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# Prevalence and work-related factors associated with burnout among healthcare workers in Kamina, Democratic Republic of Congo

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## Abstract

# Background

Burnout is a major occupational health issue affecting healthcare workers worldwide, particularly in low-resource settings where working conditions are often demanding. This study aimed to determine the prevalence of burnout and identify work-related factors associated with burnout among healthcare workers in Kamina, Democratic Republic of Congo.

# Methods

A cross-sectional analytical study was conducted among 509 healthcare workers using a convenience sampling approach. Data were collected through a structured questionnaire incorporating items adapted from the Maslach Burnout Inventory. Burnout was defined as a dichotomous outcome (yes/no). Independent variables included sociodemographic and work-related characteristics based on the demand–control–support model. Bivariate and multivariate logistic regression analyses were performed to identify independent predictors of burnout.

# Results

The prevalence of burnout was 45.3%. Multivariate analysis identified three independent predictors of burnout: more than five years in service (adjusted OR = 1.89; 95% CI: 1.24–2.89; p = 0.003), working in health centers compared to hospitals (adjusted OR = 1.69; 95% CI: 1.17–2.45; p = 0.005), and having an imposed work schedule (adjusted OR = 2.55; 95% CI: 1.11–5.85; p = 0.027). No significant associations were observed with sociodemographic variables.

# Conclusion

Burnout is highly prevalent among healthcare workers in Kamina and is significantly associated with modifiable work-related factors, particularly those related to work organization and job control. Strengthening working conditions and organizational support is essential to mitigate burnout and enhance health system performance.

## INTRODUCTION

Burnout is a work-related syndrome resulting from chronic occupational stress that has not been successfully managed. It is characterized by three core dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment, which collectively reflect a deterioration in both psychological well-being and professional efficacy (Maslach & Jackson, 1996). The World Health

Organization recognizes burnout as an occupational phenomenon that significantly affects workers' health and performance, particularly in high-demand professions such as healthcare [1].

Healthcare workers are especially vulnerable to burnout due to the nature of their work, which involves high emotional demands, heavy workloads, long working hours, and frequent exposure to suffering and death [2]. These conditions are often exacerbated by limited resources, insufficient organizational support, and poor working environments, particularly in low- and middle-income countries. As a result, burnout has emerged as a major public health concern, affecting not only healthcare workers but also the quality and safety of patient care[3].

Globally, burnout among healthcare workers is highly prevalent. Studies have reported that approximately one-third of healthcare professionals experience burnout symptoms, with even higher rates observed during periods of increased stress such as the COVID-19 pandemic [4]. In the Middle East and North Africa region, burnout prevalence has been estimated between 40% and 60%, highlighting the magnitude of the problem in resource-constrained settings [5]. Similarly, studies conducted in Asia have also reported significant levels of burnout, influenced by multiple sociodemographic and occupational factors [6].

In sub-Saharan Africa, the burden of burnout is also substantial but remains underexplored. Available evidence suggests that healthcare workers in this region are exposed to challenging working conditions, including high patient loads, insufficient infrastructure, and limited support systems, all of which increase the risk of burnout [1]. In the Democratic Republic of Congo (DRC), recent studies have reported considerable levels of burnout among healthcare providers, with occupational stressors playing a major role [7]. Moreover, burnout has been associated with other health outcomes such as hypertension among healthcare workers in Kinshasa, highlighting the importance of occupational determinants [8].

The work environment plays a crucial role in the development of burnout. Psychosocial factors such as workload, time pressure, lack of autonomy, poor interpersonal relationships, and inadequate organizational support have been consistently identified as key determinants of burnout [2]. In addition, environmental conditions such as safety, infrastructure, and workplace organization have been shown to significantly influence healthcare workers' well-being and burnout levels [9].

Despite the growing body of evidence globally, data on burnout and its work-related determinants remain limited in many African settings, particularly in the DRC. Most existing studies are localized and do not fully capture the role of the work environment in shaping burnout among healthcare workers. Understanding these factors is essential for designing targeted interventions aimed at improving healthcare workers' well-being and strengthening health system performance.

Therefore, this study aims to assess the prevalence of burnout and to identify work-related factors associated with burnout among healthcare workers in Kamina .

# METHODOLOGY

## 1. Study design and setting

This study was a cross-sectional analytical study conducted among healthcare workers in Kamina, Democratic Republic of Congo. The study aimed to assess the association between work environment characteristics and the occurrence of burnout among health personnel.

## 2. Study population and eligibility criteria

### Target population

The study population consisted of healthcare workers, including doctors, nurses, laboratory technicians, and administrative staff working in selected health facilities in Kamina.

### Inclusion criteria

Participants were eligible if they:

· Were present during the study period

· Had worked in the facility for at least six months

· Provided informed consent

### Exclusion criteria

Participants were excluded if they:

· Were absent during data collection

· Refused to participate

· Submitted incomplete questionnaires

## 3. Sample size and sampling

The sample size was initially estimated using the single population proportion formula, assuming a 50% prevalence of burnout, a 95% confidence level (Z = 1.96), and a 5% margin of error, yielding a minimum sample size of 384. After accounting for a 10% non-response rate, the required sample size was 422.

However, all eligible healthcare workers available during the data collection period were included, resulting in a final sample size of 509 participants, which increased the statistical power and precision of the study.

A convenience sampling method was used to recruit participants from selected health facilities.

## 4. Data collection tool and procedure

Data were collected using a structured and pre-tested questionnaire administered to participants. The questionnaire comprised four main sections:

· Sociodemographic characteristics

· Occupational characteristics

· Psychosocial work environment

· Burnout assessment

**5. Definition of variables**

**5.1 Dependent variable (Outcome)**

**Burnout**

Burnout was assessed using items adapted from the Maslach Burnout Inventory (MBI), covering three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment.

A composite burnout score was calculated by summing the responses to all items. Based on predefined criteria, burnout was dichotomized into:

· Yes (presence of burnout)

· No (absence of burnout)

**5.2 Independent variables**

Independent variables were selected based on the demand–control–support model (Karasek), which conceptualizes the work environment through three main dimensions: psychological demands (workload), job control (decision latitude), and social support (from supervisors and colleagues).

**A. Sociodemographic variables**

· Age (continuous or categorized)

· Sex (male/female)

· Marital status (married, single, divorced, widowed)

· Number of children

· Education level

· Professional category (doctor, nurse, laboratory technician, administrative staff)

· Years of experience

· Department/service

**B. Work organization variables**

· Working hours per day

· Number of patients attended per day

· Night work (yes/no)

· Additional job (yes/no)

· Severity of patients managed

· Salary satisfaction (yes/no)

· Staff shortage (yes/no)

· Lack of equipment (yes/no)

**C. Workload-related variables (psychological demands)**

· Work requires working very fast (yes/no)

· Work requires intense mental effort (yes/no)

· Not enough time to complete tasks (yes/no)

· Frequent interruptions (yes/no)

· Work is hectic (yes/no)

· Repetitive tasks (yes/no)

· Work requires concentration (yes/no)

· Work requires creativity (yes/no)

**D. Job control variables (decision latitude)**

· Freedom to make decisions (yes/no)

· Ability to choose how to perform work (yes/no)

· Opportunity to use skills (yes/no)

· Opportunity to learn new things (yes/no)

· Possibility of initiative (yes/no)

**E. Social support variables**

**Supervisor support**

· Supervisor support (yes/no)

· Supervisor helpfulness (yes/no)

· Supervisor hostility (yes/no)

· Supervisor encouragement (yes/no)

**Coworker support**

· Colleagues support (yes/no)

· Friendly colleagues (yes/no)

· Hostile colleagues (yes/no)

· Good team atmosphere (yes/no)

### 5.2. Dependent variable (Outcome)

**Burnout**

Burnout was assessed using items adapted from the Maslach Burnout Inventory (MBI), a widely used and validated instrument that evaluates three core dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment. A composite burnout score was calculated by summing the responses across all items, with higher scores indicating greater levels of burnout. Internal consistency of the scale was assessed using Cronbach's alpha. For analytical purposes, burnout was dichotomized into two categories ("Yes" and "No").

**Ethics Statement**

Ethical approval for for this study was obtained from the Ethics Committee of the Faculty of Medicine, University of Lubumbashi, Democratic Republic of Congo (UNILU/CEM/023/2026). This study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent to participate in this study was obtained from all participants.

# RESULTS

Table 1
Sociodemographic characteristics of participants

| Variables | n | % |
|---|---|---|
| **Age (years)** | | |
| < 30 | 74 | 14.6 |
| 30–45 | 290 | 57.3 |
| > 45 | 142 | 28.1 |
| **Sex** | | |
| Female | 253 | 50.0 |
| Male | 253 | 50.0 |
| **Marital status** | | |
| Married | 347 | 68.6 |
| Single | 105 | 20.8 |
| Divorced | 16 | 3.2 |
| Separated | 15 | 3.0 |
| Widowed | 23 | 4.5 |
| **Number of children** | | |
| ≤ 5 | 283 | 55.9 |
| > 5 | 223 | 44.1 |
| **Education level** | | |
| Graduate | 180 | 35.6 |
| Doctor | 129 | 25.5 |
| Licensed | 130 | 25.7 |
| Diploma | 67 | 13.2 |

As shown in Table 1, the study population was predominantly composed of individuals aged 30–45 years (57.3%), followed by those over 45 years (28.1%), while participants under 30 years represented 14.6%. The sex distribution was balanced, with equal proportions of males and females (50.0% each).

Most participants were married (68.6%), whereas single individuals accounted for 20.8%, and only a small proportion were divorced, separated, or widowed. More than half of the participants had five or

fewer children (55.9%). In terms of education, the majority had a graduate level (35.6%), followed by licensed and doctoral levels."

Table 2
Work-related characteristics of participants

| Variables | n | % |
|---|---|---|
| **Facility type** | | |
| Hospital | 268 | 53.0 |
| Health center | 238 | 47.0 |
| **Work experience** | | |
| ≤ 15 years | 291 | 57.5 |
| > 15 years | 215 | 42.5 |
| **Years in service** | | |
| ≤ 5 years | 137 | 27.1 |
| > 5 years | 369 | 72.9 |
| **Working hours/day** | | |
| ≤ 8 hours | 221 | 43.7 |
| > 8 hours | 285 | 56.3 |
| **Patients/day** | | |
| ≤ 12 | 310 | 61.3 |
| > 12 | 196 | 38.7 |
| **Work schedule** | | |
| Chosen | 32 | 6.3 |
| Imposed | 474 | 93.7 |
| **Additional job** | | |
| Yes | 359 | 70.9 |
| No | 147 | 29.1 |
| **Heard about burnout** | | |
| Yes | 212 | 41.9 |
| No | 293 | 57.9 |

Table 2 shows that slightly more than half of the participants worked in hospitals (53.0%), while 47.0% were employed in health centers. The majority had 15 years or less of professional experience (57.5%), and most had been working in their current service for more than five years (72.9%). More than half of the participants reported working more than eight hours per day (56.3%), and 38.7% attended to more than 12 patients daily. Work schedules were predominantly imposed (93.7%), and a large proportion of participants reported having a secondary job (70.9%). Additionally, more than half of the participants had never heard of burnout (57.9%).”

Table 3
Prevalence of burnout among healthcare workers

| **Burnout status** | **n** | **%** |
|---|---|---|
| No | 277 | 54.7 |
| Yes | 229 | 45.3 |

Table 3 shows that burnout affected a substantial proportion of healthcare workers in the study population. Out of 506 participants, 229 were identified as experiencing burnout, giving a prevalence of 45.3%, while 277 participants (54.7%) did not present burnout.

Table 4
Factors associated with burnout among healthcare workers

| Variables | Burnout | | OR (95% CI) | p-value |
|---|---|---|---|---|
| **Age (years)** | **Yes n (%)** | **No n (%)** | | |
| > 39 | 113 (46.3) | 131 (53.7) | 1.09 (0.77–1.54) | 0.646 |
| ≤ 39 (ref) | 116 (44.3) | 146 (55.7) | | |
| **Sex** | | | | |
| Male | 119 (47.0) | 134 (53.0) | 1.15 (0.81–1.64) | 0.421 |
| Female | 110 (43.5) | 143 (56.5) | | |
| **Marital status** | | | | |
| Married | 155 (44.7) | 192 (55.3) | 1.08 (0.74–1.57) | 0.69 |
| Non-married | 74 (46.5) | 85 (53.5) | | |
| **Number of children** | | | | |
| > 5 | 107 (48.0) | 116 (52.0) | 1.21 (0.86–1.73) | 0.27 |
| ≤ 5 | 122 (43.1) | 161 (56.9) | | |
| **Doctor status** | | | | |
| Yes | 60 (46.5) | 69 (53.5) | 1.07 (0.72–1.60) | 0.74 |
| No | 169 (44.8) | 208 (55.2) | | |
| **Facility type** | | | | |
| Health center | 119 (50.0) | 119 (50.0) | 1.44 (1.01–2.04) | 0.04 |
| Hospital | 110 (41.0) | 158 (59.0) | | |
| **Professional experience** | | | | |
| > 15 years | 101 (47.0) | 114 (53.0) | 1.12 (0.79–1.61) | 0.50 |
| ≤ 15 years (ref) | 128 (44.0) | 163 (56.0) | | |
| **Years in service** | | | | |
| > 5 years | 180 (48.8) | 189 (51.2) | 1.71 (1.14–2.56) | 0.009 |
| ≤ 5 years | 49 (35.8) | 88 (64.2) | | |
| **Working hours/day** | | | | |
| ≤ 8 hours | 102 (46.2) | 119 (53.8) | 1.06 (0.75–1.52) | 0.72 |
| > 8 hours | 127 (44.6) | 158 (55.4) | | |

| Variables | Burnout | | OR (95% CI) | p-value |
|---|---|---|---|---|
| **Age (years)** | **Yes n (%)** | **No n (%)** | | |
| **Patients/day** | | | | |
| ≤ 12 | 145 (46.8) | 165 (53.2) | 1.18 (0.82–1.70) | 0.38 |
| > 12 | 84 (42.9) | 112 (57.1) | | |
| **Work schedule** | | | | |
| Imposed | 221 (46.6) | 253 (53.4) | 2.62 (1.15–5.95) | 0.017 |
| Chosen | 8 (25.0) | 24 (75.0) | | |

As shown in Table 4, burnout was significantly associated with facility type (p = 0.04), years in service (p = 0.009), and work schedule (p = 0.017). No significant associations were found with sociodemographic characteristics or workload indicators.

Table 5
Multivariate logistic regression analysis of factors associated with burnout

| Variables | B | SE | aOR (95% CI) | p-value |
|---|---|---|---|---|
| **Years in service (> 5 years)** | 0.637 | 0.216 | 1.89 (1.24–2.89) | 0.003 |
| **Facility type (Health center)** | 0.525 | 0.189 | 1.69 (1.17–2.45) | 0.005 |
| **Work schedule (Imposed)** | 0.936 | 0.424 | 2.55 (1.11–5.85) | 0.027 |
| **Constant** | -0.308 | 0.156 | | 0.048 |

As shown in Table 5, multivariate logistic regression analysis identified three variables independently associated with burnout: years in service, facility type, and work schedule.

Healthcare workers with more than five years of service had significantly higher odds of experiencing burnout compared to those with five years or less (adjusted OR = 1.89; 95% CI: 1.24–2.89; p = 0.003). Similarly, working in health centers was significantly associated with burnout compared to working in hospitals (adjusted OR = 1.69; 95% CI: 1.17–2.45; p = 0.005).

In addition, participants with an imposed work schedule had significantly higher odds of burnout compared to those with a self-selected schedule (adjusted OR = 2.55; 95% CI: 1.11–5.85; p = 0.027).

# DISCUSSION

The present study assessed the prevalence of burnout and its associated work-related factors among healthcare workers in Kamina, Democratic Republic of Congo. The findings revealed that 45.3% of healthcare workers experienced burnout, indicating a substantial burden of this condition in this setting.

This prevalence is comparable to findings reported in the Democratic Republic of Congo. A recent study conducted in Butembo, Eastern DRC, reported a burnout prevalence of 47.0% among healthcare providers, which is very close to our findings [7]. Similarly, studies conducted in Kinshasa have highlighted high levels of occupational stress and burnout among healthcare workers, further confirming the magnitude of this problem in the national context [8]. The high prevalence observed in this study may be explained by the structural challenges faced by the healthcare system in the DRC. The country is characterized by a shortage of healthcare workers, inadequate infrastructure, and limited access to healthcare services, all of which contribute to increased workload and stress among healthcare professionals. In our study, most participants reported long working hours, imposed schedules, and additional jobs, which are known to exacerbate occupational stress and increase the risk of burnout.

Beyond the DRC, our findings are closely aligned with those reported in sub-Saharan Africa. For instance, a recent study conducted in Tanzania reported a burnout prevalence of 54.5% among healthcare providers working in primary healthcare settings [10], which is slightly higher but comparable to the 45.3% observed in our study. Similarly, research conducted in Uganda showed moderate to high burnout levels, with an overall mean burnout score of 57.4%, reflecting a substantial burden of burnout among healthcare professionals [11]. These findings suggest that burnout is consistently prevalent across African health systems, particularly in resource-limited environments.

In addition, evidence from other regions with similar healthcare system constraints supports our findings. A systematic review and meta-analysis conducted in the Middle East, North Africa, and Turkey reported pooled burnout prevalence estimates of approximately 40% for emotional exhaustion and 31% for depersonalization [12]. Likewise, a study conducted in Saudi Arabia reported high levels of burnout among healthcare workers, with emotional exhaustion reaching 67% [3]. Differences in burnout prevalence may be explained by variations in measurement methods, populations, working conditions, and contextual factors such as health system constraints and stress levels.

The multivariate analysis identified three independent predictors of burnout—years in service, facility type, and work schedule highlighting the possible role of work organization and the work environment in burnout among healthcare workers. Healthcare workers with more than five years of service had significantly higher odds of experiencing burnout compared to those with shorter duration of service, which may suggest a cumulative effect of prolonged exposure to occupational stress. Over time, repeated exposure to high job demands, emotional strain, and limited recovery opportunities may lead to emotional exhaustion and reduced coping capacity. Similar findings have been reported in sub-Saharan Africa, where prolonged exposure to stressful working conditions contributes to burnout among healthcare workers, particularly in resource-constrained settings [13]. This is also supported by evidence indicating that chronic occupational stress, including long working hours and high workload, significantly increases the risk of burnout among healthcare professionals [14]. However, studies in different contexts have reported heterogeneous results, suggesting that professional experience may also influence burnout depending on the balance between job demands and available resources [15].

Facility type was also significantly associated with burnout, with higher odds observed among healthcare workers in health centers compared to hospitals. This finding points to structural inequalities within the healthcare system, as primary healthcare facilities in low-resource settings often operate with limited staff, insufficient equipment, and inadequate infrastructure, thereby increasing workload and psychological stress. Similar patterns have been reported in primary healthcare settings, where resource shortages, high patient loads, and understaffing significantly increase burnout among healthcare providers [10]. In addition, poor working environments, inadequate organizational support, and limited professional development opportunities have been identified as key determinants of burnout in healthcare systems [13].

Work schedule emerged as the strongest predictor of burnout, with imposed schedules significantly increasing the likelihood of burnout compared to self-selected schedules. This finding is consistent with the Job Demands–Resources model, which highlights the importance of job control and decision latitude in occupational health. Lack of autonomy in scheduling may increase psychological strain, reduce job satisfaction, and limit recovery time, which may contribute to burnout. Similar findings have been reported in studies showing that high workload, frequent night shifts, and poor work-life balance are major contributors to burnout among healthcare workers[16]. Furthermore, evidence shows that excessive workload and prolonged working hours significantly increase emotional exhaustion and stress-related disorders among healthcare professionals[17].

Importantly, after adjustment, sociodemographic characteristics and workload indicators were not significantly associated with burnout, suggesting that organizational and environmental factors play a more critical role than individual characteristics. This may be explained by a relatively homogeneous exposure to high workload across participants or by limitations in the measurement of workload variables. This aligns with evidence indicating that burnout is primarily driven by workplace conditions, including stress levels, organizational support, and work environment quality, rather than personal factors alone[18].

Overall, these findings emphasize that burnout among healthcare workers in Kamina is largely influenced by modifiable work-related factors, particularly those related to organizational structure and job control. Addressing these factors through improved working conditions, better staffing, enhanced resource allocation, and more flexible work organization could significantly reduce burnout and improve the performance of the healthcare system [10], [13].

# Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to establish causal relationships between work-related factors and burnout. The observed associations reflect correlations at a single point in time and do not allow for temporal sequencing or causal inference.

Second, the use of a convenience sampling method may have introduced selection bias, as participants were recruited based on their availability during the data collection period. Consequently, the study sample may not be fully representative of all healthcare workers in Kamina or in the Democratic Republic of Congo.

Finally, the study was conducted in a single city, which may limit the generalizability of the findings to other regions of the DRC or to healthcare settings with different organizational structures and resource levels.

## CONCLUSION

This study highlights that burnout is a substantial and pressing issue among healthcare workers in Kamina, affecting nearly one in two professionals. The findings suggest that burnout is strongly associated with modifiable organizational and work-related factors. In particular, prolonged exposure to occupational stress, disparities in working conditions across facility types, and limited autonomy in work scheduling were significantly associated with higher odds of burnout.

These results emphasize the urgent need for health system-level interventions targeting the work environment. Improving staffing levels, ensuring adequate resource allocation, and promoting supportive and flexible work organization are critical strategies to reduce burnout. Furthermore, strengthening managerial support and enhancing decision-making autonomy among healthcare workers could play a key role in mitigating occupational stress.

Addressing burnout is essential not only for improving the well-being of healthcare workers but also for ensuring the quality, safety, and sustainability of healthcare services. In resource-limited settings such as the Democratic Republic of Congo, integrating burnout prevention into health system strengthening policies should be considered a priority.

## Declarations

# Clinical trial number

Not applicable.

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The authors received no specific funding for this work.

# Author Contribution

V.M.K. and M.K.N. conceptualized and designed the study. V.M.K., F.K.L., and E.K.N.U. were responsible for data collection and data management. V.M.K. and I.B.K. performed the statistical analysis and interpretation of the data. V.M.K. drafted the initial manuscript. M.K.N. critically revised the manuscript for important intellectual content. All authors contributed to the interpretation of the results, reviewed the manuscript, and approved the final version.

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