



Occupational Stress and Associated Factors Among Nurses Working at Public Hospitals of Addis Ababa, Ethiopia, 2022

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Abstract: Background: By its very nature, the nursing profession involves a lot of stress. Working in this field includes interacting with individuals who are already under a great deal of stress. Workplace stress affects the quality of services provided and also causes staff burnout, departure, and absenteeism. Objective: This study is to assess occupational stress and associated factors among nurses working at public hospitals, Addis Ababa, Ethiopia, 2022. Method and Materials: An institutional based cross sectional study was conducted among 422 nurses working at public hospitals from March 1 to April 1/2022. Simple random sampling technique was used to select public hospitals. The data was collected by using a self-administered structured questionnaire (Expanded Nursing Stress Scale). The collected data was entered by Epi-data version 3.1 and analyzed by SPSS version 23. Binary logistic regression was used to assess associations between dependent and independent variables. Finally, texts, tables and graphs were used to describe study variables. Result: The study finding showed that 198 (47.8%) of nurses were occupationally stressful. Factors significantly associated with occupational stress among nurses were having children (no: AOR=0.46, 95% CI: 0.22, 0.96) and work shift (rotating: AOR=2.89, 95% CI: 1.87, 4.45). Conclusion: In this study, job stress affected over half of the nurses. The presence of children and respondents' work shifts were personal characteristics that were significantly linked to job stress. Therefore, Addis Abeba public hospitals should work with interested parties to develop a program for stress reduction to address occupational stress among nurses.

Keywords: Stress, Occupational Stress, Nurses, Addis Ababa, Public Hospital

1. Introduction

Occupational stress is defined by the National Institute for Occupational Safety and Health (NIOSH) as "the negative physical and emotional reactions that occur when the requirements of the job do not match the worker's talents, resources, or needs" [1]. Occupational stress is sometimes referred to as job stress and/or work-related stress (WRS) in an organizational environment. In organizations, both phrases are frequently used interchangeably, but their meanings are the same [2].

Stress is often described as a feeling of being overloaded,

wound-up tight, tense and worried [3]. It is a disruptive condition that occurs in response to adverse influences from the internal or external environments [4].

The working environment is one of the most important resources of occupational stress [5]. Work related stress is a problem and is of great concern to employees and employers, psychologists and counselors [6].

Nursing is generally considered a stressful and demanding profession [7]. There is a number of evidence that nursing is a stressful occupation, which can lead to disruptions in both psychological and physical health and can impair professional practice [8].

Occupational stress can lead to various negative consequences for the individual and the workplace. On the individual level poor physical health and poor mental health and on the organizational level organizational costs were reported [9]. Further more stress has a cost for individuals in terms of health, well-being and job dissatisfaction, as well as for organizations in terms of absenteeism and turnover, which in turn may impact upon the quality of patient care [10].

Over the years stress continues to be an increasing problem in organizations [11]. Stress varies in situations and among individuals and if unmanaged can undermine the achievement of goals, both for individuals and for organizations. Particular concern has been expressed for the effects of stress on health-care professionals and, in particular, on nurses [12]. Nurses are seen to have more stress than most people due to the nature of the profession and the system within which they work [13]. The National Association of Safety Professionals introduced nursing as the first stressful profession among 40 stressful professions [14].

Nurses play a pivotal role in any health care institution and encompass the largest workforce in any health care institution. Nurses are direct caregivers and caring is an interpersonal procedure defined by expert nursing, interpersonal sensitivity and intimate relationships, including positive communication and implementation of professional knowledge and skills. Sometimes nurses are required to serve for a long period of time without having adequate rest [15, 16]. As a result, nursing occupation is subject to a high degree of stress. Moreover, the profession involves working with people who are themselves suffering a considerable degree of stress. Sometimes patients can be difficult, frightened and angry and nurses can find themselves responding with a growing sense of irritability and frustration, which may lead to quitting the profession [17, 18].

The common sources of stress among nurses at work place includes work shift, long working hours, lack of control and conflicting demands, bad relations with colleagues, low pay, and poor working environments [19].

Research indicated that high job related stress and physical and psychological problems in nurses leads to escape from job, the clashes between personnel and intense displacement, impaired health and inability to perform the task, vulnerabilities in professional communication, and ultimately reducing the quality of care provided and dissatisfaction and leaving the profession. The impact may also lead to harmful consequences in patient care like medication errors and lack of appropriate attention to the care receivers [20].

In particular stress in the nursing profession has been a major worldwide problem according to studies conducted in different countries. A study among personnel of a United Kingdom health authority reported that nurses were under the greatest pressure among all health care personnel [21]. The study conducted in Indian revealed that 87.4% of Indian nurses reported stressed [22]. According to study conducted in Greater Accra Region in Ghana revealed that a cause of

stress to nurses was number of working hours, financial difficulties, and death of patient [23].

Ethiopia has one of the lowest health workers per population ratio in African countries. According to world health organization report indicated that one health worker served for every 4,050 population. This Human resource crisis exists in Ethiopia due to resource constraints, macroeconomic and governing factors [24, 25]. But, according to health sector development program (HSDP) IV final report in Ethiopian there was gap with regard to shortage of nursing staff nationally and nurse to population ratio nationally showed that 1: 3,870 [26]. In Ethiopia, a study conducted in Jima Zone southwest Ethiopia showed an average overall job related stress level of 58.46 ± 12.62 and in East Gojjam Zone Public hospitals northwest Ethiopia, 57.3% of nurses were occupationally stressful [15, 18].

Recent acceleration in the speed of COVID-19's spread caused heavy workload, physical burnout, high infection risk and ethical conflicts regarding the decisions on the patients to be prioritized, which, in turn, resulted with serious psychological stress in health professionals. Compared to other health professionals, nurses are disproportionately affected by the pandemic since they spend more time with the COVID-19 patients [27, 28].

Although literature showed that several studies had been documented in developed countries regarding work-related stress among nurses, still there is limited information supported by research in developing countries including Ethiopia. So, this study identifies the prevalence and associated factors of stress among nurses in the study area.

2. Method and Materials

2.1. Study Area and Period

This study was conducted in Addis Ababa which is the capital city of Ethiopia. It is located at the center of the country with an estimated area of 527 square kilometers [46]. Currently, Addis Ababa has 12 state run and more than 40 private hospitals [47]. Five public hospitals namely, Menelik II, St. Paul, St. Peter, Yekatit 12 and Zewditu memorial hospitals was included in this study. The study was done from March 1 to April 1/2022.

2.2. Study Design

Institution based cross sectional study was conducted.

2.3. Population

2.3.1. Source Population

Nurses who were working at public hospitals of Addis Ababa.

2.3.2. Study Population

Nurses who were working at selected public hospitals of Addis Ababa.

2.4. Eligibility Criteria

2.4.1. Inclusion Criteria

Nurses who had experience of working for at least 6 months at public hospitals were included.

2.4.2. Exclusion Criteria

Nurses who were seriously ill or unable to give response due to this illness during data collection period were excluded.

2.5. Sample Size Determination and Sampling Technique

A single population proportion calculation was used to get the sample size. The previous research's 49.2% prevalence rate of occupational stress is used to compute the sample size [48].

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

Where

P = prevalence of occupational stress = 49.2%.

Z = Level of confidence interval 95% = 1.96.

d = Degree of precision (the margin of sampling error to be used) = 0.05.

$$n = \frac{(1.96)^2 * 0.49(1-0.49)}{(0.05)^2} = 384$$

The total sample size was calculated as 384 + 384 * 10% (38.4) = 422, taking into account a 10% non-response rate.

Five hospitals were selected by simple random sampling technique. The calculated sample size was allocated proportionally to each hospital based on the number of nurses. Finally, simple random sampling method was used to approach the study participants.

2.6. Data Collection Tools and Procedure

Data was collected using self-administered structured questionnaire. There are three sections in the questionnaire. Socio-demographic information, working place data, and Modified Expanded Nursing Stress Scale make up Parts 1 through 3. An instrument for measuring work-related stress is the Expanded Nursing Stress Scale [45]. The ENSS measures occupational stress by using 54 items over eight subscales. The response options on the ENSS questionnaire, which is often created using a likert scale format, typically suggest that stress levels are (1=never stressful, 2=occasionally stressful, 3=frequently stressful, and 4=always stressful). The responder agreed that the scenario was stressful to a greater extent the higher the score. An overall cronbach's alpha score of 0.78 indicates that the instrument is reliable [45].

Five BSc nurses one for each hospital as data collector and two BSc nurses as supervisor working outside the selected hospitals was recruited. On the day of data collection, the data collectors explained the purpose of the study to the participants before data collection. Then self-administered structure questioner was distributed by giving appropriate

instruction to assist respondents how to fill the questions. The study was done from March 1 to April 1/2022.

2.7. Study Variables

2.7.1. Dependent Variable

Occupational stress

2.7.2. Independent Variable

- 1) Socio-demographic factors (Age, sex, marital status, child rearing, level of education, work experience, salary).
- 2) Work place factors (work unit, work shift and hours worked per day).
- 3) Psychological factors.
- 4) Physical factors.
- 5) Social factors.

2.8. Operational Definitions

Stressed- It is defined as having an ENSS score of mean or higher [45].

Not stressed- It is defined as a score in the ENSS that is below the mean [45].

2.9. Data Quality Control

A pre-test was conducted using 5% of the sample size among nurses working at Ras Desta Damtew hospital two weeks prior to data collection and necessary amendment was made. To ensure quality of data training was given for data collectors and supervisors on data collection tool and data collection procedure. Data completeness was checked by data collectors and principal investigator.

2.10. Data Processing and Analysis

Data was coded, cleaned and entered to Epi-data version 3.1 and exported to Statistical Package for Social Science (SPSS) version 23 for analysis. Descriptive analysis such as frequency distribution and measure of central tendency and variability (mean and standard deviation) was computed to describe variables of the study. Binary logistic regression was used to assess associations between dependent and independent variables. The degree of associations was interpreted using odds ratio (OR) and 95% confidence interval (CI) and statically significance at p-value < 0.05. The result was presented using text, tables, and graphs.

3. Results

3.1. Socio Demographic Characteristics of the Respondents

This study had a response rate of 414 (98.1%). In all, 178 (43%) men and 236 (57%) women took part in the study. The respondents' average age was 27.85 ± 4.28 years. According to this study, 350 (84.5%) of individuals had a BSc degree. Nurses with five to ten years of professional experience made up more than 50% of the participants. Additionally, 179

(43.2%) respondents had children, while 190 (45.9%) respondents were married (Table 1).

Table 1. Socio-demographic characteristics of nurses working at public hospitals of Addis Ababa, Ethiopia, 2022 (N=414).

Variables	Categories	Frequency	Percent
Age	<25 years	43	10.4
	25-30 years	217	52.4
	>30 years	154	37.2
Gender	Male	178	43
	Female	236	57
Marital status	Single	220	53.1
	Married	190	45.9
	Divorced	4	0.96
Children	Yes	179	43.2
	No	235	56.8
Level of education	Diploma holder	25	6
	Bachelor degree	350	84.5
	Master degree	39	9.4
Experience	<5 years	105	25.4
	5-10 years	268	64.7
	>10 years	41	9.9
Monthly salary (in birr)	<5000	35	8.5
	5000-9000	326	78.7
	>9000	53	12.8

3.2. Work Place Characteristics of the Respondents

Majority of participants 239 (57.7%) reported working shift of them were rotating. Most of participants 250 (60.4%) had a daily work schedule of no more than eight hours. (Table 2).

Table 2. Work place characteristics of nurses working at public hospitals of Addis Ababa, Ethiopia, 2022 (N=414).

Variables	Categories	Frequency	Percent
Working unit	Medical ward	116	28.0
	Surgical ward	58	14.0
	Obstetrics & Gynecology	36	8.7
	Pediatrics	67	16.2
	Other	137	33.1
Work shift	Fixed	175	42.3
	Rotating	239	57.7
Hours worked per day	≤8 hours	250	60.4
	>8 hours	164	39.6

3.3. Prevalence of Occupational Stress Among Nurses

Respondents who scored below the mean value were labeled as "Not stressed," while those who scored the mean value or higher were categorised as "Stressed" in order to assess the prevalence of occupational stress. As a result, 198 (47.8%) of nurses reported having occupational stress (Figure 3).

The mean score of the occupational stress subscales was computed. According to this research, the least stressful aspects of nurses' jobs were problems with peers while the most stressful aspects were death and dying, uncertainty about treatment, and conflict with physician (Table 3).

Table 3. Mean score of response of nurse to ENSS in Addis Ababa public hospitals, Ethiopia, 2022 (N=414).

Subscales	Number of Items	Mean
Psychological factors		
Death and dying	7	2.87
Uncertainty concerning treatment	9	2.53
Inadequate emotional preparation	3	2.36
Physical factors		
Workload	9	2.476
Social factors		
Conflict with physician	5	2.478
Problems With Peers	6	2.29
Problems with Supervisors	7	2.40
Patient and Family	8	2.46

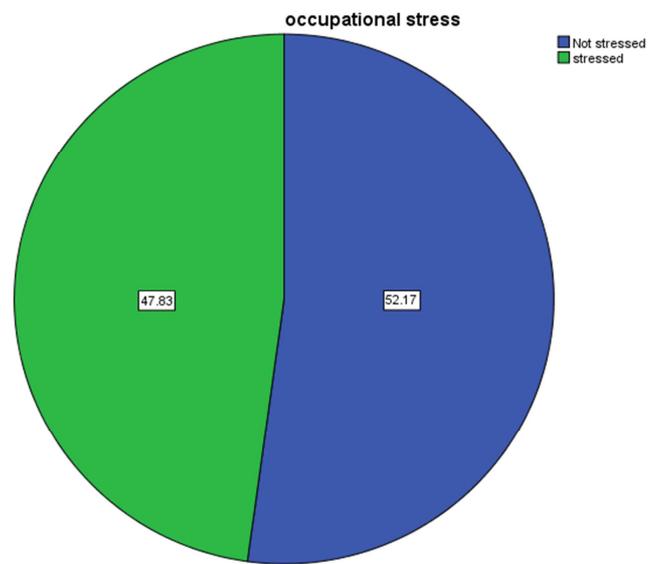


Figure 3. Prevalence of occupational stress among nurses working at Addis Ababa public hospitals, Ethiopia, 2022.

3.4. Factors Associated with Occupational Stress

The relationship between the independent variables and the dependent variable was examined using binary logistic regression. The multivariate analysis included all independent variables with p-values less than 0.25 in the bivariate analysis, and p-values less than 0.05 in multiple logistic regressions were regarded as significant. The results of the multivariate analysis showed that working shifts and having children were both strongly related to job stress.

According to the findings, nurses without children were 54% less anxious than nurses with children (AOR: 0.46, 95% CI: 0.22, 0.96). Working rotating shifts increased respondents' risk of occupational stress by 2.8 times compared to working fixed shifts (AOR=2.89, 95% CI: 1.87, 4.45) (Table 4 and Table 5).

Table 4. Socio demographic results of bivariate and multivariate binary logistic regression of factors associated with occupational stress among nurses working at public hospitals of Addis Ababa, Ethiopia, 2022 (N=414).

Variables	Categories	Occupational stress		COR (95% CI)	AOR (95% CI)
		Yes, N (%)	No, N (%)		
Age	<25 years	23 (53.5%)	20 (46.5%)	1.00	
	25-30 years	106 (48.8%)	111 (51.2%)	0.83 (0.43, 1.6)	
	>30 years	69 (44.8%)	85 (55.2%)	0.70 (0.35, 1.39)	
Gender	Male	81 (45.5%)	97 (54.5%)	1.00	
	Female	117 (49.6%)	119 (50.4%)	1.17 (0.79, 1.73)	
Marital status	Single	119 (29.71%)	101 (24.39%)	1.00	1.00
	Married	72 (37.9%)	118 (62.1%)	0.51 (0.34, 0.76)*	0.54 (0.34, 0.84)
Children	Divorced	2 (50%)	2 (50%)	0.84 (0.11, 6.13)	1.69 (0.21, 13.56)
	Yes	78 (43.6%)	101 (56.4%)	1.00	1.00
Level of education	No	120 (51.1%)	115 (48.9%)	1.35 (0.91, 1.99)*	0.46 (0.22, 0.96)**
	Diploma holder	12 (48.0%)	13 (52.0%)	1.00	
	Bachelor degree	163 (46.6%)	187 (53.4%)	0.94 (0.41, 2.12)	
Experience	Master degree	23 (59.0%)	16 (41.0%)	1.55 (0.56, 4.28)	
	<5 years	58 (55.2%)	47 (44.8%)	1.00	1.00
	5-10 years	125 (46.6%)	143 (53.4%)	0.70 (0.45, 1.11)*	0.77 (0.46, 1.28)
Monthly salary (in birr)	>10 years	15 (36.6%)	26 (63.4%)	0.46 (0.22, 0.98)*	0.89 (0.34, 2.36)
	<5000	17 (48.6%)	18 (51.4%)	1.00	1.00
	5000-9000	166 (50.9%)	160 (49.1%)	1.09 (0.54, 2.20)	1.59 (0.74, 3.40)
	>9000	15 (28.3%)	38 (71.7%)	0.41 (0.17, 1.02)*	0.63 (0.23, 1.73)

*p-value <0.25 **P value < 0.05 CI=Confidence Interval, COR=Crude Odds Ratio, AOR=Adjusted Odds Ratio.

Table 5. Work place results of bivariate and multivariate binary logistic regression of factors associated with occupational stress among nurses working at public hospitals of Addis Ababa, Ethiopia, 2022 (N=414).

Variables	Categories	Occupational stress		COR (95% CI)	AOR (95% CI)
		Yes, N (%)	No, N (%)		
Working unit	Medical ward	60 (51.7%)	56 (48.3%)	1.00	1.00
	Surgical ward	28 (48.3%)	30 (51.7%)	0.74 (0.32, 1.72)	0.47 (0.18, 1.21)
	Obstetrics & Gynecology	20 (55.6%)	16 (44.4%)	0.85 (0.40, 1.81)	0.73 (0.31, 1.68)
	Pediatrics	28 (41.8%)	39 (58.2%)	0.57 (0.25, 1.3)*	0.63 (0.24, 1.62)
	Other	62 (45.3%)	75 (54.7%)	0.66 (0.31, 1.38)	0.60 (0.26, 1.39)
Work shift	Fixed	60 (34.3%)	115 (65.7%)	1.00	1.00
	Rotating	138 (57.7%)	101 (42.3%)	2.61 (1.74, 3.92)*	2.89 (1.87, 4.45)**
Hours worked per day	≤8 hours	127 (50.8%)	123 (49.2%)	1.00	1.00
	>8 hours	71 (43.3%)	93 (56.7%)	0.73 (0.49, 1.09)*	0.75 (0.48, 1.16)

*p-value <0.25 **P value < 0.05 CI=Confidence Interval, COR=Crude Odds Ratio, AOR=Adjusted Odds Ratio.

4. Discussion

The prevalence of occupational stress among nurses was found to be 47.8% in this study, which is higher than the studies conducted in Isfahan, Iran, which found that the prevalence of stress was 34.9% [36] and Addis Ababa, Ethiopia, which found that the prevalence of occupational stress among nurses was 37.8%. [50]. The difference could be a result of the different tools used and the sample size, but another explanation could be that Isfahan, Iran, had stronger occupational health and safety practices implemented.

However, the results of this study are less significant than those of earlier research done in Delhi, which found that 87.4% of nurses experienced job-related stress, and in Jima Zone South West Ethiopia, which found that the average level of job-related stress was 58.46 ± 12.62 [51, 52]. When compared to the study conducted in Jima, this may be related to sample size, however in Delhi, the discrepancy may be caused by study tools and the study location.

According to this study, the four main sources of stress for nurses are "death and dying," "uncertainty regarding patient treatment," "conflict with physician," and "work load." The biggest source of stress, in respondent's opinions, was death and dying. The current study found that dealing with death and dying situations is a significant source of stress, which is consistent with studies conducted in Sudan, where dealing with death and dying situations had the highest mean scores of ENSS, mean =2.23, Standard deviation =0.56, and in Jima, where the highest stressful condition that nurses rated as always stressful was the death and dying of a patient with 62.94%, followed by uncertainty regarding patient treatment with 57.72%. [43, 52]. The study participants' cultural and humanitarian sympathy may be the cause of their emotional problems with relation to the patient's death or dying.

Uncertainty regarding the treatment subscale was the second cause of work-related stress in this study. Similar findings were found in a research conducted among 135 ICU nurses at the Children's University Hospital at El-Shatby (Egypt), which demonstrated "death and dying" followed by

uncertainty concerning the treatment [53]. This could be as a result of a lack of knowledge, experience, or expertise in dealing with unforeseen and challenging issues.

The third source of stress had a mean score of 2.47 and was conflict with physician subscale. Conflict with physician was identified as a source of work-related stress in studies conducted in Spain, which is consistent with this finding [31]. This may be due to a lack of relationships, communication, and cooperation.

Many of sociodemographic and workplace factors in this study had no statistically significant relationships with overall occupational stress. This may be the tool's strongest attribute. In multivariate logistic regression, the only significant predictors of occupational stress were having children and working a shift.

According to this study, there is a significant association between having children and workplace stress. Nurses who did not have children reported being 54% less stressed than those who did (AOR: 0.46, 95% CI: 0.22, 0.96). This may be because raising children increases the workload for these nurses. This study is in line with one done in Kampala, Uganda, which found that nurses in Ugandan hospitals deal with a fair amount of occupational stress. Additionally, the findings revealed that nurses without children experienced much less occupational stress than those with children [39].

A significant relationship between work shift and stress at work was also discovered in this study; rotating shift nurses reported higher levels of stress than fixed shift nurses (AOR=2.89, 95% CI: 1.87, 4.45). This result was in line with a study conducted in Addis Abeba, which found that nurses working rotational shifts experienced higher levels of stress than those working fixed shifts [54]. Additionally, this result was consistent with study conducted in Egypt that found the work shift was the strongest predictor of nurses' stress [53] and that revealed nurses working the rotating shift were more stressed than those who worked the morning shift [55].

5. Conclusion

In this study, about half of the nurses reported experiencing occupational stress. The presence of children and respondents' work shifts were personal characteristics that were significantly linked to job stress. The biggest drivers of work-related stress for nurses were death and dying, treatment uncertainty, conflict with physician, and problem with peers.

Acronyms

AOR: Adjusted Odd Ratio; CI: Confidence Interval; COR: Crude Odd Ratio; COVID-19: Coronavirus Disease 2019; ENSS: Expanded Nursing Stress Scale; HSDP: Health Sector Development Program; ICU: Intensive Care Unit; NIOSH: National Institute for Occupational Safety and Health; OR: Odd Ratio; SPSS: Statistical Package of Social Sciences; SD: Standard Deviation; WRS: Work Related Stress;

Availability of Data and Materials

All data are already described and included in the manuscript.

Competing Interests

The authors declare that we have no competing interests.

Author Contribution

EB wrote the proposal, participated in data collection, analyzed the data, wrote the manuscript, approved and revised the manuscript for publication. ZS reviewed and approved the manuscript. TB participated in manuscript preparation, revision and approval.

Ethical Consideration

Ethical clearance was obtained from Addis Ababa Health Bureau before data collection. Supportive letter was obtained from Kotebe University of Education, Menelik II College of medical and health science. Oral consent was obtained from each study participants during data collection. Right was given to study participants to refuse, stop, or withdraw from the interview at any time. Confidentiality was maintained throughout the study.

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