



Prevalence and Attributing Factors of Occupational Stress among Primary Healthcare Physicians, Menoufia Governorate, Egypt

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ABSTRACT

Background: Stress at work, particularly for primary healthcare physicians, is known to worsen physical and psychological conditions in addition to lowering productivity. **Objective:** To measure the degree of occupational stress experienced by primary healthcare physicians and its attributing factors. **Method:** A cross-sectional study was carried out on 240 primary healthcare physicians in the Menoufia governorate, Egypt. A pre-designed questionnaire about sociodemographic and occupational information was filled out by each participant. Additionally, the New Job Stress Scale was filled. It included 22 questions, divided into four subdomains: job stress, role expectation conflict, co-worker support, and work-life balance. **Results:** The mean age of the studied primary healthcare physicians was 33.4 years and 62.1% were female. They were working for an average 7.5±4.3 years and 59.6% of them worked one-to-four-night shifts per week. Approximately 1.2% of the physicians had low, 50% had moderate, and 48.8% had high levels of job stress. About 70% of them had poor co-worker support and work-life balance items, while 57.5% reported a moderate degree of role expectation conflict. The job stress and role expectation conflict items were significantly increased with studying advanced qualifications, increasing working hours, and working night shifts per week ($P < 0.05$). The attributing factors for high-grade job stress were the fellowship degree, master's degree, number of night shifts, and working hours per week. **Conclusion:** Stress is very prevalent among the studied primary healthcare physicians. Workload management and psychological support may help avoid occupational stress, promote a more engaged workforce, and improve productivity.

Submission Date:

2024-06-08

Revision Date:

2024-09-04

Acceptance Date:

2024-09-05

Key Words:

Occupational health, stress, risk factors, primary healthcare physicians.

INTRODUCTION

Occupational stress refers to the harmful physical and psychological responses that occur when a worker's needs, resources, or abilities are not matched by the demands of their job.^{1,2} Workplace stress is known to aggravate several behavioral, psychological, and physical illnesses.³ Unfavorable workplaces can also result in decreased productivity, unproductive behavior, increased absenteeism, injuries and lowering the quality of life.⁴

Burnout syndrome is the term for occupational stress associated with an extreme and ongoing degree of stress, lack of social interaction, and

emotional exhaustion.⁵ Many factors can lead to occupational pressures, such as ineffective management techniques, job requirements, a lack of support or flexibility, long work hours, a lack of skills necessary for the position, unlawful activity, and discrimination.⁶

The levels of occupational stress and process-related stress must be ascertained to collect the information required for reorganizing services and improving working conditions. These programs have the potential to increase the productivity of the primary care workers.⁷

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Various scales of occupational stress were used and relied on six different factors: job features, organizational structure, role and connection, career advancement, external obligations, and responsibilities. These scales formed two dimensions: One dimension was time stress (feelings of being under steady strain), and the second one was discovered to be anxiety (job-related feelings of worry).^{8,9}

The psychological component is crucial to quantify; stress is dynamic in nature, and the variables contributing to stress differ based on the workplace.¹⁰ Consequently, a revised version of the job stress scale was created by Shukla and Srivastava in 2016. They considered the psychological component as well as the work environment because better workplace conditions significantly lower mental health issues. The four subdomains comprise this scale: work-life balance, coworker support, role expectation conflict, and job stress. There are numerous factors influencing the subdomains of this scale. Examples fall into one of the following subdomains: role expectation conflict (conflicting demands from juniors and colleagues), coworker support (advice or assistance from colleagues), job stress (time, workplace pressure, and anxiety), and work-life balance (balancing work, family, and other activities). Organizations can use this tool to create policies that address these and lessen workplace stress.¹¹

Stress-related illnesses are more common among healthcare workers and healthcare sector in general.¹² The purpose of this study is to measure the degree of occupational stress experienced by primary healthcare physicians and its attributing factors. Most studies conducted in Egypt examined job stress level among hospital specialties; few of these studies focused on healthcare providers at primary healthcare centres (PHCs). However, the initial point of contact for patients in need of medical attention is their primary healthcare physician. Therefore, it is critical to measure their degree of occupational stress and eliminate any factors that can be harmful to their health. The objective of the current study was to measure the degree of occupational stress experienced by primary healthcare physicians and its attributing factors.

METHODS

A cross-sectional study was carried out on 240 primary healthcare physicians in the Menoufia governorate, Egypt. Primary healthcare centres are located in both urban and rural regions. Each urban

centre may have 5–10 primary care physicians, but each rural unit may have from one to five physicians. Urban PHCs provide more services and see more patients. Pre-marital examinations, birth and death certificates, curative, preventive, and public health services are all provided by primary care physicians in addition to administrative functions. Primary healthcare centres are staffed by primary healthcare providers, such as family doctors or general practitioners. The studied primary healthcare physicians work in an outpatient clinic, mostly during the morning shifts, while handling regular cases, antenatal care, vaccinations, chronic disease management, school health services, minor surgeries, and referral services, which are considered non-emergency situations. During the rest of the day, they handle emergencies. Physicians' workloads at PHCs are allocated based on the number of physicians and responsibilities.

This cross-sectional study involved 240 primary healthcare physicians. The participants were collected from different primary healthcare centres in Menoufia Governorate, Egypt, by a multistage random sample from the beginning of January to the end of May 2024. All physicians at primary healthcare levels, of all ages and sexes, with work durations exceeding one year were eligible for inclusion in this study.

To determine the sample size, version 3 of the OpenEpi online calculator with a 95% confidence interval and 80% power was utilized. Based on a previous study of Lourencao et al., 2022, the findings showed that 19.4% of primary healthcare providers were under stress at work. Total participants were 240 primary healthcare physicians.

A multistage random sampling was used to select the primary care physicians. In the first stage, five centres (Shebin Alkom, Menouf, Elbagour, Ashmoon, and Quesna) out of the nine centres within the Menoufia governorate were randomly selected. The second stage was the selection of PHCs, considering the representation of both urban and rural areas. There were five urban PHCs and twenty-four rural units at the Shebin Alkom Centre; two urban and twenty-six rural PHCs at the Menouf Center; three urban and thirty-two rural PHCs at the Elbagour Centre; three urban and forty-six rural PHCs at the Ashmoon Centre; and one urban and thirty-four rural PHCs at the Quesna Centre. Two of the five urban PHCs at Shebin Alkom Center were chosen; in the remaining four centres, one urban PHC was selected. Additionally, fifteen rural PHCs connected

to each studied centre were chosen using a simple random sampling technique. There were 265 primary healthcare physicians working at the chosen PHCs. The studied participants were 240, and the response rate was 90.6%.

Data collection: Each participant received a self-administered questionnaire that examined all the following items: (a) Sociodemographic factors: these consisted of age, gender, marital status, and residence. (b) Occupational history: this comprised the qualification, employment years, the job nature, number of night shifts per week, number of working hours per week, and the income (sufficient or insufficient). (c) New Job Stress Scale: Four items were measured using an English-language new job stress questionnaire which was developed and validated by Shukla and Srivastava in 2016.¹¹ It consisted of 22 questions: the job stress scale (9 questions such as Do you have a lot of work and fear that very little time to do it?), the job expectation conflict (5 questions e.g. Are you not able to satisfy the conflicting demands of your colleagues and juniors?), the co-worker support (4 questions e.g. Have the people working with you ever understand you and given advice?), and the work-life balance (4 questions e.g. Do you feel that the job and other activities are currently balanced?). All the items had five-point Likert scales for scoring (1 being strongly disagree, and 5 being strongly agree), except for the co-worker's support item, which had a six-point scale (1 being never, and 6 being all the time). Higher scores corresponded with a worse degree of job stress and job expectation conflict subdomains, while worse degrees of co-worker support and work-life balance subdomains were correlated with lower scores. The scale had a good degree of internal consistency reliability and was valid. The four items of the used scale were demonstrated valid with the item correlation score was exceed 0.30, and the scale's Cronbach's alpha coefficient was 0.81 overall. Each item categorization into low, moderate, and high levels was documented by Mahmudah et al., 2022¹⁴ (Table 1).

Statistical analysis: The IBM SPSS statistical package version 20 (SPSS Inc., Chicago, IL, USA) was used. To investigate the association between the qualitative variables, the chi-square test was employed. The student t-test and the Mann-Whitney test were used to compare two sets of quantitative data when the data were parametric and non-

Table 1: The classification of the four items of New Job Stress Scale by Mahmudah et al., 2022.

| Subdomains | Degree | | |
|---------------------------------|--------|----------|--------|
| | Low | Moderate | High |
| Job stress (JS) | <17.12 | 17.12 - | >31.3 |
| Role expectation conflict (REC) | <9.05 | 9.05 - | >17.91 |
| Co-worker support (CWS) | <14.02 | 14.02 - | >22.18 |
| Work-life balance (WLB) | <12.16 | 12.16 - | >16.66 |

parametric, respectively. To examine the correlation between numerical variables, the Spearman-Rho method was employed. The link between the dependent variable (job stress scale) and the independent variables (other quantitative characteristics acting as predictors) was examined using multiple linear regression. The categorical dependent variable (job stress scale categories: Mild to moderate versus severe) and other independent factors were compared using binary logistic regression with risk estimation by the odds ratio (OR) and 95% confidence interval (CI). A p-value of less than 0.05 was significant.

RESULTS

The age of the studied primary healthcare physicians ranged from 26 to 47 years, with a mean age of 33.4 years. Of these, 62.1% were female, 51.2% came from rural areas, and 90.4% of them were married. The current study had 52.5% of its participants with a master's degree and 26.3% with a fellowship degree. The mean±SD of their work years was 7.5±4.3, and 59.6% of them worked one-to-four-night shifts per week, with 16 to 40 working hours each week (Table 2).

Among the primary healthcare physicians in the study, the mean±SD of the job stress scale was 33.03±7.25, with 1.2% being rated as mild, 50% as moderate, and 48.8% as high grades of stress. A moderate degree of role expectation conflict was reported among 57.5% of them, while approximately seventy percent had low co-worker support and work-life balance items (Figure 1).

The co-worker support and work-life balance items were significantly positively correlated with age (r = 0.278 and r = 0.296; respectively) and years of employment (r = 0.423 and r = 0.476; respectively), but they were significantly inversely correlated with night shift per week (r = -0.450 and r = -0.538; respectively) (P<0.05).

Table 2: Sociodemographic and occupational characteristics of studied participants

| Sociodemographic characteristics | Total studied participants (No. =240) | |
|---|---------------------------------------|-------|
| Age (year) | | |
| Mean±SD | 33.4±4.1 | |
| Median (Range) | 33 (26-47) | |
| Gender | | |
| Male | 91 | 37.9% |
| Female | 149 | 62.1% |
| Marital status | | |
| Single | 17 | 7.1% |
| Married | 217 | 90.4% |
| Divorced | 6 | 2.5% |
| Residence | | |
| Urban | 117 | 48.8% |
| Rural | 123 | 51.2% |
| Qualification | | |
| MBBS | 36 | 15.0% |
| Master | 126 | 52.5% |
| MD | 15 | 6.3% |
| Fellowship | 63 | 26.3% |
| Years of employment | | |
| Mean±SD | 7.5±4.3 | |
| Median (Range) | 5 (1-21) | |
| Night shifts per week | | |
| Absent | 97 (40.4%) | |
| Present | 143 (59.6%) | |
| Mean±SD | 2.3±0.81 | |
| Median (Range) | 2 (1-4) | |
| Number of working hours per week | | |
| Mean±SD | 32.4±8.3 | |
| Median (Range) | 36 (16-40) | |
| Salary | | |
| Adequate | 48 | 20.0% |
| Inadequate | 192 | 80.0% |

SD: standard deviation; MBBS, A Bachelor of Medicine, Bachelor of Surgery; MD, Doctor of Medicine

The job stress and role expectation conflict items were significantly increased with increasing working hours ($r = 0.332$ and $r = 0.285$; respectively) and night shift per week ($r = 0.488$ and $r = 0.482$; respectively) ($P < 0.05$). In addition, the job stress scale was significantly increased with studying advanced qualifications ($r = 0.315$) ($P < 0.05$) (Table 3). The correlation of the job stress scale with the significant predictors (studying advanced qualifications, increasing working hours, and night shift per week) was confirmed by linear regression (Table 4).

Primary care physicians with high job stress were considerably more likely to be studying for a fellowship degree and to reside in an urban area when compared to those with low to moderate job stress ($P < 0.05$). Moreover, those with a high level of job stress reported working longer hours and working nights more frequently than those with a low to moderate level ($P < 0.05$) (Table 5). After the adjustment of sociodemographic parameters, the attributing factors for high grade job stress were the fellowship degree, master's degree, number of night shifts per week, and working hours per week (OR: 8.97, 5.71, 1.87, and 1.17; respectively, with $P < 0.05$) (Table 5).

DISCUSSION

Because of the demands of the modern work environment, pressure at work is inevitable. Stress, however, results when that pressure gets too great or becomes uncontrollable in different ways. The health of workers might be harmed by stress. To create preventive or management regulations, it is critical to understand the stress levels of the workforce. Two hundred and forty primary care physicians from various PHCs in the Menoufia Governorate were the subjects of the current study. 48.8% of the participants reported having a high level of occupational stress. It had a greater prevalence than other studies. According to various research conducted in Saudi Arabia¹⁵, Jordan¹⁶, Brazil¹³, and Iran¹⁷, primary healthcare providers had high levels of job stress in 29.1%, 27%, 25.0%, and 18.2% of the participants, respectively. The high prevalence of high job stress grade among PHCs in the present study could be explained by the fact that most studied participants were married women, who in Egypt are increasingly responsible for a heavy labor and more accessibility to gain job stress problems. In addition, women are less able to cope with stress at work as they were in earlier research.^{18,19} This is in line with Ebrahimi and Kargar study²⁰ which found that women experienced higher levels of occupational stress than men did. This could be because women are more likely than their male co-workers' to take on family tasks and social responsibilities in addition to their professional responsibilities. China's research on general practitioners also showed that, among those surveyed, 9.67%, 31.77%, and 58.56 indicated they experienced low, medium, or high levels of occupational stress, respectively.²¹

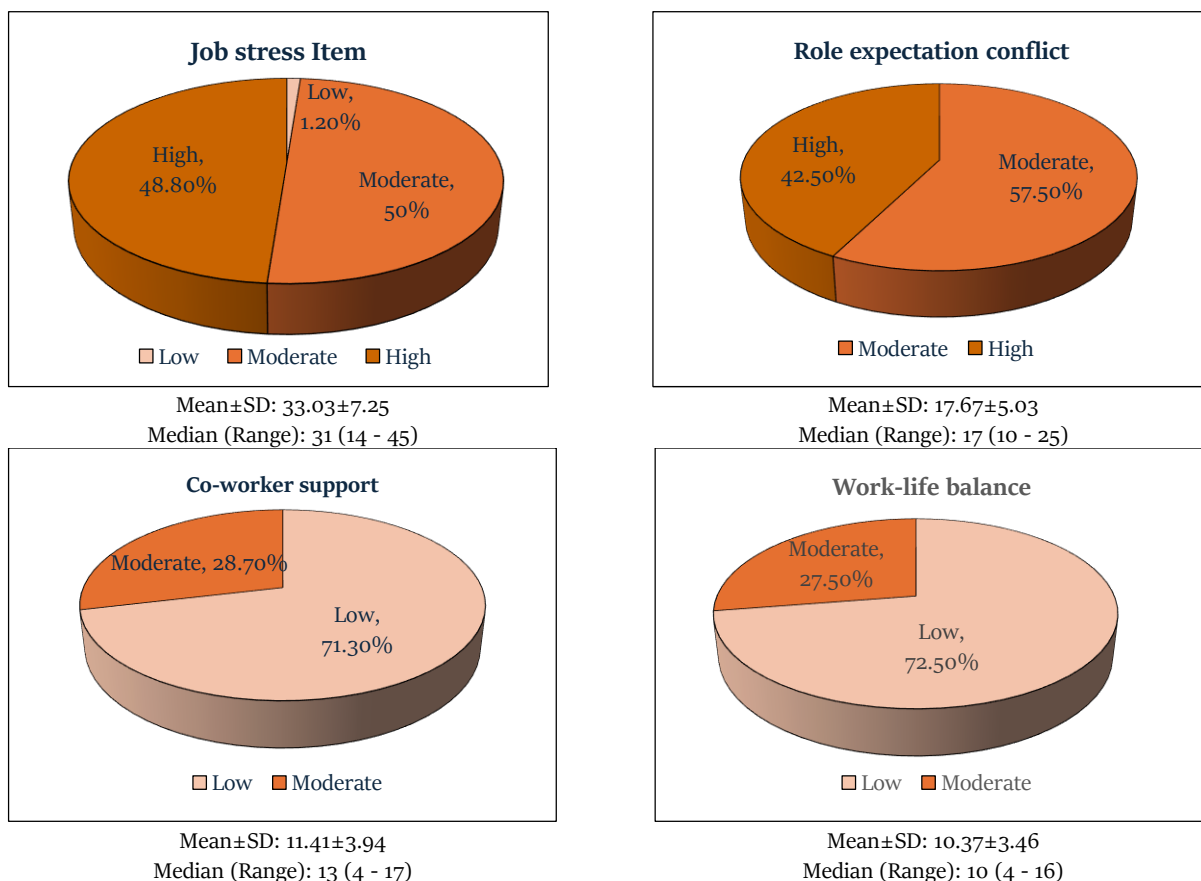


Figure 1: Pie chart showing the categorization of job stress scale among the studied participants

Table 3: Correlation between the subdomains of the New Job Stress Scale and different characteristics of the studied participants

| Variable | Job stress scale | | Role expectation conflict | | Co-worker support | | Work-life balance | |
|----------------------------------|------------------|---------|---------------------------|---------|-------------------|---------|-------------------|---------|
| | r | P value | r | P value | r | P value | r | P value |
| Age (year) | -0.049 | 0.38 | 0.241 | 0.45 | 0.278 | <0.001* | 0.296 | <0.001* |
| Qualification | 0.315 | <0.001* | 0.108 | 0.09 | -0.094 | 0.15 | 0.011 | 0.87 |
| Years of employment | -0.007 | 0.91 | -0.121 | 0.06 | 0.423 | <0.001* | 0.476 | <0.001* |
| Number of night shifts per week | 0.332 | <0.001* | 0.285 | <0.001* | -0.450 | <0.001* | -0.538 | <0.001* |
| Number of working hours per week | 0.488 | <0.001* | 0.482 | <0.001* | 0.387 | 0.34 | 0.303 | 0.21 |

r, Spearman-Rho coefficient; *Significant correlation

Table 4: Multiple linear regression between job stress and different characteristics of the studied participants

| Variable | Beta | 95% CI | t | P value |
|----------------------------------|-------|--------------|------|---------|
| Age (year) | 0.21 | -0.34 - 0.76 | 0.74 | 0.45 |
| Qualification | 1.85 | 0.98 - 2.27 | 4.20 | <0.001* |
| Years of employment | -0.21 | -0.74 - 0.32 | 0.78 | 0.43 |
| Number of night shifts per week | 0.91 | 0.21 - 1.61 | 2.57 | 0.01* |
| Number of working hours per week | 0.40 | 0.30 - 0.50 | 7.85 | <0.001* |

*Significant difference, CI: Confidence Interval

Previous research done in Egypt has looked at the stress level of healthcare workers at different hospitals. For instance, it was discovered that 5.2% of healthcare personnel in the NICU department at Cairo University teaching hospitals reported having high levels of stress²², whereas 37.8% of resident physicians at Tanta University Hospitals reported having high levels of stress.²³ Approximately 26.2% of physicians at Banha hospitals reported having a high job stress level.²⁴ Additionally, research by Farahat et al. (2016) that assessed burnout among healthcare providers employed by PHCs discovered that 66.7% of general practitioners and 50% of family physicians had high burnout, compared to just 6.7% of specialists.²⁵ Studies conducted at the Faculty of Medicine at Suez Canal University and family health facilities at the Port Said Governorate

have found that 41.94% and 65.8% of working physicians, respectively, have burnout syndrome.^{26,27} There was a direct correlation between either of the job stress or role expectation conflict items and increasing working hours, night shift per week, and studying advanced qualification. Likewise, a recent study in Iran¹⁷ found that job-related excessive workload, work-life imbalance, and role ambiguity. This is also in line with research conducted in Belgrade, Serbia²⁸, which found a statistically significant association between the effects work hours and educational characteristics on overall stress. The present results agreed with Boran et al., study¹⁶ of work-related stress among health professionals in northern Jordan. They concluded that long working hours and female gender were all linked to high levels of occupational stress.

Table 5: Association between different categories of job stress scale and other characteristics of the studied participants

| Variable | Job stress scale | | P value | Adjusted OR (95% CI) |
|---|---------------------------|----------------|---------|----------------------|
| | Low to moderate (No.=123) | High (No.=117) | | |
| Age (year) | | | | |
| Mean±SD | 33.3±4.0 | 33.5±4.2 | 0.78 | 0.79 (0.74-1.25) |
| Gender | | | | |
| Male | 43 (35.0%) | 48 (41.0%) | 0.33 | - |
| Female | 80 (65.0%) | 69 (59.0%) | | 2.25 (0.75-6.76) |
| Marital status | | | | |
| Single | 9 (7.3%) | 8 (6.8%) | 0.06 | - |
| Married | 108 (87.8%) | 109 (93.2%) | | 0.27 (0.06-1.18) |
| Divorced | 6 (4.9%) | 0 (0.0%) | | 0.00 (0.00) |
| Residence | | | | |
| Urban | 48 (39.0%) | 69 (59.0%) | 0.002* | 0.87 (0.35-2.14) |
| Rural | 75 (61.0%) | 48 (41.0%) | | - |
| Qualification | | | | |
| MBBS | 24 (19.5%) | 12 (10.3%) | <0.001* | - |
| Master | 78 (63.4%) | 48 (41.0%) | | 5.71 (1.82-17.89)* |
| MD | 12 (9.8%) | 3 (2.6%) | | 1.19 (0.16-8.50) |
| Fellowship | 9 (7.3%) | 54 (46.2%) | | 8.97 (3.02-26.60)* |
| Years of employment | | | | |
| Median (Range) | 5 (1-21) | 7 (1-16) | 0.77 | 1.15 (0.85-1.54) |
| Number of night shifts per week | | | | |
| Median (Range) | 2 (1-4) | 3 (1-4) | 0.005* | 1.87 (1.33-2.62) * |
| Number of working hours per week | | | | |
| Median (Range) | 24 (16-40) | 40 (16-40) | <0.001* | 1.17 (1.09-1.26) * |
| Salary | | | | |
| Adequate | 21 (17.1%) | 27 (23.1%) | 0.24 | - |
| Inadequate | 102 (82.9%) | 90 (76.9%) | | 0.84 (0.38-1.83) |

*Significant difference, SD: standard deviation, OR: Odds Ratio, CI: Confidence Interval

In addition, Feng et al.²¹ studied occupational stress and associated factors among general practitioners in China and concluded that occupational stress was substantially correlated with weekly work hours and overtime in every area that was examined.

In the present study, the main attributing factors for high job stress were qualifications such as fellowships and master's degrees, in addition to the number of night shifts and hours worked per week. This corresponds with previous studies in Brazil¹³, Iran¹⁷ and China²¹. Additionally, a study on medical oncologists' work stress at multi-centers in Egypt discovered that longer hours of work and night shifts were predictors of higher levels of workplace stress.²⁹

AlMuammar et al.'s study³⁰ examined occupational stress in Saudi Arabian healthcare workers at a university hospital in Jeddah. They discovered that longer work hours and higher educational attainment were all linked to higher levels of occupational stress. Higher educated nurses reported relatively greater levels of stress at work, according to the Higazee Jordanian study³¹, indicating a connection between education level and occupational stress. This was explained by the finding that educated health staff had a higher propensity to be dissatisfied since their superior performance was not recognized, falling short of their expectations.

CONCLUSIONS

The current study is examined the occupational stress levels of primary healthcare physicians and to address the underlying attributing factors. There was a significant prevalence of high-grade occupational stress. Advanced qualifications, hours worked, and the number of night shifts worked each week were the main significant associated factors. Thus, among the research participants, workload management and psychological support may help avoid occupational stress and burnout, promote a more engaged workforce, and improve productivity.

Ethical Consideration: The Menoufia Faculty of Medicine ethical committee formally examined and approved this research with the Institutional Review Board (IRB) (3/2024FAML5). Every participant received an explanation of the study's purpose and specifics. It was entirely voluntary to participate. Personal information was kept confidential.

Funding source: The authors received no financial support related to this research.

Conflict of interest: All authors have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement: We are grateful to the participants for taking the time to offer insightful information.

Author contributions: Faten Ezzelarab Younis: Research concept, literature search, statistical analysis, interpretation of results and writing; Basma Shokry Hamed: literature search, writing, collecting material and critical review; Asmaa Abubakr Mohammed: collecting material, critical review, and literature search.

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Cite this article as: Younis, FE et al Prevalence and Attributing Factors of Occupational Stress among Primary Healthcare Physicians, Menoufia Governorate, Egypt. *Egyptian Journal of Community Medicine*, 2025;43(1):48-55.

DOI: 10.21608/ejcm.2024.296323.1302