Prevalence and Factors Associated with Burnout among Healthcare Workers in Emergency Departments in Dongola, Northern State, Sudan

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❖Introduction

- **Back ground:**

Burnout syndromes (BOS) is a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job [20]. The term “burnout” was coined in the 1970s by the American psychologist Herbert Freudenberger [21]. In the 11th revision of the International
Classification of Diseases (ICD-11), BOS was conceptualized as “a syndrome resulting from chronic workplace stress that has not been successfully managed. BOS refers specifically to phenomena in the occupational context and should not be applied to describe experiences in other areas of life” [22]. Three sub-dimensions characterize BOS; high emotional exhaustion, an increase in the mental distance from the profession; high depersonalization, skepticism about
the career; and a sense of decreased

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professional achievement [20].
The Burnout is a global concern in healthcare (1) adversely impacting the quality of care, patient satisfaction (2) and staff well-being with an increased risk of substance abuse, medical errors, psychiatric disorders and suicide (3, 4, 5). The most universal definition was coined by Christina Maslach, who stated: Burnout is a syndrome of emotional exhaustion, depersonalization and reduced personal accomplishment that can occur among individuals who do “people work” of some kind”. Emergency department (ED) staff are at an elevated risk of burnout compared to other healthcare workers (HCW). (6,7,8) The estimated prevalence in this subgroup is high globally, ranging from 49.3% to 58.0%, (9) and is attributed to chronic workplace stressors (10). Multiple factors cause fatigue, anxiety and stress in HCW contributing to burnout, (11) with the critical drivers considered in two categories: internal (individual) and external(organizational)(12).
Individual factors include aspects of work-life balance, coping mechanisms and support structures.

In addition, the individual factors of

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psychological flexibility (capacity to remain in the present with emotional awareness) and resiliency (ability to quickly adapt to stress and adversity) function as mediators in reducing the effects of stress and burnout (13,14). Organisational factors are the predominant contributor to burnout (15), and encompass aspects of the work environment, including workload, resources (2), and the nature of care along with witnessing human suffering (16, 17). Moreover, ED workers are exposed to high risk of workplace violence from patients and visitors [18 ,19], such that burn out has been associated with exposure to violence.

The Sudan Medical Specialization Board (SMSB) is the professional training organization

responsible for managing and delivering medical and health-specialized programs in Sudan

[23]. Sudan has difficulty coordinating human resources for health policies and overall health

planning. There has been an imbalance in the training and production of health professionals

in certain professions due to a lack of coordination between the health

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authorities–represented

by the Federal Ministry of Health–and the medical training sector–represented by the SMSB

[24]. Furthermore, the mass migration of qualified health workers due to the economic crisis

has left Sudan with a severe shortage in terms of qualified trainers. Moreover, the privatization

of the health sector during the previous regime in Sudan has made the remaining qualified

practitioners much less available for education and training in teaching hospitals, affecting the

quality of medical training.

Psychological and Professional Impacts of Displacement and Their Effect on the Medical Field Work Environment Displacement poses a major challenge for healthcare workers ,as it negatively affects both their psychological well-being and professional conditions ..

- **Problem statement:-**

Burnout is a critical healthcare challenge ,worldwide that impairs clinician well-being

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increases medical errors, and reduces staff retention

Emergency department staff face elevated burnout risks due to heavy workloads, rapid decision-making, overcrowded conditions, and frequent workplace violence

In Sudan, emergency department personnel ,operate under severe health-system pressures including acute resource shortages, high patient volume, and conflict-related displacement

Empirical studies evaluating burnout dimensions and workplace stressors among Sudanese emergency workers remain scarceThere is no local data on the prevalence and correlates of burnout among emergency department staff in Dongola, Northern State

Quantifying burnout and its associated factors in Dongola is necessary to help hospital leadership develop targeted support strategies and maintain emergency care quality

. Justification:

- Understanding the magnitude and correlates

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of burnout among ED healthcare workers in Dongola can provide locally relevant evidence for hospital administrators and policymakers.

- Identification of potentially modifiable workplace factors such as workload, working hours, shift patterns, staffing adequacy, resource availability, workplace violence, and organizational support may help guide future staff-support and workload -management strategies.
- The study will also provide evidence on whether burnout dimensions differ among physicians, nurses, and paramedics.

❖Objectives:-

▯ General:

To determine the prevalence and associated occupational and personal factors of burnout among healthcare workers working in emergency departments in Dongola, Northern

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State, Sudan.

❖ Specific:

1. To determine the prevalence and levels of burnout among healthcare workers in emergency departments in Dongola.
2. To assess emotional exhaustion, depersonalization, and personal accomplishment among emergency-department healthcare workers.
3. To examine sociodemographic, occupational, and workplace factors associated with burnout.
4. To compare burnout dimensions and prevalence among physicians, nurses, and paramedics.

Research question:-

1. What is the prevalence of burnout among ED healthcare workers?
2. What are the levels of emotional exhaustion, depersonalization, and personal accomplishment?

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3. Which sociodemographic and occupational characteristics are associated with burnout?
4. Are burnout scores significantly different among physicians, nurses, and paramedics?

Literature review:-

 A Study Conducted in Poland titled , Determinants of occupational burnout among employees of the Emergency Medical Services in Poland 2019.

Result:

The average score for occupational burnout was 131.0 points (SD ± 31.47). The tool's reliability measured by means of Cronbach's alpha was 0.910). Both nurses and doctors obtained higher results throughout the scale (βstand. 0.147 and 0.215). Significant differences were shown between the group working only in the Helicopter Emergency Medical Service (HEMS) teams and the other services (land EMS, emergency rooms, etc.) at the level of $p < 0.000$.
 A Study Conducted in French titled, Stress and burnout among professionals working in the emergency department in a French university hospital :Prevalence and associated factors.

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Result:

- Of the 166 respondents (75.8 ,)% 19.3 % reported burnout and 27.1 % job strain .Factors associated with burnout were work-related dissatisfaction ,fear of making mistakes ,lack of time to perform tasks , and being younger .Those factors associated with job strain were having at least one sick leave in the past year ,being affected by hard work ,interpersonal conflicts at workplace ,and sleep disorders.

A Study condected in South Africa titled, Prevalence and factors associated with burnout among junior medical doctors at a South African tertiary public sector hospital.

Result:

out of apossible 165 potential participants, 101 medical interns enrolled. 95% of the participantsreported burnout. Statistically significant factor contributing towards burnout were lack of resources and poor relations with support staff and senior staff. The medical

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rotation that was reported by the participants to contribute most towards their burnout was internal medicine.

A Study condected in Sudan titled, A cross-sectional survey of burnout in a sample of resident physicians in Sudan

Results :

From the 300 resident physicians, 208 (69.3%) responded. The average age of the study population was 29.99 ± 3.01 years, with more than half were females (56.7%), single (59.6%), and with more than three years of residency experience (50.5%). In total, 86.1% met the criteria for burnout in at least one dimension and 13.9% in all three dimensions. On the dimension of emotional exhaustion (EE), 70.7% reported high levels of burnout. While, 44.2% reported high levels of depersonalization (DP), and 73.1% experienced a sense of decreased professional accomplishment (PA). There were significant differences in burnout, EE, and DP levels among different specialties, with the pediatrics-specialty trainees reported higher levels.

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Burnout syndrome was associated with the working hours per single duty; participants who reported working for more than 24 hours had experienced higher levels of burnout, EE, and D

❖**Hypotheses:-**

Null hypothesis 1: There is no statistically significant association between occupational workload and burnout among ED healthcare workers.

Alternative hypothesis 1: Higher occupational workload is statistically significantly associated with greater burnout.

Null hypothesis 2: Burnout dimensions and overall burnout prevalence do not differ significantly among physicians, nurses, and paramedics.

Alternative hypothesis 2: Burnout dimensions and/or overall burnout prevalence differ significantly among physicians, nurses, and paramedics.

❖ Methodology:

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Study Design:-

A hospital-based analytical cross-sectional study will be conducted among healthcare workers in the emergency departments of selected hospitals in Dongola, Northern State, Sudan.

- **Study area and setting:-**

emergency department of selected hospital (Dongola specialized hospital and Dongola police hospital).

Dongola Specialized Hospital is a prominent healthcare institution offering a comprehensive range of medical services .The facility comprises a Surgery Department ,which includes General Surgery ,Orthopedics ,Plastic Surgery , and Urology ,alongside a Pediatrics Department and an Internal Medicine Department ,encompassing subspecialties such as Nephrology ,Pulmonology , Endocrinology ,Cardiology ,and Psychiatry .

The emergency department is divided into:

 Cold cases.

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- Triage area.
- Resuscitation area.
- Acute area.

And consists of approximately 90 staff members and 19 beds

The emergency department of Dongola police hospital comprises:

- Cold area.
- Acute area,
- Resuscitation area.
- Triage area.

And approximately consists 15 staff members and 10 beds

- **Sample size (sampling technique):**

A census sampling approach will be used, whereby all eligible healthcare workers employed in the emergency departments of the selected hospitals.

Total Eligible Population N)):150

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Number to be Approached :

All eligible participants N will be directly approached to take part in the study =150

Anticipated Response Rate:

An estimated response rate of is expected

Expected Final Sample Size: Approximately participants are expected to submit fully completed questionnaires.

❖**Study population:-**

The target population includes all healthcare workers in the EDs ,such as:

- permanent staff
- temporary staff
- medical officers.
- residents;
- agency staff;
- volunteers.

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- **Study Period:-**

August 2026 To November 2026

inclusion criteria:

Participants will be eligible to participate in this study if they meet all of the following conditions:

Healthcare professionals (physicians, registered nurses, and paramedics) providing direct patient care in the selected Emergency Departments.

Employed in the Emergency Department for at least 6 months prior to data collection. This threshold was selected to ensure that participants have experienced sufficient exposure to the emergency work environment to assess chronic workplace burnout accurately.

Present in the hospital during the designated data collection period.

Willing to participate and provide written or verbal informed consent.

Exclusion Criteria:

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- Administrative and Non-Clinical Staff: Personnel who are not directly involved in providing patient care in the Emergency Department.
- Workers on Extended Leave: Healthcare workers who are on extended medical, maternity, annual, or study leave throughout the data-collection period, as they cannot complete the questionnaire during the study period.
- Refusal to Participate: Healthcare workers who decline to provide informed consent.

❖**Methods of data collection:-**

- Data will be collected using a self-administered structured questionnaire , which consists of two sections:
- 1- .Socio-demographic and occupational factors(age ,gender ,marital status , years of experience ,shift pattern, working hours , workload)
- 2 . Burnout assessment using the Maslach Burnout Inventory – Human Services

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Survey(MBI-HSS), which measures three dimensions:

Emotional Exhaustion (EE)

Depersonalization (DP)

Reduced Personal Accomplishment (PA)

To ensure precise interpretation, the dimensions will be scored and interpreted according to the standardized MBI manual:

Emotional Exhaustion (EE):

Higher scores indicate higher levels of burnout.

Depersonalization (DP):

: Higher scores indicate higher levels of burnout.

Personal Accomplishment (PA):

The instrument yields a direct Personal Accomplishment score, where lower scores represent higher levels of burnout (reduced personal)sense of competence and achievement .

High burnout will be operationally defined using the established cutoff thresholds:

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- High EE
- High
- Low PA

- **Operational definition of burnout**

  is a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job.

Methods of data collection:-

Data will be collected using a structured, self-administered questionnaire divided into four main sections:

- Sociodemographic and Basic Occupational Profile
- Demographics :

Age, sex, marital status, and displacement status.

Work Background :

Professional cadre, educational qualification,

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hospital, total years in profession, and years in the Emergency Department (ED).

Workload and Shift Patterns:

Quantitative Workload:

Average weekly working hours, average number of patients seen per shift, total shifts per month, night shifts per month, shift duration, and additional employment.

Perceived Workload:

Subjective strain and staff-to-patient pressure evaluated using **structured Likert-scale items**.

Work Environment, Violence, and Support

Workplace Violence:

Exposure over the past 12 months (physical, verbal, threats, or harassment) , frequency, and perpetrator type (patients or relatives).

Resource Availability: Rated availability of essential medications, equipment, PPE, beds, staffing, laboratory support, and emergency supplies.

Dependent variables

- burnout classification;

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- Emotional Exhaustion score;
- Depersonalization score;
- Personal Accomplishment score.

Independent variables

Sociodemographic:

- age;
- sex;
- marital status.

Professional:

- cadre;
- hospital;
- years of experience;
- years in ED.

Occupational:

- working hours;
- shifts;
- night duty;
- workload;
- resource adequacy;
- workplace violence;

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- support.

❖**descriptive analysis:**

For categorical variables:

- frequency;
- percentage.

For continuous variables:

- mean and standard deviation when appropriate;
- median and interquartile range for skewed data.

For burnout:

- EE score;
- DP score;
- PA score;
- prevalence according to predefined criterion;
- **95% confidence interval for prevalence**.

Pilot Testing:

A pilot study will be conducted among approximately 5–10% of the expected study population, preferably among comparable healthcare workers outside the final study

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population. The pilot will assess clarity, comprehension, completion time, cultural appropriateness, and technical problems. Reliability of newly developed multi-item workplace domains will also be assessed where applicable. Pilot participants will not be included in the final analytical dataset if substantial questionnaire modifications are made.

❖**Questionnaire Translation and Adaptation:**

The questionnaire administration language will be specified before fieldwork. If the questionnaire or newly developed occupational items are translated into Arabic, forward translation, expert reconciliation, and back-translation where appropriate will be undertaken. The translated questionnaire will be pilot tested for clarity and cultural appropriateness.

❖**Bivariate analysis:**

- Chi-square test will be used to assess associations between categorical variables and categorical burnout status when assumptions are satisfied.
- Fisher's exact test will be used when

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expected cell counts are small, particularly where the paramedic group is small.

- One-way ANOVA will be used to compare mean EE, DP, and PA scores across physicians, nurses, and paramedics when distributional assumptions are satisfied.
- Kruskal–Wallis test will be used when assumptions for ANOVA are not satisfied.

❖ **Multivariable analysis:**

If burnout is analyzed as a binary outcome, binary logistic regression will be used to estimate crude and adjusted odds ratios with 95% confidence intervals and p-values. Candidate predictors will be selected based on scientific relevance, prior literature, and conceptual importance rather than automatic statistical selection. Because the eligible population is approximately 105 workers, the final model will contain only a limited, theory-driven number of predictors appropriate to the number of observed outcome events. Potential high-priority predictors include professional cadre, workload/weekly working hours, night

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shifts, resource adequacy, workplace violence, and years of experience, with age and sex considered for adjustment.

Model diagnostics will include assessment of multicollinearity and model fit, with influential observations considered where relevant. Where appropriate, continuous EE, DP, and PA scores may also be analyzed using suitable regression models, provided model assumptions are satisfied.

Analysis Matrix:

Objective	Outcome	Analysis
Estimate burnout prevalence	Burnout yes/no	n, %, 95% CI
Assess burnout dimensions	EE, DP, PA scores	Mean±SD or median/IQR
Identify associated factors	Burnout status	Chi-square/Fisher; logistic

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		regression
Compare professional cadres	EE, DP, PA	ANOVA or Kruskal–Wallis
Compare professional cadres	Burnout category	Chi-square/Fisher

- **Ethical Consideration:-**

- The current study will receive ethical approval from the ethical committee of the ministry of health of northern state, Sudan.
- Permission will be secured from hospital administrations.
- Informed consent will be obtained from participants ,ensuring confidentiality and anonymity.
- participation is voluntary;
- refusal will have no employment consequence;
- questionnaires will not include staff names;
- data will be coded;

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- electronic data will be password protected;
- reporting will be aggregated.
- participants may skip questions or withdraw;

- appropriate support/referral information should be considered for participants experiencing severe psychological distress
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