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Factors Affecting Employee Performance in Public Sector Hospitals in Sudan During the Conflict

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INDEXING

Keywords:
Physical health;
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Employee performance

ABSTRACT

This study examines the factors influencing employee performance in public sector hospitals in Sudan during conflict periods. The research focuses on four key variables: physical health, work environment, work motivation, and job satisfaction. A quantitative cross-sectional survey was conducted using structured questionnaires distributed to healthcare professionals in three public hospitals in Khartoum, Sudan. A random sampling technique was employed to ensure representativeness and 56 responses were analyzed using multiple regression analysis in SPSS. The findings indicate that physical health, work environment, and job satisfaction positively and significantly impact employee performance. However, work motivation has an insignificant effect. These results highlight the necessity for healthcare administrators and policymakers to prioritize improving physical well-being, optimizing workplace conditions, and enhancing job satisfaction to boost employee performance in conflict-affected hospitals. Future research should explore other influencing factors, regional variations, and long-term effects in similar crisis settings.

Kata kunci:
Kesehatan fisik;
Lingkungan kerja;
Motivasi kerja;
Kepuasan kerja;
Kinerja karyawan

Penelitian ini meneliti faktor-faktor yang memengaruhi kinerja karyawan di rumah sakit sektor publik di Sudan selama masa konflik. Studi ini berfokus pada empat variabel utama, yaitu kesehatan fisik, lingkungan kerja, motivasi kerja, dan kepuasan kerja. Survei kuantitatif dengan desain cross-sectional dilakukan menggunakan kuesioner terstruktur yang disebarkan kepada tenaga kesehatan di tiga rumah sakit umum di Khartoum, Sudan. Teknik random sampling digunakan untuk memastikan representativitas sampel, dengan 56 responden yang dianalisis menggunakan analisis regresi berganda dalam SPSS. Hasil penelitian menunjukkan bahwa kesehatan fisik, lingkungan kerja, dan kepuasan kerja memiliki pengaruh positif dan signifikan terhadap kinerja karyawan. Namun, motivasi kerja memiliki pengaruh yang tidak signifikan. Hasil ini menekankan pentingnya bagi administrator rumah sakit dan pembuat kebijakan untuk memprioritaskan peningkatan kesejahteraan fisik, pengoptimalan kondisi kerja, dan peningkatan kepuasan kerja guna meningkatkan kinerja karyawan di rumah sakit yang terdampak konflik. Penelitian selanjutnya perlu mengeksplorasi faktor lain yang mempengaruhi kinerja, variasi regional, serta dampak jangka panjang dalam konteks krisis yang serupa.

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INTRODUCTION

Armed conflicts and political instability have long-standing implications for healthcare systems across the globe, severely disrupting service delivery, access to care, and the well-being of health workers. According to the (World Health Organization, 2022), over 1,000 attacks on healthcare facilities and workers were reported globally between 2018 and 2021, resulting in deaths, injuries, and widespread disruptions in essential services. Health professionals working in conflict zones often experience excessive workloads, insufficient medical supplies, and threats to personal safety, leading to burnout, reduced productivity, and increased attrition (Kruk et al., 2017). In Syria, for example, more than 70% of healthcare workers were forced to flee or were unable to work due to violence (Alhaffar & Janos, 2021), while in Yemen, over

50% of hospitals were either partially functional or completely out of service due to the ongoing conflict (OCHA, 2022).

In Southeast Asia, countries like Myanmar and the Philippines have also experienced significant disruptions in healthcare due to internal conflict, with health workers facing intimidation, limited support, and safety concerns (International Federation of Red Cross and Red Crescent Societies (IFRC), 2022). Although Indonesia is not currently in a state of war, regions such as Papua have seen instability that impacts the local healthcare system, particularly in rural and underserved areas (Ministry of Health, 2021). These global and regional trends highlight the vulnerability of healthcare systems in conflict-affected areas and underscore the pressing need to study and support healthcare workers' performance under such conditions.

In Sudan, decades of civil unrest and economic instability have devastated the public healthcare system. As of 2023, nearly 70% of healthcare facilities in conflict zones were reported to be non-functional or operating under severe limitations (Dafallah et al., 2023). Healthcare workers in public hospitals—which serve the majority of the population—are confronted with acute shortages of medical supplies, exposure to physical danger, chronic stress, and limited institutional support. Nevertheless, despite these challenges, there is a scarcity of empirical research exploring the factors that influence healthcare employee performance in Sudan during periods of conflict (Dalouk & Haar, 2023; Elnour et al., 2023). This represents a significant knowledge gap, given that human resource capacity is a core determinant of healthcare system resilience.

Prior research has established the relationship between physical health, work environment, motivation, and job satisfaction with employee performance in stable settings (Van Laar et al., 2007; Sinval et al., 2020; Mansour & Tremblay, 2019). However, these variables may operate differently in conflict zones where safety, trauma, and instability dominate the work environment. Studies by (Bou-Karroum et al., 2020) and (Shields et al., 2023) confirm that physical exhaustion, mental fatigue, and emotional burnout are more prevalent among healthcare workers exposed to crises, often leading to absenteeism and low-quality patient care.

Furthermore, motivation in conflict settings is shaped by non-traditional incentives such as safety, recognition for humanitarian service, or ethical duty rather than promotions or financial rewards (Baba & Jamal, 1991; Sirgy et al., 2001). Similarly, job satisfaction in fragile states is influenced by coping strategies, team resilience, and informal support networks rather than standard institutional benefits (Mansour & Tremblay, 2019; Idris et al., 2011). These distinctions underscore the need for context-specific frameworks to understand workforce dynamics in crisis-affected settings.

This study aims to fill the existing gap by empirically examining how physical health, work environment, work motivation, and job satisfaction influence employee performance among healthcare providers in Sudan's public hospitals during the conflict. This research is among the first to quantitatively assess these interrelations in the Sudanese context, using validated constructs adapted to fragile healthcare systems. The novelty of this study lies in its integrated examination of multiple psychosocial and structural determinants of performance, grounded in the realities of a war-affected healthcare workforce. The findings will offer actionable insights for hospital administrators, policymakers, and humanitarian actors to design support systems that sustain healthcare delivery during prolonged emergencies.

The study focuses on assessing the employee performance of healthcare providers in public sector hospitals in Sudan amidst conflict. It aims to understand the impact of conflict on healthcare workers and the quality of care provided. By investigating key factors such as the work environment, job satisfaction, and physical health, the research aims to provide insights into enhancing employee performance despite challenging conditions.

RESEARCH METHOD

This study adopted a quantitative cross-sectional approach to explore the factors influencing employee performance in public hospitals in Sudan during periods of conflict. The research examined four key variables—physical health, work environment, work motivation, and job satisfaction—to understand their impact on healthcare professionals working in challenging conditions.

The study was conducted in three major public hospitals in Khartoum, Sudan, selected based on their critical role in providing healthcare services amid ongoing instability. Given the unpredictable nature of conflict settings, a random sampling technique was employed to ensure fair representation of various hospital employees, including doctors, nurses, administrators, pharmacists, and clinical officers. A total of 56 respondents participated in this study. The inclusion criteria were: (1) currently employed in a public sector hospital in Sudan; (2) having at least six months of work experience at the current facility; and (3) directly involved in patient care or hospital operations during the conflict period. The exclusion criteria comprised (1) temporary staff or volunteers, (2) employees on extended leave during data collection, and (3) individuals unwilling to provide informed consent. These professionals were recruited because they were directly affected by the demands and risks of working in a conflict zone, making their insights particularly relevant to understanding employee performance.

To collect primary data, a structured questionnaire was developed, focusing on respondents' perceptions of their physical well-being, work conditions, motivation, job satisfaction, and overall job performance. Each item was rated using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), enabling quantifiable responses. The total scores for each construct were calculated by summing the individual item scores, and these totals were then used in two ways. First, for descriptive analysis, the scores were categorized into three levels: low (mean score ≤ 2.99), moderate (mean score 3.00–3.99), and high (mean score ≥ 4.00), to interpret the general perception trends among respondents. Second, the continuous (numerical) scores were used directly in multiple linear regression analysis to examine the influence of each variable on employee performance. This dual approach allowed both interpretive categorization and robust statistical analysis. Before full-scale data collection, the questionnaire was pre-tested with a small sample to ensure clarity and relevance. Subject-matter experts reviewed the instrument for content validity, and Cronbach's Alpha test was applied to confirm the reliability of the measurement items, ensuring internal consistency above 0.70, which is considered acceptable in behavioral research.

The collected data was processed and analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive analysis was used to summarize the demographics and key characteristics of the 56 respondents who participated in the study. The results are presented in Table 1, which provides a breakdown of participants by profession, gender, age group, years of service, and department/unit. This data offers essential contextual insights into the

composition of the sample and serves as a foundation for interpreting the subsequent regression analysis. To test the study's hypotheses, multiple regression analysis was conducted to determine how strongly the independent variables influenced employee performance. Classic assumption tests, including normality checks, were performed to validate the data's suitability for regression analysis. To further assess the relationships between variables, t-tests were used to measure the significance of individual predictors, while F-tests evaluated the combined effect of all independent variables. The Adjusted R^2 value provided insights into the proportion of employee performance variations explained by the selected factors.

Given the sensitive nature of conducting research in a conflict zone, ethical considerations were carefully addressed. Ethical approval was obtained from relevant institutional review boards, and all participants were provided with informed consent forms before taking part in the study. Participation was entirely voluntary, and strict confidentiality measures were in place to protect respondent anonymity and ensure the integrity of the findings.

Despite the study's contributions, certain limitations should be acknowledged. The research was limited to Khartoum's public hospitals, which may not fully capture the broader situation in other conflict-affected regions of Sudan. Additionally, self-reported data carries the risk of response bias, where participants may provide answers influenced by personal perceptions rather than objective reality. Future studies should consider expanding to multiple regions and employing longitudinal research designs to assess how these factors evolve.

By shedding light on the critical factors that shape employee performance in conflict settings, this study provides valuable insights for hospital administrators, policymakers, and humanitarian organizations seeking to enhance working conditions and healthcare service delivery in unstable environments.

RESULTS AND DISCUSSION

The population in the study was healthcare professionals, including hospital administrators, pharmacists, physicians, clinical officers, and nurses. This population was chosen because of their similar characteristics that are relevant to the research. Based on the sampling technique used, 56 samples were obtained from three public hospitals in Khartoum, Sudan.

Table 1. Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	32	57.1
	Female	24	42.9
Age Group (years)	20–29	15	26.8
	30–39	28	50.0
	40 and above	13	23.2
Profession	Doctor	14	25.0
	Nurse	20	35.7
	Pharmacist	6	10.7
	Administrator	9	16.1
	Clinical Officer	7	12.5
Years of Experience	<5 years	18	32.1
	5–10 years	23	41.1
	>10 years	15	26.8

Source: *Primary data, 2024*

The coefficient of determination was used to see the ability of the independent variable to explain the dependent variable, where the Adjusted R Square value was close to one, so the independent variable provided almost all the information needed to predict variations in the dependent variable, the results of which can be seen in the following table.

Table 2. Correlation and Determination Coefficient Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.693[a]	0.480	0.440	1.58609	1.246

Source: *SPSS output results (2024)*

From the results shown in Table 2, the correlation coefficient (R) value is 0.693, indicating a strong positive relationship between the independent variables—physical health, work environment, work motivation, and job satisfaction—and the dependent variable, employee performance. The Adjusted R Square value is 0.480, meaning that approximately 48% of the variance in employee performance can be explained by these four predictors, while the remaining 52% is attributed to other unmeasured factors outside this research model.

Each variable, including employee performance, was measured using multiple items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Total scores were obtained by summing the responses for each construct. For interpretive clarity, these total scores were categorized as follows: scores with a mean of ≤2.99 were considered low, scores between 3.00–3.99 were categorized as moderate, and scores with a mean of ≥4.00 were classified as high. For instance, the employee performance variable was measured through items reflecting task completion, service quality, punctuality, and adaptability during conflict situations. Higher scores indicated better-perceived performance levels.

This classification enabled both descriptive interpretation of respondents' perceptions and regression-based analysis. By applying this structured categorization, the study ensures that each factor's influence on employee performance can be understood both statistically and practically.

Table 3. Descriptive Summary of Respondents' Perceptions (n = 56)

Variables	Low		Moderate		High	
	n	%	n	%	n	%
Physical Health	5	8.9%	26	46.4%	25	44.6%
Work Environment	8	14.3%	24	42.9%	24	42.9%
Work Motivation	10	17.9%	30	53.6%	16	28.6%
Job Satisfaction	6	10.7%	27	48.2%	23	41.1%
Employee Performance	4	7.1%	25	44.6%	27	48.2%

Source: *Primary data, 2024*

Table 3 presents the descriptive summary of respondents' perceptions regarding the five core variables in the study: physical health, work environment, work motivation, job satisfaction, and employee performance. Each variable was categorized into three levels based on the mean scores derived from the 5-point Likert scale responses: low (≤2.99), moderate (3.00–3.99), and high (≥4.00).

For physical health, 44.6% of respondents reported a high level, 46.4% were at a moderate level, and only 8.9% indicated a low perception. This suggests that while most healthcare workers maintain relatively positive physical well-being, a small proportion experience significant health-related challenges.

Regarding the work environment, responses were nearly evenly split between moderate (42.9%) and high (42.9%), with 14.3% rating their environment as poor. This indicates that many respondents operate in suboptimal workplace conditions, which may affect their overall performance.

The work motivation variable revealed a more concerning pattern. While 53.6% of participants fell within the moderate category, only 28.6% expressed high motivation, and 17.9% reported low levels of motivation. This suggests that conflict conditions may have a demotivating effect on healthcare professionals.

Job satisfaction was reported as high by 41.1% of the respondents and moderate by 48.2%, while 10.7% expressed low satisfaction. These findings suggest that despite the challenging environment, a majority of healthcare workers retain some degree of professional satisfaction, which could be crucial for performance retention.

Finally, employee performance was rated high by 48.2% of respondents, moderate by 44.6%, and low by only 7.1%. These results imply that, despite adversity, many healthcare professionals are still able to maintain effective job performance, potentially due to adaptive coping mechanisms or professional commitment.

Overall, these descriptive findings provide a foundational understanding of how healthcare providers in conflict-affected public hospitals in Sudan perceive their work conditions and performance. They also underscore the need for targeted interventions aimed at improving motivation, workplace support, and physical well-being to sustain high-quality healthcare services under crisis conditions.

Table 4. Correlation and Determination Coefficient Test Results

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	12.833	2.25		5.703	0.000
Physical_Health	0.409	0.117	0.51	3.481	0.001
Work_Environment	0.179	0.142	0.154	1.257	0.014
Work_Motivation	0.011	0.036	0.037	0.303	0.163
Job_Satisfaction	0.224	0.086	0.358	2.619	0.012

Source: *SPSS output results (2024)*

Hypothesis testing in this research used the multiple regression analysis method, and the following results were obtained:

Employee performance= β 12.833+ β1 0.409 + β2 0.179+ β3 0.011 + β4 0.224+ e

Description:

β0 = Constant regression coefficient

β1,2,3,4 = Regression coefficient of each proxy

EP =Employee performance

X1 = Physical health

X2 = Work environment

X3 = Work motivation
X4 = Job satisfaction
e = Error

The regression coefficient for physical health, work environment, work motivation, and job satisfaction on employee performance attained a value of 12.833 with a significant value of 0.000 below 0.05. This means that it influences employee performance. The regression coefficient for physical health had a value of 0.409 with a significance value of 0.001, which is below 0.05. It means having an impact on employee performance. The work environment regression coefficient yielded a value of 0.179, with a significant value of 0.014 below 0.05. This means that it influences employee performance.

The work motivation regression coefficient had a value of 0.011 with a significant value of 0.163, which is greater than 0.05. This means that it has an insignificant influence on employee performance. The job satisfaction regression coefficient obtained a value of 0.224 with a significant value of 0.012 below 0.05. This means that it has an insignificant influence on employee performance.

Table 5. F-Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	118.557	4	29.639	11.782	.000[b]
	Residual	128.300	51	2.516		
	Total	246.857	55			

Source: *SPSS output results (2024)*

Table 5 shows that by carrying out testing with a confidence level of 95% ($\alpha = 0.05$), a significant value of 0.000<0.05 (standard value) was obtained. This means that physical health, work environment, work motivation, and job satisfaction simultaneously or together influence the performance of public hospital employees in Sudan.

The findings of this study highlight several critical factors that influence employee performance in public sector hospitals in Sudan during the conflict. By examining physical health, work environment, motivation, and job satisfaction, a comprehensive understanding of the unique challenges faced by healthcare providers in these settings and how these factors interplay to affect their performance can be gained.

The results of this study uncover that physical health significantly influences employee performance in conflict-affected public hospitals. As indicated in Table 2, 44.6% of respondents rated their physical health as high, while 8.9% reported low physical health. The regression analysis further confirms this association, with physical health showing a statistically significant positive effect ($\beta = 0.409$, $p = 0.001$). These findings demonstrate that compromised physical health—often caused by poor nutrition, long working hours, exposure to infectious diseases, and chronic stress—can lead to absenteeism, reduced productivity, and increased risk of burnout, which ultimately impairs performance (Bou-Karroum et al., 2020; Loeppke et al., 2013). Therefore, ensuring access to adequate nutrition, healthcare, and wellness programs for healthcare workers in conflict zones is essential.

Regarding the work environment, 42.9% of respondents perceived their environment as moderate, while an equal percentage (42.9%) rated it as high (see Table 2). The regression

results indicate a positive, though less strong, relationship with employee performance (β = 0.179, p = 0.014). These empirical findings align with existing literature, which emphasizes that resource shortages, safety concerns, and a lack of institutional support increase psychological strain and hinder job effectiveness (Bakker et al., 2003; Dollard et al., 2012). Improving the hospital environment by addressing infrastructure deficiencies, ensuring security, and promoting organizational support is crucial for performance sustainability.

Interestingly, work motivation showed no statistically significant impact on performance in this study (β = 0.011, p = 0.163), although 53.6% of respondents reported moderate motivation levels. This suggests that while motivation is an established driver of performance in stable contexts (Chien et al., 2020), in conflict zones, its effect may be overshadowed by more immediate concerns such as personal safety, emotional exhaustion, and resource scarcity (Baba & Jamal, 1991). This finding highlights the need to prioritize fundamental survival and support mechanisms over conventional motivational strategies in emergency settings.

In contrast, job satisfaction emerged as a significant predictor of employee performance (β = 0.224, p = 0.012), with 41.1% of respondents reporting high satisfaction and only 10.7% indicating low satisfaction (Table 2). This supports the notion that satisfied employees—those who feel valued, recognized, and supported—are more likely to remain committed and perform effectively, even in adverse conditions (Van Laar et al., 2007; Thompson & Phua, 2012). Contributing factors to satisfaction in this context may include leadership quality, team support, and personal meaning derived from serving vulnerable populations during crises.

These conclusions are grounded in the data collected and analyzed in this study and are further supported by relevant literature. The structured measurement of variables using categorized Likert scores ensures both interpretability and empirical robustness, distinguishing this research from assumption-based narratives.

The findings of this study have important implications for policymakers and healthcare administrators. To improve employee performance in public sector hospitals during conflict, a multi-faceted approach is necessary. This includes ensuring physical health by providing healthcare services and support systems for healthcare workers, ensuring access to proper nutrition and medical care, and implementing measures to reduce stress and prevent burnout. Improving the work environment involves investing in infrastructure and resources to create a conducive work environment, enhancing security measures to protect healthcare workers, and fostering a supportive organizational culture. Enhancing job satisfaction can be achieved by offering professional development opportunities, recognizing and appreciating the efforts of healthcare workers, and providing fair compensation and benefits. Additionally, addressing immediate needs such as safety, health, and work conditions should be prioritized over motivational interventions. By addressing these areas, healthcare administrators can create a more supportive and effective work environment for healthcare workers in conflict-affected public sector hospitals, ultimately leading to improved performance and better healthcare outcomes for the population they serve. The findings of this study shed light on the critical factors influencing employee performance in public sector hospitals in Sudan during periods of conflict. Specifically, the study examined the roles of physical health, work environment, work motivation, and job satisfaction.

The analysis revealed that physical health has a significant positive impact on employee performance. This aligns with existing literature, which emphasizes that healthcare workers'

well-being is crucial for maintaining productivity and reducing absenteeism (Loeppke et al., 2013). In conflict zones, healthcare professionals often face increased health risks, including exposure to infectious diseases and inadequate rest, which can impair their ability to perform effectively (Pronk et al., 2012). Therefore, ensuring the physical well-being of healthcare workers is paramount for sustaining healthcare delivery in such challenging environments.

The work environment was found to influence employee performance significantly. A supportive and safe work environment enhansources job satisfaction and reduces stress, leading to better performance (Bakker et al., 2003). Conversely, a poor work environment, characterized by inadequate resources and safety concerns, can lead to burnout and decreased efficiency (Dollard et al., 2012). In the context of Sudan's public hospitals, addressing environmental factors such as resource availability and workplace safety is essential to improve employee performance.

Interestingly, work motivation did not show a significant effect on employee performance in this study. This finding contrasts with previous research that highlights motivation as a key driver of performance (Ellis & Pompili, 2002). One possible explanation is that in high-risk environments like conflict zones, immediate concerns for safety and basic survival needs may overshadow traditional motivators such as recognition and career advancement (Baba & Jamal, 1991). This suggests that while motivation remains important, its impact on performance may be diminished in crisis settings.

The study confirmed that job satisfaction positively influences employee performance. High job satisfaction is associated with increased commitment and reduced turnover, leading to improved patient care and organizational efficiency (Thompson & Phua, 2012). In healthcare settings, job satisfaction can be enhanced through supportive management, opportunities for professional development, and fair compensation (Van Laar et al., 2007). In conflict-affected hospitals, addressing factors that contribute to job satisfaction is crucial for maintaining a committed and effective work

The findings of this study have several practical implications. Hospital administrators and policymakers should prioritize the physical health of healthcare workers by providing adequate protective measures and ensuring reasonable working hours. Improving the work environment through resource allocation and safety protocols can enhance employee performance. While traditional motivational strategies may be less effective in conflict zones, alternative approaches that address immediate concerns and provide psychological support may be necessary. Finally, fostering job satisfaction through supportive leadership and opportunities for professional growth can lead to a more committed and efficient workforce.

This study has several limitations that should be acknowledged. The research was limited to public hospitals in Khartoum, which may not fully capture the situation in other regions of Sudan. Additionally, the reliance on self-reported data introduces the possibility of response bias. Future research should consider expanding the study to include multiple regions and employing longitudinal designs to assess how these factors evolve. Exploring other potential factors influencing employee performance, such as organizational culture and leadership styles, could provide a more comprehensive understanding of the challenges faced by healthcare workers in conflict zones.

CONCLUSION

The study reveals that physical well-being, work environment, and job satisfaction significantly impact the performance of healthcare providers in Sudan's public sector hospitals during the conflict, with enhanced physical health, supportive work conditions, and high job satisfaction leading to better employee performance. The findings imply that improving these areas is essential for enhancing healthcare worker performance in conflict zones, providing valuable insights for policymakers and hospital managers. However, the study is limited to Khartoum, potentially not representing all of Sudan, and relies on self-reported data that may introduce bias, with a cross-sectional design that does not account for long-term effects. Future research should include other regions, adopt longitudinal designs to understand the long-term impacts and investigate additional factors affecting performance in conflict-affected areas.

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