

Research Article

Magnitude of Occupational Stress and Its Associated Factors Among Healthcare Professionals Working at Adama Hospital Medical College, Adama, Ethiopia: An Institution-based Cross-sectional Study

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Abstract

Introduction: Occupational stress affects professionals across all fields; however, healthcare professionals are particularly highly prone to workplace stress. This group is especially vulnerable to workplace stress, given the critical nature of their responsibilities and the high-pressure settings in which they operate. **Objectives:** The study was done to determine the level of occupational stress and its associated factors among healthcare professionals in Adama Hospital Medical College, Adama, Ethiopia. **Methods:** An institutional-based cross-sectional study was conducted among 421 randomly selected health-care professionals in Adama Hospital Medical College. Data were collected using a self-administered structured questionnaire by trained data collectors under supervision. The data were then entered into SPSS version 25 for analysis. Both binary and multivariable logistic regression analyses were done to assess the associations between dependent and explanatory variables. **Result:** In this study the magnitude of occupational stress was 45.6% (95% CI: 40.8-50.4). Being female (AOR = 3.1, 95% CI: 1.7, 5.6), being married (AOR: 3.7, 95% CI: 2.0, 6.9), working greater than 50 hours per week (AOR: 3.5; 95% CI: 1.7, 7.4), and assigning duty greater than 4 days per week (AOR: 2.8; 95% CI: 1.6, 4.9) were significantly associated factors with occupational stress. **Conclusions:** Occupational stress is a serious problem among the health professionals in AHMC. This study found that nearly half of the study participants experienced occupational stress. Being female, having married, working more than 50 hours per week, and being assigned duty more than 4 days per week were significantly associated with occupational stress among health professionals.

Keywords

Occupational Stress, Health Professional, Adama, Ethiopia

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Received: 14 June 2025; **Accepted:** 19 July 2025; **Published:** 7 August 2025



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1. Introduction

1.1. Background

Stress is a multidimensional concept, which is originally derived from the Latin word “stringer,” which refers to “drawing tight,” and it used to describe hardships or affliction [1]. It is a response to stressors and can be positive or negative in its nature [2]. According to the National Institute of Occupational Safety and Health (NIOSH), occupational stress is defined as “harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, and needs of the worker” [3].

Occupational stress can be defined as the psychological or physiological response of workers when they are faced with excessive workloads and responsibilities that exceed their capacities and knowledge, resulting in an inability to cope with work demands [4]. Workplace stress is a public health problem worldwide. Various research findings have shown that occupational stress significantly affects both individuals and organizations. Despite this, it affects all employed professionals. The burden is too high among health care providers [5]. Health-care professionals comprise an important group that can be affected by workplace stress because of the nature of their work environment [6]. Healthcare settings are particular risks for occupational stress, burnout, and job dissatisfaction because of the increased patient load and the high patient-to-health professional ratios [7].

In general, an imbalance between work demands and the capacity to cope with such demands will cause stress [8]. Globally, the cost of work-related stress is estimated to be approximately \$5.4 billion each year, second to low back pain, which is the most frequent occupational health problem [3].

1.2. Statement of the Problem

Globally, occupational stress is estimated to affect one in three employees in general, a public health problem in particular, and it affects both developed and developing countries. Specifically, health professionals are more vulnerable to stress-related events than other professions [3].

Healthcare professionals are often subjected to high workloads, emotional demands, lack of resources, and administrative pressures. These factors can lead to burnout, decreased job satisfaction, and increased turnover rates.

In developing countries, the number of people suffering from work-related stress or worsening their condition as a result of stress is increasing at an alarming rate, and it is becoming a public health concern [9].

Occupational stress is a major reason for work-related delay, absenteeism, hypertension, cardiovascular disorders, and substance use. Moreover, it is also a major cause of mental disturbance, injuries, and staff turnover [9, 10]. It is a significant concern in the healthcare sector, affecting the well-being of professionals and the quality of care provided to patients. It

can have a number of impacts on health, including mental and behavioral disorders such as exhaustion, burnout, anxiety, and depression, as well as other physical impairments such as cardiovascular disease and musculoskeletal disorders. In addition, stress can result in work absences, higher turnover, early retirement, lower productivity, and lower quality of services or products [11].

According to the International Labor Organization, almost 10% of workplace accidents are related to stress, seeing that the ability to effectively manage stress can help maintain organizational harmony [12].

In the globe, a minimum of 3 million employees face grave occupational stress problems, and 28% of employees in the European Union are affected by occupational stress [13]. In 2019, about 83% of workers suffered from occupational stress in the United States (US), and it also caused 120,000 deaths [14].

In Ethiopia, particularly in urban centers like Adama, healthcare professionals face various stressors that may impact their mental and physical health.

Understanding the specific sources of occupational stress in the Ethiopian context is crucial for developing effective interventions and policies to enhance the well-being of healthcare workers. Although literature showed that several studies had been documented in Ethiopia regarding work-related stress in health professionals, most studies conducted on the magnitude and factors associated with occupational stress were more focused on specific working groups of health professionals, and still there is limited information supported by research in Ethiopia, particularly in Adama Comprehensive Specialized Hospital Medical College.

1.3. Significance of the Study

Various studies have been conducted worldwide to explore the sources, levels, and associated factors of occupational stress. Stress is a complex phenomenon resulting from the interaction between individuals and environmental factors, often leading to poor quality of healthcare service delivery, employee burnout, turnover, and absenteeism. However, most of these studies have focused on developed countries and sectors outside the healthcare field. There is limited research in developing countries like Ethiopia, particularly at Adama Hospital Medical College.

Therefore, this study provides information for health professionals, hospital administrators, and health policymakers concerning the level and associated factors of occupational stress among healthcare professionals in AHMC. The information generated is useful in designing appropriate interventions to develop stress reduction strategies and programs. Furthermore, this study also generates knowledge that can contribute to ongoing research efforts and also be used as additional input for further study in the same area of inquiry.

2. Objectives

2.1. General Objective

To assess the magnitude and factors associated with occupational stress among healthcare professionals working at Adama Hospital Medical College, Adama, Ethiopia, 2024.

2.2. Specific Objectives

- 1) To determine the magnitude of occupational stress among healthcare professionals working at Adama Hospital Medical College, Adama, Ethiopia, 2024.
- 2) To identify factors those contribute to occupational stress among healthcare professionals working at Adama Hospital Medical College, Adama, Ethiopia, 2024.

3. Methods and Materials

3.1. Study Area and Period

The study was conducted in Adama Hospital Medical College (AHMC), which was previously known by the name of Hayile Mariam Mamo Memorial Hospital. It is one of the first medical hospitals situated in Adama town, located in the Oromia Region, 100 km southeast of Addis Ababa, Ethiopia. The hospital was inaugurated by missionaries from abroad in 1938 E.C. The hospital was upgraded to a medical college in 2003 E.C. because of its location, patient load, and staff capacity. The hospital is serving a catchment population of more than 6.6 million from five regions (Oromia, Amhara, Afar, Somali, and Dire-Dawa). The study period was from November 1 to 30, 2024.

3.2. Study Design

An institution-based cross-sectional study design was used to assess the magnitude.

3.3. Population

3.3.1. Source Population

The source population includes all the health professionals (doctors, nurses, pharmacists, laboratory staff, etc.) working in Adama Hospital Medical College.

3.3.2. Study Population

The study population includes all health professionals who worked in Adama Comprehensive and Specialized Hospital Medical College who were available at the time of data collection.

3.4. Inclusion and Exclusion Criteria

3.4.1. Inclusion Criteria

All of the healthcare professionals working in Adama Comprehensive and Specialized Hospital Medical College who were available during the data collection period and had served one or more years at the current health facility were included.

3.4.2. Exclusion Criteria

Healthcare professionals who were not permanent employees at the institutions were excluded.

3.5. Sample Size Determination

3.5.1. Sample Size Determination for the First Objective

The sample size for this study was determined by using a single population proportion formula by considering the prevalence of occupational stress as 47.8%, which was obtained from a previous study conducted in Addis Ababa [28].

Hence, assuming a 95% level of confidence and a 5% margin of error, the sample size for the first objective was calculated as follows:

$$n = \frac{(Z_{\alpha/2})^2 p (1-p)}{d^2}$$

Where n = the sample size required

p = prevalence

d = margin of error

$Z_{\alpha/2}$ = the standard normal variable at $(\alpha-1)$ r 95% confidence level = 1.96

Therefore,

$$n = \frac{(1.96)^2 (0.478)(1 - 0.478)}{(0.05)^2}$$
$$= 383$$

By allowing 10% contingency for non-response rate, the total sample size for this study was 421.

3.5.2. Sample Size Determination for the Second Objective

The sample size for the second objective is calculated by using EPI INFO version 7 for those factors that can influence occupational stress. During the calculation of the 95% CI, 80% power, percent of unexposed with outcome, and adjusted odds ratio on health professional gender, working greater than 50 hours per week, and being married were used.

The calculated samples for both objectives are compared to obtain the maximum sample. Since the sample size calculated by single population proportion is large, it is taken as a final sample. The final sample size is 421.

3.6. Sampling Technique

All health professionals found in the hospital were stratified based on their profession (job). The stratified sampling technique was used to select the study units in each stratum. Based on the number of professionals found in each stratum, proportional allocation of the total sample size was carried out to attain the required sample size. Finally, the determined sample size for each stratum was recruited using a simple random sampling technique by using the payroll of each health facility as a sampling frame.

3.7. Data Collection Tools and Procedures

Data was collected using a structured self-administered questionnaire prepared in English that contains open- and closed-ended questions. The questionnaire included three parts. Part I is on socio-demographic characteristics like age, gender, education level, and years of experience. Part II includes associated factors: workload, work environment, and support systems. Final part of the Occupational Stress Scale: A validated questionnaire was used to measure occupational stress levels. Data was collected by 3 data collectors and two supervisors. Occupational stress was measured by WSS, which was developed by the Marlin Company, North Haven, CT, USA, and the American Institute of Stress, Yonkers, NY, USA. The WSS consists of eight items describing how often a respondent feels an aspect of his or her job, and each item was rated on a 5-point scale ranging from never (1) to very often (5), or having possible responses from 1 to 5 for each item and ranging from never, almost never, sometimes, fairly often, and very often, respectively. The possible range score of WSS ranges from 8 to 40, and the degree of association between dependent and independent variables was computed.

The ranges of WSS scores were divided into stratified quartiles, and the upper two and lower two quartiles were combined and labeled as stressed and not stressed, respectively.

3.8. Data Quality Assurances

The designed, structured, self-administered questionnaire was prepared in English. A pretest was done among 5% of study participants in the Adama Health Center, and unclear questions were restated in a way that a participant could easily understand. Training was given for two days for 3 data collectors and two supervisors before data collection. The collected data were checked for completeness and for their consistencies by the investigator and supervisor every day.

3.9. Study Variable

3.9.1. Dependent Variable

Occupational stress

3.9.2. Independent Variables

- 1) Socio-demographic factors including age, sex, marital status, religion, and educational level
- 2) Work-related factors include working unit/department, work experience, number of duty assignments per week, and having a position in the hospital
- 3) Social and Organizational Factors: Includes frequency of changing working unit. Salary per month
- 4) Comorbid illness, including chronic illness (HTN, DM, ART) and psychiatric illness

3.10. Data Processing and Analysis

Data were entered into SPSS-25 for analysis. The outcome variable was dichotomized into two groups (1 stress and 0 no stress). Descriptive statistics were expressed by using frequencies, mean, SD, and percentages. Binary logistic regression analysis was done to identify variables as candidates for multi-logistic regression analysis. Those variables with a p-value < 0.25 in binary logistic regression were entered into the multivariate logistic regression models. OR with 95% CI was computed to identify factors that are statistically significant with occupational stress. The statistical significance level was declared at p-value < 0.05 in multivariate logistic regression. Hosmer-Lemeshow was checked to determine the goodness of fitness of the model. Multi-collinearity was checked by a variance inflation factor (VIF) for each independent variable, and a VIF less than 5 was acceptable. Then those variables with a p-value less than 0.05 were regarded as statistically significant, and the odds ratio with a 95% confidence interval was calculated to determine the strength of associations between selected variables.

4. Results

4.1. Socio-demographic Characteristics

A total of 421 health professionals participated in this study. More than half, 260 (61.8%), of the respondents were males. Two hundred fifty-one (59.6%) of the respondents were in the age range of 30-35 years, with a median age of 32 years, and 203 (48.2%) of them were Orthodox Christian followers, followed by 153 Muslims (36.3%).

In terms of educational level, 237 (56.3%) of the respondents were BSc degree holders, followed by 142 (33.7%) medical doctors. Regarding salary per month, 313 (74.3%) of respondents earned 5000-10000 Ethiopian birr (Table 1).

About working environment conditions, around 87 (20.7%) of respondents were working in the obstetrics and gynecology ward, followed by 71 (16.9%) working in the pediatric ward, and 240 (57%) of them had 1-5 years of experience in this hospital. Around half, 223 (53%), of the respondents rotated from different working units every month, and 258 (61.3%) of them were assigned 1-3 duties per week (Table 2).

Table 1. Sociodemographic characteristics of health professionals in AHMC, Adama, Ethiopia, December 2024 (n = 421).

	Categories	Frequency (n =421)	Percentage (%)
Sex	Male	260	61.8
	Female	161	38.2
Age	24-29 years	101	24.0
	30-35 years	251	59.6
	36-41 years	43	10.2
	42-47 years	26	6.2
	Protestant	65	15.4
Religion	Orthodox	203	48.2
	Muslim	153	36.3
	BSc	237	56.3
Educational status	Medical Doctors	142	33.7
	MSc	33	7.8
	Diploma	9	2.1
Salary per month	<10000 Birr	314	74.6
	>=10000 Birr	107	25.4

Table 2. Working environment conditions and other social factors of health professionals in AHMC, Adama, Ethiopia, December 2024 (n = 421).

Variables	Categories	Frequency	Percentage (%)
Working experience	1-5 years	240	57.0
	6-10 years	83	19.7
	11-20 years	98	23.3
Working Unit	medical ward	47	11.2
	surgical ward	65	15.4
	pediatric ward	71	16.9
	oby/gyni ward	87	20.7
	ICU	25	5.9
	Emergency	53	12.6
	Operation room	9	2.1
	Psychiatry	8	1.9
	OPD	56	13.3
	Working other place (other than this hos- pital)		
	No	184	43.7
	Yes	237	56.3
Work shift/rotation from work place	per week	108	24.5
	per month	247	58.7
	per quarter	71	16.9
working hour per week	<40 hr.	82	19.5

Variables	Categories	Frequency	Percentage (%)
Number of assign duty per week	41-39 hr.	136	32.3
	>=50 hr.	203	48.2
	<=3 days per week	258	61.3
	4-7 days per week	163	38.7

4.2. Magnitude of Occupational Stress

Magnitud of Occupational Stress

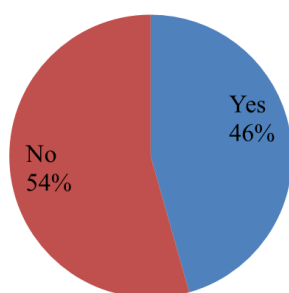


Figure 1. The pie chart showed the magnitude of occupational stress among health professionals in AHMC, Adama, Ethiopia, December 2024 (n=421).

This study revealed that among the 421 healthcare professionals who participated, the Workplace Stress Scale (WSS) scores ranged from 8 to 36, with a mean score of 22.34 ± 5.93 . Based on the stress level classification, participants with a WSS score of 22 or above were considered stressed. Accordingly, the magnitude of occupational stress in this study was 45.6% (95% CI: 40.8-50.4).

Among 192 health professionals who had occupational stress, 86 (53.4%) were females, and 115 (45.8%) of them were between the ages of 30 and 35 years old. Meanwhile, regarding marital status, more than three-quarters, 109 (76.8%), of them were single.

4.3. Factors Associated with Occupational Stress Among Health Professionals

Among the socio-demographic and socio-economic factors, various variables were included in the bi-variable logistic regression analysis. Of these, sex, marital status, monthly salary, weekly working hours, work experience, number of assigned duties per week, frequency of work shifts, and history of substance use were significantly associated with occupational stress at a 5% level of significance.

In the multivariable logistic regression analysis, after adjusting for potential confounders, the following factors remained significantly associated with occupational stress ($p < 0.05$): female sex, being married, working hours per week, work experience, number of assigned duties per week, and frequency of work shifts.

Health professionals who were female were 3 times more likely to experience occupational stress than males (AOR = 3.1, 95% CI: 1.7, 5.6). Health professionals who were married were 3.7 times more likely to experience occupational stress than those who were single (AOR = 3.7, 95% CI: 2.0, 6.9), provided that the other variables were kept constant.

Similarly, health professionals who were working greater than 50 hours per week were 3.5 times more likely to experience occupational stress than those who worked less than 40 hours per week (AOR: 3.5; 95% CI: 1.7, 7.4), keeping the other variables constant.

Likewise, health professionals who were assigned duty greater than four days per week were 2.8 times more likely to experience occupational stress than those who were assigned duty less than three days per week (AOR: 2.8; 95% CI: 1.6, 4.9) (Table 3).

Table 3. Binary and multivariate logistic regression of factors associated with occupational stress among health professionals in AHMC, Adama, Ethiopia, December 2024 (n=421).

Variable	Category	Occupational Stress			
		Yes (%)	No (%)	COR (95% CI)	AOR (95% CI)
Sex	Female	99(60.7)	64(48.3)	2.74(1.83-4.11) ***	3.09(1.71-5.58) ***
	Male	93(36.0)	165(64.0)	1	1

Variable	Category	Occupational Stress			
		Yes (%)	No (%)	COR (95% CI)	AOR (95% CI)
Marital status	Single	44(27.0)	119(73.0)	1	1
	Married	93(41.5)	131(58.5)	0.37(0.17-0.79)	3.75(2.03-6.94)**
	Divorced	17(50.0)	17(50.0)	1.41(0.68-2.90)*	4.28(0.89-20.48)
Salary per month	Greater than 10000	41(38.3)	66(61.7)	1	1
	Less than 10000	151(48.1)	163(51.9)	1.49(0.95-2.34)*	1.34(0.63-2.82)
Working hour per week	40 hr.	48.8(64.0)	27(36.0)	1	1
	40-50 hr.	110 (68.3)	51(31.7)	0.82(0.46-1.47)	1.12(0.53-2.39)
	>=50 hr.	71(38.4)	114(61.6)	2.85(1.64-4.98) ***	3.53(1.68-7.40)**
Working experience	1-5 years	138(55.0)	113(45.0)	1	1
	5-10 years	75(75.8)	24(24.2)	0.39(0.23-0.66)	0.47(0.24-0.93)
	>10 years	16(22.5)	55(77.5)	4.20(2.28-7.72)***	6.31(2.68-14.84)***
Number of assign duty per week	1-3 days	155(64.0)	87(36.0)	1	1
	≥ 4 days	74(41.3)	105(58.7)	2.53(1.70-3.76)***	2.82(1.61-4.92)***
History of substance use	Yes	206(53.0)	183(47.0)	1	1
	No	23(71.9)	9(28.1)	0.44(0.20-0.98)	0.40(0.15-1.04)

COR Crude odds ratio; AOR Adjusted odds ratio; CI Confidence Interval *p<0.05, **P<0.01, ***P<0.001

Hosmer and Lemeshow goodness of fit test, P=0.102

5. Discussions

This study assessed the magnitude and factors associated with occupational stress among health professionals who work in AHMC, Adama, Ethiopia.

The overall magnitude of occupational stress in this study was 45.6% (95% CI: 40.8-50.4), which is comparable to findings from other studies, such as those conducted in Mekele, Ethiopia (46.9%) [22]; Addis Ababa specialized mental hospital (46.8%) [17]; Addis Ababa public hospitals (47.8%) [28]; Bahir Dar public hospitals (48.6%) [29]; and South Africa (51%) [30]. However, it is lower than the prevalence reported in Ambo town public hospitals (52.33%) [31]; Arsi Zone public hospitals (53%) [27]; Afar region (57.5%), [18]; Felege Hiwot Hospital (68.2%) [19]; Gurage Zone hospitals (78.5%) [21]; Harar government hospitals (66.2%) [23]; and Western Ghana (69.5%) [16]. The possible reasons for the difference might be due to differences in tools used, study participants (previous studies included only one professional group), and the relatively larger sample size in the current study.

In this study different types of factors were contributing to experiencing occupational stress by health professionals. Sex was significantly associated with occupational stress. Female

workers were more likely to be stressed than male health workers. This finding is in line with the studies done in East Gojjam [20], Addis Ababa [3], Worabe, South West Ethiopia [24], Meerut City, India [32], and Iran [33]. This might be females; most of the time they had multiple roles in the family and society in addition to the work. Moreover, females, in their nature, might be more compassionate than males. But this finding was contradicted by the findings in Iran: female nurses had 21% lower stress than male nurses. This difference could be a result of variation in sociocultural and study population and tools used.

Marital status was significantly associated with occupational stress; health professionals who were married were more stressed than single ones. This was consistent with other studies in India [34] and Indonesia [35]. This might be due to married workers having a greater social and economic burden than single workers. But it was inconsistent in another study done in India [36].

Health professionals with work experience greater than 10 years were 6 times more likely to be stressed than those who have had less than 5 years' work experience and significantly associated with occupational stress. This result was inconsistent with a study in East Gojjam [20], Kampala Uganda [25], Iran [34]. The possible reason may be that health professionals who work longer years may be exhausted and burned out by high workloads and experience occupational

stress.

Health professionals who were assigned duty more than 4 days per week were 2.8 times more likely to experience occupational stress than those who were assigned duty less than 3 days per week. This result was consistent with a study in Jordan [15], New Zealand [26]. The possible explanation for this might be that those who assigned more duty may have more workload and lack enough time for rest, so this may lead to more stress than those who had low assigned duty per week.

6. Conclusions and Recommendations

Occupational stress is a serious problem among the health professionals in AHMC. This study found that nearly half of the study participants were stressed.

Being female, having married, working more than 50 hours per week, and being assigned duty more than 4 days per week were significantly associated with occupational stress among health professionals.

Based on the findings of the study, the following were recommended:

1) To Oromia Regional Health Bureau

The bureau collaborates with concerned stakeholders to design a stress reduction program and strategy for tackling occupational stress among health professionals.

2) To Adama Hospital Medical College

Hospital administrative bodies should hire adequate health professionals to decrease workload.

In general, more studies should be conducted on a larger scale nationwide to identify sources of occupational stress.

7. Operational Definitions

Occupational Stress: It is described as participants who score the mean and above the score in the Workplace Stress Scale (WSS).

Not stressed: Participants who score below the mean score of the workplace stress scale (WSS).

Health professionals: In this study, health professionals include general physicians, nurses, pharmacists, laboratory professionals, and public health professionals.

Abbreviations

AHMC	Adama Hospital Medical College
AOR	Adjusted Odd Ratio
CI	Confidence Interval
CODR	Crude Odd Ratio
ICU	Intensive Care Unit
MCH	Mother Child Health
NIOSH	National Institute for Occupational Safety and Health
OPD	Outpatient Department
OR	Odd Ratio

SD	Standard Deviation
USA	United States of America
WHO	World Health Organization
WRS	Work-related Stress

Ethical Considerations

The study was being conducted after obtaining ethical clearance from Adama Hospital Medical College. The confidentiality and privacy of participants was assured. All the health professions were informed of the purpose of the study. An attempt is made first to explain the objectives and significance of the study to the respondents. The respondents were not required to write their names. The purpose of the study is disclosed in the introductory part of the questionnaire. Furthermore, the researcher tried to avoid misleading or deceptive statements in the questionnaire. Lastly, the information obtained from this research was used only for the intended purpose.

Author Contributions

Aychew Getie: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Software, Supervision, Validation, Writing - original draft, Writing - review & editing

Worku Dugassa: Data curation, Methodology, Supervision, Validation, Writing - review & editing

Nuru Hassen: Data curation, Formal Analysis, Investigation, Methodology, Supervision, Validation, Writing - review & editing

Funding

This research work is not fund by any individual or organization.

Conflicts of Interest

The authors declare no conflicts of interest.

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