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Original article

Job strain and associated factors among medical school employees in Thailand: A cross-sectional study

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Abstract

Background: Mental health issues are increasing among workers and are often linked to job strain. Medical schools, with their diverse workforce, including healthcare workers, educators, and support staff, are in demanding work environments and are susceptible to job strain.
Objective: This study investigated the prevalence and associated factors of job strain among support staff at a medical school in Bangkok, Thailand.
Methods: A cross-sectional study of 721 support staff employed at a medical school in Bangkok, Thailand, was conducted between May and July 2024. The study included a questionnaire that consisted of three sections, including demographic data, work-related factors, and the Thai version of the Job Content Questionnaire to assess job strain. Data analysis involved descriptive and inferential statistics, and bivariate analysis and binary logistic regression analyses were also performed.
Results: The response rate was 55.6% (n = 401), and 18.5% (n = 74) reported job strain. Job strain was significantly associated with an underweight body mass index (odds ratio (OR) = 2.1; 95% confidence interval (CI): 1.1–4.1), having debt (OR = 2.1; 95% CI: 1.1–3.8), working in office positions (OR = 4.4; 95% CI: 1.1–17.4), shift work (OR = 2.8; 95% CI: 1.2–6.5), high physical job demand (OR = 2.6; 95% CI: 1.1–5.9), and high workplace hazards (OR = 3.9; 95% CI: 2.1–7.4).
Conclusion: Underweight body mass index, debt, job type, shift work, physical job demands, and workplace hazards are associated with job strain. Addressing these factors can facilitate the development of prevention strategies.

Keywords: Job strain, medical school, occupation, stress, Thailand.

Mental health problems are becoming more prevalent among the working population. These issues can have serious consequences for an individual's personal and professional well-being, leading to decreased productivity and efficiency in the workplace. [1] Consequently, to address these mental health concerns, a collaborative approach is required that involves all stakeholders, from policymakers to individual employees. Executives and employees must actively engage with healthcare professionals and other relevant experts to promote and manage mental health within the working-age population. [2] Data on the disability-adjusted life years, which were collected worldwide by a Global Burden of Disease study in 2019, revealed that the working-age population, specifically individuals aged 25–49 years, has shown an upward trend in the loss of healthy years due to mental health problems. These issues, which include headache disorders, depressive disorders, and anxiety disorders, have been steadily increasing over recent decades. [3]

The fundamental origin of mental health issues among employees often stems from job strain, which arises from a conflict between job demand and job control. In this context, job demand refers to the pressures and requirements of the assigned tasks, while job control involves the decision-making power of an individual to accomplish the expected tasks. [4] Moreover, job strain can also impact physical health,

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increasing the risk of developing conditions such as stroke and elevating the mortality rate from cardiovascular diseases. [5, 6] This remains a grave concern that affects the well-being of the current working-age population.

Medical schools are considered workplaces that are driven by a diverse workforce, including healthcare workers and educators, as well as support staff involved in clinical operations and teaching, researchers, laboratory assistants, and office workers. These employees often face heavy workloads, rigid time constraints, pressure, and exposure to various health hazards. [7] As a result, employees in medical schools are at a higher risk of experiencing job strain. However, previous studies on job strain or workplace interventions in medical school settings have predominantly focused on healthcare workers, such as physicians, nurses, or medical students [8, 9], thereby potentially overlooking the support staff.

Therefore, this study investigated the prevalence and associated factors of job strain among the support staff at a medical school in Bangkok, Thailand.

Materials and methods

The study procedures and informed consent were reviewed and approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB no. 0127/67). The IRB follows the ethical principles of the Declaration of Helsinki and its amendments. All participants provided written informed consent before being included in the study, in accordance with the Ethics Committee regulations.

Study setting and population

This study used a cross-sectional study design. The sample group consisted of support staff employed at a medical school in Bangkok, Thailand. Data were collected from all eligible participants without random sampling, and the total number of participants was 721 employees who had completed at least one year of probationary work at the institution.

Data collection

The questionnaire comprised three sections as follows:

Section 1) Demographic data, which comprised sex, age, body mass index (BMI) for the Asian population, education level, marital status, debt status, economic status, smoking habits, alcohol consumption, hypertension, diabetes, hyperlipidemia, mental disorders, physical exercise, and sleep duration.

Section 2) Work-related factors, which comprised affiliated departments, job type categorized as clinical or laboratory support (researchers, laboratory staff, medical technologists, science officers, and psychologists), office work (management personnel, administrative staff, and other office roles), and physical and facility maintenance (technicians, janitors, laborers, gardeners, and drivers). It also covered employment status, length of service, weekly working hours, overtime, and part-time employment.

Section 3) Job strain assessment was measured using the Thai version of the Job Content Questionnaire (Thai-JCQ). This tool was originally developed by Karasek *et al.* and has been validated for content in various occupational groups across Thailand. [4, 10] It consists of 45 items across six components: 1) job control; 2) psychological job demands; 3) physical job demands; 4) job security; 5) social support; and 6) hazards at work.

Data collection for this study utilized a questionnaire that was refined through a pilot study that involved 20 support staff members at another tertiary hospital. The reliability of the questionnaire was assessed, and it yielded a Cronbach's alpha coefficient of 0.9. Subsequently, the finalized questionnaire was distributed through the human resources department, and it reached all staff members between May and July 2024.

Statistical analysis

Data analysis was performed using Stata version 18.0 (Stata Corp., College Station, TX, USA). $P < 0.05$ was considered statistically significant.

Descriptive statistics for qualitative data were presented using frequency and percentage, while quantitative data were reported as the mean and standard deviation (SD) as well as the median and interquartile range (IQR). The Thai-JCQ scores were categorized into two groups based on the 75th percentile (P75), dividing each component score into two levels: low ($\leq$ P75) and high ($>$ P75). Only component 1 (job control) and component 2 (psychological job demand) were considered to assess job strain. Scores were grouped according to the job demand-control model, classifying a "high-strain job" as one with low job control and high psychological job demand. Employees meeting these criteria were deemed to experience "job strain" under this theoretical framework. [4] The remaining cases were classified as non-high-strain jobs and were segregated into three subgroups: "low-strain job" (high job control

and low psychological job demand), "active job" (high job control and high psychological job demand), and "passive job" (low job control and low psychological job demand). Components 3, 4, 5, and 6 in the Thai-JCQ were treated as independent variables within the work-related factors data. Inferential statistics were used to examine the association between the qualitative factors and job strain using the Chi-square test. Following this, relevant factors identified in the bivariate analysis were selected through purposeful selection, based on a literature review and $P < 0.25$. [11] These variables were then analyzed using binary logistic regression to investigate the relationship between the factors associated with job strain.

Results

A total of 401 participants responded to the questionnaire (55.6% response rate). The majority of respondents were female (n, %: 261, 65.1%), with most participants >45 years of age. Among the participants, 47.9% were classified as having a healthy weight. Most had a bachelor's degree (80.3%) and were single (65.3%). The majority had no children (71.3%) and had debt (55.6%). In terms of the economic aspect, 195 participants (48.6%) stated that they had sufficient income for subsistence but lacked any surplus for savings. A large portion had never smoked (81.3%) and consumed alcohol occasionally (54.6%). Hypertension was reported by 34 participants (8.5%), diabetes by 5 participants (1.5%), and hyperlipidemia by 37 participants (9.2%). In addition, 16 participants (4.0%) had mental disorders, most exercised less than 150 minutes per week (50.8%), and slept for 7 or more hours per day (55.1%) **(Table 1).**

Regarding the work-related factors, the majority of participants were affiliated with the administrative department (37.7%) and primarily engaged in office work (82.8%). Most participants were employed as permanent staff (79.0%), had tenure of more than 3–8 years (38.9%), and had a weekly average of ≤ 48 working hours (93.0%). Most participants did not work in shifts (88.8%), did not work overtime (68.1%), and did not work part-time (75.1%). The majority reported low physical job demands (89.5%), low job security (77.8%), low social support (81.6%), and low hazard levels at work (78.3%) **(Table 2).**

Table 3 presents the Thai-JCQ job strain questionnaire scores, including the components used to assess the job strain levels. The job control component had a mean score of 55.2 (SD = 6.7), and the psychological job demand component had a mean score of 47.2 (SD = 9.0). The 75P criterion was applied to classify each component into low and high levels to evaluate job strain. For Component 1 (job control), the 75P threshold was 58.0, while for Component 2 (psychological job demand) it was 53.1.

In this study, job strain was assessed using the job demand-control model. High-strain jobs, defined as those with low job control and high psychological demand, were considered to have job strain, which included 74 participants (18.5%). Non-high-strain jobs comprised 80 participants in low-strain jobs (19.9%), 17 participants in active jobs (4.2%), and 230 participants in passive jobs (57.4%).

Bivariate analysis was performed to examine the relationship between job strain and various factors using the chi-square test. Variables with a $P < 0.25$ were selected for inclusion in the multivariate analysis model. These included age ($P = 0.18$), BMI ($P = 0.25$), education level ($P < 0.05$), debt status ($P = 0.08$), smoking ($P = 0.24$), alcohol consumption ($P = 0.09$), diabetes ($P = 0.23$), job type ($P = 0.12$), job tenure ($P = 0.16$), shift work ($P < 0.05$), overtime ($P = 0.20$), part-time job ($P = 0.11$), physical job demand ($P < 0.05$), social support ($P < 0.05$), and hazards at work ($P < 0.001$).

After controlling for all other variables, factors associated with job strain among medical school employees in Bangkok, Thailand, included being underweight compared to the healthy weight group (odds ratio (OR) = 2.1; 95% confidence interval (CI): 1.1–4.1), having debt (OR = 2.1; 95% CI: 1.1–3.8), working in office positions compared to clinical and laboratory roles (OR = 4.4; 95% CI: 1.1–17.4), shift work (OR = 2.8; 95% CI: 1.2–6.5), high physical job demand (OR = 2.6; 95% CI: 1.1–5.9), and high workplace hazards (OR = 3.9; 95% CI: 2.1–7.4) **(Table 4** and **Figure 1).**

Table 1. Characteristics of the study participants (n = 401).

Variables	(n)	
Sex		
Male	140	34.9
Female	261	65.1
Age (years)		
< 45	343	85.5
≥ 45	58	14.5
Body mass index (BMI) (kg/m²)		
Healthy (18.5 to 22.9 kg/m²)	192	47.9
Underweight (< 18.5 kg/m²)	63	15.7
Overweight (23 to 24.9 kg/m²)	50	12.5
Obesity class 1 (> 25 to 29.9 kg/m²)	67	16.7
Obesity class 2 (> 30 kg/m²)	29	7.2
Education level		
Below bachelor's degree	28	7.0
Bachelor's degree	322	80.3
Master's degree or higher	51	12.7
Marital status		
Single	262	65.3
Married	131	32.7
Divorced/separated/widowed	8	2.0
Having children		
None	286	71.3
Have	115	28.7
Debt status		
No debt	178	44.4
In debt	223	55.6
Economic status		
Insufficient	68	17.0
Sufficient, no savings	195	48.6
Sufficient, with savings	138	34.4
Smoking status		
Never	326	81.3
Ex-smoker	56	14.0
Current smoker	19	4.7
Alcohol consumption		
None	154	38.4
Occasional	219	54.6
Regular	28	7.0
Hypertension		
Yes	34	8.5
Diabetes		
Yes	5	1.2
Hyperlipidemia		
Yes	37	9.2
Mental disorders		
Yes	16	4.0
Physical exercise		
No exercise	149	37.6
< 150 minutes per week	201	50.8
≥ 150 minutes per week	46	11.6
Sleep duration (hours per day)		
< 7 hours	180	44.9
≥ 7 hours	221	55.1

Table 2. Work-related factors of the study participants (n = 401).

Variables	n	(%)
Affiliated department		
Administrative divisions	151	37.7
Academic divisions	92	22.9
Pre-clinical departments	108	26.9
Clinical departments	50	12.5
Job type		
Clinical or laboratory work	39	9.7
Office work	332	82.8
Physical and facility maintenance	30	7.5
Employment status		
Permanent employee	317	79.0
Temporary contract	84	21.0
Job tenure (years)		
1 to 3	146	36.4
> 3 to 8	156	38.9
> 8	99	24.7
Working hours		
≤ 48 hours per week	373	93.0
> 48 hours per week	28	7.0
Shift work		
Yes	45	11.2
Overtime		
Yes	128	31.9
Part-time job		
Yes	100	24.9
Physical job demand*		
High > P75	42	10.5
Job security*		
High > P75	89	22.2
Social support*		
High > P75	74	18.4
Hazard at work*		
High > P 75	87	21.7

* From the Thai version of the Job Content Questionnaire (Thai-JCQ), components 3 to 6.

Table 3. Component scores from the Thai-JCQ of the study participants (n = 401).

Job strain	Mean (SD)	Median (IQR)	min	Percentile			max	Low level (≤ P75) n (%)	High level (> P75) n (%)
				P25	P50	P75			
Components used to assess job strain level*									
Component 1: job control	55.2 (6.7)	54 (6)	32	52.0	54.0	58.0	72	304 (75.8)	97 (24.2)
Component 2: psychological job demand	47.2 (9.0)	48 (11)	18	41.7	48.0	53.1	72	310 (77.3)	91 (22.7)

*Levels classified as 'high' and 'low' using the 75th percentile (P 75) threshold based on the Thai-JCQ questionnaire.

Table 4. Job strain and associated factors (n = 401).

Variables	Crude OR	95% CI	Adjusted OR†	95% CI
Age (years)				
<45	reference		reference	
≥45	0.6	0.3 - 1.3	0.6	0.2 - 1.7
BMI (kg/m²)				
Healthy	reference		reference	
Underweight	**2.1***	**1.1 - 4.1**	**2.6***	**1.2 - 5.8**
Overweight	1.1	0.5 - 2.6	1.2	0.5 - 3.0
Obesity class 1	1.1	0.5 - 2.4	1.4	0.6 - 3.3
Obesity class 2	0.8	0.3 - 2.6	1.0	0.3 - 3.3
Debt status				
No	reference		reference	
Yes	1.6	1.0 - 2.7	**2.1***	**1.1 - 3.8**
Diabetes				
No	reference		reference	
Yes	3.0	0.5 - 18.3	1.6	0.2 - 16.3
Job type				
Clinical or laboratory work	reference		reference	
Office work	3.0	0.9 - 10.2	**4.4***	**1.1 - 17.4**
Physical and facility maintenance	1.8	0.4 - 9.0	1.8	0.3 - 11.1
Job tenure				
1 to 3	reference		reference	
> 3 to 8	1.6	0.9 - 2.9	1.5	0.8 - 2.8
> 8	1.0	0.5 - 1.9	1.3	0.5 - 3.4
Shift work				
No	reference		reference	
Yes	**2.2***	**1.1 - 4.4**	**2.8***	**1.2 - 6.5**
Overtime				
No	reference		reference	
Yes	0.7	0.4 - 1.2	0.6	0.3 - 1.1
Part-time job				
No	reference		reference	
Yes	0.5	0.3 - 1.1	0.6	0.3 - 1.3
Physical job demand				
Low	reference		reference	
High	**3.2***	**1.6 - 6.3**	**2.6***	**1.1 - 5.9**
Social support				
Low	reference		reference	
High	**0.3***	**0.1 - 0.8**	0.4	0.2 - 1.1
Hazard at work				
Low	reference		reference	
High	**3.8****	**2.2 - 6.5**	**3.9****	**2.1 - 7.4**

†Adjusted for other variables including age, BMI, debt status, diabetes, job type, job tenure, shift work, overtime, part-time job, physical job demand, social support, and hazard at work

*$P < 0.05$; **$P < 0.001$

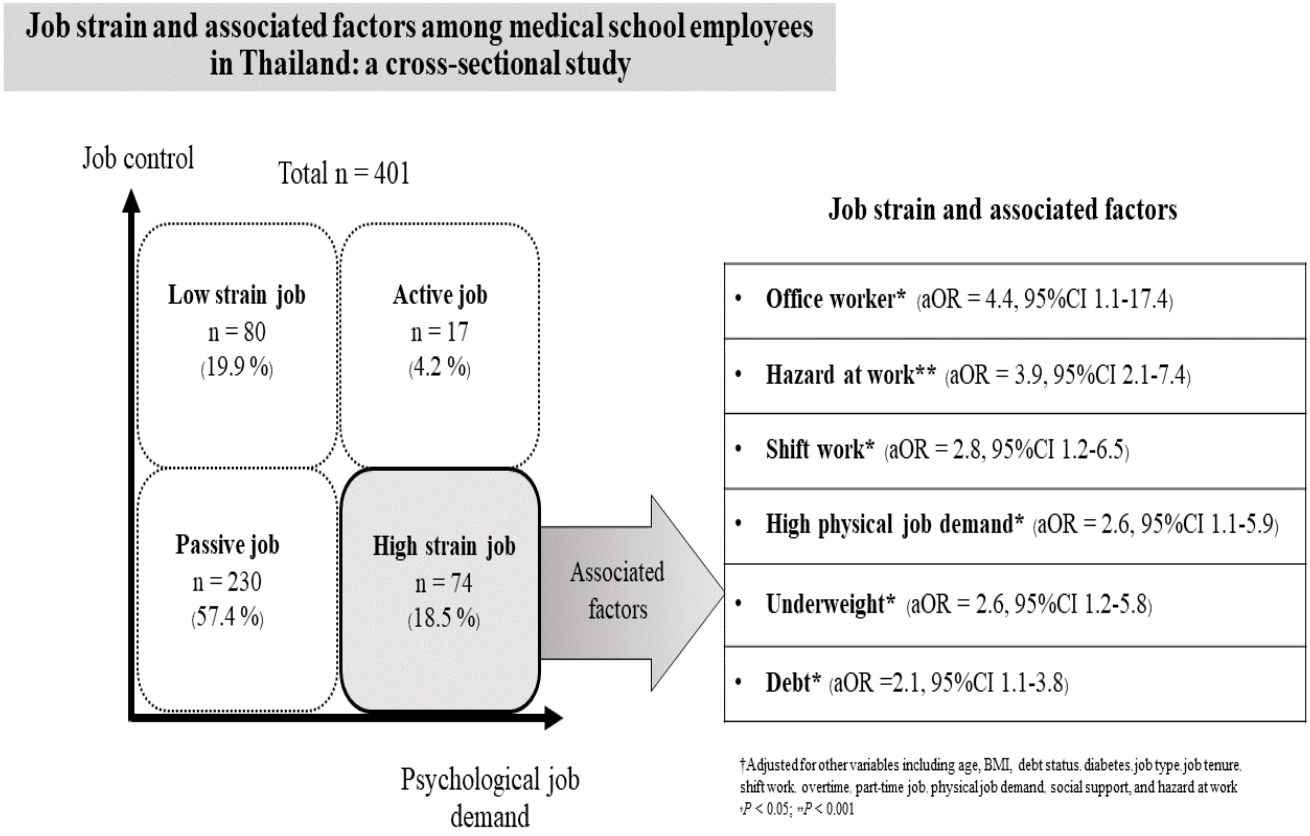

Figure 1. Job strain and associated factor.

Discussion

This study identified an 18.5% prevalence of job strain among support staff working at this medical school. Compared with similar studies in terms of research design and population, the prevalence is close to that observed in a study of general university staff in a neighboring country, Malaysia, where a 21.7% prevalence of job strain was reported. [12] Another study of lecturers at two medical schools in Malaysia found a job strain prevalence ranging between 17.5% and 23.3%. [13] In Thailand, studies on job strain among worker groups similar to the sample population in this research remain limited. A previous study among factory workers at a rubber glove factory in central Thailand reported a job strain prevalence of 27.5%, which was higher than that found in our study. This can be attributed to the labor-intensive nature of factory work, greater exposure to physical hazards, and typically lower job control among factory workers. [14] Another study performed among nurses in Bangkok found a job strain prevalence of only 4.8%. However, upon closer examination, 52.7% of the sample population reported a high psychological job demand. Despite this, nursing is considered a high job control profession, with 97.5% of participants falling into this category. Consequently, the majority of cases were classified as active jobs, comprising 51.5% of the sample. [15]

This study identified factors associated with job strain among medical school employees in Thailand, including BMI, debt status, job type, shift work, high physical job demand, and high workplace hazards.

An underweight BMI was found to be positively associated with job strain, possibly due to increased health issues related to being underweight, such as irregular eating behaviors, chronic illnesses, and mental health disorders, which can lead to various poor health conditions. These health challenges can affect work performance, contributing to stress and the accumulation of job strain. The average BMI in this study was similar to that of a previous study in healthcare workers. [16] A systematic review of the impact of job strain and BMI among hospital staff indicated a correlation between job strain and changes

in BMI. [17] Another study conducted among a working-age population in Europe found an association between job strain and being underweight, as well as with all three levels of obesity. This contrasts with the present study, which did not find an association in individuals with a higher-than-normal BMI. [18]

This study found that employees with debt exhibited a positive association with job strain. With the ongoing global economic challenges, debt burdens have continuously increased among the working-age population. For support staff, insufficient income to cover expenses can lead to issues in their financial well-being, which, in turn, may contribute to job strain due to concerns over job security. This aligns with a study of the working population in China, which found that financial pressure or debt was positively associated with job strain and decreased work performance. [19]

Office work, compared with clinical and laboratory work, was significantly associated with higher job strain. This can be explained by the repetitive, routine nature of office tasks, which can lead to monotonous work. In contrast, clinical and laboratory roles tend to provide more varied responsibilities. [20] Office employees face multiple factors that can trigger job strain. These include job-related factors such as excessive workload, working under pressure, limited job control, lack of social support, and interpersonal and organizational challenges. Physical factors also play a role, including unsuitable work environments and ergonomic issues, all of which may contribute to job strain. [7]

Shift work was positively associated with job strain, as working hours misaligned with the body's natural circadian rhythms, thereby disrupting hormonal balance. This imbalance can lead to altered health behaviors, such as irregular eating patterns and insufficient rest, which may result in fatigue, insomnia, and exhaustion at work. These factors contribute to job strain and can lead to other mental health issues. [21] This aligns with a study of office employees at several companies in China, which found an association between shift work and job strain, as well as increased risks of developing emotional disorders and depression. [22]

High physical job demand was positively associated with job strain. A recent study among employees in physically demanding roles at the same medical school as our research found that lower physical fitness was linked to reduced work ability, which is another factor associated with job strain. [23] A systematic review examining the relationship between psychosocial work factors and upper musculoskeletal disorders among nurses found that a high physical workload was positively associated with job strain. [24]

Moreover, high workplace hazards were positively associated with job strain. This causes dangerous work processes and increased risk of workplace accidents, which could impact on the physical and mental health of employees. This corresponds with a survey of the working population in South Korea, where workplace hazards, such as exposure to loud noise, vibrations, heat, or unsuitable environmental conditions, were considered as stress-inducing factors that have a negative impact on mental health. [25]

The strengths of this study lie in its focus on the prevalence and associated factors of job strain among the support staff in a medical school, which covered a diverse range of multidisciplinary roles with unique job contexts and is an area with limited existing research. Previous studies have primarily focused on job strain in specific medical personnel groups, namely, physicians, nurses, or medical students. However, this study utilized the Thai-JCQ, which is specifically adapted for the Thai context, unlike other research in Thailand, which often relies on general stress measurement tools that were not specifically designed for job strain. The study also achieved a substantial response rate of 55.6%, which ensured a sufficiently large sample size with demographic representation across age, gender, and departments that closely align with the overall employee profile of the medical school.

This study provides relatively valuable information for prioritizing policies, preventive measures, or activities, particularly in promoting organizational health and managing occupational health. Addressing factors that contribute to job strain can inform policy-level prevention strategies, aiding in problem resolution at the organizational level. [26] This includes self-care strategies for employees, with an emphasis on the promotion of mental health literacy and activities that enhance their mental well-being. The focus is on self-awareness, which could foster the internalization of one's health status, especially mental health. It also involves fostering life satisfaction, optimism, self-esteem, mastery, a sense of control, a sense of purpose in life, and a sense of belonging within the organization. [27]

The limitations of this study include its cross-sectional design, which identifies associations with relevant factors, but it does not establish a causal relationship or temporal sequence. This study was conducted exclusively among employees from a single medical school, with a predominance of office-based staff, which may limit the generalizability of these findings to the broader population. Having the participants complete the questionnaire independently may lead to score variability over time and possibly trigger them toward recall bias as well as social preference bias. Due to the potential impact on their careers, the researchers sought to mitigate this challenge by clarifying the nature and purpose of the questions and providing detailed instructions for responses. The researchers also emphasized data confidentiality and the exclusive use of information for research purposes.

In light of this, future research may benefit from adopting a longitudinal study design to better understand the causality and direction of the various relationships. Furthermore, broadening the scope to include diverse work characteristics or other operational contexts is recommended. Regular monitoring and surveillance, through surveys or assessments, should be implemented to evaluate job strain among medical school employees, which will enable more comprehensive mental health screening. This approach could also help assess the effectiveness of mental health programs aimed at reducing job strain and improving organizational well-being.

Conclusion

The study found that support staff at a medical school experienced job strain levels similar to those observed among university staff in previous studies. Factors associated with job strain included being underweight, debt, office job type, shift work, high physical job demand, and workplace hazards.

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Conflict of interest

The authors declare that they have no conflicts of interest.

Data sharing statement

The data sets generated or analyzed during the present study are available from the corresponding author upon reasonable request.

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