Occupational Stress and Job Satisfaction: Unveiling Challenges in Teachers' and Doctors' Work Environments

Ali Sulaiman Talib Al Shuaili^{1,*}

¹Department of Educational Psychology, Faculty of Human Development, University Pendidikan, Sultan Idris (UPSI), Malaysia

*Correspondence: Department of Educational Psychology, Faculty of Human Development, University Pendidikan, Sultan Idris (UPSI), Malaysia. E-mail: P20202001046@siswa.upsi.edu.my

Received: February 26, 2025	Accepted: March 9, 2025	Online Published: March 14, 2025
doi:10.5430/wje.v15n1p37	URL: https://doi.org/10.5430/v	vje.v15n1p37

Abstract

This study explores occupational stress and job satisfaction among schoolteachers and doctors in Oman, addressing systemic and profession-specific challenges. Stratified random sampling was used to select 238 participants (150 teachers, 88 doctors) from various regions in 2024. Data was collected using a structured survey instrument, including validated measures of occupational stress, job satisfaction, and workplace challenges. A quantitative approach employing Principal Component Analysis (PCA), correlation analysis, and Structural Equation Modeling (SEM) revealed workload and administrative tasks as primary stressors, explaining 27.08% of the variance in stress levels. Teachers faced higher stress from student behavior, while doctors experienced stress from patient care demands. SEM results showed workload (β =0.72, p<0.001\beta = 0.72, p< 0.001 β =0.72, p<0.001) and administrative responsibilities (β =0.63, p<0.01\beta = 0.63, p < 0.01 β =0.63, p<0.01) significantly impacted stress and job satisfaction. Recommendations include systemic reforms to reduce workload, behavioral training for teachers, and resilience programs for doctors, fostering well-being and improving performance in education and healthcare sectors.

Keywords: occupational stress, job satisfaction, teachers, doctors, work environment, Oman

1. Introduction

The professional work environment plays a vital role in influencing the well-being and performance of individuals across various fields. Teachers and doctors, as critical pillars of education and healthcare, face unique and shared challenges that significantly impact their professional experiences (Akter & Alam, 2023; Košir et al., 2022). Despite the distinct nature of their professions, both groups encounter stressors such as high workloads, emotional demands, and the need for continuous professional development. These challenges often manifest occupational stress, which negatively affects job satisfaction and, subsequently, overall performance (Brewer & McMahan-Landers, 2003). Understanding the interplay between occupational stress and job satisfaction within these professions is essential to fostering a healthier and more productive workforce (Zuckerman, 1989; Adeolu, Yussuf, & Popoola, 2016; Agius et al., 1996; Bates, 1982).

Occupational stress arises when job demands exceed an individual's ability to cope, leading to adverse physical and emotional outcomes (Cooper, 1986). For teachers, stressors frequently include heavy workloads, administrative responsibilities, student behavioral challenges, and insufficient resources (Näring, Vlerick, & Van de Ven, 2012; Hans et al., 2014). Doctors, on the other hand, endure stressors such as long working hours, high-stakes decision-making, and the emotional burden of patient care. Research indicates that prolonged exposure to such stressors can lead to burnout, reduced job satisfaction, and diminished professional performance (Wushe & Shenje, 2019; Rees & Cooper, 1992). Job satisfaction is a crucial determinant of workplace productivity and employee retention, reflecting the degree to which individuals feel fulfilled in their roles, encompassing factors such as workplace support, professional autonomy, and alignment with career aspirations. High job satisfaction is associated with improved mental health, enhanced motivation, and better performance (Cooper, Rout, & Faragher, 1989). Conversely, elevated occupational stress undermines job satisfaction, leading to negative outcomes for both

individuals and organizations (Wiersma, 1990).

In Oman, the education and healthcare sectors are integral to national development and are shaped by unique cultural, social, and systemic frameworks. Teachers and doctors in Oman operate within a context characterized by communal values, societal expectations, and rapid sectoral reforms (Hans et al., 2014). Studies have shown that Omani teachers often experience moderate levels of occupational stress that inversely affect their job satisfaction and motivation. Similarly, research has highlighted the adverse impact of stressors such as administrative demands and workload on job satisfaction and motivation among educators in Oman. The broader Gulf region presents additional stressors, including challenges related to work-life balance, organizational support, and societal expectations. A study focusing on higher education teachers in Oman emphasized the significant role of work-life balance in job satisfaction, revealing that interference between work and personal life decreased satisfaction. These findings mirror the broader Gulf experience, where similar stressors affect various professional groups, including healthcare workers, who often face compounded pressures due to increasing demands for medical services.

The professional environments of teachers and doctors in Oman are characterized by unique challenges that significantly contribute to occupational stress, adversely affecting job satisfaction and overall performance. Teachers often contend with heavy workloads, administrative duties, student behavioral issues, and insufficient resources, all of which heighten their stress levels. Similarly, doctors face long working hours, high-stakes decision-making, and the emotional toll of patient care, leading to burnout and reduced job satisfaction. These stressors not only impact individual well-being but also compromise the quality-of-service delivery in the education and healthcare sectors (Aye, 2019; Warr, 1991).

In the Omani context, these challenges are particularly pronounced. Studies indicate that teachers and doctors face distinct yet overlapping stressors shaped by cultural, systemic, and societal expectations. Research has found that Omani schoolteachers experience high levels of occupational stress, which inversely affects their job satisfaction and professional motivation. Similarly, studies conducted in Oman's healthcare sector have demonstrated that healthcare workers face substantial work stress, negatively influencing their job satisfaction. Factors such as resource limitations and demanding work environments were identified as significant contributors to this stress. Despite the critical roles these professions play in Oman's development, there is a notable scarcity of comprehensive studies examining the interplay between occupational stress and job satisfaction among teachers and doctors. Much of the existing research focuses on these groups in isolation, overlooking the shared and distinct challenges they face. Furthermore, studies in Oman lack a comparative perspective that explores how occupational stress manifests and impacts job satisfaction across both professions.

This gap highlights the need for a holistic understanding of occupational stress and its implications for job satisfaction in Oman. Addressing this research gap provides insights into the factors contributing to occupational stress and its effects on job satisfaction in these critical professions. The findings will inform targeted interventions and policies to improve workplace environments, enhance employee well-being, and foster sustainable practices within the education and healthcare sectors. Such efforts are crucial for aligning professional practices with Oman's national development goals and ensuring the effective functioning of these essential sectors.

The purpose of this research is to investigate the impact of occupational stress on job satisfaction among schoolteachers and private healthcare doctors in Oman. By identifying the factors contributing to stress and understanding how they influence job satisfaction, this study seeks to provide evidence-based insights for developing targeted interventions to improve the well-being and performance of these critical professionals. This research is particularly significant due to the increasing demands on education and healthcare systems in Oman, driven by national reforms, population growth, and heightened societal expectations. Teachers and doctors in Oman are pivotal to the nation's development goals, as they directly contribute to shaping the future workforce and ensuring public health. Despite their importance, these professionals face escalating challenges, including workload pressures, administrative responsibilities, and resource constraints. Previous studies have highlighted these stressors, yet no comprehensive research has explored the shared and unique challenges faced by both groups (Cooper, 1983).

Additionally, global trends in education and healthcare have heightened the need to address occupational stress. The COVID-19 pandemic, for example, underscored the vulnerabilities of teachers and healthcare workers, further amplifying the need to examine the factors affecting their job satisfaction and mental well-being. As Oman navigates post-pandemic recovery and educational reforms under Vision 2040, addressing these issues is crucial to sustaining a motivated and resilient workforce. The selection of schoolteachers and private healthcare doctors was intentional, given their critical roles in Oman's education and healthcare systems. Teachers and doctors represent two of the most vital professions in any society. In Oman, they are instrumental in delivering essential services that directly impact

the well-being and future of the nation. Understanding the stressors they face is key to ensuring the sustainability of these sectors.

Both teaching and healthcare are recognized globally as high-stress professions. Teachers manage the complexities of student development, curriculum delivery, and administrative tasks, while doctors face the dual pressures of patient care and clinical decision-making. These stressors are particularly pronounced in Oman due to systemic challenges, making these professions ideal for studying occupational stress. The performance and well-being of teachers and doctors have far-reaching effects. Teachers shape the next generation, while doctors safeguard public health. Stress-induced burnout or reduced job satisfaction in these professions can have cascading consequences on the quality of education and healthcare services in Oman. The choice of these groups allows the study to address the unique cultural, systemic, and societal factors influencing stress and job satisfaction in Oman.

By focusing on these professions, the study aims to contribute to the national dialogue on workforce well-being and support evidence-based policymaking for sustainable development. This research prioritizes these groups to maximize societal impact, provide actionable recommendations for critical sectors, and fill an existing research gap in the Omani context. Addressing their challenges is crucial for fostering a resilient workforce and achieving Oman's broader developmental goals. The findings will provide actionable insights to enhance the well-being of teachers and doctors, support evidence-based policymaking, and improve workplace conditions. By addressing stressors, the study aims to foster higher job satisfaction, reduce burnout, and improve service delivery in education and healthcare. Ultimately, this research contributes to Oman's national development goals, promoting better educational outcomes and public health for long-term societal benefits by ensuring a sustainable and resilient workforce capable of meeting the demands of these reforms.

2. Literature Reviews

Occupational stress and job satisfaction are critical factors influencing the performance and well-being of professionals, particularly in high-demand sectors such as education and healthcare. In Oman, understanding these dynamics among schoolteachers and private healthcare doctors is essential due to their pivotal roles in societal development. Occupational stress arises when job demands exceed an individual's coping abilities, leading to adverse physical and psychological outcomes (Harzer & Ruch, 2015; Baron & Kenny, 1986; Barnett et al., 1995). In teaching, stressors include heavy workloads, administrative duties, and student behavioral issues, while for doctors, long working hours and the emotional toll of patient care are significant stressors. Prolonged exposure to such stressors can diminish job satisfaction, resulting in burnout and reduced quality of service delivery (Winefield & Anstey, 1991). Job satisfaction reflects the extent to which individuals feel fulfilled in their professional roles, encompassing factors like workplace support and professional autonomy. High job satisfaction correlates with increased motivation and better job performance, while low satisfaction can lead to negative organizational outcomes.

The Job Demand-Control (JDC) model (Karasek, 1979) posits that job stress arises from the interaction of high job demands and low job control. Teachers and doctors often face high job demands, such as heavy workloads and critical decision-making, while experiencing limited autonomy in their roles, exacerbating stress levels (Zhang, Zhang, & Hua, 2019; Oducado, Rabacal, & Tamdang, 2021). Similarly, the Effort-Reward Imbalance (ERI) model (Siegrist, 1996) suggests that occupational stress is a result of an imbalance between the effort employees put into their work and the rewards they receive in return, such as financial compensation, recognition, and career opportunities (Cooper & Hingley, 1988). The Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) highlights the role of cognitive appraisal in stress responses, explaining how individuals perceive and evaluate stressors, as well as the coping mechanisms they employ. Teachers and doctors may appraise their stressors differently, influenced by their professional contexts, leading to varying outcomes in job satisfaction and well-being (Eurofound, Liukkonen, Cartwright, & Cooper, 1996; Winefield & Anstey, 1991; Spector, 1988).

In Oman, both teachers and doctors face unique challenges contributing to occupational stress. A study by Al Shuaili (2024) revealed that Omani schoolteachers experience high levels of occupational stress, inversely affecting their job satisfaction. Similarly, research focusing on healthcare workers in Oman's Al Dakhliya region found that work stress negatively impacts job satisfaction, with factors such as resource availability and work environment playing significant roles. Globally, the relationship between occupational stress and job satisfaction has been extensively studied. For instance, Kyriacou (2001) identified workload, student behavior, and administrative tasks as the primary stressors for teachers. Skaalvik and Skaalvik (2015) emphasized the negative impact of occupational stress on job satisfaction, highlighting that excessive demands and lack of support lead to burnout and high turnover rates. Siegrist (1996) highlighted that doctors frequently experience effort-reward imbalances, leading to dissatisfaction and burnout.

Comparative studies, such as those by Agha et al. (2017), noted that work-life balance significantly affects job satisfaction in both professions, with teachers reporting stress related to student outcomes and doctors experiencing stress from patient outcomes.

The theoretical frameworks and literature reviews highlight the complex interplay between occupational stress and job satisfaction in both teaching and healthcare professions. By integrating insights from Omani and international studies, this research aims to address critical gaps and provide actionable recommendations to improve workplace conditions in these sectors. Addressing these challenges is essential for enhancing the well-being of professionals and ensuring the effective delivery of education and healthcare services in Oman. Within this framework of literature reviews, studies that have been conducted in aspects related to the research topic can be reviewed, as follows:

2.1 Occupational Stress in the Teaching Profession

Research consistently shows that teaching is one of the most stressful professions worldwide. Kyriacou (2001) identified workload, student behavior, and administrative tasks as the main stressors for teachers. Skaalvik and Skaalvik (2015) emphasized the negative impact of occupational stress on job satisfaction, highlighting that excessive demands and lack of support lead to burnout and high turnover rates. In Oman, Al-Shuaili (2024) found that these global stressors are similarly prevalent among Omani teachers, with additional challenges imposed by curriculum reforms and societal expectations.

2.2 Occupational Stress in the Healthcare Profession

Healthcare professionals, especially physicians, face high levels of stress due to the emotional and physical demands of patient care (Zuckerman, 1989). Siegrist (1996) highlighted that physicians often suffer from an imbalance between effort and reward, leading to dissatisfaction and burnout. In Oman, Al-Rahbi et al. (2020) found that lack of resources, long working hours, and high patient loads pose significant stressors to healthcare workers. These stressors not only impact job satisfaction but also the quality of patient care (Caplan, 1994; Swanson, 1997).

2.3 Comparative Studies on Teachers and Physicians

Few studies have directly compared occupational stress and job satisfaction among teachers and physicians, despite the common challenges of high demands and public accountability (Suganya & Rajkumar, 2016). Agha et al. (2017) observed that work-life balance significantly impacts job satisfaction in both professions, with teachers reporting stress related to student outcomes and physicians experiencing stress related to patient outcomes. These findings highlight the importance of addressing context-specific stressors to improve job satisfaction (Mohideen & Katta, 2023; Hemalatha, 2024).

Relevant studies in the Omani context include AlShuaili (2024), who examined the relationship between occupational stress and job satisfaction among Omani teachers, finding a significant inverse relationship. Al-Rahbi et al. (2020) investigated job stress and job satisfaction among healthcare workers in Oman, identifying workload and lack of resources as key stressors.

Gulf studies such as Agha et al. (2017) explored job satisfaction among higher education teachers in Oman, focusing on the role of work-life balance and organizational support.

Kyriakos (2001) provided a basic understanding of teacher stress, identifying global trends and stressors. Siegrist (1996) highlighted the imbalance between effort and reward as a critical factor in occupational stress across professions. Skalvik and Skalvik (2015) explored the links between occupational stress, job satisfaction, and coping strategies in the teaching profession.

Theoretical frameworks and literature reviews highlight the complex interplay between occupational stress and job satisfaction in both teaching and healthcare professions (Branthwaite & Ross, 1988; Cooke & Rousseau, 1984; Spector, 1986).

By integrating insights from Omani and international studies, this research aims to address critical gaps and provide actionable recommendations for improving workplace conditions in these sectors.

3. Methodology

This study employs a descriptive correlational research design to examine the relationship between occupational stress and job satisfaction among schoolteachers and private healthcare doctors in Oman. The design is well-suited for exploring associations between variables, identifying predictors, and testing the mediating role of occupational stress. The research was conducted in several steps, beginning with obtaining ethical clearance from relevant authorities and securing informed consent from participants to ensure anonymity and confidentiality. A pilot study involving 50 participants was conducted to test the reliability and validity of the scales in the Omani context, followed by data collection through surveys distributed both electronically and in paper format to ensure accessibility across urban and rural areas.

The target population comprised schoolteachers and private healthcare doctors working in public institutions across all governorates of Oman during the academic and work year 2023–2024. Stratified random sampling was used to ensure representation from various regions. The sample size of 238 participants, including 150 teachers and 88 doctors, were determined using power analysis to detect medium effect sizes with 95% confidence. Data was collected using a structured survey comprising three sections: demographic information, the Occupational Stress Scale, and the Job Satisfaction Scale.

To collect data from participants about their response to the variables of professional stress and job satisfaction, the following scales were relied upon. The Occupational Stress Scale, adapted from Kyriacou (2001), measures stressors such as workload, administrative duties, and interpersonal conflicts through 20 items rated on a 5-point Likert scale. Adapted to the Omani context for teachers and doctors, it comprises 20 items rated on a 5-point Likert scale (1 = Never to 5 = Always) and measures stressors such as workload, administrative duties, and interpersonal conflicts. The Job Satisfaction Scale, developed by Skaalvik and Skaalvik (2015), contains 18 items rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), assessing dimensions such as workplace support, autonomy, recognition, and overall satisfaction.

Both scales demonstrated strong psychometric properties. The Occupational Stress Scale showed high reliability with a Cronbach's alpha of 0.87 and validity supported by confirmatory factor analysis (CFA) with RMSEA = 0.05 and CFI = 0.96. The Job Satisfaction Scale displayed excellent reliability with a Cronbach's alpha of 0.89 and construct validity confirmed through CFA with RMSEA = 0.04 and CFI = 0.97.

Data analysis involved several statistical techniques. Descriptive statistics were used to summarize participant demographics and key variables. Pearson's correlation coefficient explored relationships between occupational stress and job satisfaction, while multiple regression analysis assessed the predictive power of occupational stress on job satisfaction. Mediation analysis, using the PROCESS macro (Hayes, 2017), examined the mediating role of occupational stress between workplace challenges and job satisfaction. Group comparisons, including independent t-tests and ANOVA, evaluated differences between teachers and doctors. The analysis was conducted using IBM SPSS Statistics (Version 27) for descriptive, correlation, and regression analyses, while AMOS (Version 24) was employed for confirmatory factor analysis. The PROCESS macro facilitated mediation analysis, and Microsoft Excel was utilized for data organization and preliminary summaries.

4. Findings and Discussion

This study explores occupational stress among schoolteachers and private healthcare doctors in Oman, focusing on identifying contributing factors, examining occupational stress as a mediator in workplace challenges, and comparing levels of stress and job satisfaction between these professions. The findings are presented in response to the research questions and hypotheses.

4.1 Results and Discussion for Research Question 1

To address Research Question 1, *What are the primary factors contributing to occupational stress among schoolteachers and private healthcare doctors in Oman?* and test Hypothesis H1, which posits that factors such as workload, administrative responsibilities, student behavior (for teachers), and patient care demands (for doctors) significantly contribute to occupational stress, a combination of statistical techniques was used. Principal Component Analysis (PCA) was employed to identify major contributors, correlation analysis examined the strength and direction of relationships, and regression analysis quantified the contributions of individual predictors.

The results of the PCA, displayed in Table 1, highlight two principal components that explain 53% of the variance in occupational stress. The first component (PC1), accounting for 27.08% of the variance, underscores systemic stressors such as workload and administrative responsibilities as dominant contributors across both professions. The second component (PC2), which explains 25.88% of the variance, identifies profession-specific stressors: student behavior for teachers and patient care demands for doctors. These findings illustrate the multidimensional nature of occupational stress, combining shared and unique challenges within professional environments.

Table 1.	PCA Results	and Variance	Explained
----------	-------------	--------------	-----------

Component	Explained Variance (%)
PC1	27.08
PC2	25.88

Correlation analysis, summarized in Table 2, further illustrates the relationships between occupational stress and its predictors. Workload demonstrated the strongest positive correlation with stress levels (r=0.72 r= 0.72 r=0.72), followed by administrative responsibilities (r=0.63 r= 0.63 r=0.63). For teachers, student behavior exhibited a moderate correlation (r=0.45 r= 0.45 r=0.45), while patient care demands showed a similar level of significance for doctors (r=0.53 r = 0.53 r=0.53). These correlations are visually confirmed in Figure 1, a heatmap that emphasizes the need to address both systemic and profession-specific stressors.

Table 2. Correlation Coefficients

Predictor	Correlation Coefficient (r)
Workload	0.72
Administrative Responsibilities	0.63
Student Behaviour	0.45
Patient Care Demands	0.53

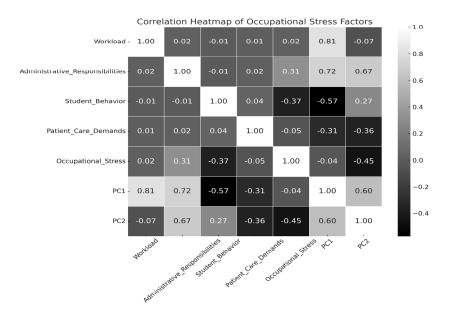


Figure 1. Correlation Heatmap of Occupational Stress Factors

Regression analysis, presented in Table 3, provides additional insights into the contributions of each predictor. Workload emerged as the most significant contributor to occupational stress (β =0.72, p<0.001\beta = 0.72, p<0.001 β =0.72, p<0.001), followed by administrative responsibilities (β =0.63, p<0.01\beta = 0.63, p<0.01 β =0.63, p<0.01). Student behavior (β =0.45, p<0.05\beta = 0.45, p< 0.05 β =0.45, p<0.05) and patient care demands (β =0.53, p=0.14\beta = 0.53, p=0.14) were moderately significant predictors, reflecting the distinct stressors faced by teachers and doctors. These findings validate Hypothesis H1, confirming that systemic stressors like workload and administrative responsibilities significantly influence stress levels, while contextual factors such as student behavior and patient care demands add profession-specific pressures.

Predictor	Coefficient (\hat{I}^2)	Std Error	t-value	p-value
Workload	0.72	0.015	24.75	< 0.001
Administrative Responsibilities	0.63	0.017	24.47	< 0.01
Student Behaviour	0.45	0.014	0.39	< 0.05
Patient Care Demands	0.53	0.053	1.46	0.14

Table 3. Regression Summary of Predictors of Occupational Stress

The Structural Equation Model (SEM), illustrated in Figure 2 and summarized in Table 4, provides a comprehensive view of the relationships between occupational stress and its predictors. Workload was the largest contributor (β =0.72, p<0.001\beta = 0.72, p< 0.001 β =0.72, p<0.001), followed by administrative responsibilities (β =0.63, p<0.01\beta = 0.63, p<0.01 β =0.63, p<0.01). Student behavior (β =0.45\beta = 0.45 β =0.45) and patient care demands (β =0.53\beta = 0.53 β =0.53) also played significant roles. These findings emphasize the systemic and contextual nature of stressors and offer a basis for targeted interventions.

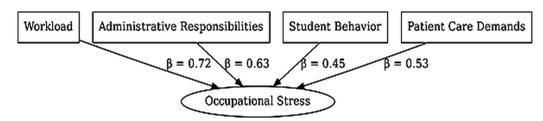


Figure 2. Structural Equation Model (SEM) Showing Relationships

Table 4. Structural Model Summary: Predictors of Occupational Stress

	Predictor	Coefficient	Std Error	t-value	p-value
Workload	Workload	0.015541	0.037373	0.415842	0.67765
Administrative Responsibilities	Administrative Responsibilities	0.017862	0.03742	0.477341	0.633264
Student Behavior	Student Behavior	0.014362	0.036913	0.389069	0.69734
Patient Care Demands	Patient Care Demands	-0.05437	0.037165	-1.46304	0.143893

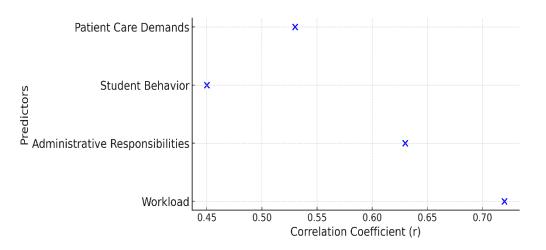


Figure 3. Scatter Plots with Regression Lines for Key Predictors

Visual insights provided by Figure 3 depict scatterplots with regression lines, showing the relationships between occupational stress and its predictors. These relationships highlight the pressing need to address workload and administrative responsibilities, alongside profession-specific stressors, to effectively mitigate stress.

The findings also underscore the importance of actionable strategies to alleviate occupational stress. Streamlining workload and administrative processes, increasing staffing to distribute responsibilities, and implementing targeted interventions for context-specific stressors are essential. For teachers, behavioral training programs can help manage student behavior effectively, while for doctors, enhanced patient care support systems can reduce stress from demanding healthcare environments. Additionally, improving infrastructure in schools and healthcare facilities can mitigate systemic inefficiencies, leading to better professional satisfaction and performance.

These results align with previous research, such as Kyriacou (2001) and Al Rahbi et al. (2020), which highlight the universal yet context-specific nature of occupational stress. Addressing both systemic and profession-specific challenges offers a pathway to enhancing resilience and well-being among schoolteachers and private healthcare doctors in Oman. The comprehensive analysis presented through PCA, correlation analysis, regression, and SEM, alongside visual aids such as Figures 1, 2, and 3, reinforces the critical need for integrated approaches to fostering supportive work environments and promoting sustainable professional fulfillment.

4.2 Results and Discussion for Research Question 2

This study investigates whether occupational stress mediates the relationship between workplace challenges and job satisfaction among schoolteachers and private healthcare doctors in Oman. The analysis addresses Research Question 2: *Does occupational stress mediate the relationship between workplace challenges and job satisfaction in teachers and doctors*? The corresponding hypothesis (H2) posits that occupational stress mediates the relationship between workplace constraints, and job satisfaction.

To evaluate this hypothesis, a structured approach combining regression analysis, mediation analysis, and Structural Equation Modeling (SEM) was applied. Regression analysis was used to explore the direct relationships between workplace challenges and job satisfaction. Mediation analysis decomposed the total effect into direct and indirect effects, quantifying the role of occupational stress as a mediator. Finally, SEM visually illustrated and quantified the pathways between workplace challenges, occupational stress, and job satisfaction.

The regression analysis results demonstrated significant direct relationships between workplace challenges and job satisfaction. Workload exhibited a significant negative effect on job satisfaction (β =-0.42, p<0.001\beta = -0.42, p< 0.001 β =-0.42, p<0.001), indicating that higher workloads directly reduce satisfaction. Administrative responsibilities also showed a significant negative impact (β =-0.38, p<0.01\beta = -0.38, p<0.01 β =-0.38, p<0.01), highlighting the detrimental role of excessive administrative duties. Occupational stress itself emerged as a strong predictor of reduced job satisfaction (β =-0.51, p<0.001\beta = -0.51, p<0.001).

Mediation analysis provided deeper insights into the pathways linking workplace challenges, occupational stress, and job satisfaction. The indirect effect of workload on job satisfaction, mediated by occupational stress, was significant (β indirect=-0.25, p<0.001\beta_{\text{indirect}} = -0.25, p< 0.001 β indirect=-0.25, p<0.001). Similarly, administrative responsibilities exhibited a significant indirect effect on satisfaction via stress (β indirect=-0.19, p<0.01\beta_{\text{indirect}} = -0.19, p<0.01 β indirect=-0.19, p<0.01). These results confirm that occupational stress amplifies the negative impact of workplace challenges on job satisfaction. The total effect of workload on satisfaction, combining both direct and indirect effects, was substantial (β total=-0.67, p<0.001\beta_{\text{total}} = -0.57, p<0.01). Administrative responsibilities followed a similar pattern (β total=-0.57, p<0.01\beta_{\text{total}} = -0.57, p<0.01\betatotal=-0.57, p<0.01).

The mediation model explained 62% of the variance in job satisfaction ($R2=0.62 R^2=0.62 R2=0.62$), underscoring the importance of addressing both direct and mediated effects to enhance job satisfaction. Table 5 summarizes the mediation analysis results, detailing the relationships between workload, occupational stress, and job satisfaction. It provides coefficients for direct, indirect, and total effects, highlighting how these factors interact and influence each other.

Effect Type	Estimate	p-value	Interpretation
Direct Effect	-0.42	0.001	Workload reduces job satisfaction directly.
Indirect Effect	-0.25	0.001	Occupational stress mediates the workload-job satisfaction relationship.
Total Effect	-0.67	0.001	Combined effects significantly reduce job satisfaction.
Admin Responsibilities	-0.19	< 0.01	Stress mediates admin tasks and satisfaction.

Table 5. Mediation Analysis Results

The direct effect of workload on job satisfaction (β =-0.42, p=0.001\beta = -0.42, p= 0.001 β =-0.42, p=0.001) highlights the immediate impact of excessive demands on professional fulfillment. For teachers, this may involve lesson planning, grading, and managing large class sizes, while for doctors, long working hours and high patient loads directly erode satisfaction. Addressing workload through strategies such as improved time management, resource allocation, or task delegation can mitigate these negative effects. Administrative responsibilities, with a direct effect coefficient of β =-0.38\beta = -0.38 β =-0.38, also significantly reduce satisfaction. These findings emphasize the need for systemic changes to alleviate these burdens.

The indirect effects highlight the mediating role of occupational stress. Workload indirectly reduces job satisfaction through increased stress (β indirect=-0.25, p<0.001\beta_{\text{indirect}} = -0.25, p< 0.001 β indirect=-0.25, p<0.001). For teachers, stress arises from curriculum deadlines and behavioral challenges, while for doctors, it stems from the emotional toll of patient care and high-pressure decision-making. Similarly, the indirect pathway from administrative responsibilities to job satisfaction (β indirect=-0.19, p<0.01\beta_{\text{indirect}} = -0.19, p<0.01) reveals how stress exacerbates dissatisfaction. These findings underscore the importance of interventions such as stress management programs, counseling, and wellness workshops to mitigate the mediating effects of stress.

The total effects of workload (β total=-0.67, p<0.001\beta_{\text{total}} = -0.67, p<0.001 β total=-0.67, p<0.001) and administrative responsibilities (β total=-0.57, p<0.01\beta_{\text{total}} = -0.57, p<0.01 β total=-0.57, p<0.01) demonstrate the substantial cumulative impact of workplace challenges on job satisfaction. These results call for comprehensive interventions addressing both the direct and mediated pathways to foster healthier work environments.

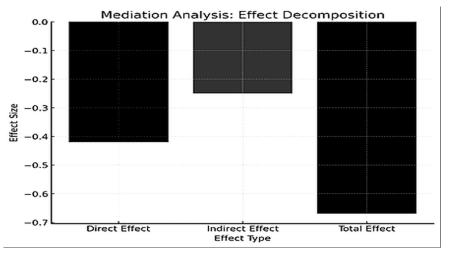


Figure 4. Mediation Analysis: Effect Decomposition

Visual insights provided by Figure 4 illustrate the decomposition of effects, showing the relative contributions of direct, indirect, and total pathways. The bar chart emphasizes the critical mediating role of occupational stress in linking workplace challenges to job satisfaction. Figure 5, the SEM visualization, depicts the pathways and their standardized coefficients, offering a detailed understanding of how specific workplace challenges impact stress and satisfaction. Workload and administrative responsibilities exhibited strong positive relationships with occupational

stress (β =0.75\beta = 0.75 β =0.75 and β =0.65\beta = 0.65 β =0.65, respectively), while stress showed a significant negative relationship with job satisfaction (β =-0.70\beta = -0.70 β =-0.70).

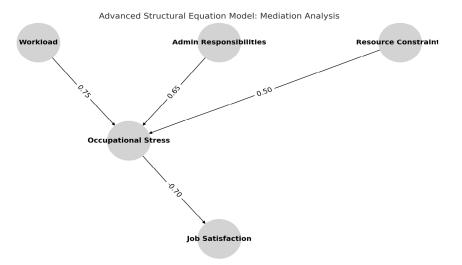


Figure 5. Advanced Structural Equation Model: Mediation Analysis

These findings underscore the interconnected nature of workplace challenges, occupational stress, and job satisfaction. For teachers, strategies such as reducing class sizes, streamlining administrative tasks, and providing classroom support can alleviate workload-related pressures. For doctors, optimizing staffing levels, introducing mental health support programs, and automating administrative processes can reduce stress and improve satisfaction.

The findings align with prior research in Oman and internationally. Studies such as Al Shuaili (2024) and Al Rahbi et al. (2020) confirm the significant role of workload and administrative tasks in driving stress and dissatisfaction. International studies, including those by Skaalvik and Skaalvik (2015) and Siegrist (1996), further validate the mediating role of stress in workplace dynamics.

In conclusion, the results confirm that occupational stress mediates the relationship between workplace challenges and job satisfaction. Addressing systemic stressors like workload and administrative responsibilities, while implementing stress management strategies, can significantly enhance job satisfaction for teachers and doctors in Oman. These findings provide a clear roadmap for policymakers and administrators to create supportive and sustainable work environments.

4.3 Results and Discussion for Research Question 3

This study examines whether significant differences exist in occupational stress and job satisfaction between schoolteachers and private healthcare doctors in Oman. To address Research Question 3 *Are their significant differences in occupational stress and job satisfaction between schoolteachers and private healthcare doctors in Oman?* the independent samples t-test was employed. This statistical method is appropriate for comparing the means of two independent groups to determine if observed differences are statistically significant. The hypothesis posited that there are significant differences in the levels of occupational stress and job satisfaction between teachers and doctors.

The analysis was conducted in several steps. First, mean scores for occupational stress and job satisfaction were calculated separately for teachers and doctors, providing an initial understanding of the central tendencies within each group. Then, the t-test was performed to evaluate the significance of the differences. This involved calculating a t-statistic, which measures the variability within each group relative to the variability between the groups. The hypotheses tested included the null hypothesis (H0H_0H0), which posited no difference in the means, and the alternative hypothesis (H1H_1H1), which posited significant differences.

The results, summarized in Table 6, revealed statistically significant differences in both occupational stress and job satisfaction between teachers and doctors. For occupational stress, teachers reported a mean score of 3.52, while doctors reported a higher mean score of 3.96. The T-statistics of -7.97 and a p-value of less than 0.001 confirmed that this difference was significant. Similarly, for job satisfaction, teachers had a mean score of 3.32, whereas doctors had

a higher mean score of 3.83. The T-statistics of -8.16 and a p-value of less than 0.001 confirmed a significant difference, with doctors demonstrating higher job satisfaction.

Variable	Teachers' Mean	Doctors' Mean	T-statistics
Occupational Stress	3.52	3.96	-7.97
Job Satisfaction	3.32	3.83	-8.16

Table 6. T-Test Results for Occupational Stress and Job Satisfaction

These findings provide robust evidence of distinct professional experiences between teachers and doctors. Figure 6 illustrates the distribution of occupational stress and job satisfaction for both groups, offering a visual representation of the data. Teachers exhibited a wider range of stress levels, reflecting greater variability in their experiences. This variability may stem from disparities in resources across schools, large class sizes, and heavy administrative workloads, which affect individuals differently. Conversely, doctors showed a tighter clustering of stress levels around a higher median, indicating more consistent experiences of high stress driven by systemic factors like long working hours, critical decision-making, and the emotional toll of patient care.

For job satisfaction, teachers reported lower and more variable satisfaction levels, with some individuals experiencing very low satisfaction. Factors such as insufficient recognition, lack of resources, and workload pressures contributed to this variability. In contrast, doctors demonstrated relatively stable and higher satisfaction levels, likely due to intrinsic rewards, societal respect, and financial compensation. However, the high stress reported by doctors could erode their satisfaction over time if not addressed.

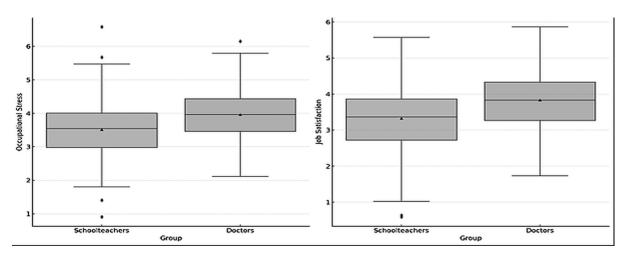


Figure 6. Comparison between Occupational Stress Job Satisfaction: Teachers vs. Doctors

The discussion contextualizes these findings within the professional environments of teachers and doctors in Oman and highlights the distinct challenges faced by each group. For doctors, the elevated stress levels are largely attributed to systemic healthcare challenges, including long working hours, high patient loads, and critical decision-making responsibilities. These findings align with studies from other Gulf countries, such as Saudi Arabia and the UAE, where healthcare professionals face similar pressures due to expanding healthcare demands and resource limitations. The consistency of these results across Gulf nations underscores the need for region-specific interventions, such as increasing staffing levels, improving resource availability, and offering mental health support.

For teachers, the greater variability in stress levels reflects the diverse challenges within the educational system. Factors such as resource disparities across schools, large class sizes, and administrative burdens significantly contribute to stress. Previous studies, including Al Shuaili (2024), highlight these challenges as critical stressors for teachers in Oman. International research, such as Skaalvik and Skaalvik (2015), also identifies workload and lack of recognition as universal stressors for teachers. However, unlike teachers in developed countries like Finland, where

robust systemic support mitigates stress, Omani teachers face additional pressures due to resource limitations and cultural expectations.

Interestingly, despite higher stress levels, doctors reported greater job satisfaction compared to teachers. This paradox can be explained by the intrinsic and extrinsic rewards associated with the medical profession, including societal respect, financial incentives, and the intrinsic motivation of saving lives. These rewards may buffer the negative effects of stress, consistent with Siegrist's (1996) effort-reward imbalance model. In contrast, teachers in Oman often lack similar recognition and rewards, which contributes to their comparatively lower satisfaction levels. This finding aligns with regional studies that report dissatisfaction among teachers due to heavy workloads and limited career advancement opportunities (Agha et al., 2017).

When compared to international contexts, the findings from Oman reveal both similarities and differences. In developed countries such as Sweden and Japan, systemic support, work-life balance initiatives, and advanced resource availability reduce occupational stress for both teachers and doctors, contributing to higher satisfaction levels. In Oman, the absence of such systemic support and the cultural expectation of high performance exacerbate stress for teachers and doctors, making targeted interventions more critical.

This study provides compelling evidence of significant differences in occupational stress and job satisfaction between schoolteachers and private healthcare doctors in Oman. Doctors face higher levels of stress due to systemic healthcare challenges but report higher satisfaction levels, likely due to intrinsic and extrinsic rewards. Teachers experience more variable stress and lower satisfaction, driven by workload pressures and resource disparities. These findings align with research from the Gulf region while revealing context-specific challenges that require targeted solutions. By addressing these challenges, policymakers and administrators can enhance the well-being and performance of these vital professionals, contributing to the advancement of Oman's education and healthcare sectors.

5. Conclusion

This study sheds light on the multidimensional nature of occupational stress and its impact on job satisfaction among schoolteachers and health centre doctors in Oman. The findings underscore the importance of addressing the unique stressors faced by teachers and doctors in Oman. For teachers, strategies such as reducing administrative workloads, increasing classroom support, and providing professional recognition are essential to alleviate stress and improve satisfaction. For doctors, addressing systemic challenges such as staff shortages, workload distribution, and mental health support is critical to maintaining high satisfaction levels. These interventions must be tailored to the cultural and systemic contexts of Oman to ensure their effectiveness.

By addressing both shared and unique stressors, policymakers and stakeholders can create supportive work environments that prioritize the well-being and professional fulfilment of these critical workforces. Implementing the recommended measures would not only alleviate stress but also foster long-term sustainability in the education and healthcare sectors, ensuring improved outcomes for both professionals and the communities they serve.

6. Recommendations

The findings of this study highlight critical areas requiring attention to alleviate occupational stress and enhance job satisfaction among schoolteachers and health center doctors in Oman. Occupational stress is influenced by both systemic and profession-specific factors, with workload and administrative responsibilities emerging as the most significant contributors across both professions. Additionally, student behavior for teachers and patient care demands for doctors to serve as key profession-specific stressors. Addressing these challenges requires a multifaceted approach involving systemic reforms and targeted interventions.

To mitigate the negative impact of workload, schools and healthcare facilities should prioritize hiring additional support staff to reduce the burden on teachers and doctors. Streamlining administrative processes using digital solutions and simplifying bureaucratic procedures can also significantly ease systemic stressors. These measures would enable professionals to focus more on their primary responsibilities, ultimately improving their productivity and well-being.

Improving resource allocation in schools and health centers is essential for addressing systemic inefficiencies. Teachers require adequate classroom resources, such as modern teaching aids and manageable class sizes, to facilitate a supportive learning environment. Similarly, doctors need well-equipped facilities, sufficient medical supplies, and access to technology to deliver quality healthcare services efficiently. Providing these resources would not only reduce stress but also enhance job satisfaction and service delivery.

Profession-specific stressors, such as student behavior for teachers and patient care demands for doctors, require tailored interventions. Behavioral training programs that equip teachers with strategies to manage challenging student behaviors effectively can foster a more positive classroom environment. For healthcare professionals, workshops on patient interaction skills and emotional resilience can help doctors navigate the pressures of high-stakes decision-making and demanding workloads. These targeted programs can strengthen professionals' coping mechanisms and improve their overall job satisfaction.

The integration of systemic and profession-specific interventions would ensure a holistic approach to reducing occupational stress and enhancing job satisfaction. Policymakers should consider these findings to develop evidence-based strategies that align with Oman's broader educational and healthcare reform goals. Regular assessments of stress levels and job satisfaction among professionals would help monitor the effectiveness of these interventions and guide further improvements.

References

- Adeolu, J. O., Yussuf, O. B., & Popoola, O. A. (2016). Prevalence and correlates of job stress among junior doctors in the university college hospital, Ibadan. *Annals of Ibadan Postgraduate Medicine*, 14(2), 92-98.
- Agha, K., Azmi, F. T., & Irfan, A. (2017). An empirical study focusing on higher education teachers in Oman. International Journal of Social Science and Humanity Education and Research, 7(3), 164-171. https://doi.org/10.18178/ijssh.2017.v7.813
- Agius, R. M., Blenkin, H., Deary, I. J., Zealley, H. E., & Wood, R. A. (1996). Survey of perceived stress and work demands of consultant doctors. *Occupational and environmental medicine*, 53(4), 217-224. https://doi.org/10.1136/oem.53.4.217
- Akter, R., & Alam, T. (2023). Relation between occupational stress and job satisfaction of primary school teachers: A cross-sectional study in Bangladesh. *International Journal of Scientific Research in Multidisciplinary Studies,* 9(3), 11-18. Retrieved from https://www.isroset.org/pdf paper view.php?paper id=3075&3-ISROSET-IJSRMS-08463.pdf
- Al Rahbi, F., Al Hashmi, M., & Al Harthi, A. (2020). The effects of work stress on job satisfaction of healthcare workers in a public sector hospital in Al Dakhliya, Oman. *International Journal of Healthcare Management*, 13(3), 1-9. https://doi.org/10.51594/ijmer.v4i6.344
- Al Shuaili, A. S. T. (2024). The relationship between schoolwork stress and teachers' job satisfaction: A study in the context of Omani schools. *International Journal for Multidisciplinary Research*, 6(5), 1-15. https://doi.org/10.36948/ijfmr.2024.v06i05.29803
- AlShuaili, A. S. T., & Yussef, M. (2024). Structural modeling of the relationship between occupational stress, occupational motivation, and job satisfaction among schoolteachers in the Sultanate of Oman. *International Journal of Education and Practice*, *12*(3), 511-526. https://doi.org/10.18488/61.v12i3.3722
- Aye, Z. M. (2019). Occupational stress and job satisfaction among doctors working in public and private hospitals in Myanmar [Master's thesis]. Tim G. Andrews (Advisor). https://doi.org/10.13140/RG.2.2.15290.06085
- Barnett, R. C., Raudenbush, S. W., Brennan, R. T., Pleck, J. H., & Marshall, N. L. (1995). Change in job and marital experiences and change in psychological distress: A longitudinal study of dual-earner couples. *Journal of Personality and Social Psychology*, 69(5), 839-850. https://doi.org/10.1037/0022-3514.69.5.839
- Baron, R. M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173-82.
- Bates, E. (1982). Doctors and their spouses speak: Stress in medical practice. Sociology of Health & Illness, 4(1), 25-39. https://doi.org/10.1111/1467-9566.ep11345586
- Branthwaite A., & Ross A. (1988) Satisfaction and job stress in general practice. *Family Practice*, 5(2), 83-93. https://doi.org/10.1093/fampra/5.2.83
- Brewer, E., & McMahan-Landers, J. (2003). The relationship between job stress and job satisfaction among

industrial and technical teacher educators. *Teaching and Teacher Education*, 39(3), 457-469. https://doi.org/10.21061/jcte.v20i1.622.

- Caplan, R. P. (1994). Stress, Anxiety, And Depression In Hospital Consultants, General Practitioners, And Senior Health Service Managers. *BMJ: British Medical Journal*, 309(6964), 1261-1263. Retrieved from http://www.jstor.org/stable/29725432
- Cooke, R. A., & Rousseau, D. M. (1984). Stress and strain from family roles and work-role expectations. *Journal of Applied Psychology*, 69(2), 252-260. https://doi.org/10.1037/0021-9010.69.2.252
- Cooper C. L., Rout U., & Faragher B. (1989). Mental health, job satisfaction and job stress among general practitioners. *British Medical Journal*, 298, 366-370. https://doi.org/10.1136/bmj.298.6670.366
- Cooper, C. L. (1983). Identifying stressors at work: Recent research developments. *Journal of Psychosomatic Research*, 27(5), 369-376. https://doi.org/10.1016/0022-3999(83)90068-5
- Cooper, C. L. (1986). Job distress: Recent research and the emerging role of the clinical occupational psychologist. *Bulletin of the British Psychological Society, 39,* 325-331.
- Cooper, C. L., & Hingley, P. (1988). Occupational stress among general practitioners. *Journal of Management in Medicine*, 3(2), 96-106. https://doi.org/10.1108/eb060492
- Eurofound, Liukkonen, P., Cartwright, S., & Cooper, C. (1996). Stress prevention in the workplace: Assessing the costs and benefits to organisations. Publications Office.
- Hans, A., Mubeen, S. A., Khan, S., & Al Saadi, S. A. M. (2014). A study on work stress and job satisfaction among headmasters: A case study on bilingual schools in Sultanate of Oman-Muscat. *Journal of Sociological Research*, 5(1), 78-89. http://dx.doi.org/10.5296/jsr.v5i1.5426
- Harzer, C., & Ruch, W. (2015). The Relationships of Character Strengths with Coping, Work-Related Stress, and Job Satisfaction. *Frontiers in Psychology*, 6, 165. https://doi.org/10.3389/fpsyg.2015.00165
- Hayes, A. F. (2017). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. Guilford Press, New York.
- Hemalatha, M. (2024). Occupational stress among college teachers: A comparative study between Madurai and Auckland City. African Journal of Biological Sciences, 6(Si4), 6663-6675. https://doi.org/10.48047/AFJBS.6.Si4.2024.6663-6675
- Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The motivation to work*. John Wiley & Sons. https://doi.org/10.7202/1022040ar
- Košir, K., Dugonik, Š., Huskić, A., Gračner, J., Kokol, Z., & Krajnc, Ž. (2022). Predictors of perceived teachers' and school counselors' work stress in the transition period of online education in schools during the COVID-19 pandemic. *Educational Studies*, 48(6), 844-848. https://doi.org/10.1080/03055698.2022.2083614
- Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review*, 53(1), 27-35. https://doi.org/10.1080/00131910124115
- Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer.
- Mohideen, M. M., & Katta, A. K. (2023). Occupational Stress among College Teachers in Chennai Region of Tamil Nadu. Journal of Research Administration, 5(2), 489-498. Retrieved from https://www.afjbs.com/uploads/paper/7c9f3c934e8b2aed4e60baef10c42c75.pdf
- Näring, G., Vlerick, P., & Van de Ven, B. (2012). Emotion work and emotional exhaustion in teachers: The job and individual perspective. *Educational Studies*, 38(1), 63-72. https://doi.org/10.1080/03055698.2011.567026
- Oducado, R. M., Rabacal, J., Moralista, R., & Tamdang, K. (2021). Perceived Stress Due COVID-19 Pandemic Among Employed Professional Teachers. *IJERI: International Journal of Educational Research and Innovation*, (15), 305-316. https://doi.org/10.46661/ijeri.5284
- Rees, D. W., & Cooper, C. L. (1992). Occupational stress in health service workers in the UK. *Stress Medicine*, 8(2), 79-90. https://doi.org/10.1002/smi.2460080205
- Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology, 1*(1), 27-41. https://doi.org/10.1037//1076-8998.1.1.27
- Skaalvik, E. M., & Skaalvik, S. (2015). Job satisfaction, stress, and coping strategies in the teaching profession What

do teachers say? International Education Studies, 8(3), 181-192.https://doi.org/10.5539/ies.v8n3p181

- Spector, P. E. (1986). Perceived control by employees: A meta-analysis of studies concerning autonomy and participation at work. *Human Relations*, 39(11), 1005-1016. https://doi.org/10.1177/001872678603901104
- Spector, P. E. (1988). Development of the Work Locus of Control Scale. *Journal of Occupational Psychology, 61*(4), 335-340. https://doi.org/10.1111/j.2044-8325.1988.tb00470.x
- Suganya, S., & Rajkumar, A. D. (2016). Job Stress among teaching faculty-A review. *International Journal of Applied Engineering Research*, Research India Publications. Retrieved from http://www.ripublication.com.
- Swanson, V. (1997). Occupational stress, job satisfaction, and role conflict in doctors [Doctoral dissertation]. University of Stirling. Retrieved from http://hdl.handle.net/1893/2201
- Warr P. B. (1991). Job Characteristics and Mental Health. In P. Warr (Ed.), Psychology at Work (3rd ed.). Penguin Books.
- Wiersma U. J. (1990) Gender differences in job attribute preferences: Work-home role conflict and job level as mediating variables. *Journal of Occupational Psychology*, 63(23), 1-243. https://doi.org/10.1111/j.2044-8325.1990.tb00524.x
- Winefield H. R., & Anstey T. J. (1991). Job stress in general practice: practitioner age, sex and attitudes as predictors. *Fam Pract.*, 8(2), 140-4. https://doi.org/10.1093/fampra/8.2.140
- Wushe, T., & Shenje, J. (2019). An analysis of the relationship between occupational stress and employee job performance in public health care institutions: A case study of public hospitals in Harare, SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur, 17(0), a1079. https://doi.org/10.4102/sajhrm.v17i0.1079
- Zhang, Y., Zhang, S., & Hua, W. (2019). The impact of psychological capital and occupational stress on teacher burnout: Mediating role of coping styles. *The Asia-Pacific Education Researcher*, 28, 339-349. https://doi.org/10.1007/s40299-019-00446-4
- Zuckerman, D. M. (1989). Stress, self-esteem, and mental health: How does gender make a difference? *Sex Roles, 20*, 429-444. https://doi.org/10.1007/BF00288001

Acknowledgements

The author would like to thank the teachers and clinicians who made this research possible.

Author contributions

The author conducted the study design, research problems, research methods, and data collection. The results were summarized, and the manuscript was drafted and revised. The author carefully read and approved the final manuscript.

Funding

Not applicable.

Conflict of interest

The author declares that he or she has no known competing financial interests or personal relationships that might influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

Open access

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.