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Caring hands, heavy minds: prevalence and associated factors of depression, anxiety, and stress symptoms among nurses in Mogadishu, Somalia

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Abstract

Background Nurses are the foundation of healthcare systems, providing clinical care, emotional support, health education, and patient advocacy. Their frontline role and dedication significantly enhance patient outcomes and healthcare system efficiency. However, the high-pressure nature of nursing exposes them to increased risk of mental health disorders, particularly depression, anxiety, and stress, which can undermine both personal well-being and the quality of patient care. Despite global recognition of this issue, data from resource-limited and conflict-affected settings, such as Somalia, remain scarce. This study therefore aimed to assess the prevalence of depression, anxiety, and stress symptoms and to identify associated factors among nurses in Mogadishu, Somalia.

Methods A multicenter, cross-sectional study was conducted between November and December 2024 among 372 nurses across four hospitals in Mogadishu. Data were collected using self-administered online questionnaires comprising a demographic section, the 21-item Depression, Anxiety, and Stress Scale, the Pittsburgh Sleep Quality Index, and the Oslo Social Support Scale–3. Statistical analysis was performed using SPSS version 26, including descriptive statistics, bivariate analyses, and multivariable logistic regression. Statistical significance was set at $p < 0.05$.

Results The prevalence of depression, anxiety, and stress symptoms among participants was 29% (95% CI: 24.5–33.9%), 32.5% (95% CI: 27.8–37.5%), and 15.1% (95% CI: 11.6–19.1%), respectively. Female was significantly associated with depression (AOR = 1.72; 95% CI: 1.01–2.92; $p = 0.045$) and anxiety (AOR = 1.69; 95% CI: 1.03–2.80; $p = 0.040$), while being over 30 years old was linked to anxiety (AOR = 2.59; 95% CI: 1.34–5.01; $p = 0.005$) and stress (AOR = 2.34; 95% CI: 1.09–5.02; $p = 0.029$). Stress was further associated with physical inactivity (AOR = 2.00; 95% CI: 1.02–3.81; $p = 0.044$) and ICU work assignments (AOR = 3.39; 95% CI: 1.08–10.65; $p = 0.036$). Notably, poor sleep quality and limited social support consistently were strongly associated with all outcomes, with adjusted odds ratios ranging from 4.60 to 8.18 for sleep and 2.46 to 3.86 for social support.

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Conclusions The findings underscore a critical mental health burden among nurses in Mogadishu, driven by both occupational and personal factors. High-risk groups such as ICU staff and female nurses appear particularly vulnerable. Urgent institutional responses including regular mental health screenings, support programs (e.g., peer-support groups or employee assistance programs), workload management, and wellness promotion are essential to safeguard nurse well-being and ensure the delivery of high-quality patient care.

Keywords Nurses, Depression, Anxiety, Stress, Somalia

Background

Nurses are the cornerstone of the healthcare system, playing a critical role in patient care, advocacy, and support. They serve on the front lines, delivering essential services such as medication administration, health monitoring, emotional support, and care coordination among physicians, patients, and families [1, 2]. Beyond clinical duties, nurses provide compassionate care that addresses patients' physical, emotional, and psychological needs [3]. Furthermore, they play a vital role in health promotion, disease prevention, and community education, thereby contributing to the overall well-being of society [2]. Their dedication and expertise not only enhance patient outcomes but also ensure the efficient operation of healthcare systems, underscoring their indispensable role in the medical field [4].

Despite this central role, nurses are particularly vulnerable to psychological distress [5]. Depression, anxiety, and stress are among the most common mental health disorders affecting this workforce, with significant implications for their well-being, job performance, and the quality of care delivered [5, 6]. Contributing factors include high-stress work environments, extended shifts, emotional demands, and ongoing exposure to patient suffering, all of which can lead to emotional exhaustion and burnout [7, 8]. These conditions can impair concentration, decision-making, and clinical judgment, directly increasing the risk of errors and compromising patient safety [7, 8]. The mental health of nurses is therefore a critical component of patient safety, care quality, job satisfaction, and workforce sustainability [9].

Evidence from various countries—including Australia, India, and China—demonstrates wide variation in the prevalence of depression (32.4–70.8%), anxiety (27.1–74%), and stress (39.9–50.8%) among nurses [5, 10, 11], reflecting the substantial psychological burden in this profession. However, to our knowledge, such estimates are lacking in Somalia, where nurses face unique occupational challenges. The healthcare system is strained by protracted conflict, chronic resource shortages, high patient loads, and limited mental health infrastructure [12–14]. These pressures are compounded by cultural stigma surrounding mental illness, which can discourage help-seeking and contribute to psychological distress [12, 15, 16].

Understanding the magnitude of depression, anxiety, and stress among Somali nurses, and the factors associated with these conditions, is essential for several reasons. First, it provides baseline data to inform hospital administrators and policymakers about the scope of the problem, enabling the development of targeted interventions to safeguard nurse well-being. Second, identifying modifiable associated factors—such as sleep quality, social support, and work environment—can guide workplace policies and training programs that enhance resilience and reduce occupational stress. Third, such data can contribute to regional and global comparative analyses, enriching the evidence base for mental health promotion in low-resource and conflict-affected settings.

Given the absence of comparable studies in Somalia, this research addresses a critical knowledge gap. The findings will help shape evidence-based strategies to promote nurses' psychological well-being, improve retention, and strengthen the quality of care within Somali health services. Therefore, this study aimed to determine the prevalence of depression, anxiety, and stress symptoms, and to identify their associated factors among nurses in Mogadishu, Somalia.

Methods

Study design and setting

Somalia's healthcare system has developed within a fragile context shaped by decades of conflict, political instability, and limited public-sector infrastructure [14]. It is composed of a mix of public, private, and non-governmental providers, with the majority of services concentrated in urban centers such as Mogadishu. The country has relatively few tertiary-level hospitals and relies heavily on primary and secondary care facilities, small private clinics, and humanitarian health programs for service delivery [14].

Somalia's nursing workforce is critically understaffed, with nurse-to-patient ratios among the lowest in the region. Nurses face high workloads, scarce resources, and difficult working conditions. Training is provided through diploma and degree programs at local universities and nursing schools, where English is the main language of instruction. Their responsibilities go beyond basic care, encompassing clinical decision-making, patient education, and teamwork with physicians, midwives, laboratory staff, and other allied health professionals. Daily

duties often involve multitasking under resource constraints, managing heavy patient loads, and addressing both acute and chronic health needs [13].

This multicenter cross-sectional study was conducted from November 1 to December 31, 2024, in four Mogadishu hospitals: Mogadishu Somali Turkiye Recep Tayyip Erdogan Training and Research Hospital (a major public tertiary referral and teaching hospital), Shaafi Hospital (private general), Mogadishu Specialist Hospital (private multi-specialty), and Dr. Sumait Hospital (private general). These facilities, chosen via convenience sampling based on staff availability for data collection, represent both public and private healthcare models, serve varied patient populations, and provide general, emergency, and specialized services.

Nurses working in these hospitals provide care in departments such as internal medicine, surgery, pediatrics, maternity, and intensive care units. In addition to clinical duties, they participate in interdisciplinary ward rounds, patient discharge planning, and ongoing monitoring of patient progress. However, they often face significant occupational stressors, including high patient loads, shortages of medical supplies and equipment, extended working hours, and exposure to infectious diseases [13, 14]. These structural and contextual challenges can contribute to increased psychological strain, making the study of nurses' mental health in this environment both timely and relevant.

Sample size and sampling procedure

To determine the appropriate sample size for this study, we employed the single population proportion formula: $n = (z)^2 * p * (1-p) / d^2$, where n represents the required sample size, p is the estimated prevalence rate, z is the z-value corresponding to a 95% confidence level, and d is the margin of error set at 0.05 [17]. Due to the absence of previous research on the prevalence of depression, anxiety, and stress symptoms among nurses in Somalia and neighboring countries, we assumed a conservative prevalence rate of 50% ($p = 0.5$). Given that the total nursing population in the target hospitals was reported as 419, the initial calculated sample size was 201 participants. To accommodate a potential non-response rate of 10%, the sample size was adjusted upward to 223 nursing personnel. To ensure comprehensive representation and enhance the validity of the findings, we invited all eligible nursing staff to participate, maximizing participation and strengthening the reliability of the study. Although a convenience sampling approach was used, the sample size was calculated to ensure sufficient statistical power for estimating prevalence and examining associations, as well as to account for potential non-response.

Study population and recruitment

The study targeted all nursing staff employed at the selected hospitals, extending invitations for their participation. To facilitate recruitment, a research team member from each hospital initially contacted nursing supervisors either via phone or in person, explained the study objectives, and requested their assistance in participant recruitment. Supervisors subsequently received detailed information about the study, along with a link to an online questionnaire hosted on Google Forms, distributed through WhatsApp. They were responsible for forwarding this information to all nursing staff under their supervision. Periodic reminders were sent through WhatsApp to maximize participation and encourage questionnaire completion.

Inclusion criteria

The study included nursing staff formally employed in the selected hospitals at the time of data collection. Eligible participants were required to have a minimum of six months of continuous employment in their current hospital, ensuring sufficient exposure to workplace conditions that might influence mental health outcomes. Additional criteria included the ability to read and understand English, as the study instruments were administered in their original English versions, and the willingness to voluntarily participate, confirmed through the provision of informed consent.

Exclusion criteria

Nursing students, interns, and trainee nurses were excluded to avoid potential confounding arising from differing workloads and responsibilities. Nurses who were critically ill or on extended medical leave during the data collection period were also excluded. Pregnant nurses were not included, given that pregnancy-related physiological and psychological changes could influence mental health scores. In addition, nurses with less than six months of employment in their current hospital were excluded to ensure sufficient work experience in the present setting.

Variables of study and measurements

Dependent variable

The presence of depression, anxiety, and stress symptoms was assessed as dichotomous variables (yes/no). Scores from the Depression Anxiety Stress Scales-21 (DASS-21) were classified according to established severity thresholds [18]. Participants with scores ≥ 10 for depression, ≥ 8 for anxiety, and ≥ 15 for stress were categorized as "yes" (symptoms present), whereas scores below these thresholds were categorized as "no" (symptoms absent).

Independent variables

The study assessed socio-demographic and behavioral factors, including age, gender, marital status, educational background, number of children, monthly income, presence of chronic health conditions, level of physical activity, cigarette smoking, and khat consumption. Additionally, job-related and clinical factors were explored, such as job title, years of professional experience, work schedules, departmental affiliation, sleep quality, and availability of social support.

Data collection tools

Four self-administered questionnaires were distributed via WhatsApp groups to the target population for data collection: a structured questionnaire, the DASS-21, the PSQI, and the OSSS-3. The structured questionnaire gathered data on participants' socio-demographic, behavioral, occupational, and clinical characteristics, developed based on a literature review [7, 19]. Apart from age and the first four items of the PSQI, all variables were categorical and assessed using closed-ended questions.

Depression, anxiety, and stress

Depression, anxiety, and stress symptoms were assessed using the 21-item DASS, developed by Lovibond and Lovibond in 1995 [18]. The instrument comprises three subscales (depression, anxiety, stress) of seven items each, rated on a 4-point Likert scale (0–3) based on symptom frequency over the past week. Subscale scores were summed, multiplied by two, and categorized into five severity levels (normal to extremely severe) according to the DASS manual. The DASS-21 is widely recognized for its validity and reliability in assessing emotional distress [10, 20].

Sleep quality

Sleep quality was measured using the PSQI, a self-administered questionnaire developed by Buysse and colleagues [21] to assess sleep behaviors over the past month. The PSQI is a 19-item measure comprising seven components. Each component is scored from 0 to 3, with higher scores indicating greater impairment. Component scores are summed to produce a global score (0–21), with scores > 5 indicating poor sleep quality. The PSQI is widely used and has demonstrated strong reliability and validity across diverse populations [22].

Perceived social support

Perceived social support was measured utilizing the OSSS-3, an established assessment tool developed by Dalgard [23] that is extensively applied in research settings. The OSSS-3 assesses the frequency of contact with close family and friends and satisfaction with perceived support. Scores range from 3 to 14, with 3–8 indicating inadequate, 9–11 intermediate, and 12–14 strong social support. The OSSS-3 is widely used in psychological and public health research for its reliability and validity across diverse populations [19].

The study population comprised nurses who had completed their formal nursing education in English, which is the primary language of instruction in Somali nursing schools. As such, the original English versions of the DASS-21, PSQI, and OSSS-3 were administered without translation. To ensure clarity and appropriateness, the instruments were piloted with 20 nurses from the target population prior to data collection. No comprehension issues or ambiguities were reported, confirming the suitability of the English versions for use in this context.

Data management and statistical analysis

Data were collected via self-administered questionnaires distributed through WhatsApp and completed in Google Forms. All items were mandatory, resulting in no incomplete submissions. After downloading into Microsoft Excel, empty submissions were removed, and categorical variables were systematically recoded into numerical format to ensure the analytical readiness of the dataset. The data were then transferred to the Statistical Package for the Social Sciences (SPSS), version 26 (Armonk, NY: IBM Corp.), for statistical analysis. Descriptive analyses were performed to examine socio-demographic, behavioral, occupational, and clinical characteristics. The prevalence of Depression, anxiety, and stress was calculated, with 95% CIs generated using the Clopper-Pearson method [24]. Bivariate and multivariable logistic regression analyses were conducted to identify factors associated with these outcomes. Variables with $p \leq 0.25$ in the bivariate analysis were included as candidates for the multivariable logistic regression model [25]. Multicollinearity was assessed among independent variables in the multivariate model using Variance Inflation Factor (VIF) and correlation matrix. All VIF values were below 2.5, indicating acceptable levels. The goodness-of-fit for the final model was assessed using the Hosmer–Lemeshow test [26]. The model's ability to accurately distinguish between outcomes was assessed through receiver operating characteristic (ROC) curve analysis. Model performance was interpreted based on the area under the ROC curve (AUC), with values ranging from 0.7 to 0.8 indicative of satisfactory discriminatory power [26]. Variables with a p-value less than 0.05 in the multivariable analysis were deemed statistically significant and presented as adjusted odds ratios (AOR) along with their respective 95% CIs.

Ethical approval

The study was conducted in strict accordance with hospital guidelines, policies, ethical standards, and the Declaration of Helsinki. Ethical approval was granted by the

Table 1 Socio-demographic and behavioral characteristics of nurses in Mogadishu, Somalia, 2025 ($n = 372$)

Variable	Category	Frequency	Percentage
Gender	Female	185	49.7
	Male	187	50.3
Age	≤ 30 years	294	79.0
	> 30 years	78	21.0
Marital status	Unmarried	219	58.9
	Married	153	41.1
Educational status	Diploma	37	9.9
	BSc nursing	296	79.6
	MSc nursing	39	10.5
Have children	No	229	61.6
	Yes	143	38.4
Presence of chronic condition	No	335	90.1
	Yes	37	9.9
Monthly income	≤ 600 USD	302	81.2
	> 600 USD	70	18.8
Physically active	No	144	38.7
	Yes	228	61.3
Smoking cigarette	No	340	91.4
	Yes	32	8.6
Khat use	No	351	94.4
	Yes	21	5.6

Table 2 Job-related and clinical characteristics of nurses in Mogadishu, Somalia, 2025 ($n = 372$)

Variable	Category	Frequency	Percentage
Job title	Nurse Administrator	63	16.9
	Registered Nurse (RN)	309	83.1
Job experience	< 5 years	198	53.2
	5–10 years	135	36.3
	> 10 years	39	10.5
Work shift	Day shift	128	34.4
	Night shift	108	29.0
	Mixed day and night shift	136	36.6
Work department	Internal medicine	78	21.0
	Surgical department	94	25.3
	Emergency department	52	14.0
	Intensive care units (ICU)	70	18.8
	Outpatient department (OPD)	78	21.0
Sleep quality	Good	223	59.9
	Poor	149	40.1
Social support	Poor	166	44.6
	Moderate	121	32.5
	Strong	85	22.9

Note: Percentages may not total exactly 100% due to rounding

Table 3 Prevalence of depression, anxiety, and stress symptoms among nurses in Mogadishu, Somalia, 2025 ($n = 372$)

Variables	Symptom Severity Level				
	Normal *n* (%)	Mild *n* (%)	Moderate *n* (%)	Severe *n* (%)	Extremely severe *n* (%)
Depression	264 (71.0)	42 (11.3)	42 (11.3)	20 (5.4)	4 (1.1)
Anxiety	251 (67.5)	25 (6.7)	53 (14.2)	16 (4.3)	27 (7.3)
Stress	316 (84.9)	23 (6.2)	24 (6.5)	7 (1.9)	2 (0.5)

Note: Percentages may not total exactly 100% due to rounding

Institutional Review Board (IRB) of Mogadishu Somali Turkiye Recep Tayyip Erdogan Research and Training Hospital (reference number MSTH/19830). All eligible participants were thoroughly informed about the study's purpose and objectives prior to their voluntary participation. Each participant provided written informed consent, explicitly acknowledging their right to withdraw at any stage without any form of coercion. We ensured strict confidentiality of responses, maintained data anonymity, and refrained from collecting or disclosing personally identifiable information.

Results

Socio-demographic and behavioral characteristics of nurses

A total of 372 nurses participated in the study, corresponding to a response rate of 88.8%. Male participants slightly outnumbered females, comprising 50.4% of the sample. The majority of respondents (aged ≤ 30 years) had a mean age of 27.9 years (SD = 4.9). Additionally, 58.9% reported being unmarried, and most participants (79.6%) held a Bachelor of Science degree in Nursing. Concerning lifestyle behaviors, a significant proportion (61.3%) reported regular physical activity, whereas smaller proportions reported tobacco use (8.6%) and khat chewing (5.6%) (Table 1).

Job-related and clinical characteristics of nurses

A considerable proportion of participants (53.2%) reported having fewer than five years of professional experience. Regarding sleep quality, the majority of respondents (59.9%) reported good sleep quality. However, approximately half of the participants (44.6%) reported inadequate levels of social support (Table 2).

Prevalence of depression, anxiety, and stress among nurses in Mogadishu, Somalia

The findings of this study revealed that a substantial proportion of nurses in Mogadishu, Somalia, experienced mental health difficulties, with depressive symptoms observed in 29% (95% CI: 24.5–33.9%), anxiety symptoms in 32.5% (95% CI: 27.8–37.5%), and stress symptoms in 15.1% (95% CI: 11.6–19.1%) of respondents. These results underscore notable levels of psychological distress among frontline nursing professionals, highlighting the necessity of prioritizing their mental health and well-being within clinical environments (Table 3).

Factors associated with depression among nurses in Mogadishu, Somalia

In the bivariate logistic regression analysis, gender, years of professional experience, physical activity, job title, department, sleep quality, and social support were significantly associated with depression. However, in the multivariable logistic regression analysis, only gender, sleep quality, and social support remained significantly associated with depression at the $p \leq 0.05$ level. The study found that female nurses had a 1.72-fold greater likelihood of experiencing depressive symptoms compared to male nurses (AOR = 1.72; 95% CI: 1.01–2.92). Additionally, nurses who reported poor sleep quality were 8.18 times more likely to exhibit depressive symptoms than those who reported good sleep quality (AOR = 8.18; 95% CI: 4.76–14.05). Furthermore, nurses with inadequate social support were 2.46 times more likely to experience depressive symptoms compared to those reporting moderate to strong social support (AOR = 2.46; 95% CI: 1.20–5.12) (Table 4).

Factors associated with anxiety among nurses in Mogadishu, Somalia

The bivariate logistic regression analysis indicated significant associations between anxiety symptoms and several factors, including age, gender, years of professional experience, physical activity, department, sleep quality, and social support. However, after adjusting for confounding variables in the multivariable logistic regression analysis, only age, gender, sleep quality, and social support remained significantly associated with anxiety symptoms at a significance level of $p \leq 0.05$. Specifically, female nurses exhibited a 1.69-fold higher likelihood of experiencing anxiety symptoms compared to male nurses (AOR = 1.69; 95% CI: 1.03–2.80). Additionally, nurses aged above 30 years had a 2.59 times greater likelihood of anxiety symptoms compared to younger nurses (AOR = 2.59; 95% CI: 1.34–5.01). Furthermore, nurses reporting inadequate social support were 2.84 times more likely to experience anxiety symptoms compared to those reporting moderate to strong social support (AOR = 2.84; 95% CI: 1.38–5.84) (Table 5).

Factors associated with stress among nurses in Mogadishu, Somalia

The bivariate logistic regression analysis showed significant associations between stress symptoms and factors including age, gender, physical activity, department, sleep quality, and social support. However, after adjusting for confounding variables in the multivariable logistic regression analysis, only age, physical activity, department, sleep quality, and social support maintained significant associations with stress symptoms at a significance level of $p \leq 0.05$. Specifically, nurses aged above 30 years exhibited a 2.34 times higher likelihood of experiencing stress symptoms compared to younger nurses (AOR = 2.34; 95% CI: 1.09–5.02). Additionally, physically inactive participants had twice the likelihood of reporting stress symptoms compared to their physically active counterparts (AOR = 2.00; 95% CI: 1.02–3.81). Furthermore, nurses working in intensive care units (ICUs) were 3.39 times more likely to experience stress symptoms than those employed in other departments (AOR = 3.39; 95% CI: 1.08–10.65) (Table 6).

Discussion

This study investigated the prevalence and associated factors of depressive, anxiety, and stress symptoms among nurses in Mogadishu, Somalia. Depressive symptoms were reported by 29% of participants, anxiety symptoms by 32.5%, and stress symptoms by 15.1%. Factors significantly associated with these conditions included age,

Table 4 Bivariate and multivariable logistic regression of depression and associated factors among of nurses in Mogadishu, Somalia, 2025 ($n = 372$)

Variables	Category	Positive depressive symptoms		COR (95% CI)	AOR (95% CI)	*p*-value
		No (%)	Yes (%)			
Gender	Female	120 (64.9)	65 (35.1)	1.81 (1.15–2.86)	1.72 (1.01–2.92)	0.045*
	Male	144 (77.0)	43 (23.0)	1	1	
Physically active	No	94 (65.3)	50 (34.7)	1.56 (0.990–2.46)	1.08 (0.625–1.86)	0.786
	Yes	170 (74.6)	58 (25.4)	1	1	
Job experience	< 5 years	126 (63.6)	72 (36.4)	1.46 (0.684–3.10)	1.16 (0.499–2.72)	0.725
	5–10 years	110 (81.5)	25 (18.5)	0.579 (0.254–1.32)	0.477 (0.191–1.19)	0.113
	> 10 years	28 (71.8)	11 (28.2)	1	1	
Sleep quality	Good	194 (87.0)	29 (13.0)	1	1	
	Poor	70 (47.0)	79 (53.0)	7.55 (4.55–12.52)	8.18 (4.76–14.05)	< 0.001*
Social support	Poor	102 (61.4)	64 (38.6)	2.93 (1.55–5.55)	2.46 (1.20–5.12)	0.015*
	Moderate	92 (76.0)	29 (24.0)	1.47 (0.733–2.95)	0.952 (0.431–2.11)	0.904
	Strong	70 (82.4)	15 (17.6)	1	1	

Note: $p < 0.05$ was considered statistically significant; significant values are marked with an asterisk (*), COR: Crude odd ratio, AOR: Adjusted odds ratio, 1: reference categories, CI: Confidence interval

Table 5 Bivariate and multivariable logistic regression analysis of anxiety and associated factors among nurses in Mogadishu, Somalia, 2025 ($n=372$)

Variables	Category	Positive anxiety symptoms		COR (95% CI)	AOR (95% CI)	*p*-value
		No (%)	Yes (%)			
Age	≤ 30 years	206 (70.0)	88 (30.0)	1	1	
	> 30 years	45 (57.7)	33 (42.3)	1.72 (1.03–2.87)	2.59 (1.34–5.01)	0.005*
Gender	Female	114 (61.6)	71 (38.4)	1.71 (1.10–2.65)	1.69 (1.03–2.80)	0.040*
	Male	137 (73.3)	50 (26.7)	1	1	
Job experience	< 5 years	125 (63.1)	73 (36.9)	0.934 (0.461–1.90)	1.18 (0.494–2.81)	0.712
	5–10 years	102 (75.6)	33 (24.4)	0.518 (0.243–1.10)	0.545 (0.229–1.29)	0.170
	> 10 years	24 (61.5)	15 (38.5)	1	1	
Physically active	No	87 (60.4)	57 (39.6)	1.68 (1.08–2.61)	1.34 (0.810–2.23)	0.252
	Yes	164 (71.9)	64 (28.1)	1	1	
Sleep quality	Good	182 (81.6)	41 (18.4)	1	1	
	Poor	69 (46.3)	80 (53.7)	5.15 (3.23–8.21)	4.60 (2.80–7.60)	< 0.001*
Social support	Poor	101 (60.8)	65 (39.2)	3.00 (1.59–5.69)	2.84 (1.38–5.84)	0.004*
	Moderate	80 (66.1)	41 (33.9)	2.39 (1.22–4.69)	2.09 (0.982–4.44)	0.056
	Strong	70 (82.4)	15 (17.6)	1	1	

Note: $p < 0.05$ was considered statistically significant; significant values are marked with an asterisk (*), COR: Crude odd ratio, AOR: Adjusted odds ratio, 1: reference categories, CI: Confidence interval

Table 6 Bivariate and multivariable logistic regression of a stress and associated factors among nurses in Mogadishu, Somalia, 2025 ($n=372$)

Variables	Category	Positive stress symptoms		COR (95% CI)	AOR (95% CI)	*p*-value
		No (%)	Yes (%)			
Age	≤ 30 years	255 (86.7)	39 (13.3)	1	1	
	> 30 years	61 (78.2)	17 (21.8)	1.82 (0.966–3.44)	2.34 (1.09–5.02)	0.029*
Gender	Female	151 (81.6)	34 (18.4)	1.69 (0.946–3.02)	1.68 (0.866–3.23)	0.125
	Male	165 (88.2)	22 (11.8)	1	1	
Physically active	No	112 (77.8)	32 (22.2)	0.412 (0.231–0.377)	2.00 (1.02–3.81)	0.044*
	Yes	204 (89.5)	24 (10.5)	1	1	
Department	Internal medicine	70 (89.7)	8 (10.3)	1.37 (0.453–4.16)	1.11 (0.339–3.65)	0.859
	Surgical departments	73 (77.7)	21 (22.3)	3.45(1.32–9.05)	2.71 (0.939–7.80)	0.065
	Emergency room	44 (84.6)	8 (15.4)	2.18 (0.710–6.71)	2.91 (0.842–10.07)	0.091
	ICU	57 (81.4)	13 (18.6)	2.74 (0.979–7.65)	3.39 (1.08–10.65)	0.036*
	OPD	72 (92.3)	6 (7.7)	1	1	
Sleep quality	Good	211 (94.6)	12 (5.4)	1	1	
	Poor	105 (70.5)	44 (29.5)	7.37 (3.73–14.54)	7.69 (3.67–16.09)	< 0.001*
Social support	Poor	130 (78.3)	36 (21.7)	4.43 (1.67–11.76)	3.86 (1.31–11.93)	0.015*
	Moderate	106 (87.6)	15 (12.4)	2.26 (0.790–6.49)	1.63 (0.518–5.13)	0.403
	Strong	80 (93.0)	6 (7.0)	1	1	

Note: $p < 0.05$ was considered statistically significant; significant values are marked with an asterisk (*), COR: Crude odd ratio, AOR: Adjusted odds ratio, 1: reference categories, CI: Confidence interval

gender, sleep quality, social support, physical activity, and clinical department assignment.

Depression is a common psychological disorder among healthcare professionals, including nurses, and can markedly affect work performance, patient care quality, and overall well-being [11, 19, 27]. In this study, nearly one-third of nurses reported depressive symptoms—a prevalence comparable to findings from China [11] and Australia [5], as well as a systematic review of 18 studies involving 2,611 Iranian nurses [28]. However, this rate was lower than those documented in Egypt [29], India [10], and Brazil [30], and in a Chinese meta-analysis [31]. Conversely, it exceeded rates reported in other Chinese [32] and Vietnamese [33] studies and in another meta-analysis of Iranian nurses [34].

Anxiety is similarly prevalent among nurses and can lead to heightened stress, burnout, and emotional exhaustion, ultimately reducing the quality of patient care [11, 27, 35]. In the present study, approximately one-third of nurses reported anxiety symptoms, closely matching results from China [32] and a multi-country meta-analysis of 23 studies involving 44,165 nurses [36]. The rate was lower than those found in Egypt [29], India

[10], Australia [5], and Brazil [30], yet higher than those reported among Indonesian nurses [37].

Nursing stress is often linked to heavy workloads, extended shifts, high emotional demands, and the responsibility of delivering optimal patient care [7]. Persistent stress contributes to burnout, reduced job satisfaction, and a greater likelihood of patient-care errors [27]. In this study, stress symptoms were present in about 15% of nurses, comparable to one Chinese study [32] but lower than rates reported in India [10], Australia [5], China [11], and Brazil [30].

Variations in prevalence across studies may be explained by differences in methodology, including sample size, study design, assessment tools, and participant characteristics. For instance, the Egyptian study [29] used the Hospital Anxiety and Depression Scale (HADS) to measure depression and anxiety, while Hu et al. [11] in China employed multiple instruments—the Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), and Perceived Stress Scale (PSS)—and followed participants over three years in a longitudinal cohort, which may have influenced prevalence estimates. Zheng et al. [32] limited their sample to 617 pediatric nurses, whereas the Australian study by Maharaj [5] involved only 102 participants. In comparison, the present study used the DASS-21 in a cross-sectional survey of 372 nurses from multiple hospital departments. Despite these methodological differences, evidence consistently shows that nurses are more likely to experience psychological disorders such as depression, anxiety, and stress compared to the general population [38].

Poor sleep quality emerged as a strong predictor of all three mental health outcomes. Nurses reporting poor sleep were significantly more likely to experience depression, anxiety, and stress compared to those with good sleep quality. This finding is consistent with prior studies highlighting the harmful impact of inadequate sleep on nurses' mental health [22, 39, 40]. The relationship between sleep and mental health is bidirectional: psychological disorders can disrupt sleep, and sleep disturbances can worsen mental health symptoms [41, 42]. Possible mechanisms include neurotransmitter dysregulation, altered stress response, and circadian rhythm disruption [41, 43]. These results emphasize sleep quality as a critical factor of nurses' psychological well-being and suggest that interventions to improve sleep may yield meaningful mental health benefits [42, 44].

Existing research highlights the critical role of social support in preventing psychological disorders, maintaining emotional well-being, and aiding recovery from mental health conditions [45, 46]. In this study, nurses with limited social support had higher levels of depression, anxiety, and stress than those with moderate or strong support networks. This finding aligns with prior studies showing the detrimental impact of inadequate social support on healthcare professionals' mental health [19, 47, 48], and suggests that strengthening support systems could improve psychological well-being among nurses.

Research consistently shows significant gender differences in mental health disorders, with women experiencing higher rates than men [49]. Depression and anxiety are particularly more prevalent among women, influenced by biological, hormonal, and psychosocial factors [50, 51]. In this study, female nurses were more susceptible to depressive and anxiety symptoms than male nurses, consistent with evidence that female healthcare professionals face greater likelihood of psychological disorders [19, 52, 53]. Gender differences in stress perception and coping styles have been reported, with women more likely to encounter stressors and use emotion-focused coping [54], potentially increasing vulnerability to distress. In Muslim communities, women may also carry the dual burden of cultural and social responsibilities alongside professional duties, further elevating susceptibility [55]. These findings highlight the need for gender-sensitive mental health strategies in healthcare settings, where women may face a unique interplay of professional, cultural, and societal pressures.

Regular physical activity is well established as a protective factor against stress, helping to regulate both psychological and physiological responses [56]. Exercise promotes the release of neurotransmitters such as endorphins, serotonin, and dopamine, which can mitigate stress and improve mood [57, 58]. In this study, nurses with sedentary lifestyles were more likely to report stress symptoms than those engaging in regular physical activity, consistent with previous evidence supporting the stress-buffering effects of exercise [59]. The relationship is likely bidirectional—while regular activity reduces stress by lowering cortisol and enhancing endorphin release, high stress levels can reduce motivation and increase fatigue, leading to inactivity and other unhealthy behaviors [59, 60].

The association between age and psychological distress among nurses remains unclear, with studies reporting mixed findings. Some evidence suggests that older nurses experience higher stress and anxiety due to prolonged exposure to occupational demands, physical strain, and increased responsibilities [61]. In contrast, other studies indicate that younger nurses are more vulnerable, possibly because of limited clinical experience, less developed coping skills, and greater susceptibility to workplace pressures [62]. In this study, nurses over the age of thirty reported significantly higher stress and anxiety levels than younger participants. Differences in study populations, clinical settings, and measurement tools may explain these inconsistencies, highlighting the complex

nature of the relationship between age and psychological well-being in nursing.

Nurses in ICUs face exceptionally high occupational stress due to the demanding, high-stakes nature of their work [7]. Their roles require managing critically ill patients, making rapid clinical decisions, and frequently confronting life-threatening situations, all of which contribute to psychological distress [63]. Additional pressures include heavy workloads, extended shifts, and the emotional strain of witnessing patient suffering and mortality [7, 64]. In this study, ICU nurses reported significantly higher stress levels than those in other hospital departments. By contrast, a cross-sectional study in private tertiary hospitals in Karachi found the highest stress levels among emergency department nurses, indicating variability in stress exposure across clinical units [65].

Beyond workplace factors, Somalia's broader sociopolitical and cultural context likely contributes to the high prevalence of depression, anxiety, and stress among nurses. Decades of protracted conflict, ongoing insecurity, and chronic shortages in healthcare resources impose a substantial psychological burden on the population, including healthcare professionals [12, 16]. Cultural stigma surrounding mental health may further deter help-seeking, leading to underdiagnosis and undertreatment [12]. These structural and cultural stressors not only exacerbate symptoms but may also shape how nurses perceive and respond to mental health assessments.

Strengths and limitations

This study offers several notable strengths. Its multicenter design, involving participants from multiple healthcare facilities across Mogadishu, enhanced the diversity and representativeness of the sample. The use of well-established, psychometrically robust instruments to assess mental health symptoms, sleep quality, and social support strengthened internal validity and facilitated meaningful international comparisons. Rigorous statistical procedures—including multivariable logistic regression, multicollinearity assessment, and model fit evaluation (e.g., VIF, ROC curves, Hosmer–Lemeshow test)—further enhanced the credibility and reliability of the findings.

Nonetheless, some limitations should be acknowledged. Mental health outcomes and associated factors were assessed through self-reported questionnaires, which may be affected by recall and social desirability biases; these were mitigated through the use of validated tools (DASS-21, PSQI, OSSS-3) and assurances of anonymity. The instruments served as screening rather than diagnostic tools, though established cut-off scores were applied for accuracy. Potential non-response bias cannot be excluded, as information on non-participants was unavailable; repeated reminders and flexible data collection schedules were employed to minimize this risk. Convenience sampling and inclusion of nurses from all departments may have introduced variability, although recruitment from four major hospitals representing different institutional types improved diversity. The study's restriction to nurses in Mogadishu may limit generalizability, though inclusion of multiple hospitals across various care settings partially addressed this. The cross-sectional design precludes causal inference, reinforcing the need for longitudinal studies. Finally, convenience-based hospital selection and the use of online questionnaires may have introduced selection and response biases; future studies could employ stratified/random sampling and mixed data-collection methods, and also offer alternative data collection formats (e.g., paper-based surveys or interviews) to enhance representativeness. Despite these constraints, this study, to the best of our knowledge, represents the first investigation of its kind among nurses in Mogadishu, Somalia, and provides a valuable evidence base for policy and practice.

Practical and policy implications

The findings have important implications for healthcare policy, institutional practice, and nursing education. Hospitals should prioritize the establishment of dedicated mental health units, institutionalize regular psychological screening for nurses, and embed structured workplace wellness programs into routine operations. Given the high prevalence of poor sleep quality, stress, and anxiety, interventions should incorporate education on sleep hygiene, stress reduction, and healthy lifestyle practices.

From an educational standpoint, integrating wellness and resilience modules into nursing curricula covering stress management, mental health self-care, physical activity, and sleep hygiene would equip future nurses with proactive coping strategies before entering demanding clinical environments. At the institutional level, peer-support networks, mentorship programs, and accessible counseling services can strengthen social support systems, while culturally tailored interventions can enhance feasibility and sustainability in the Somali healthcare context.

Conclusion and recommendations

In summary, this study revealed that a substantial proportion of nurses in Mogadishu experience psychological distress, with poor sleep quality, limited social support, female gender, physical inactivity, older age, and ICU assignment identified as key contributing factors. These results highlight the need for targeted mental health interventions within the nursing workforce.

Healthcare facilities should implement comprehensive mental health screening, counseling, and support services tailored to nurses' needs, with particular focus on

high-risk groups such as ICU staff and female nurses. Workload optimization, adequate staffing, regular shift rotations, and structured mental health breaks can help mitigate work-related stressors. Policy measures should institutionalize psychological screening, embed workplace wellness programs, and integrate resilience-building content into nurse training curricula. Strengthening social support through peer networks, mentoring, and accessible counseling will further enhance nurses' emotional resilience and job satisfaction, ultimately improving patient care quality.

Future research should adopt longitudinal designs to clarify causal relationships between identified factors and mental health outcomes, while expanding to diverse geographic and cultural contexts to improve generalizability. By translating these findings into evidence-based policies and educational reforms, Somalia's healthcare system can take a decisive step toward protecting and promoting the mental well-being of its nursing workforce.

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Author contributions
NAM, RYHM, and YAM: Conceptualization and methodology; NAM, RYHM, AMA, HAA, AMHH, IMO, and AAM: Investigation, data collection, and data entry; AMA, HAA, and AMHH: Validation; NAM, RYHM, YAM, and AAG: Search for articles and extraction of data; AMA, AAM, and AAG: Editing; NAM, RYHM, and MSH: Performed statistical analysis and interpretation; NAM, MSH, NOS: Writing—original draft preparation; YAM, NOS, and IMO: Writing—review and editing. All authors have read and approved the final version of the manuscript.

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Data availability
The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The study underwent review and approval by the Institutional Review Board (IRB) of Mogadishu Somali Turkiye Recep Tayyip Erdogan Research and Training Hospital (reference number MSTH/19830). All procedures were conducted in alignment with the ethical principles outlined in the Declaration of Helsinki. Prior to participation, written informed consent was obtained from all participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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