

Prevalence and determinants of depression among primary healthcare workers in Jeddah, Saudi Arabia 2020

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ABSTRACT

Objectives: To estimate the prevalence and assess the levels of depression among primary healthcare workers (HCWs) and to explore the associated determinants. **Methods:** A multicenter, cross-sectional study was carried out at 10 primary healthcare centers (PHCCs) in Jeddah, Saudi Arabia (October 2020–December 2020) involving care- and non-care-related professions. A Patient Health Questionnaire-9 (PHQ-9) and two levels of depression severity were considered and analyzed separately as dependent variables, including moderately severe or severe (Level 1 depression, PHQ-9 score ≥ 15); and moderate-to-severe (Level 2 depression, PHQ-9 score ≥ 10) for screening depression. Demographic and professional factors and the presence of stressors in different life dimensions were analyzed as independent variables. **Results:** We received 256 valid participations with a female ratio = 2.56 and mean (SD) age = 35.7 (6.9) years. Nurses represented 43.8%, followed by physicians (21.1%), and dentists (13.3%). More than half were work stressors (52.7%), followed by social (30.5%), and health stressors (19.9%). The prevalence of Level 1 depression was 19.1% (95% CI = 14.5–24.5%), and was independently determined by female gender (odds ratio [OR] = 4.66, $P = 0.006$) and work stressors (OR = 3.08, $P = 0.025$). The prevalence of Level 2 depression (moderate-to-severe) was 36.3% (95% CI = 30.4–42.6%), and was independently determined by female gender (OR = 2.57, $P = 0.013$), work stressors (OR = 3.71, $P = 0.004$), and dentist position (OR = 4.12, $P = 0.008$). **Conclusion:** Primary care professionals are exposed to a high risk of depressive disorders, with significant contribution of work stressors. The issues related to psychological health and its relation to the working environment should be part of the organizational culture in all health institutions, both at the staff and managerial levels.

Keywords: Depression, healthcare provider, primary care, stressor

Introduction

Healthcare professionals are exposed to high levels of occupational stress associated with a high prevalence of anxiety and depression disorders.^[1,2] Depression among healthcare

workers (HCWs) has significant public health implications owing to the nature of the profession and its relation with assisting in others' health. Furthermore, depressed HCWs are exposed to specific hazards, notably the risk of malpractice and medication errors, which compromise patients' health in addition to their exposure to substance misuse and suicide.^[3–7] This study estimated the prevalence, assessed the levels, and explored the determinants of depression among primary HCWs in Jeddah, Saudi Arabia.

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Methods

Design and setting

A cross-sectional study was carried out at the Ministry of Health (MoH) primary healthcare centers (PHCCs), in Jeddah, Saudi Arabia, from October 2020 to December 2020. The study protocol was reviewed and approved by the Ethical Research Committee of the MoH. Further permissions were obtained from the administrators of the participating PHCCs.

Jeddah is one of the major cities in Saudi Arabia. It has 47 PHCCs organized into five sectors, each related to a tertiary hospital. The PHCCs provide preventive, promotive, and curative services for the general population.

Population

The study targeted all physicians, nurses, pharmacists, lab technologists, physiotherapists, social workers, other healthcare providers, and administrators, who were regularly working in the included PHCCs during the study period. The temporary staff and HCWs on sick leave were excluded.

Sampling

The sample size for a single proportion was computed using an online sample size calculator (Raosoft.com). The following parameters were used—target population size: 1,000; proportion to be detected: unknown (50%); confidence interval: 95%; statistical power: 80%; type 1 error: 0.05. The calculated sample size was 278 participants, which was increased by 10% to compensate for eventual non-responders or incomplete participation. Thus, the total sample size was rounded to 300 participants.

A stratified cluster sampling was used to include 10 PHCCs, distributed as 2 PHCCs (clusters) from each sector (stratum), which were selected using a simple random generator. We targeted an equivalent number (~30) of participants by PHCC.

Tools

A structured questionnaire consisting of three sections was used to collect data. Section one comprised demographic factors including age, gender, marital status, number of children, and monthly income. Section two comprised professional factors including position (physician, nurse, etc.), years of experience, duration of work in the current PHCCs, the average number of patients attended in a day, number of workers in the department, working schedule (full time vs. part time), and working hours (day time, night time, shifts, or changing). Section three included screening for depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9). It consisted of a 9-item self-administered questionnaire that captures the frequency of a set of depression-related symptoms such as the feeling of hopelessness, loss of appetite, trouble concentrating, etc. The scale enables the calculation of a score (range = 0–27), indicating the depression severity level. Five levels of depression are defined:

minimal (PHQ-9 score = 1–4), mild (5–9), moderate (10–14), moderately severe (15–19), and severe (20–27). The PHQ-9 was validated in several populations including the healthcare workers.^[8] A validated Arabic translation of the PHQ-9^[9] was also used, and the participants were offered the possibility to use either version as per preference. Section four of the tool explored the presence (yes vs. no) of significant stressors in different life domains including social-, work-, or health-related stressors as well as those related to economic status or any other relevant dimension. The questionnaire underwent face and content validity before administration.

Procedure

The research team presented to the included PHCCs during workdays and hours. The questionnaires were distributed to the eligible HCWs, who were identified and reached with the help of the PHCC administration. The investigator presented the study objectives in brief and collected verbal consent from the participants. The questionnaires were collected 2 days later from the PHCC administrators. The data collection process took place from October 2020 to December 2020.

Statistical methods

Statistical analysis was performed with the Statistical Package for Social Sciences version 21.0 for Windows (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to present the patterns of answers to the questionnaire sections; categorical variables were presented as frequency and percentage, while continuous variables were presented as mean $\pm$ standard deviation (SD). Independent t-test was used for inter-group comparison of continuous variables with normal distribution, and Chi-square test was used to analyze the association between two categorical variables. The levels of depression were dichotomized to calculate the prevalence of moderately severe or severe depression (Level 1: PHQ-9 score ≥ 15) and the prevalence of moderate-to-severe depression (Level 2: score ≥ 10). Multivariate binary logistic regression was used to analyze independent factors of depression using the two previously defined levels. The results are presented as odds ratio (OR) with 95% CI. A *P* value of < 0.05 was considered to reject the null hypothesis.

Results

Participants' characteristics

We received 256 complete participations out of 280 distributed questionnaires (response rate = 91.4%). The demographic and professional characteristics of the participants are depicted in Table 1 and Table 2, respectively. The female ratio was 2.56. The mean (SD) age was 35.7 (6.9) years. A majority of the participants were married (72.3%) and had children (68.4%). Professionally, nurses represented 43.8%, followed by physicians (21.1%), and dentists (13.3%). More than half the participants had 10 years of cumulative experience (54.7%), and half have been working in the same PHCC for at least 3 years (50.4%).

Levels of depression and life stressors

The prevalence of Level 1 depression (moderately severe or severe) was 19.1% (95% CI = 14.5–24.5%), while the prevalence of Level 2 depression (moderate-to-severe) was 36.3% (95% CI = 30.4–42.6%). The most reported life stressors included work stressors (52.7%), followed by social (30.5%), and health stressors (19.9%) [Table 3].

Clinical significance of self-reported depression

Of the participants, 175 (68.4%) described themselves as being depressed, and this was correlated with the levels

Table 1: Demographic factors (n=256)

Parameters	Category	Frequency	Percentage
Age	Mean, SD	35.7	6.9
Gender	Male	72	28.1
	Female	184	71.9
Marital status	Single	54	21.1
	Married	185	72.3
	Divorced	13	5.1
	Widowed	4	1.6
Number of children	None	81	31.6
	1-2	75	29.3
	3-4	75	29.3
	5+	25	9.8
Monthly income (SAR)	≤10 k	56	21.9
	>10 k	200	78.1

Table 2: Professional factors (n=256)

Parameters	Category	Frequency	Percentage
Position	Physician	54	21.1
	Nurse	112	43.8
	Dentist	34	13.3
	Pharmacist	22	8.6
	Lab/Radiology technician	14	5.5
	Psychologist/Social worker	12	4.7
	Other	8	3.1
Years of experience after graduation	<3 years	39	15.2
	3-9 years	77	30.1
	10 years and more	140	54.7
Duration of work in current center	<1 year	46	18.0
	1-2 years	81	31.6
	3-5 years	60	23.4
	>5 years	69	27.0
No. of patients seen per day	Up to 20	73	28.5
	20-40	74	28.9
	40-60	62	24.2
	>60	47	18.4
No. of workers in the department	Alone	45	17.6
	>1	211	82.4
Schedule	Full time	251	98.0
	Part time	5	2.0
Working hours	Day time	200	78.1
	Night time	6	2.3
	Shifts (day/Night)	24	9.4
	Changing	26	10.2

of depressions as determined using the PHQ-9 scale. The prevalence of self-reported depression ranged from 47.6% in the participants having minimal depression (PHQ-9 score = 1–4) to 92.1% in those with moderately severe depression (PHQ-9 score 15–19), and the difference was statistically significant ($P < 0.001$) [Table 4, Figure 1].

Factors associated with depression

The prevalence of both levels of depression was higher among females compared to males (Level 1: 24.5% vs. 5.6%, $P < 0.001$; Level 2: 42.4% vs. 20.8%, $P = 0.001$). The prevalence of Level 2 depression was highest among dentists (47.1%), followed by nurses (41.1%), and physicians (37.0%), compared with other HCWs (19.6%) ($P = 0.023$) [Table 5].

The presence of work stressors was associated with a higher prevalence of both moderately severe depression (28.9% vs. 8.3, $P < 0.001$) and moderate depression (52.6% vs. 18.2%, $P < 0.001$), compared to the absence of the stressor, respectively. On the other hand, the presence of social stressors was only associated with moderate depression (51.3% vs. 29.8%, $P = 0.001$), compared with the absence of the stressor. The number of cumulative stressors was positively correlated with the prevalence of both moderately severe depression and moderate depression [Table 6].

Predictors of depression

Level 1 depression was independently determined by female gender (OR = 4.66, $P = 0.006$) and the presence of work stressors (OR = 3.08, $P = 0.025$). Level 2 depression was independently determined by female gender (OR = 2.57, $P = 0.013$), the presence of work stressors (OR = 3.71, $P = 0.004$), and dentist position (OR = 4.12, $P = 0.008$); however, the reference category for job position did not reach the statistical significance ($P = 0.066$) [Table 7].

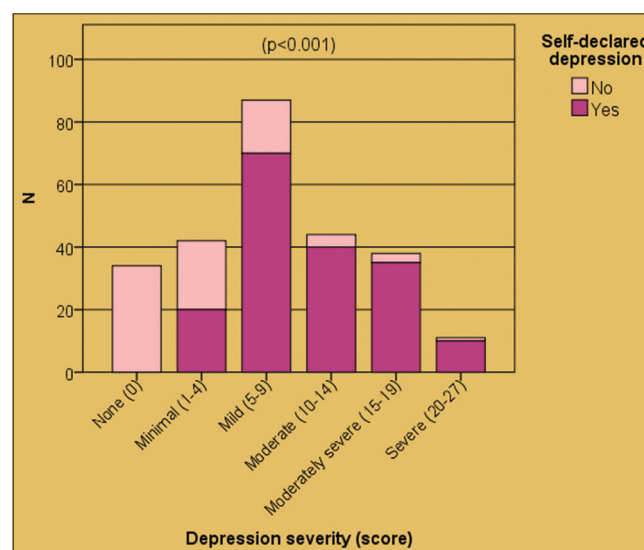


Figure 1: Measured and self-declared depression

Table 3: Levels of depression and perceived stressors (n=256)

Parameter	Frequency	Percentage
Depression severity		
None (0)	34	13.3
Minimal (1-4)	42	16.4
Mild (5-9)	87	34.0
Moderate (10-14)	44	17.2
Moderately severe (15-19)	38	14.8
Severe (20-27)	11	4.3
Level 1 Depression (15-27)	49	19.1
Level 2 Depression (10+)	93	36.3
Stressors		
Social stressors	78	30.5
Work stressors	135	52.7
Health stressors	51	19.9
Intrinsic stressors	2	0.8
COVID-19-related stress	4	1.6
Economic status	2	0.8
No. of stressors		
0	72	28.1
1	111	43.4
2	59	23.0
3+	14	5.5

Table 4: Correlation between the severity of measured depression and the perceived (self-declared) depression

Level of depression	Total n, %	Perceived depression		P
		No, n (%)	Yes, n (%)	
None (0)	34 (13.3)	34 (100.0)	0 (0.0)	<0.001
Minimal (1-4)	42 (16.4)	22 (52.4)	20 (47.6)	
Mild (5-9)	87 (34.0)	17 (19.5)	70 (80.5)	
Moderate (10-14)	44 (17.2)	4 (9.1)	40 (90.9)	
Moderately severe (15-19)	38 (14.8)	3 (7.9)	35 (92.1)	
Severe (20-27)	11 (4.3)	1 (9.1)	10 (90.9)	

Discussion

Summary of findings

The psychological well-being of HCWs is a vital element for the healthiness and viability of the healthcare system. This multicenter study found a high prevalence of depression among HCWs in PHCCs, accounting for 19.1% of the participants, by considering moderately severe or severe depression, and 36.3% by considering moderate-to-severe depression. However, by including mild scores (PHQ-9 5–9), the prevalence of depression rose to 70.3%, which is an extremely high rate. The females had approximately a five-fold risk of depression than males, and the presence of perceived work stressors increased the risk by three-fold; both factors were significant in an independent fashion. Further, the prevalence of depression was higher among professions directly involved in patient care, including physicians, nurses, and dentists; however, this association was only significant in bivariate analysis.

The burden of depression

Depression is a common psychiatric illness affecting more than 260 million people worldwide and is considered a major cause of disability with a substantial and rising burden globally.^[10] In 2015, the World Health Organization estimated the prevalence of depression to be 44 per 1,000 individuals with a higher prevalence among women (5.1%) than in men (3.6%) and great regional variability.^[11] According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), depression is defined by the occurrence during at least 2 weeks of depressed mood or loss of interest or pleasure, concomitant to at least four out of seven other somatic and non-somatic symptoms such as loss of appetite, sleep disturbance, feeling of guilt, and thought of self-harm or suicide.^[12] Suicide represents the major health risk related to depression, and suicide attempts were reported in more than one out of five depressive patients.^[13]

Depression in HCWs versus the Saudi population

The rates of depression among the PHCC HCWs observed in this study are higher than those reported in the PHCC patient population and other subgroups from the Saudi population. A study by Al-Dabal *et al.*^[14] estimated the prevalence of depression among 680 attendees of nine PHCCs in Al Khobar city in the eastern province of Saudi Arabia, using the same tool used in this study, that is, PHQ-9. The authors reported a prevalence of 16.1% by considering moderate and severe depression, which is more than two times the prevalence found in our study. Another study by Becker *et al.*,^[15] from Riyadh, the capital of Saudi Arabia, involved 431 primary care patients and found a 20% prevalence of depression using the PHQ-9 scale. Another study from Riyadh city by Al-Qadhi enrolled 477 patients from three primary care centers and found 18.8% of depression using the PHQ-9 scale; these included 13.4% moderate, 4.4% moderately severe, and 1.0% severe forms.^[16] Similar data were observed in migrant workers in the Al-Qassim region, where Nadim *et al.*^[17] used the Center for Epidemiological Studies on Depression (CES-D) scale among 400 participants and found a 20% prevalence of depression. On the other hand, the levels of depression found in the present study are comparable to those found in patients with chronic pain. A study by Al-Maharbi *et al.*^[18] screened for depressive symptoms among 200 patients with different chronic pain syndromes using the PHQ-9 scale. The authors found that 40.5% of the patients had moderate-to-severe depression, which was distributed as moderate (20.5%), moderately severe (15.5%), and severe (4.5%). These figures are comparable with the observed data in this study, which may indicate an ongoing malaise or discomfort among the PHCC HCWs. Nonetheless, the interpretation of these findings should take into consideration the fact that the present study was conducted during the coronavirus disease (COVID-19) crisis, which exerted high levels of stress, role conflict, and feelings of fear and isolation on the PHCC HCWs, notably those working in the COVID-19-designated centers.^[19,20]

Table 5: Factors associated with depression

Table 5: Factors associated with depression					
Factor	Level	Level 1 Depression (PHQ-9 score ≥15)		Level 2 Depression (PHQ-9 score ≥10)	
		Rate	P	Rate	P
Demographic factors					
Gender	Male	5.6		20.8	
	Female	24.5	<0.001*	42.4	0.001*
Marital status	Single	14.8		29.6	
	Married	19.5		37.3	
	Divorced	30.8		38.5	
No. of children	Widowed	25.0	0.596	75.0	0.929
	None	13.6		33.3	
	1-2	21.3		36.0	
	3-4	24.0		36.0	
	5+	16.0	0.368	48.0	0.616
	Monthly income (SAR)	≤10 k	17.9		33.9
	>10 k	19.5	0.782	37.0	0.673
Professional factors					
Position	Physician	24.1		37.0	
	Nurse	20.5		41.1	
	Dentist	26.5		47.1	
	Others	7.1	0.061	19.6	0.023*
Years of experience after graduation	<3 years	12.8		28.2	
	3-9 years	22.1		37.7	
	10 years and more	19.3	0.487	37.9	0.519
Duration of work in current center	<1 year	13.0		32.6	
	1-2 years	19.8		38.3	
	3-5 years	16.7		31.7	
	>5 years	24.6	0.439	40.6	0.680
No. of patients seen per day	Up to 20	21.9		41.1	
	20-40	12.2		25.7	
	40-60	25.8		43.5	
	>60	17.0	0.203	36.2	0.125
No. of workers in the department	Alone	24.4		40.0	
	>1	18.0	0.319	35.5	0.537
Schedule	Full time	18.7		35.5	
	Part time	40.0	0.244 ^F	80.0	0.060 ^F
Working hours	Day time	17.5		35.5	
	Night time	16.7		50.0	
	Shifts (day/Night)	25.0		37.5	
	Changing	26.9	0.589	38.5	0.894

*Statistically significant result ($P < 0.05$); test used: ^F Fisher's exact test otherwise Chi-square test was used

Prevalence of depression in HCWs

Depression results in functional impairment in both social and professional lives, which further impacts the quality of life of patients and their relatives, and compromises their career and economic status.^[21-24] Nonetheless, the relation between job environment and depression is intricate and mutually causative. The primary health care centers comprise a wide range of professions with different duties, responsibilities, and schedule practices, presenting a broad array of psychological stressors and risk factors.

In Saudi Arabia, most research that has evaluated the mental health of the HCWs has been conducted in hospitals or focused on specific professions. A study by Alshardi and Farahat involving medical residents, in the Western region of Saudi Arabia, reported

a prevalence of moderate-to-severe depression as high as 40%, while severe depression accounted for 6%.^[25] These figures are compatible with those reported in the present study, notably by considering the subpopulation of physicians, among whom 37.0% had moderate-to-severe depression. In the Holy City of Makkah, which is in the same region of the country, Raffah and Alamir used the Beck Depression Inventory (BDI) scale and estimated that 29% of the physicians working in the PHCCs had mild or moderate depressive symptoms, while none had severe depression.^[26] This figure is relatively lower compared with our findings as well as with those from the previously mentioned study, although the populations are comparable (physicians). This relative inconsistency may be related to the use of a different scale with a different level of sensitivity and specificity. On the other hand, by using the Depression Anxiety Stress Scale-21 item (DASS-21), Saquib *et al.*^[27] estimated the prevalence

of depression among expatriate nurses in the Al-Qassim region. The authors found that 40.5% of the participants had mild-to-moderate depressive symptoms, while 13.3% had severe depression. These figures are consistent with the data reported in this study. By using the Hospital Anxiety and Depression scale (HADS), Abbas *et al.*^[28] screened for depression among 715 nurses working in PHCC in Riyadh city. The results showed that 25% of the nurses had depression scores of 8 or higher indicating a high risk of depression of which 10% were classified as probable clinical cases of depression. Click or tap here to enter text. Relatively lower levels of depression were observed among undergraduate students from different medical sciences faculties in Riyadh city, including medicine, nursing, dentistry, and others. The study used the BDI-II, and found that 25% of the participants had moderate or severe depression, while 21% had mild depressive symptoms.^[29]

Table 6: Association of depression with life stressors

Factor	Level	Moderately severe depression		Moderate depression	
		Rate	P	Rate	P
Social stressors	No	17.4		29.8	
	Yes	23.1	0.289	51.3	0.001*
Work stressors	No	8.3		18.2	
	Yes	28.9	<0.001*	52.6	<0.001*
Health stressors	No	17.1		34.6	
	Yes	27.5	0.092	43.1	0.259
No. of stressors	None	5.6		12.5	
	1	21.6		39.6	
	2	23.7		49.2	
	3+	50.0	<0.001*	78.6	<0.001*

*Statistically significant result ($P < 0.05$)

Internationally, Eusof-Izzudin found comparable figures among Malaysian HCWs in PHCCs. The authors used the PHQ-9 scale and found the prevalence of depression as high as 38%.^[30] In Australia, 32.4% prevalence of depressive symptoms was found in a cohort of healthy nurses, who were free of any chronic disease, medication use, smoking, or alcohol consumption. The study used the DASS-42 scale and the depression severity levels were distributed as mild/moderate (21.6%), severe (4.9%), and extremely severe (5.9%).^[2] It is to note that the rates of depression found using these self-administered tools may be overestimated, and the consultation of a specialist is required to confirm the diagnosis and to start appropriate management. A study from Brazil estimated that 12.0% of the physicians working in public healthcare had depression as diagnosed by another physician.^[31]

The relevance of depression and other mental disorders among the HCWs has a great significance at the public health levels, and may lead to impaired performance and shortage in the healthcare personnel due to burnout and absenteeism. A systematic review by Elbarazi *et al.*, estimated the prevalence of burnout among HCWs in 19 studies from the Arab countries of which seven were from Saudi Arabia. The findings showed up to 81.0% prevalence of emotional exhaustion, up to 80.0% prevalence of depersonalization, and up to 85.8% prevalence of low personal accomplishment, being the three subscales of the Maslach Burnout Inventory scale.^[32] By focusing on emotional exhaustion, studies from Saudi Arabia showed discrepant figures ranging from 29.5% in primary healthcare doctors in the Asir Province^[33] to 54.0% in the physicians working in a tertiary care hospital in Riyadh.^[34] This emphasizes the urgent need to enhance the work environment in healthcare institutions to promote psychological

Table 7: Predictors of depression

Predictor	Level	OR	95% CI		P
Moderately severe or severe depression (PHQ-9 score 15-27)					
Gender	Male	Ref	-	-	-
	Female	4.66	1.56	13.87	0.006*
Work stressor	Yes	3.08	1.15	8.24	0.025*
No. of stressors	0	Ref	-	-	0.410
	1	1.81	0.47	6.93	0.388
	2	1.53	0.34	6.87	0.581
	3+	3.87	0.65	22.97	0.137
Moderate or severe depression (PHQ-9 score 10+)					
Gender	Male	Ref	-	-	-
	Female	2.57	1.22	5.39	0.013*
Position	Physician	1.72	0.66	4.43	0.265
	Nurse	1.82	0.79	4.21	0.159
	Dentist	4.12	1.46	11.63	0.008*
	Others	Ref	-	-	0.066
Social stressor	Yes	1.72	0.67	4.38	0.256
Work stressor	Yes	3.71	1.52	9.03	0.004*
No. of stressors	0	Ref	-	-	0.571
	1	1.57	0.53	4.60	0.415
	2	1.32	0.27	6.50	0.733
	3+	3.08	0.35	27.50	0.313

Multivariate binary logistic regression; OR: Odds ratio; 95% CI: 95% confidence interval. *Statistically significant result ($P < 0.05$)

health and well-being among HCWs, and such measures should be a top priority for administrators and decision-makers.

Determinants of depression among HCWs

The present study identified female gender and the presence of work stressors as major risk factors of depression among the HCWs in the PHCCs by considering both levels of depression that were investigated. The importance of work stressors and factors related to the work environment are consistently reported in the literature, whereas the gender effect is variable. Consistent with our findings, Raffah and Alamir reported twice as high a prevalence of depression among female physicians (46.2%) with reference to males (21.9%) and the difference was statistically significant. Additionally, the authors found a greater workload among depressed physicians, indicated by a higher number of patients seen per day (an average of 12 patients more), with reference to non-depressed physicians.^[26] In line with these observations, a study by Saquib *et al.*^[27] demonstrated that the prevalence of depression among nurses was determined by their job satisfaction including salary, workload, and teamwork, and job dissatisfaction was independently associated with up to a three-fold risk of depression in a dose-response fashion. In the study by Abbas *et al.*,^[28] depression among nurses was significantly associated with male gender (26.5% vs. 7.4%), widowed status (18.2% vs. 10% or less), sedentary lifestyle (12.8% vs. 8.0%), and active smoking (31.7% vs. 7.6%) compared to their counterparts, respectively ($P < 0.05$); however, the adjusted analysis showed working duration at the PHCC (OR = 1.14, $P = 0.04$) and non-smoking (OR = 0.33, $P = 0.01$) as being the only independent factors of depression. In Malaysia, the likelihood of depression was higher among the males (55.2% vs. 35%) and assistant medical officers (70.6% vs. 38.3% or lower) in unadjusted analysis; however, only long working hours (10 hours or more) were significant in adjusted analysis associated with a three-fold risk of depression with reference to fewer working hours.^[30] These observations further demonstrate the importance of enhancing the quality of work-life and job satisfaction to prevent psychological suffering and mental morbidity among the HCWs.

Limitations

The present study is principally limited by the performance of the PHQ-9 scale and secondarily by its concomitance with the COVID-19 crisis.

Conclusion

Primary care professionals are exposed to a high risk of depressive disorders. This risk is further increased in the professionals involved directly in patient care. The prevalence of depression among the HCWs is independently associated with the presence of work stressors that should be thoroughly explored to conduct the corrective measures accordingly. Particularly, attention should be given to dentists and females. Continuous monitoring and improvement of working environment are

warranted in the PHCCs to promote psychological health and well-being among the HCWs. Healthcare professionals should be educated regarding occupational risks and their relation to psychological health. Such measures should be integrated into the organizational culture of the health institution and should be encouraged by the health authorities.

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Conflicts of interest

There are no conflicts of interest.

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