Prevalence and Predictors of Stress, Anxiety, and Depression among Physicians in Two Selected Hospitals in Accra, Ghana

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ABSTRACT

Although work-related stress, anxiety, and depression are well-established globally, the mental well-being of healthcare professionals is often underprioritised in Sub-Saharan Africa. These conditions can impair communication, reduce productivity, increase absenteeism, and compromise the quality and safety of patient care. Little is known about the prevalence and determinants of stress, anxiety, and depression among physicians at two major referral hospitals in Accra: Korle Bu Teaching Hospital (KBTH) and Greater Accra Regional Hospital (GARH). A cross-sectional study involving 394 physicians — 334 (85%) general physicians and 60 (15%) specialists — was conducted from June to August 2023 at KBTH and GARH, the two largest hospitals in the Greater Accra Region, selected because of their status as the principal referral centres serving the highest patient volumes in Ghana. The DASS-21 questionnaire measured levels of stress, anxiety, and depression. Multiple logistic regression identified associated risk factors. Stress, anxiety, and depression were reported by 24.9% (95% CI: 0.21–0.29), 57.4% (95% CI: 0.52–0.62), and 36.0% (95% CI: 0.31–0.41) of participants, respectively. Stress was significantly associated with working at KBTH (AOR=2.27; p=0.031), being a medical officer (AOR=0.21; p=0.005), 1–3 years of experience (AOR=9.83; p<0.001), and seeing 10–20 (AOR=4.12; p<0.001) or >20 patients daily (AOR=6.38; p<0.001). Anxiety was associated with KBTH (AOR=1.95; p=0.005), 4–6 years of practice (AOR=1.78; p=0.039), ≥7 years (AOR=0.29; p=0.001), working in surgery (AOR=0.43; p=0.043) or theatre (AOR=4.02; p=0.019), and patient volume. Depression was linked to KBTH (AOR=2.50; p=0.004), age ≥50 years (AOR=32.88; p=0.010), medical officer rank (AOR=0.14; p<0.001), and higher patient load. The study revealed a high burden of psychological distress among physicians. Key predictors included workplace environment (KBTH), limited clinical experience, patient volume, and inadequate institutional support. Targeted interventions addressing workload management and mental health promotion are urgently needed in Ghana's major referral hospitals.

Keywords: Stress, Anxiety, Depression, Physicians, Healthcare Workers, Korle Bu Teaching Hospital, Greater Accra Regional Hospital, Ghana, DASS-21

1.0 INTRODUCTION

Mental health disorders, including stress, anxiety, and depression, represent a significant global burden. In 2019, the World Health Organisation estimated that 970 million people — approximately 1 in every 8 individuals — were living with a mental health disorder (World Health Organisation, 2022). Anxiety and depressive disorders were among the most prevalent, affecting 301 million and 280 million people, respectively (Institute of Health Metrics and Evaluation, 2022). The COVID-19 pandemic further amplified this burden, with an estimated 26% increase in anxiety disorders and 28% increase in depressive disorders globally in 2020 (World Health Organisation, 2022).

In Africa, the lifetime prevalence of mental health disorders is rising, with up to 15.8% of the adult population affected (Greene et al., 2021). Ghana faces comparable challenges, with over 18% of adults experiencing a mental health disorder (Dattani et al., 2023; Sipsma et al., 2013). Despite this, mental health services remain severely underfunded, with only 2% of people with common mental health conditions receiving treatment (Eaton & Ohene, 2016). Physicians are particularly susceptible to psychological distress due to prolonged working hours, high patient loads, exposure to traumatic events, and the emotional demands of clinical care (Clancy, 2009; Rosenstein et al., 2018; Wada et al., 2011). These stressors manifest as burnout, depression, anxiety, sleep disturbances, and other health problems (Khanal et al., 2020; Muller et al., 2020; Vizheh et al., 2020; Woo et al., 2020), with depression and anxiety being the most prevalent disorders among this group (Harvey et al., 2021).

Global studies have reported the prevalence of depression and depressive symptoms among physicians to range from 20.9% to 43.2% (Mata et al., 2015), while anxiety disorders have been documented in approximately 24% (Ruitenburg et al., 2012). In Nigeria, stress levels of 62.4% were recorded among physicians and nurses during the COVID-19 pandemic (Olude et al., 2022). The consequences of untreated mental health disorders are serious, including decreased productivity, absenteeism, impaired patient safety, and increased risk of chronic non-communicable diseases such as hypertension, diabetes, and ischaemic heart disease (Dyrbye et al., 2014; Esterling et al., 1994; Necho et al., 2021).

In sub-Saharan Africa, where healthcare systems face unique structural and resource challenges, the mental well-being of healthcare professionals is often overlooked. Ghana's healthcare system is particularly fragile, with a critical shortage of mental health professionals and limited infrastructure (Atakora et al., 2020). Odonkor and Frimpong (2020) highlighted the need for systematic assessment of stress and burnout among Ghanaian health workers; however, targeted data on the prevalence and predictors of stress, anxiety, and depression specifically among physicians remain scarce. Additionally, the stigma associated with mental illness and physicians' tendency to self-manage further delay help-seeking and worsen outcomes (Lam et al., 2015; Davidson & Schattner

, 2003; Rosvold & Bjertness, 2002).

This study therefore aims to investigate the prevalence and predictors of stress, anxiety, and depression among physicians at two major referral hospitals in Accra, Ghana. Understanding the burden and determinants of these conditions is essential for designing evidence-based interventions to protect physician well-being and, by extension, improve the quality of patient care.

2.0 METHODOLOGY

2.1 Study Design

This cross-sectional study investigated the prevalence and predictors of stress, anxiety, and depression among practising physicians in the Greater Accra Region of Ghana. Participants were practising medical doctors, house officers, and resident physicians with at least six months of service at either study site. Data collection was conducted on working days between 1st June and 31st August 2023.

2.2 Study Setting and Rationale for Site Selection

The study was conducted at Korle Bu Teaching Hospital (KBTH) and Greater Accra Regional Hospital (GARH), the two largest and highest-volume hospitals in the Greater Accra Region of Ghana. These sites were purposively selected based on the following criteria: KBTH is the oldest and largest tertiary referral hospital in Ghana, affiliated with the University of Ghana Medical School. It has over 2,000 beds and employs more than 3,000 staff, including approximately 720 doctors (Oruh & Achi, 2023). As a teaching hospital, it carries the dual burden of clinical service delivery and undergraduate/postgraduate medical education, creating unique occupational stressors not found in other institutions. GARH (formerly Ridge Hospital) is the second-largest public hospital in the Greater Accra Region, operating over 700 beds with approximately 315 doctors and 1,800 staff in total. Following its upgrade from a regional to a referral hospital, GARH serves an increasing caseload from across the Greater Accra and Eastern Regions.

Together, these two hospitals serve a combined outpatient attendance exceeding 7.5 million patient contacts annually (Oruh & Achi, 2023), making them the most appropriate settings for studying physician mental health in Ghana. Their contrasting institutional profiles — one an academic teaching centre, the other a non-teaching referral hospital — also allow meaningful comparisons of occupational stressors across different healthcare environments. No other hospitals in Ghana match this combination of scale, referral load, and physician workforce size.

The sample size was calculated using Cochran's formula: $n = Z^2P(1-P)/E^2$, where $Z = 1.96$ (95% confidence level), $P = 0.58$ (prevalence estimate from prior literature on anxiety among physicians in West Africa), and $E = 0.05$ (5% margin of error). This yielded a minimum required sample of 375 participants. To account for a 5% non-response rate, the final target sample was set at 394.

Proportional allocation was used: 276 physicians (70%) were recruited from KBTH and 118 (30%) from GARH, reflecting the relative physician workforce sizes at each facility (Belete & Anbesaw, 2022; Kothari, 2004).

2.3 Sample Size Determination

The sample size was calculated using Cochran's formula: $n = Z^2P(1-P)/E^2$, where $Z = 1.96$ (95% confidence level), $P = 0.58$ (prevalence estimate from prior literature on anxiety among physicians in West Africa), and $E = 0.05$ (5% margin of error). This yielded a minimum required sample of 375 participants. To account for a 5% non-response rate, the final target sample was set at 394. Proportional allocation was used: 276 physicians (70%) were recruited from KBTH and 118 (30%) from GARH, reflecting the relative physician workforce sizes at each facility (Belete & Anbesaw, 2022; Kothari, 2004).

2.4 Sampling Technique

A proportionate stratified sampling approach was adopted, stratifying by hospital site. Within each stratum, participants were selected using simple random sampling via the lottery method. A complete, up-to-date list of registered doctors from each institution served as the sampling frame. Each physician was assigned a unique identifier; identifiers were randomly drawn until the required sample size for each stratum was reached.

2.5 Data Collection Instruments

Data were collected using a structured self-administered questionnaire comprising five sections: (1) socio-demographic data; (2) hospital-related factors (department, duty hours, patient load, availability of PPE, and policy/protocol availability); (3) subjective experiences and perceived effects of stress, anxiety, and depression; (4) the Depression, Anxiety and Stress Scale-21 (DASS-21); and (5) the Brief COPE Scale.

2.6 Measurement of Stress, Anxiety, and Depression

The DASS-21 is a validated 21-item instrument organised into three 7-item subscales measuring depression, anxiety, and stress over the preceding week (Lovibond & Lovibond, 1995). Each item is rated on a 4-point Likert scale (0 = did not apply to me at all; 3 = applied to me very much or most of the time). Subscale scores are summed and multiplied by two to derive final scores (Lovibond & Lovibond, 1995; Tran et al., 2013). The instrument has demonstrated high internal consistency (Cronbach's $\alpha > 0.70$) across diverse clinical populations. Binary outcome variables were defined using standard DASS-21 cut-off thresholds: depression ≥10, anxiety ≥8, and stress ≥15.

2.7 Measurement of Coping Strategies

Coping strategies were assessed with the Brief COPE Scale, a 28-item instrument covering 14 coping domains (problem-focused, emotion-focused, and avoidant strategies) (Carver, 1997).

Items are rated on a 4-point scale (1 = not doing this at all; 4 = doing this a lot), with subscale scores classified as low (<8), moderate (8–12), or high (>12).

2.8 Data Management and Statistical Analysis

Data were captured using KoBoToolbox and analysed using Stata MP version 17.0. Datasets were anonymised, cleaned, and checked for internal consistency before analysis. Descriptive statistics (frequencies, proportions, means, and standard deviations) with 95% confidence intervals were computed for all study variables. Bivariate associations between predictor variables and each outcome (stress, anxiety, and depression) were assessed using Pearson's Chi-square test or Fisher's exact test, where cell counts were below five ($p < 0.05$ significance threshold). Crude odds ratios (COR) and adjusted odds ratios (AOR) with 95% confidence intervals were estimated through binary logistic regression. Variables achieving statistical significance in bivariate analysis were entered into multivariable models; clinically or theoretically important variables were included regardless of bivariate significance.

2.9 Ethical Considerations

Ethical approval was granted by the Ghana Health Service Ethics Review Committee (GHS-ERC:056/05/23) and the Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-IRB 00111/2023). Written informed consent was obtained from all participants before data collection. Anonymity and confidentiality were maintained throughout.

3.0 RESULTS

3.1 Participant Characteristics

A total of 394 physicians were enrolled, constituting a 100% response rate against the target sample. Of these, 276 (70.0%) were from KBTH and 118 (30.0%) from GARH (Table 1). The mean age was 30.3 years (SD = 6.1), with 56.1% aged under 30 years. Males constituted 52.5%, and the majority (61.9%) were single. House officers represented the largest occupational group (47.5%), and 45.4% had less than one year of clinical experience.

3.2 Hospital-Related Characteristics

Most physicians (23.6%) worked in the Medical department, followed by Obstetrics and Gynaecology (16.0%), Paediatrics (19.8%), Surgery (14.2%), and Theatre (8.9%) (Table 2). Over half (52.5%) reported working 8–10 hours daily, while 35.8% worked more than 10 hours. In terms of patient load, 45.2% saw fewer than 10 patients per day, 42.6% saw 10–20 patients, and 12.2% attended to more than 20 patients daily. PPE availability was confirmed by 56.6%, and 67.5% reported the existence of hospital policies and protocols.

3.3 Prevalence of Stress, Anxiety, and Depression

The overall prevalence of stress, anxiety, and depression was 24.9% (95% CI: 0.21–0.29), 57.4% (95% CI: 0.52–0.62), and 36.0% (95% CI: 0.31–0.41), respectively (Table 3 and Figure 1). Among physicians with stress, 10.0% had mild, 9.5% moderate, and 5.3% extremely severe levels. Anxiety was most prevalent at moderate (17.0%) and severe (16.2%) grades, with 14.5% reporting extremely severe anxiety. Among those with depression, 9.9% had mild, 17.3% moderate, 5.1% severe, and 3.8% extremely severe depression.

3.4 Individual-Level Predictors of Stress, Anxiety, and Depression

Multiple logistic regression identified several significant individual-level predictors (Tables 5 and 6). For stress, physicians at KBTH had more than twice the odds compared to GARH counterparts (AOR=2.27; 95% CI: 1.08–4.81; p=0.031). Practising for 1–3 years was the strongest predictor (AOR=9.83; 95% CI: 3.51–27.50; p<0.001), while medical officer rank reduced odds by 79% (AOR=0.21; 95% CI: 0.07–0.62; p=0.005). For anxiety, KBTH assignment (AOR=1.95; p=0.005) and 4–6 years of practice (AOR=1.78; p=0.039) increased risk, while ≥7 years of experience was protective (AOR=0.29; p=0.001). For depression, KBTH physicians had 2.5-fold higher odds (AOR=2.50; p=0.003). A U-shaped age effect was observed: physicians aged 30–39 years were less likely to be depressed (AOR=0.31; p=0.005), while those aged 40–49 (AOR=3.74; p=0.042) and ≥50 years (AOR=32.88; p=0.010) had dramatically higher odds. Medical officer rank was strongly protective against depression (AOR=0.14; p<0.001), and early career stages (1–3 years: AOR=8.25; 4–6 years: AOR=7.40) were significantly associated.

3.5 Hospital-Level Predictors of Stress, Anxiety, and Depression

Hospital-related factors are presented in Tables 7 and 8. Patient volume was a consistent and strong predictor across all three outcomes. Compared with seeing fewer than 10 patients daily, seeing 10–20 patients increased the odds of stress (AOR=4.12; p<0.001), anxiety (AOR=3.84; p<0.001), and depression (AOR=3.68; p<0.001). Attending to more than 20 patients daily further amplified these risks (stress: AOR=6.38; anxiety: AOR=4.36; depression: AOR=5.93; all p<0.001). Regarding departmental placement, surgeons had lower anxiety odds compared to Allied department physicians (AOR=0.43; p=0.043), while theatre physicians had markedly higher anxiety odds (AOR=4.02; p=0.019). Unexpectedly, longer daily working hours (8–10 hours: AOR=0.05; >10 hours: AOR=0.04; both p<0.001) were associated with lower anxiety compared to those working fewer than 8 hours. Absence of hospital policies and protocols was associated with lower odds of anxiety (AOR=0.53; p=0.012) and depression (AOR=0.34; p<0.001) in adjusted models.

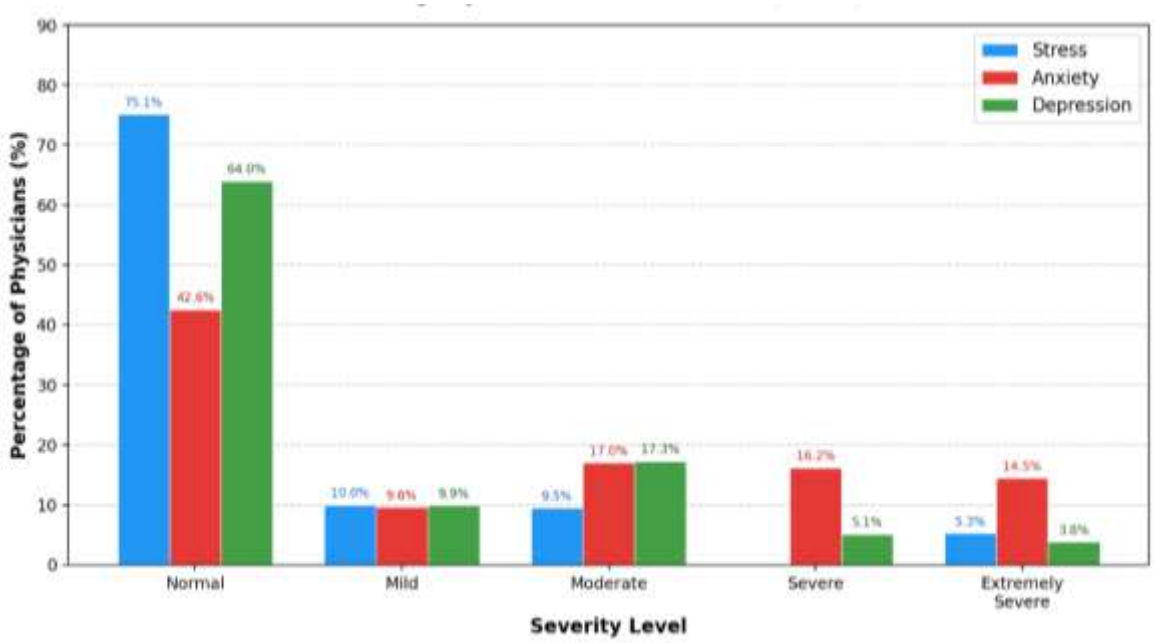

Figure 1: Severity Levels of Depression, Anxiety, and Stress among Physicians in GARH and KBTH (N=394)

Note: Percentages reflect proportions within the total sample (N=394). Severity levels derived from DASS-21 scoring guidelines.

Table 1: Demographic Characteristics of Physicians at GARH and KBTH (N=394)

Variable	**Frequency (N=394)**	**Percentage (%)**
Hospital		
GARH	118	30.0
KBTH	276	70.0
Age		
Mean age (SD)	30.3 (SD: 6.08)	—
<30 years	221	56.1
30–39 years	120	30.5
40–49 years	47	11.9
≥50 years	6	1.5
Sex		
Female	187	47.5
Male	207	52.5
Marital Status		
Single	244	61.9
Married	150	38.1

Variable	Frequency (N=394)	Percentage (%)
Highest Level of Education		
Bachelor's	282	71.6
Master's	85	21.6
PhD	27	6.9
Rank/Position		
House Officer	187	47.5
Medical Officer	112	28.4
Resident	35	8.9
Specialist	36	9.1
Consultant	24	6.1
Years of Practice		
<1 year	179	45.4
1–3 years	81	20.6
4–6 years	91	23.1
≥7 years	43	10.9

Footnote: GARH = Greater Accra Regional Hospital; KBTH = Korle-Bu Teaching Hospital; SD = Standard Deviation

Table 2: Workload, Access to PPE, Policies, and Departmental Distribution of Physicians at GARH and KBTH (N=394)

Variable	Frequency (N=394)	Percentage (%)
Department of Work		
Allied	69	17.5
Medical	93	23.6
Obstetrics & Gynaecology	63	16.0
Paediatrics	78	19.8
Surgery	56	14.2
Theatre	35	8.9
Average Working Hours per Day		
<8 hours	46	11.7
8–10 hours	207	52.5
>10 hours	141	35.8

Average Number of Patients per Day		
<10 patients	178	45.2
10–20 patients	168	42.6
>20 patients	48	12.2
Availability of Personal Protective Equipment (PPE)		
Available	223	56.6
Not Available	171	43.4
Access to Hospital Policies and Protocols		
Available	266	67.5
Not Available	128	32.5

Footnote: O&G = Obstetrics and Gynaecology; PPE = Personal Protective Equipment

Table 3: Prevalence of Stress, Anxiety, and Depression by Hospital among Physicians at GARH and KBTH

Variable	GARH n (%)	95% CI	KBTH n (%)	95% CI	Total n (%)	95% CI
Stress						
Not Present	99 (83.9%)	0.76–0.90	197 (71.4%)	0.66–0.76	296 (75.1%)	0.71–0.79
Present	19 (16.1%)	0.10–0.24	79 (28.6%)	0.24–0.34	98 (24.9%)	0.21–0.29
Anxiety						
Not Present	61 (51.7%)	0.43–0.61	107 (38.8%)	0.33–0.45	168 (42.6%)	0.38–0.48
Present	57 (48.3%)	0.39–0.57	169 (61.2%)	0.55–0.67	226 (57.4%)	0.52–0.62
Depression						
Not Present	89 (75.4%)	0.67–0.82	163 (59.1%)	0.53–0.65	252 (64.0%)	0.59–0.69
Present	29 (24.6%)	0.18–0.33	113 (40.9%)	0.35–0.47	142 (36.0%)	0.31–0.41

Footnote: GARH = Greater Accra Regional Hospital; KBTH = Korle-Bu Teaching Hospital; CI = Confidence Interval

Table 4: Association between Hospital and Individual Factors and Stress, Anxiety, and Depression among Physicians (Bivariate Analysis)

Variable	Stress n (%) [N=98]		Anxiety n (%) [N=226]		Depression n (%) [N=142]	
	n (%)	p-value	n (%)	p-value	n (%)	p-value
Department						
Allied	16 (16.3%)	0.534	41 (18.1%)	0.007*	22 (15.5%)	0.258
Medical	28 (28.6%)	—	49 (21.7%)	—	36 (25.4%)	—
O & G	15 (15.3%)	—	39 (17.3%)	—	27 (19.0%)	—
Paediatrics	20 (20.4%)	—	39 (17.3%)	—	27 (19.0%)	—
Surgery	9 (9.2%)	—	28 (12.4%)	—	14 (9.9%)	—
Theatre	10 (10.2%)	—	30 (13.3%)	—	16 (11.3%)	—
Average Working Hours						
<8 hours	11 (11.2%)	0.064	43 (19.0%)	<0.001*	19 (13.4%)	0.149
8–10 hours	61 (62.2%)	—	111 (49.1%)	—	81 (57.0%)	—
>10 hours	26 (26.5%)	—	72 (31.9%)	—	42 (29.6%)	—
Patients per Day						
<10	21 (21.4%)	<0.001*	78 (34.5%)	<0.001*	33 (23.2%)	<0.001*
10–20	56 (57.1%)	—	115 (50.9%)	—	79 (55.6%)	—
>20	21 (21.4%)	—	33 (14.6%)	—	30 (21.1%)	—
PPE Availability						
Available	56 (57.1%)	0.900	134 (59.3%)	0.211	79 (55.6%)	0.772
Not Available	42 (42.9%)	—	92 (40.7%)	—	63 (44.4%)	—

Policies and Protocols Available						
Yes	77 (78.6%)	0.007*	168 (74.4%)	0.001*	118 (83.1%)	<0.001*
No	21 (21.4%)	—	58 (25.7%)	—	24 (16.9%)	—

Footnote: O&G = Obstetrics and Gynaecology; PPE = Personal Protective Equipment; * = p ≤0.05

Table 5: Individual-Level Predictors of Stress, Anxiety, and Depression among Physicians — Crude Odds Ratios

Variable	**Stress COR (95% CI)**		**Anxiety COR (95% CI)**		**Depression COR (95% CI)**	
	COR (95% CI)	**p-value**	**COR (95% CI)**	**p-value**	**COR (95% CI)**	**p-value**
Hospital						
GARH (ref)	1	—	1	—	1	—
KBTH	2.09 (1.20–3.64)	0.009*	1.69 (1.09–2.61)	0.018*	2.13 (1.31–3.45)	0.002*
Age Group						
<30 years (ref)	1	—	1	—	1	—
30–39 years	0.68 (0.40–1.18)	0.169	0.70 (0.45–1.09)	0.114	0.39 (0.23–0.65)	<0.001*
40–49 years	1.79 (0.92–3.46)	0.085	1.19 (0.62–2.29)	0.602	1.13 (0.60–2.14)	0.701
≥50 years	1.00	—	0.67 (0.13–3.42)	0.634	1.40 (0.28–7.10)	0.683
Sex						
Female (ref)	1	—	1	—	1	—
Male	1.09 (0.69–1.71)	0.724	0.67 (0.44–1.00)	0.047*	1.06 (0.70–1.61)	0.769
Marital Status						
Single (ref)	1	—	1	—	1	—
Married	1.38 (0.87–2.20)	0.173	0.84 (0.56–1.26)	0.397	0.79 (0.51–1.21)	0.275
Education Level						
Bachelor's (ref)	1	—	1	—	1	—

Master's	0.64 (0.34–1.18)	0.153	0.99 (0.61–1.62)	0.980	0.95 (0.57–1.57)	0.836
PhD	2.38 (1.06–5.32)	0.035*	0.79 (0.36–1.73)	0.551	0.87 (0.38–2.00)	0.742
Rank/Position						
House Officer (ref)	1	—	1	—	1	—
Medical Officer	0.45 (0.23–0.87)	0.017*	0.96 (0.60–1.55)	0.869	0.43 (0.26–0.73)	0.002*
Resident	1.86 (0.87–4.00)	0.110	0.80 (0.38–1.64)	0.536	0.81 (0.38–1.70)	0.574
Specialist	4.42 (2.10–9.28)	<0.001*	0.67 (0.33–1.37)	0.272	0.98 (0.47–2.01)	0.949
Consultant	0.83 (0.29–2.35)	0.726	0.57 (0.24–1.33)	0.193	0.68 (0.28–1.68)	0.406
Years of Practice						
<1 year (ref)	1	—	1	—	1	—
1–3 years	2.64 (1.49–4.68)	0.001*	1.10 (0.65–1.89)	0.717	1.27 (0.75–2.17)	0.377
4–6 years	1.22 (0.67–2.23)	0.510	1.54 (0.91–2.62)	0.110	0.99 (0.59–1.68)	0.991
≥7 years	0.62 (0.24–1.59)	0.320	0.25 (0.12–0.52)	<0.001*	0.27 (0.11–0.68)	0.005*

Footnote: GARH = Greater Accra Regional Hospital; KBTH = Korle-Bu Teaching Hospital; COR = Crude Odds Ratio; ref = Reference category; — = Not applicable; * = p ≤0.05

Table 6: Individual-Level Predictors of Stress, Anxiety, and Depression among Physicians — Adjusted Odds Ratios

Variable	**Stress AOR (95% CI)**		**Anxiety AOR (95% CI)**		**Depression AOR (95% CI)**	
	AOR (95% CI)	**p-value**	**AOR (95% CI)**	**p-value**	**AOR (95% CI)**	**p-value**
Hospital						
GARH (ref)	1	—	1	—	1	—
KBTH	2.27 (1.08–4.81)	0.031*	1.95 (1.22–3.11)	0.005*	2.50 (1.35–4.63)	0.003*
Age Group						

<30 years (ref)	1	—	—	—	1	—
30–39 years	0.42 (0.16–1.05)	0.064	—	—	0.31 (0.14–0.70)	0.005*
40–49 years	2.45 (0.59–10.19)	0.220	—	—	3.74 (1.05–13.34)	0.042*
≥50 years	1	—	—	—	32.88 (2.29–471.45)	0.010*
Sex						
Female (ref)	1	—	1	—	1	—
Male	0.97 (0.56–1.68)	0.906	0.70 (0.46–1.07)	0.096	0.94 (0.58–1.52)	0.796
Rank/Position						
House Officer (ref)	1	—	—	—	1	—
Medical Officer	0.21 (0.07–0.62)	0.005*	—	—	0.14 (0.05–0.41)	<0.001*
Resident	1.37 (0.41–4.52)	0.607	—	—	0.39 (0.12–1.31)	0.128
Specialist	5.33 (0.98–29.03)	0.053	—	—	0.51 (0.12–2.19)	0.362
Consultant	0.85 (0.17–4.15)	0.843	—	—	0.28 (0.06–1.27)	0.100
Years of Practice						
<1 year (ref)	1	—	1	—	1	—
1–3 years	9.83 (3.51–27.50)	<0.001*	1.33 (0.76–2.32)	0.311	8.25 (2.94–23.14)	<0.001*
4–6 years	2.80 (0.73–10.70)	0.132	1.78 (1.03–3.08)	0.039*	7.40 (2.11–26.02)	0.002*
≥7 years	0.04 (0.00–1.11)	0.058	0.29 (0.13–0.61)	0.001*	0.15 (0.02–1.19)	0.072

Footnote: GARH = Greater Accra Regional Hospital; KBTH = Korle-Bu Teaching Hospital; AOR = Adjusted Odds Ratio; ref = Reference category; — = Not included in final model; * = p ≤0.05

Table 7: Hospital-Level Predictors of Stress, Anxiety, and Depression among Physicians — Crude Odds Ratios

Variable	Stress COR (95% CI)		Anxiety COR (95% CI)		Depression COR (95% CI)	
	COR (95% CI)	p-value	COR (95% CI)	p-value	COR (95% CI)	p-value
Department						
Allied (ref)	1	—	1	—	1	—
Medical	1.43 (0.70–2.91)	0.329	0.76 (0.41–1.43)	0.394	1.35 (0.70–2.60)	0.371
O & G	1.03 (0.46–2.32)	0.933	1.11 (0.55–2.23)	0.770	1.60 (0.79–3.26)	0.194
Paediatrics	1.14 (0.54–2.43)	0.730	0.68 (0.36–1.31)	0.253	1.13 (0.57–2.25)	0.726
Surgery	0.63 (0.26–1.57)	0.325	0.68 (0.34–1.39)	0.293	0.71 (0.32–1.57)	0.399
Theatre	1.33 (0.53–3.33)	0.550	4.10 (1.42–11.85)	0.009*	1.80 (0.78–4.15)	0.168
Working Hours per Day						
<8 hours (ref)	1	—	1	—	1	—
8–10 hours	1.33 (0.63–2.79)	0.451	0.08 (0.02–0.27)	<0.001*	0.91 (0.48–1.75)	0.785
>10 hours	0.72 (0.32–1.60)	0.420	0.07 (0.02–0.25)	<0.001*	0.60 (0.30–1.20)	0.150
Patients per Day						
<10 (ref)	1	—	1	—	1	—
10–20	3.74 (2.14–6.52)	<0.001*	2.78 (1.79–4.32)	<0.001*	3.90 (2.40–6.33)	<0.001*
>20	5.81 (2.80–12.06)	<0.001*	2.82 (1.43–5.56)	0.003*	7.32 (3.65–14.69)	<0.001*
PPE Availability						
Available (ref)	1	—	1	—	1	—
Not Available	0.97 (0.61–1.54)	0.900	0.77 (0.52–1.16)	0.211	1.06 (0.70–1.61)	0.772
Policies and Protocols Available						
Available (ref)	1	—	1	—	1	—

Not Available	0.48 (0.28–0.82)	0.008*	0.48 (0.32–0.74)	0.001*	0.29 (0.17–0.48)	<0.001*

Footnote: O&G = Obstetrics and Gynaecology; PPE = Personal Protective Equipment; COR = Crude Odds Ratio; ref = Reference; * = p ≤0.05

Table 8: Hospital-Level Predictors of Stress, Anxiety, and Depression among Physicians — Adjusted Odds Ratios

Variable	**Stress AOR (95% CI)**		**Anxiety AOR (95% CI)**		**Depression AOR (95% CI)**	
	AOR (95% CI)	**p-value**	**AOR (95% CI)**	**p-value**	**AOR (95% CI)**	**p-value**
Department						
Allied (ref)	—	—	1	—	—	—
Medical	—	—	0.66 (0.32–1.35)	0.254	—	—
O & G	—	—	0.83 (0.37–1.86)	0.655	—	—
Paediatrics	—	—	0.52 (0.24–1.19)	0.094	—	—
Surgery	—	—	0.43 (0.19–0.97)	0.043*	—	—
Theatre	—	—	4.02 (1.26–12.82)	0.019*	—	—
Working Hours per Day						
<8 hours (ref)	1	—	1	—	—	—
8–10 hours	1.05 (0.47–2.32)	0.910	0.05 (0.01–0.16)	<0.001*	—	—
>10 hours	0.44 (0.18–1.04)	0.061	0.04 (0.01–0.15)	<0.001*	—	—
Patients per Day						
<10 (ref)	1	—	1	—	1	—
10–20	4.12 (2.31–7.33)	<0.001*	3.84 (2.28–6.46)	<0.001*	3.68 (2.25–6.04)	<0.001*
>20	6.38 (2.91–13.99)	<0.001*	4.36 (2.06–9.24)	<0.001*	5.93 (2.91–12.06)	<0.001*
Policies and Protocols Available						

Available (ref)	1	—	1	—	1	—
Not Available	0.61 (0.36–1.12)	0.119	0.53 (0.33–0.87)	0.012*	0.34 (0.20–0.59)	<0.001*

Footnote: AOR = Adjusted Odds Ratio; — = Not retained in the final model; * = p ≤0.05

4.0 DISCUSSION

This cross-sectional study utilised the validated DASS-21 instrument to characterise the prevalence and predictors of stress, anxiety, and depression among physicians at two major referral hospitals in Accra, Ghana. The findings reveal a substantial psychological burden: 24.9% of physicians experienced stress, 57.4% anxiety, and 36.0% depression. These rates exceed those reported among Ghanaian healthcare workers in multicentre studies (Lovibond & Lovibond, 1995; Ofori et al., 2021) and among Malaysian emergency physicians (Yahaya et al., 2018), potentially attributable to differences in study populations, timing relative to the COVID-19 pandemic, and institutional context. The figures align more closely with studies of resident doctors in Indian teaching hospitals, who reported stress, anxiety, and depression prevalence of 24.2%, 36.6%, and 27.7%, respectively (Dave et al., 2018).

Anxiety emerged as the most prevalent disorder, underscoring the acute need for targeted screening and intervention programmes. KBTH physicians experienced significantly higher odds of all three conditions compared to GARH counterparts, consistent with the greater case complexity, academic obligations, and systemic pressures inherent to large teaching hospital environments. This finding reinforces the need for differentiated mental health strategies that account for institutional type.

Younger physicians (<30 years) and those in the early stages of their careers exhibited higher stress and depression, consistent with prior research linking early-career transitions to elevated psychological distress (Yahaya et al., 2018; Iqbal et al., 2015; Beyond Blue, 2019). Physicians with 1–3 years of experience had nearly tenfold higher odds of stress, and those with 1–6 years had markedly increased odds of depression. This pattern likely reflects the challenges of transitioning from medical school to independent clinical practice, including longer working hours, unfamiliar clinical responsibilities, and personal life pressures (Dyrbye et al., 2014; Costa et al., 2014; Small, 1981). A U-shaped age–depression relationship emerged: doctors aged 30–39 years had lower odds of depression (AOR=0.31), while those aged ≥50 faced dramatically elevated risk (AOR=32.88). This latter finding may reflect the cumulative weight of career-long occupational stressors compounded by personal responsibilities.

Patient volume was consistently among the strongest predictors of poor mental health across all three outcomes, with physicians attending to more than 20 patients daily facing 4.4 to 6.4-fold higher odds of anxiety, stress, and depression. These findings align with the broader literature linking

excessive caseloads to psychological strain and burnout among physicians (Shanafelt et al., 2012; Hsu et al., 2019). System- level responses — including workload redistribution, enhanced referral pathways, and staff augmentation — are imperative.

The counterintuitive finding that working 8–10 or more than 10 hours was associated with lower anxiety than working fewer than 8 hours warrants cautious interpretation. This may reflect a survivor bias, whereby physicians with high anxiety take sick leave or reduce their hours, thus appearing in the shorter-hours group. Alternatively, those working fewer hours may do so involuntarily due to non-clinical duties, administrative obligations, or interpersonal conflicts — factors that independently elevate anxiety. Qualitative investigation is needed to disentangle this finding.

Departmental placement shaped anxiety risk, with theatre physicians at 4.0-fold higher odds compared to those in Allied departments, and surgeons exhibiting a protective effect (AOR=0.43). The high-acuity, high-stakes, and rapid-decision environment of operating theatres likely drives heightened anxiety, while surgeons' specialised training and team autonomy may be protective. These departmental differences affirm the importance of speciality-specific mental health support strategies (Ofori et al., 2021; Dave et al., 2018).

The association between absence of institutional policies and protocols and lower odds of anxiety and depression — while counterintuitive — may reflect the perceived inadequacy of existing protocols rather than a genuine protective effect of policy absence. Where protocols exist but are poorly implemented or misaligned with real-world clinical needs, physicians may experience additional administrative burden without commensurate support, increasing distress. Perceived organisational support, rather than the mere existence of policies, appears to be the operative mechanism in the literature (McKinley et al., 2020; Grover et al., 2018; Dingens, 2022; Sarabi et al., 2022; Reitz et al., 2021).

4.1 Limitations

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference; longitudinal studies are needed to establish temporality. Second, the DASS-21 is a self-report instrument, introducing potential social desirability and response bias. Third, the study did not adjust for pre-existing mental health diagnoses, which could confound the outcome measures. Fourth, although the two selected hospitals were the largest in the region, findings may not be generalisable to smaller district or private hospitals. Future studies should incorporate clinician-administered diagnostic instruments and expand to broader healthcare settings across Ghana.

5.0 CONCLUSION

This study documents a considerable burden of psychological distress among physicians working in Ghana's principal referral hospitals, with anxiety affecting more than half of the study population and

depression affecting more than one in three. Key predictors include assignment to a teaching hospital environment, early career stage, high patient volume, and inadequate institutional support structures. These findings call for urgent, multi-level interventions tailored to career stage, institutional context, and workload: robust mental health screening programmes, structured peer support for house officers and early-career physicians, workload redistribution policies, and senior leadership commitment to physician wellness. Protecting physicians' well-being is not only a professional imperative but a prerequisite for sustaining a functional and high-quality healthcare system in Ghana.

DECLARATIONS

Ethics Approval and Consent to Participate

Ethical approval was obtained from the Ghana Health Service Ethics Review Committee (GHS-ERC:056/05/23) and the Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-IRB 00111/2023). Informed consent was obtained from all participants, and anonymity and confidentiality were maintained throughout.

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Conflicts of Interest

The authors declare no competing interests.

Authors' Contributions

EOW and HAB conceptualised the study. EOW, HAB, and TAA designed the methodology. Data collection was led by MYO, CKA, and YKA. Statistical analysis was conducted by EOW, CKA, YKA, CLN, and AA. EOW drafted the initial manuscript. All authors reviewed, revised, and approved the final version.

Data Availability

The dataset will be made available upon reasonable request to the corresponding author (habonful@ug.edu.gh).

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