergency department personnel, although only staffing adequacy and work atmosphere remained independently associated with workload in the multivariable model. Daniels et al. [13] similarly reported that working conditions, organizational support and leadership quality were major determinants of staff well-being and retention in emergency departments.

In the multivariable model, perceived adequate staffing was independently associated with a lower workload score. This finding is consistent with evidence showing that understaffing contributes to burnout, turnover intention and reduced quality of care among emergency department nurses [11]. Similarly, Griffiths et al. [16] showed that better nurse staffing levels were associated with improved patient monitoring and hospital outcomes.

Our study also highlighted an increase in the perceived workload of participants reporting an average work atmosphere compared to those describing a good work atmosphere. This result is consistent with the work of Turnbach et al. [17] published in 2023, which showed that a supportive work environment was associated with better professional well-being among emergency department nurses. Similar results were reported by Munn et al. [18] in 2025, who observed that psychological safety, professional recognition and organizational support were associated with a lower level of burnout among emergency department nurses.

Professionals aged 30–39 years had a higher perceived workload than those aged under 30 years. This association may reflect the accumulation of clinical, supervisory and organizational responsibilities during this stage of the professional career. Because this relationship remains

insufficiently documented, future studies should explore the mechanisms linking career stage and perceived workload in emergency departments.

Conclusions

This study found a high level of perceived workload among healthcare professionals working in the emergency departments of Conakry's referral hospitals, with mental demand, physical demand and overall effort contributing most strongly to the workload profile. The findings suggest that perceived workload is shaped mainly by organizational factors, particularly staffing adequacy and work atmosphere. Strengthening human resources, improving the work environment and implementing context-appropriate organizational strategies could help reduce work overload, support professional well-being and improve the quality of emergency care.

Declarations

Ethics approval and consent to participate

The study was approved by the Ethics Committee of the National Institute of Public Health (Comité d'éthique de l'INSP), under approval reference 001/INSP/CE/2026. The study was conducted in accordance with ethical principles applicable to research involving human participants and with the principles of the Declaration of Helsinki. The necessary administrative authorizations were obtained from the management of the participating hospitals before data collection. Written informed consent was obtained from each participant before the survey. Anonymity and confidentiality of the data were guaranteed throughout the research process.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available because they contain potentially sensitive occupational health information, but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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This study received funding from Enabel. The funder had no role in the design of the study, data collection, analysis, interpretation of results or writing of the manuscript.

Authors' contributions

HB conceived the study, developed the research protocol and coordinated data collection. AFT and AW performed the statistical analysis, interpreted the results and contributed to drafting the manuscript. JSB, TID, AAT, SS, KDCPA and MPC contributed to critical review, scientific interpretation of the results and improvement of the manuscript. All authors read and approved the final manuscript.

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List of abbreviations

Abbreviation	Definition
AIC	Akaike information criterion
CI	Confidence interval
IQR	Interquartile range

Abbreviation	Definition
NASA-TLX	National Aeronautics and Space Administration Task Load Index
Q-Q plot	Quantile-quantile plot
VIF	Variance inflation factor
WHO	World Health Organization

References

1. World Health Organization. Emergency care systems for universal health coverage: ensuring timely care for the acutely ill and injured. Geneva: World Health Organization; 2019.

2. Pérez-Francisco DH, Duarte-Clíments G, Del Rosario-Melián JM, Gómez-Salgado J, Romero-Martín M, Sánchez-Gómez MB. Influence of Workload on Primary Care Nurses' Health and Burnout, Patients' Safety, and Quality of Care: Integrative Review. Healthcare. 2020;8:12. https://doi.org/10.3390/healthcare8010012.

3. World Health Organization. Burn-out an occupational phenomenon: International Classification of Diseases 11th Revision (ICD-11). Geneva: World Health Organization; 2019.

4. Jachmann A, Loser A, Mettler A, Exadaktylos A, Müller M, Klingberg K. Burnout, Depression, and Stress in Emergency Department Nurses and Physicians and the Impact on Private and Work Life: A Systematic Review. JACEP Open. 2025;6:100046. https://doi.org/10.1016/j.acepjo.2025.100046.

5. Alanazy ARM, Alruwaili A. The Global Prevalence and Associated Factors of Burnout among Emergency Department Healthcare Workers and the Impact of the COVID-19 Pandemic: A Systematic Review and Meta-Analysis. Healthcare. 2023;11:2220. https://doi.org/10.3390/healthcare11152220.

6. Dubale BW, Friedman LE, Chemali Z, Denninger JW, Mehta DH, Alem A, Fricchione GL, Dossett ML, Gelaye B. Systematic review of burnout among healthcare providers in sub-Saharan Africa. BMC Public Health. 2019;19:1247. https://doi.org/10.1186/s12889-019-7566-7.

7. Konlan KD, Asampong E, Dako-Gyeke P, Glozah FN. Burnout syndrome among healthcare workers during COVID-19 Pandemic in Accra, Ghana. PLOS ONE. 2022;17:e0268404. https://doi.org/10.1371/journal.pone.0268404.

8. Hart SG. Nasa-Task Load Index (NASA-TLX); 20 Years Later. Proc Hum Factors Ergon Soc Annu Meet. 2006;50:904–8. https://doi.org/10.1177/154193120605000909.

9. Ministry of Health and Public Hygiene (Guinea). National Health Development Plan 2015-2024. Conakry: MSPH; 2015.

10. Dixon E, Murphy M, Wynne R. A multidisciplinary, cross-sectional survey of burnout and wellbeing in emergency department staff during COVID-19. Australas Emerg Care. 2022;25:247–52. https://doi.org/10.1016/j.auec.2021.12.001.

11. Norful AA, Cato K, Chang BP, Amberson T, Castner J. Emergency Nursing Workforce, Burnout, and Job Turnover in the United States: A National Sample Survey Analysis. J Emerg Nurs. 2023;49:574–85. https://doi.org/10.1016/j.jen.2022.12.014.

12. Mostafa R, El-Atawi K. Strategies to Measure and Improve Emergency Department Performance: A Review. Cureus. 2024;16:e52879. https://doi.org/10.7759/cureus.52879.

13. Daniels J, Robinson E, Jenkinson E, Carlton E. Perceived barriers and opportunities to improve working conditions and staff retention in emergency departments: a qualitative study. Emerg Med J. 2024;41:257–65. https://doi.org/10.1136/emermed-2023-213189.

14. Park S, Yoo J, Lee Y, DeGuzman PB, Kang MJ, Dykes PC, Shin SY, Cha WC. Quantifying emergency department nursing workload at the task level using NASA-TLX: An exploratory descriptive study. Int Emerg Nurs. 2024;74:101424. https://doi.org/10.1016/j.ienj.2024.101424.

15. Bakhoum N, Gerhart C, Schremp E, Jeffrey AD, Anders S, France D, Ward MJ. A Time and Motion Analysis of Nursing Workload and Electronic Health Record Use in the Emergency Department. J Emerg Nurs. 2021;47:733–41. https://doi.org/10.1016/j.jen.2021.03.007.

16. Griffiths P, Ball J, Bloor K, Böhning D, Briggs J, Dall'Ora C, Iongh AD, Iongh A, Jones J, Kovacs C, Maruotti A, Meredith P, Prytherch D, Saucedo AR, Saucedo A, Redfern O, Schmidt P, Sinden N, Smith G. Nurse staffing levels, missed vital signs and mortality in hospitals: retrospective longitudinal observational study. Health Soc Care Deliv Res. 2018;6:1–120. https://doi.org/10.3310/hsdr06380.

17. Turnbach E, Coates L, Vanek F, Cotter E, Pogue CA, Clark RRS, Aiken LH. Emergency Nurses' Wellbeing in Magnet® Hospitals and Recommendations for Improvements in Work Environments: A Multi-Center Cross-Sectional Observational Study. J Emerg Nurs. 2024;50:153–60. https://doi.org/10.1016/j.jen.2023.06.012.

18. Munn LT, O'Connell N, Huffman C, McDonald S, Gibbs M, Miller C, Danhauer SC, Reed M, Mason L, Foley KL, Stopyra J, Gesell SB. Job-Related Factors Associated with Burnout and Work Engagement in Emergency Nurses: Evidence to Inform Systems-Focused Interventions. J Emerg Nurs. 2025;51:249–60. https://doi.org/10.1016/j.jen.2024.10.007.