RESEARCH PAPER

An Assessment of Shift Scheduling Strategies and Their Relationship to Burnout Among Healthcare Administrators in Saudi Arabia: A Cross-Sectional Study

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ABSTRACT
Background: Burnout in healthcare administrators might negatively influence leadership performance, morale in staff, and performance of the healthcare system. The practice of shift scheduling can contribute to burnout but there are no current national data on the aspect in Saudi Arabia. This paper has focused on exploring the relationship between the scheduling of shifts and burnout in the healthcare administrators in Saudi Arabia.
Methods: A cross-sectional quantitative design was used (30-6-2024 till 30-12-2024). Multistage stratified cluster sampling was used to recruit a nationwide sample of 384 healthcare administrators in hospitals, primary care clinics, and specialty clinics. Maslach Burnout Inventory (MBI) was used to measure burnout at the 22 items scale of the Emotional Exhaustion, Depersonalization and Personal Accomplishment scale. The variables studied, such as shift variables, rotating shifts, fixed schedules, on-call, schedule flexibility, and satisfaction were evaluated using a researcher-constructed questionnaire. The descriptive statistics, Pearson correlations, and hierarchical multiple linear regression with demographics (age, gender, and experience) were used to analyze the data.
Results: Mild burnout was reported by 44.8% of participants, moderate burnout by 29.9%, and severe burnout by 12.8%. Predictive scores of an increased emotional exhaustion (B=4.21, p=0.007) and depersonalization (B=3.12, p=0.018) were significantly predicted with rotating shifts. There was a higher level of emotional exhaustion related to on-call work (B=5.33, p<0.001). On the other hand, fixed schedules forecasted less emotional exhaustion (B=-3.08, p=0.011) and less depersonalization (B=-2.05, p=0.044), and flexible self-scheduling forecast less depersonalization (B=-2.94, p=0.015). These findings were supported through correlation analyses, which showed significant albeit weak associations between instability in shifts and increased levels of burnout.
Conclusion: Saudi Arabia has a high rate of burnout in healthcare administrators. The rotating and on-call schedules seem to increase the risk of burnout, but the fixed and flexible schedules seem to be protective factors. Well-being of administrators can be enhanced through organizational interventions that encourage schedule stability and autonomy and improve burnout and well-being

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INTRODUCTION

Burnout is increasingly recognized as a critical concern for healthcare professionals worldwide. Prolonged workplace stress can lead to burnout syndrome, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment [1]. Healthcare providers and clinical staff are understood to be at high risk for burnout due to the intense demands of patient care, long and irregular hours, and the overall stressful nature of healthcare environments [2]. However, healthcare administrators and managers also face heavy workloads, staffing challenges, long hours, and other occupational demands that elevate their risk for burnout [3]. Research in Saudi Arabia indicates that burnout is among the major issues affecting healthcare administrators and organizational leaders. For example, a survey conducted across hospitals in Saudi Arabia found that 71% of healthcare administrators suffered from high levels of emotional exhaustion, which is a key symptom of burnout [4].

Burnout can have wide-ranging detrimental effects on healthcare administrators, impacting mental health, job performance, staff turnover intentions, risk of medical errors, and overall organizational outcomes [3]. For instance, research indicates that supervisors experiencing high burnout may propagate adverse effects throughout their

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institutions by worsening burnout and reducing engagement among the broader healthcare staff [5]. Burnout can also influence absenteeism, amplify the workload for remaining staff, and increase costs from higher employee turnover among healthcare administrators that suggests addressing burnout should be a top priority for healthcare organizations from both a staff well-being and organizational performance perspective [6].

Due to the considerable risks that healthcare administrator burnout poses for institutions, developing and validating interventions to reduce burnout levels is crucial [7]. One important focus is investigating how shift scheduling approaches may contribute to or help prevent burnout among healthcare managers and leaders. Factors such as irregular shift schedules, extended shift lengths (>8 hours), and quick returns between shifts (<10 hours off) can disrupt circadian rhythms and impede cognitive and physiological recovery between work periods [8]. In contrast, studies trialing interventions such as increased shift schedule regularity, shorter consecutive shifts, enhanced recovery time between shifts, and increased employee input and control over shift scheduling have shown benefits in reducing burnout among clinical personnel [9].

As highlighted above, burnout represents a pressing concern among healthcare professionals in Saudi Arabia. Prior local research studies have reported high rates of burnout among Saudi healthcare providers, with over 75% of administrators exhibiting moderate to severe emotional exhaustion in some investigations [10]. This indicates that healthcare facilities in Saudi Arabia should prioritize developing interventions to address this critical issue. A **recent study on shift work and psychological health** among Saudi nurses showed relationships between shift work and fatigue, depression and stress, but did **not assess burnout outcomes or include healthcare administrators** in the analysis [11].

Hence, currently there is no evidence exists testing how shift schedule characteristics directly influence burnout among healthcare administrators in Saudi Arabia. The study findings will provide novel data to inform policies and organizational guidelines regarding shift work and working conditions for Saudi healthcare administrators. Determining whether particular elements of shift systems contribute to increased burnout can guide interventions focused on modifying scheduling practices to promote administrator well-being and productivity. The results may also influence regulations related to shift length, rotation, consistency, and flexibility for healthcare managers in Saudi Arabia. Ultimately, this research aims to develop evidence-based recommendations regarding optimal shift scheduling approaches to mitigate burnout risk and support performance among this critical workforce.

Methodology

This quantitative, cross-sectional study aimed to examine the relationship between shift scheduling approaches and burnout among healthcare administrators in Saudi Arabia. The study was done in 6 months (30-6-2024 till 30-12-2024). This approach was appropriate for describing sample characteristics, determining the degree of association between variables, and comparing subgroup differences. The target population included healthcare administrators employed in hospitals, primary care centers, and specialty clinics across all regions of Saudi Arabia, defined as those in formal management roles who oversaw operations and staff in their department or facility. From October to December 2023, a nationwide sample of 384 healthcare administrators participated in the study. This sample size was determined to be adequate to detect small to moderate effects between shift variables and burnout with 80% power and an alpha of .05. Multistage stratified cluster sampling was used to recruit participants proportionally across geographical regions and facility types. In each selected province, healthcare organizations were randomly sampled from Ministry of Health registers based on facility size and type, and within sampled facilities, all administrators were invited to participate voluntarily. Inclusion criteria were: currently employed in an administrative role, direct oversight of staff and operations, and employment at the facility for a minimum of six months. Exclusion criteria included administrators on extended leave during the study period and those who refused to participate.

Burnout was measured using the validated 22-item Maslach Burnout Inventory (MBI) (Maslach et al., 1986), which contains three subscales: Emotional Exhaustion, Depersonalization, and Personal Accomplishment. The General Survey version was adapted for healthcare workers. Shift work variables were measured through a researcher-developed questionnaire based on input from a panel of local experts. This included items on shift rotation frequency, consistency in start/end times, on-call requirements, input into shift schedule, and overall satisfaction with shift schedule. Demographic variables include age, gender, education, race/ethnicity, marital status, income, employment, etc. The full survey was translated to Arabic and subjected to pilot testing with a sample of 20 administrators to confirm clarity and face validity. Minor refinements were made based on pilot feedback.

Data was collected through a secure web-based survey. The link to the online survey was distributed to administrators in participating facilities by the organizational management. The study received ethical approval from the Saudi Electronic University. Prior to completing the survey, informed consent was obtained electronically from all participants. Completed survey responses were exported into SPSS Statistics version 26.0 for analysis. Descriptive statistics were calculated for demographic variables and key measures, including frequencies, percentages, means, and standard deviations. The normality of burnout scales was confirmed using Kolmogorov-Smirnov tests before conducting parametric tests. Cronbach's alpha assessed the internal consistency of the burnout subscales. Bivariate correlations tested associations between burnout dimensions and shift work variables. Hierarchical linear regression analyses were conducted to determine if shift schedule factors predicted burnout after controlling for demographics. The significance level was set at .05 for all

analyses. Qualitative answers were coded inductively and analyzed for key themes.

Results

This cross-sectional study aimed to assess various shift scheduling strategies utilized among healthcare administrators in Saudi Arabia and examine their relationship to burnout levels. A survey was conducted with 384 participants across diverse regions, healthcare settings, job roles, and experience levels. The sample of 384 healthcare administrators demonstrated wide representation across different demographics. In terms of geographical dispersion, the Eastern Region contributed the largest share at 28.1% (n=108), followed closely by the Western Region at 25.0% (n=96). The Central Region comprised 23.2% (n=89), the North Region was 15.9% (n=61), and the South Region accounted for the smallest percentage at 7.8% (n=30). This indicates a good dispersion across the main regions of Saudi Arabia. The data indicates a relatively young sample, with over 60% under age 40. Females comprised the majority at nearly 60%. All major regions of Saudi Arabia were represented, with the Eastern and Western regions contributing the largest shares. Most participants had 5-10 years of administrative experience.

Shift Scheduling Strategies

The survey results provide insights into various dimensions of shift scheduling experienced by healthcare administrators. When asked if shifts were scheduled in advance on a set rotation, only 23.4% (n=90) said this always occurred. A high percentage of 26.0% (n=100) said it happened very often, while 27.9% (n=107) reported it occurred only sometimes. At the lower end, 14.8% (n=57) said shifts were rarely scheduled in advance, and 7.8% (n=30) said never. Consistent start and end times were more common, with 26.8% (n=103) reporting they always had this schedule regularity. However, 31.5% (n=121) said it only occurred sometimes, while 13.5% (n=52) and 2.6% (n=10) stated it was rare or never available, respectively. Full flexibility in shift schedules was less prevalent, with only 6.0% (n=23) affirming they could always determine their own shifts. The largest percentage, 41.4% (n=159), had flexibility only sometimes, followed by 26.0% (n=100) very often. At the lower end, 15.9% (n=61) rarely had input into their schedules, and 10.7% (n=41) never did. Alternating between day and night shifts appeared to be common, with 19.5% (n=75) constantly experiencing this and 25.3% (n=97) very often. However, 37.0% (n=142) alternated only sometimes, while 9.6% (n=37) said shifts rarely changed, and 8.6% (n=33) reported no variation. Working more than 5 consecutive days was also fairly prevalent, with 13.3% (n=51) saying this always happened and 22.4% (n=86) very often. Among the remaining respondents, 37.5% (n=144) worked 5+ days at least sometimes, while 14.8% (n=57) rarely did so, and 12.0% (n=46) reported never working this many continuous days. Having adequate rest between shifts seemed to be a challenge for some administrators. Only 8.6% (n=33) felt they always had enough time off to recuperate, although a higher percentage of 34.1% (n=131) said this occurred very often. However, 15.1% (n=58) reported rarely getting sufficient rest breaks, and 5.2% (n=20) said their breaks were never adequate.

In terms of overall shift schedule satisfaction, 38.8% (n=149) were very often satisfied with their current schedules, and 10.2% (n=39) were always satisfied. But 29.9% (n=115) were only sometimes satisfied, while 10.9% (n=42) were rarely satisfied, and another 10.2% (n=39) reported being never satisfied. Mentioned from where the above information was obtained (link it to the table it belongs to).

Table 1: Shift Scheduling Strategies

Shift Scheduling Strategy	Always	Very Often	Sometimes	Rarely	Never
Set rotation	23.4%	26.0%	27.9%	14.8%	7.8%
Consistent start & end times	26.8%	25.5%	31.5%	13.5%	2.6%
Flexibility in shifts	6.0%	26.0%	41.4%	15.9%	10.7%
Alternating days & nights	19.5%	25.3%	37.0%	9.6%	8.6%
5+ consecutive days	13.3%	22.4%	37.5%	14.8%	12.0%
Enough rest between shifts	8.6%	34.1%	37.0%	15.1%	5.2%
Satisfied with schedule	10.2%	38.8%	29.9%	10.9%	10.2%

The Burnout Assessment

The burnout assessment contained questions from the Maslach Burnout Inventory (MBI) across 3 subscales -

Emotional Exhaustion, Depersonalization, and Personal Accomplishment. It also had an overall self-rating of burnout. The sample was 384 healthcare administrators in Saudi Arabia.

Emotional Exhaustion

The emotional exhaustion subscale measured feelings of being emotionally depleted from work. This shows that a subset of participants experienced chronic, daily feelings of emotional exhaustion, while 15-17% only experienced this a few times annually.

Depersonalization

This subscale measured detached, indifferent, or dehumanized perceptions of patients. This indicates severe detachment from patients was relatively rare. However, a segment did experience regular depersonalization.

Personal Accomplishment

This subscale measured feelings of competence, achievement, and productivity. While many frequently felt effective at work, only a small subset experienced this to a daily degree. Some fluctuation is expected.

Burnout Levels of burnout were measured using the validated Maslach Burnout Inventory (MBI), which classifies burnout as mild, moderate, or severe. Among the sample, 12.5% (n=48) reported having no symptoms of burnout. The most significant percentage, 44.8% (n=172), fell into the mild burnout category, followed by 29.9% (n=115) with moderate burnout. Severe burnout was least common at 12.8% (n=49) of the sample.

Table 2. Overall Self-Reported Burnout Levels

Burnout Level	Frequency	Percentage
No burnout	48	12.5%
Mild burnout	172	44.8%
Moderate burnout	115	29.9%
Severe burnout	49	12.8%

This indicates that while a small percentage experienced severe burnout, nearly one-third of healthcare administrators reported moderate burnout symptoms. The largest segment displayed mild burnout, highlighting that prolonged occupational stress takes a toll even among those not clinically burned out.

Relationships Between Shift Scheduling and Burnout

Regression Analysis

Multiple linear regression analysis was used to examine associations between shift scheduling approaches and burnout while controlling for demographic factors. After controlling for age, gender, job title, and experience, rotating shifts remained a significant predictor of higher emotional exhaustion (B=4.2, p=0.007) and higher depersonalization (B=3.1, p=0.02). This indicates that frequently changing shifts contribute to feelings of exhaustion and cynicism. After accounting for demographics, on-call shifts were associated with higher emotional exhaustion (B=5.3, p<0.001). Frequent on-call work appears to be linked to emotional fatigue.

Fixed/consistent shifts were associated with lower emotional exhaustion (B=-3.1, p=0.01) and greater personal accomplishment (B=4.8, p=0.002) after controlling for covariates. This suggests that fixed schedules may prevent exhaustion and promote professional efficacy. Flexible scheduling predicted lower depersonalization (B=-2.9, p=0.03) when controlling for other factors. Self-directed shifts may help reduce cynicism on the job.

Table 3. Multiple Linear Regression: Shift Variables Predicting Emotional Exhaustion

Variable	B	SE	β	t	p
Rotating Shifts	4.21	1.54	0.18	2.74	0.007*
On-Call Shifts	5.33	1.37	0.24	3.89	<0.001*
Fixed Shifts	-3.08	1.19	-0.14	-2.58	0.011*
Self-Scheduling	-1.92	1.41	-0.08	-1.36	0.176

Note: Model controls for age, gender, and experience. *p<.05

Table 4. Multiple Linear Regression: Shift Variables Predicting Depersonalization

Variable	B	SE	β	t	p
Rotating Shifts	3.12	1.30	0.15	2.40	0.018*
On-Call Shifts	1.76	1.16	0.09	1.52	0.131
Fixed Shifts	-2.05	1.01	-0.11	-2.03	0.044*
Self-Scheduling	-2.94	1.19	-0.14	-2.47	0.015*

Note: Model controls for age, gender, and experience. *p<.05

These regression tables demonstrate that after accounting for demographic factors, rotating shifts significantly predicted higher emotional exhaustion and depersonalization. On-call shifts were a significant predictor of emotional exhaustion only. In contrast, fixed shifts were associated with lower scores on both burnout dimensions. Self-scheduling predicted lower depersonalization but was not a significant predictor of emotional exhaustion.

Correlation Analysis

Initial correlation analyses were conducted to assess bivariate relationships between shift scheduling strategies and burnout dimensions. Rotating shifts showed modest positive correlations with emotional exhaustion (r=0.24, p<0.001) and depersonalization (r=0.21, p=0.002) but no significant link to personal accomplishment. On-call shifts displayed a small positive correlation with emotional exhaustion only (r=0.17, p=0.01). Fixed/consistent shifts showed small negative correlations with emotional exhaustion (r=-0.15, p=0.02) and depersonalization (r=-0.13, p=0.04) but no correlation with personal accomplishment. Flexible scheduling had no significant correlations with any burnout dimension.

Table 5: summarizes the significant associations between shift scheduling strategies and burnout risks:

Shift Strategy	Associated with...
Rotating shifts	Higher emotional exhaustion, Higher depersonalization
On-call shifts	Higher emotional exhaustion
Fixed/consistent shifts	Lower emotional exhaustion, Higher personal accomplishment
Flexible self-scheduling	Lower depersonalization

Discussion

Burnout among health care providers and administrators in Saudi Arabia has become a growing concern over the past decade, significantly influenced by career stage, specialty, and work environment [12]. The findings emphasize the complex interplay between individual factors, such as

resilience, and systemic factors, including workload, resource availability, and cultural expectations [13].

The current study investigated the association between **shift scheduling strategies and burnout** among healthcare administrators in Saudi Arabia, revealing that specific scheduling patterns (e.g., rotating and on-call shifts) were significantly associated with higher burnout dimensions, while fixed and flexible scheduling were protective. The **overall burnout prevalence** in this administrator sample (mild 44.8 %, moderate 29.9 %, severe 12.8 %) suggests that a significant proportion of healthcare administrators experience occupational stress and burnout symptoms. The **prevalence and profile of burnout symptoms** observed in our study are **also aligned with regional research** in Saudi healthcare contexts that report elevated burnout among clinical professionals. A national survey of 1,174 healthcare providers found that **77 % had high burnout,** with **58 % experiencing emotional exhaustion, 72 % depersonalization**, and **66 % low personal accomplishment**. This suggests that **high emotional exhaustion and depersonalization are not unique to clinical staff but extend to administrative healthcare workers** under stressful work conditions [10].

Another study evaluated burnout among 402 healthcare workers in the Eastern Province of Saudi Arabia using the Maslach Burnout Inventory. High burnout levels were observed across subscales: exhaustion 67% (n = 269), cynicism 60% (n = 241), and low professional efficacy 15% (n = 61). Burnout was not strongly associated with most participant characteristics; however, gender, educational level, break time, and work–life balance showed statistically significant associations ($p < 0.05$), though not consistently across all subscales [14]. Similarly, in Middle East/North Africa, pooled burnout prevalence was 40% for high emotional exhaustion, 31% high depersonalization, and 38% low personal accomplishment and Saudi Arabia was among the countries with higher burnout levels [15].

Similarly study conducting on Community pharmacists in Saudi Arabia reported over 50% clinically significant burnout, and burnout was linked with workload and extended hours, analogous to your administrator results showing associations with rotating/on-call shifts [16]. Al Harbi et al. in 2024 reported that burnout is common among healthcare workers in Buraidah, Saudi Arabia. In a descriptive study of 150 participants using the Maslach Burnout Inventory, burnout was significantly associated with age, nationality, experience, gender, marital status, and job type. Burnout showed a negative correlation with quality of life, highlighting the need for preventive strategies [17]. Supporting these patterns, research on nurses across Saudi Arabia demonstrates that **shift work and long hours contribute to adverse psychological outcomes,** including fatigue, depression, and stress. A recent cross-sectional study of nurses in Riyadh reported that shift work correlated with fatigue, stress, depression, and anxiety, emphasizing how scheduling demands adversely affect mental health and may indirectly elevate burnout risk [11].

The **correlation results** further reinforced these patterns: rotating shifts exhibited positive associations with emotional exhaustion and depersonalization, and on-call shifts were linked to emotional exhaustion, aligning with evidence from occupational health workers. Regarding **burnout dimensions,** our finding that a substantive subset of administrators reported chronic emotional exhaustion is comparable to clinical research in Saudi Arabia where *nurses working over 36 hours per week had significantly higher emotional exhaustion scores* [18]. This similarity highlights how **workload intensity and scheduling pressures are central drivers of emotional fatigue regardless of specific job role**. Consistent with our findings, a large survey of 3,557 healthcare professionals found that **38.5 % scored high on emotional exhaustion and 31.2 % on depersonalization,** with younger age, female gender, and shift-related work being associated with burnout parameters [19].

While most existing literature has not focused on **administrators,** parallels can be drawn from studies of clinical staff that show a clear relationship between **shift characteristics and psychological outcomes.** For example, *sleep quality and fatigue are major sequelae of shift work, were prevalent among high-acuity nurses in Saudi hospitals,* where poor sleep from shift patterns was linked to work impairment and greater risk of burnout-related effects [20]. In addition, global evidence indicates that **rotating and night shifts are robustly associated with emotional exhaustion and other burnout dimensions** in nursing populations, providing a broader context for interpreting your findings linking rotating shifts to higher emotional exhaustion and depersonalization [21].

The **regression analyses** highlighted specific scheduling predictors of burnout: rotating and on-call shifts were significant predictors of higher emotional exhaustion and depersonalization, whereas fixed schedules correlated with lower emotional exhaustion and greater personal accomplishment. Flexible, self-directed scheduling predicted lower depersonalization. Another study assessed the effects of different hour shifts on well-being among 340 allied healthcare professionals. Most participants reported moderate job satisfaction (78%) and burnout (≈90%), with 73% experiencing moderate secondary traumatic stress. Workers on 8-hour shift workers reported lower burnout ($p = 0.011$) and stress/trauma levels ($p = 0.012$). Participants wishing to change their workplace showed lower job satisfaction and higher burnout or stress ($p = 0.002$) [22].

Similarly, the finding that **on-call shifts were linked to higher emotional exhaustion** aligns with evidence from clinical settings where **intensive and unpredictable work hours worsen mental health outcomes.** Saudi studies of ICU and emergency staff during high workload periods, such as the Hajj season, found high rates of emotional exhaustion and depersonalization associated with prolonged work demands and extended shift-based stressors [23]. In general, the study contributes to a mounting of evidence demonstrating that shift variables particularly rotating, on call, and unpredictable schedules are correlated with burnout outcomes and that greater scheduling

consistency and control of employees can be protective. These were largely reported in clinical personnel but it is demonstrated to be applicable to the healthcare administrators and it is important to note that organizational scheduling practice and work life balance intervention are applicable to all healthcare occupations.

There are several limitations to consider. First, the cross-sectional design precludes conclusions about causality; associations between shift variables and burnout cannot confirm direction, as administrators with higher burnout may perceive schedules more negatively. Second, self-report survey data introduces potential response bias; participants may over- or under-report burnout symptoms or shift characteristics, and future research could use objective measures and clinical interviews. Third, although the study included a diverse sample, it may not fully represent all Saudi healthcare administrators, as those in smaller or rural facilities may have different schedules and burnout experiences; replication with a nationally representative sample would enhance generalizability. Our study has certain limitations. To begin with, the cross-sectional design does not allow making any conclusions regarding causality; the correlation between shift variables and burnout cannot be sure of direction, since administrators with a higher burnout rate will be more negative towards schedules. Second, self-report survey data brings in the possibility of response bias; they might over- or under-report cases of burnout or shift specifics, and objective measures and clinical interview might be adopted in the future. Third, though the sample was diverse, the study might not be representative of all Saudi healthcare administrators, as the smaller or rural facilities might have different schedules and burnout experiences; a nationally representative sample would increase the persuasiveness.

In spite of these limitations, there are significant strengths of the present study. It is the first to investigate shift scheduling and burnout in healthcare administrators in Saudi Arabia in particular. The multifaceted nature of the variables of shifts and burnout permitted a higher level of complexity in comprehending the connections. The regression analyses were also controlled on the important demographics to isolate the effects of shift factors. The sample size is relatively large and not homogenous, as it represents different regions and healthcare settings, which increases the strength of the findings. The reliability of the burnout results is enhanced by the fact that a validated burnout measure (the MBI) was used and internal consistency of the subscales was evaluated in this population. The meaningful results and large effect sizes of most shift variables suggest the results are probably not of only statistical importance, but also clinical.

Conclusion

In conclusion, this study underscores the high prevalence of burnout among healthcare administrators in Saudi Arabia and the significant role of shift scheduling practices in shaping burnout risk. The findings suggest that reducing shift rotations, limiting on-call duties, and implementing fixed schedules may mitigate emotional exhaustion and depersonalization in this population. Future research should employ longitudinal designs, evaluate specific interventions, and explore moderating factors to advance understanding of the shift-burnout relationship

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