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Influence of work-related stress on sleep quality and quality of life of healthcare practitioners undergoing one year post-training experience

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ABSTRACT

Background: Work-related stress is a significant factor affecting the well-being of healthcare practitioners, influencing both sleep quality and overall quality of life (QoL). This study examined the impact of occupational stress on sleep quality and QoL among healthcare practitioners undergoing one year post-training experience at the University of Benin Teaching Hospital (UBTH), Edo State, Nigeria.

Materials and methods: A cross-sectional study was conducted among 150 healthcare practitioners, including intern physicians, pharmacists, and medical laboratory scientists, who had worked at UBTH for at least three months. Participants completed validated questionnaires assessing sleep quality (Pittsburgh Sleep Quality Index), health-related QoL (WHOQOL-BREF), and work-related stress (Work Stress Questionnaire). Descriptive statistics of frequencies, percentages, means, and standard deviations were used to summarize data. Spearman's rank correlation was employed to determine relationships between work-related stress and health-related QoL, as well as between work-related stress and sleep quality at $P < 0.05$.

Results: The findings indicate that 58.7% of participants experienced poor sleep quality. Work-related stress was significantly ($P < 0.05$) associated with multiple dimensions of sleep quality and QoL. Stress related to workplace negatively impacted psychological health, while stress stemming from organizational ambiguity and conflicts affected social interactions. Stress from individual demands and commitment was positively significantly ($P < 0.05$) correlated with all QoL domains.

Conclusion: These findings highlight the need for targeted interventions to mitigate work-related stress among healthcare practitioners. Strategies such as promoting work-life balance, enhancing organizational support, and implementing stress management programs could improve well-being, professional satisfaction, and ultimately, patient care outcomes.

Keywords: Work-related stress, sleep quality, quality of life, healthcare practitioners.

INTRODUCTION

The healthcare industry is a highly demanding environment, characterized by long working hours, critical decision-making, and the constant pressure of patient care. Healthcare practitioners, as defined by the National Practitioner Data Bank (NPDB) of the United States Department of Health and Human Services (1), are individuals licensed or otherwise authorized to provide healthcare services. While stress is an inherent aspect of the profession, excessive work-related stress can have detrimental effects on practitioners' well-being, often outweighing any potential benefits (2). Over the past decade, job-related stress has emerged as a pressing concern, negatively impacting job performance and workplace environments, particularly in healthcare settings (2). In the United Kingdom, for instance, the healthcare sector reports significantly higher stress levels compared to other industries such as education and administration (3).

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Quality of life (QoL), which encompasses physical, psychological, and social well-being, is crucial for healthcare workers, as it directly affects their ability to manage stress and provide high-quality patient care (4). Studies have shown that work-related stress adversely influences QoL among healthcare practitioners, impairing their caregiving performance and potentially leading to suboptimal patient outcomes (5, 6). Furthermore, adequate sleep is fundamental to maintaining cognitive and physiological functions. Poor sleep quality can result in excessive daytime sleepiness, impaired judgment, and diminished neurocognitive performance, all of which may contribute to clinical decision-making errors (7).

Chronic work-related stress has been associated with fatigue, anxiety, depression, and reduced job satisfaction, all of which can negatively impact sleep quality and overall well-being (8). The demanding nature of healthcare work, including shift rotations and overnight duties, frequently disrupts normal sleep patterns, leading to increased sleep disturbances among practitioners (8). These disruptions can adversely affect physical health, psychological stability, work performance,

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and even increase the likelihood of errors in patient care (8-10).

Previous research has established a significant relationship between sleep quality and QoL among healthcare workers, with work-related stress playing a critical role in these associations (4, 11, 12). Additionally, studies conducted during the COVID-19 pandemic revealed that stress and QoL were notably lower among female healthcare workers, married practitioners, and those with children (13). Despite these findings, there is limited research exploring the interplay on work-related stress, sleep quality, and QoL among Nigerian healthcare practitioners, particularly in Benin City, undergoing their mandatory one year training post-graduation, a period traditionally called internship or housemanship. Anecdoctal evidence suggest that many of these categories of healthcare practitioners exhibit signs of fatigue, decreased productivity, and overall diminished well-being, potentially due to demanding work schedules and insufficient rest. This study examined the relationship among work-related stress, sleep quality, and QoL in healthcare practitioners undergoing one year post-training experience at the University of Benin Teaching Hospital (UBTH) in Edo State, Nigeria.

MATERIALS AND METHOD

Research design and sample selection

This cross-sectional study was conducted among healthcare practitioners at the UBTH undergoing one year post-training experience. Participants were selected using a stratified random sampling technique to ensure adequate representation of different professional categories. Inclusion criteria were participants who work on call shifts (Physicians, Pharmacists and Medical Laboratory Scientists) and who have worked for at least 3 months. Healthcare professionals who were not on internship training were excluded from participating in the study.

Sample size determination

The minimum sample size required for the study was calculated using the Slovin sample size formula: $n = N/(1 + Ne^2)$ (14), where N = population size of house officers, intern pharmacists and intern medical laboratory scientists, for which a total number of 241 was obtained from the heads of department of the healthcare professionals, e = margin of error = 0.05. Hence $n= 241/1+241(0.05)^2=150.39$. Therefore, a total of 150 participants were recruited, consisting of medical laboratory scientists, pharmacists, and physicians.

Ethical consideration

Ethical approval was obtained from Health Research Ethics Committee University of Benin Teaching Hospital (ADM/E 22/A/VOL VII/148381521869) and verbal informed consent was obtained from all participants.

Procedure for data collection

Data were collected using structured questionnaires designed to assess socio-demographic characteristics, health-related QoL (HRQoL), sleep quality, and work-related stress levels. The HRQoL was measured using the World Health Organization QoL Bref (WHOQOL-BREF) instrument, sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while work-related stress was evaluated using a validated Work Stress Questionnaire (WSQ). A total of 150 self-administered questionnaires were distributed to participants in their various departments and collected the following day.

World health organization quality of life bref: The WHOQOL-BREF is a brief version of the WHOQOL-100 questionnaire (5). It has 26 questions and 4 domains (physical health, psychological, social relationships and environment). Each question on the WHOQOL-BREF is answered on a 5-point Likert scale, where 1 represents the worst possible state and 5 represents the best, with exceptions to questions 3, 4 and 26, where you have to invert the point values using 6-x (where x=any score for Q3, Q4 or Q26) (15). The score of each domain is the sum of the points from the relevant question after which the mean of that sum is calculated, and finally multiply by 4 to get the final domain score (15). Malibary *et al* (16) in their study, showed that the WHOQOL-BREF tool has four valid domains and a Cronbach's alpha coefficient that is over 0.7 makes it reliable when assessing for the QoL among medical students in Saudi.

Pittsburgh sleep quality index: The PSQI is a self-administered questionnaire with a global score between 0 and 21 was developed by Buysse *et al* at the University of Pittsburgh and has been applied in a number of research projects (17). It is used to evaluate sleep quality within a one-month time frame. It evaluates sleep aspects such as the duration, latency, depth and restfulness of sleep in an individual. Wang and colleagues reported the reliability and validity test of the PSQ1 with the Cronbach's α value usually within the 0.70 and 0.85 ranges (18).

Work stress questionnaire: The WSQ was developed to identify individuals at the risk of taking a sick leave due to work related stress (19). It is a self-administered questionnaire with 21 questions. It has 4 main domains (indistinct organization and conflicts, individual demands and commitment, influence at work and work to leisure time interference), the first two domains can be answered 'yes', 'partly' or 'no' and the last two domains can be answered 'yes, always', 'yes, often', 'no, rarely' and 'no, never' (20). The test-retest reliability showed a percentage agreement of the items range from 48%-98% with a median value of 73% (19).

Data was analyzed using the Statistical Package for Social Sciences version 27. Descriptive statistics of frequencies, percentages, means, and standard deviations were used to

summarize data. Spearman's rank correlation was employed to determine relationships between work-related stress and HRQoL, as well as between work-related stress and sleep quality at $p < 0.05$.

RESULTS

A 100% response rate was obtained from the 150 questionnaires distributed to participants. Majority 89(59.3%) of the respondents were males, while 61(40.7%) were females (Table 1). 96(64.0%) of the respondents were aged 26-35years, 48(32.0%) were between the ages of 21-25years while 6(4.0%) were between the ages of 36-45years (Table 1). Most of the respondents 129(86.0%) were single, 64(42.7%) of the respondents were Medical laboratory scientists, 46(30.7%) were pharmacists, while 40(26.7%) were doctors (Table 1).

The total HRQoL score of the respondents ranged from 50 to 97 with an average score of 76.67 ± 11.32. The physical domain score ranged from 13 to 27 with an average score of 20.68 ± 3.25. The psychological domain score of the respondents ranged from 13 to 27 with an average score of 20.80 ± 3.56. The social domain score of the respondents ranged from 6 to 15 with an average score of 10.71 ± 2.03. Finally, the environment domain score of the respondents ranged from 15 to 34 with an average score of 24.49 ± 4.56 (Table 2). Among the respondents, the sleep quality score ranged from 1 to 4 with an average score of 1.95 ± 0.74, the sleep latency score ranged from 1 to 4 with an average score of 1.73 ± 0.71, the sleep duration score ranged from 0 to 3 with an average score of 1.77 ±0.85, while the sleep efficiency score of the respondents ranged from 0 to 3 with an average score of 1.58 ±1.02.

Also, among the respondents, the sleep disturbance score ranged from 1 to 3 with an average score of 2.18 ±0.52, use of sleep medication ranged from 1 to 3 with an average score of 1.25 ±0.55, the daytime dysfunction score ranged from 1 to 3 with an average score of 1.87 ±0.75, while the global PSQI score ranged from 5 to 17 with an average score of 12.33 ±2.28 (Table 2). Also, 71(47.3%) of the respondents reported high stress level due to influence at work, 73(48.7%) reported high perceived stress due to indistinct organization and conflicts, 57(38.0%) reported high perceived stress level due to individual demands and commitment and 69(46.0%) of the respondents reported high stress level due to work to leisure time interference (Table 3).

The findings revealed no significant relationship between influence at work and each of the physical health aspect of QoL (r=-0.160, p=0.051), social interaction aspect of QoL (r=-0.025, p=0.762), and environment aspect of QoL (r=-0.112, p=0.171), whereas a negative significant relationship was found between influence at work and psychological health aspect of QoL (r=-0.171, p=0.036) (Table 4). Also, the study found no significant relationship between perceived stress due to indistinct organization and each of conflicts and the physical health aspect of QoL (r=-0.099, p=0.226), conflicts and the psychological health aspect of QoL (r=0.014, p=0.866), conflicts and environment aspect of QoL (r=-0.011, p=0.898), whereas a negative significant relationship was observed between perceived stress due to indistinct organization and conflicts and social interaction aspect of QoL (r=-0.199, p=0.015) (Table 4).

Furthermore, there was a positive significant relationship between perceived stress due to individual demands and each of commitment and physical health aspect of QoL (r=0.253, p=0.002), commitment and the psychological health aspect of QoL (r=0.178, p=0.029), commitment and social interaction aspect of QoL (r=0.232, p=0.004), and commitment and the environment aspect of QoL (r=0.224, p=0.006), respectively (Table 4). Also, no significant relationship was found between work to leisure time interference and each of the physical health aspect of QoL (r=-0.091, p=0.266), psychological health aspect of QoL (r=0.020, p=0.808), the social interaction aspect of QoL (r=-0.085, p=0.300), and the environment aspect of QoL (r=0.034, p=0.677) (Table 4).

Table 1: Respondents' sociodemographic parameters (N=150)

Variable	Category	Frequency	Percentages
Age	21-25	48	32.0
	26-35	96	64.0
	36-45	6	4.0
Gender	Male	89	59.3
	Female	61	40.7
Marital status	Single	129	86.0
	Married	21	14.0
Occupation	Doctor	40	26.7
	Pharmacist	46	30.7
	Medical laboratory scientist	64	42.7

Table 2: Respondents scores on health-related quality of life and sleep quality

Variable	Mean ± SD	Min.	Max.
HRQoL Domains			
Physical domain	20.68±3.25	13	27
Psychological domain	20.80±3.56	13	27
Social domain	10.71±2.03	6	15
Environment domain	24.49±4.56	15	34
Total HRQoL	76.67±11.32	50	97
Sleep Quality Domains			
Subjective sleep quality	1.95±0.74	1	4
Sleep latency	1.73±0.71	1	3
Sleep duration	1.77±0.85	0	3
Sleep efficiency	1.58±1.02	0	3
Sleep disturbance	2.18±0.52	1	3
Use of sleep medications	1.25±0.55	1	3
Daytime dysfunction	1.87±0.75	1	3
Global PSQI	12.33±2.28		

Key: HQoL = Health-related quality of life; SD = Standard deviation.

Table 3: Respondents' work stress characteristics

Variable	Category	Frequency	Percentages
Influence at work	Low	79	52.7
	High	71	47.3
Perceived stress due to indistinct organization and conflicts	Low	77	51.3
	High	73	48.7
Perceived stress due to individual demands and commitment	Low	93	62.0
	High	57	38.0
Work to leisure time interference	Low	81	54.0
	High	69	46.0

Table 4: Relationship between work related stress and health related quality of life of respondents

	Physical domain (rho, p)	Psychological domain (rho, p)	Social domain (rho, p)	Environment domain (rho, p)
Influence at work	(-0.160, 0.051)	(-0.171, 0.036)	(-0.025, 0.762)	(-0.112, 0.171)
Perceived stress due to indistinct organization and conflicts	(-0.099, 0.226)	(0.014, 0.866)	(-0.199, 0.015)	(-0.011, 0.898)
Perceived stress due to individual demands and commitment	(0.253, 0.002)	(0.178, 0.029)	(0.232, 0.004)	(0.224, 0.006)
Work to leisure time interference	(-0.091, 0.266)	(0.020, 0.808)	(-0.085, 0.300)	(0.034, 0.677)

Additionally, there was a positive significant relationship between influence at work and the sleep disturbance aspect of sleep quality (r=0.162, p=0.048), a negative significant relationship was observed between the perceived stress due to indistinct organization and conflicts and the sleep latency aspect of sleep quality (r=-0.171, p=0.037), a negative significant relationship was observed between the perceived stress due to individual demands and commitment and the sleep latency aspect of sleep quality (r=-0.254, p=0.002), a negative significant relationship was observed between the perceived stress due to individual demands and commitment and the sleep duration aspect of sleep quality (r=-0.161, p-=0.049) (Table 5).

Table 5: Relationship between work related stress and sleep quality of respondents

	Sleep latency (rho, p)	Sleep duration (rho, p)	Sleep efficiency (rho, p)	Sleep disturbance (rho, p)
Influence at work	(-0.078, 0.343)	(-0.125, 0.126)	(-0.136, 0.096)	(0.162, 0.048)
Perceived stress due to indistinct organization and conflicts	(-0.171, 0.037)	(0.116, 0.158)	(-0.119, 0.147)	(-0.153, 0.062)
Perceived stress due to individual demands and commitment	(-0.254, 0.002)	(-0.161, 0.049)	(-0.150, 0.067)	(-0.055, 0.507)
Work to leisure time interference	(-0.128, 0.119)	(-0.040, 0.627)	(0.117, 0.153)	(-0.066, 0.419)

DISCUSSION

This study investigated the impact of work-related stress on sleep quality and overall QoL among intern healthcare practitioners at the UBTH. The total HRQoL score among the respondents indicates a moderate level of satisfaction. The highest satisfaction was reported in the environment domain, likely due to factors such as financial resources, safety, access to healthcare, and opportunities for skill acquisition. The psychological and physical domains also showed above-average satisfaction, possibly due to increased daily activities, work capacity, high self-esteem, positive feelings, and bodily image. The lowest satisfaction was in the social domain, which may be attributed to decreased social support and unsatisfactory personal relationships as reported in previous studies (15, 21). These findings of this study on respondents HRQoL score is in contrasts with Iqbal (22), who reported that the social domain had the highest satisfaction, and the environment domain the lowest. This present study differs from Iqbal (22), in that it involved health care professionals within one year of experience post-graduation, whereas Iqbal study involved health care providers with more than one year of experience.

The global PSQI score found that majority of the respondents experienced poor sleep quality. This finding aligns with De Carvalho *et al* (23), who reported 66.7% poor sleepers, and Jahrami *et al* (24), who reported 75%. However, it is in contrasts with some other studies (5, 26), who reported lower prevalence rates of poor sleep quality at 31% and 37%, respectively. Also, the finding of this study that healthcare practitioners frequently experience work stress is quite worthy

of note as 47.3% of respondents perceived stress due to influence at work, including decision authority and consideration of opinions. This finding of 47.3% of respondents perceived stress due to influence at work is higher than that reported by Holmgren *et al* (19) among population of employed Swedish women with lower rates of work stress. One remarkable difference between this present study and that of Holmgren *et al* is that this study was conducted in a middle-income country where working conditions may be less favorable for employees to that of higher income country like Sweden. Additionally, 48.7% of respondents perceived stress due to indistinct organization and conflicts, making it the most reported stressor. In contrast, only 38.0% perceived stress due to individual demands and commitment, indicating it was the least reported stressor. Organizational and individual importance of commitment has been advocated in work settings to mitigate stress (27), however, excessive commitment has been linked to health problems (28).

The finding of this study of no significant relationship between influence of work stress and QoL, as well as no significant relationship with physical health, but a negative significant relationship with psychological health indicate that increased influence at work negatively impacts psychological health. However, this influence of work stress has no significant relationship with social interaction or environment. Similarly, the findings of no significant relationships between perceived stress due to indistinct organization/conflicts and physical health or psychological health, but a negative significant relationship with social interaction, implies that poor social interaction increased with conflicts. On the other hand, the findings of positive significant relationships between perceived stress due to indistinct organization/conflicts with physical health, psychological health, social interaction, and environment, may indicate overall a better QoL with increased individual demands and commitment.

Furthermore, this study found a positive significant relationship between influence at work and sleep disturbance, but negative significant relationships between: sleep latency and indistinct organization and conflicts, individual demands and commitment and each of sleep latency and sleep duration. These findings may indicate that increased work exertion negatively impacts sleep quality aspects which underscores the complex interactions between work-related stress and both sleep quality and QoL among healthcare practitioners.

In sum, this study emphasizes the urgent need for interventions to address work-related stress. Strategies such as enhancing work-life balance, improving organizational support, and implementing stress management programs are recommended to mitigate stress's negative effects and promote a healthier work environment. By prioritizing healthcare practitioners' sleep quality and overall well-being, healthcare institutions can improve both employee well-being and patient care quality. This research calls for healthcare organizations to focus on the mental and physical health of their staff, fostering a more resilient and effective healthcare system.

Conclusion: The findings of this study indicate that majority of the participants suffer from poor sleep quality and that work stress negatively impacts the psychological, social, and environmental aspects of practitioners' lives. Key stressors include work influence, organizational conflicts, and high individual demands, all significantly affecting sleep quality and overall well-being.

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