



## Research article

## Factors associated with depression and determining dimensions of job satisfaction among physicians in Bangladesh

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## ABSTRACT

**Background:** Depression in physicians emerges early in their academic and professional careers. Lengthy and irregular duty time, high levels of obligation, job dissatisfaction, workstation culture, organizational rules, and so on significantly increased the psychological pressure on physicians.**Objectives:** The study's aim was to measure the level of depression, association, and influence of socio-demographic characteristics and job satisfaction on depression among physicians in Bangladesh, as well as to explore the factor structure of job satisfaction measure and examine its internal reliability.**Methods:** Data were collected using a self-administered questionnaire in a cross-sectional survey of 301 physicians. The factors related to depression were investigated using a multivariable logistic regression model, and factor analysis was done to identify the important factors associated with job satisfaction.**Results:** Male respondents made up 49.5 percent of the sample overall, while female respondents made up 50.5 percent. 24.58% of the physicians had mild depression, whereas 13.29%, 7.31%, and 0.66% of the participants had moderate, moderately severe, and severe depression, respectively. In multivariable analysis, sex (male vs. female, AOR: 2.16, 95% CI: 1.28–3.62), monthly income <15000 BDT vs. >40000 BDT, (AOR: 0.35, 95% CI: 0.14–0.89), and income <15000 BDT vs. 15,000–24,999 BDT (AOR: 0.36, 95% CI: 0.15–0.89) were the essential factors associated with depression. Furthermore, with each unit increase in the job satisfaction score was related to a 71% decrease in the odds of physicians having depression.**Conclusion:** The findings of this study indicate that providing appropriate organizational support, proper work assignments, and an adequate opportunity to develop their professional skills and career irrespective of sex may increase overall job satisfaction. Ultimately, this will serve to improve patient care as well as the whole health system's output.

## 1. Introduction

Depression is fetching the worst symptoms in the world through time. It has already been anticipated that depression will be the furthest common cause of morbidity worldwide by the year 2030 (Briley and Lépine, 2011). About 300 million people globally are expected to suffer from depression, which corresponds to 4.4% of the earth's total population (World Health Organization, 2017). Among the sufferers, nearly half portion lives in the South-East Asia region, and

Bangladesh experienced about 4.1% of the countrywide (World Health Organization, 2017). Previous studies have provided proof that the inequalities between men and women's social positions and the incidence of mental diseases are related. The socio-cultural context plays an important role in this variability (Gater et al., 1998; Rosenfield, 1980). In addition, the ratio of depression between males and females is 1 and 1.7 (Albert, 2015). The study conveyed the risk of mortality among depressed patients is more than 20-fold superior to usual residents (Briley and Lépine, 2011).

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Job satisfaction (JS) is a significant factor associated with depression (Gray-Stanley and Muramatsu, 2011). Satisfaction with remuneration, autonomy, the nature of work, promotion policies, satisfaction with co-workers, and the opportunity to learn adequate knowledge and skill, are all components of job satisfaction (Sveinsdóttir et al., 2006). Increased satisfaction at work among health care practitioners decreases the likelihood of adverse effects for patients. Subsequently, happiness with work correlated with fewer adverse accidents (Boamah et al., 2018). JS was identified as a significant factor in the retention of healthcare personnel (Gilles et al., 2014). Violence in the workplace raises worker dissatisfaction and the prospect of leaving the workforce (Boafo et al., 2016). Research has consistently shown that the rate of violence in public healthcare facilities is worse than in the private health sector (Worker Safety in Hospitals | Occupational Safety and Health Administration). A study conducted in Bangladesh on healthcare professionals shows that job satisfaction has a substantial association with depression (Salma and Hasan, 2020).

Depression among physicians begins at the early stages of the study of medical science. Research in Bangladesh showed that over half of the medical students suffered from stress directly linked to depression (Eva et al., 2015). Academic stress has long been regarded as a leading indicator of mental illness (Voltmer et al., 2012). Even though physicians' physical health is better than usual (Bailey et al., 2018a). However, a meta-analysis reported that 28.8% of doctors survived with depression or depressive symptoms (Mata et al., 2015). They are also at a significantly greater threat of psychological sickness and suicide compared to universal people (Bailey et al., 2018b). Several risk factors appear to be attached to the risk of developing depression among medical doctors. Lengthy and irregular duty time (Martini et al., 2006), high levels of obligation and comparatively lack of professional knowledge (Gray-Stanley and Muramatsu, 2011), job satisfaction (Tarcan et al., 2017), workstation culture, and getting too unsafe wealth are mentioned as the risk factors (Bailey et al., 2018b). The sharp rise in medical conflicts, such as violent demonstrations, assaults, and hospital attacks, significantly increased the psychological pressure on medical staff (He and Qian, 2016). In recent years, workplace violence in healthcare settings has grown more widespread in Bangladesh (Kader et al., 2021).

Furthermore, doctors have perceived their autonomy decreased by organizational rules and management decisions, which have been triggered to induce organizational force and time stress in the workplace. Hence, this study aimed to measure the level of depression, association, and influence of socio-demographic characteristics and job satisfaction on depression among physicians in Bangladesh, as well as to explore the factor structure of job satisfaction measure and examine its internal reliability.

## 2. Methods

### 2.1. Study design, participants, and sample size

This cross-sectional survey was conducted in the different private/government hospitals and post-graduate institutions in Dhaka city of Bangladesh, between July 2019 and January 2020. The participants who completed their graduation in medical science (MBBS/BDS) and were occupied in different health professions were considered the study population. A total of 301 samples were selected purposively by following inclusion criteria.

### 2.2. Procedure

A self-administered questionnaire was utilized to collect quantitative data from the participants of the study. The questionnaire was used to gather information regarding socioeconomic status, level of depression, and job satisfaction. We distributed roughly 380 questionnaires to the medical practitioners in different hospitals and post-graduate institutions

in Dhaka city, but only about 325 were returned. We had to eliminate 24 of the 325 questionnaires due to missing information.

## 2.3. Measures

### 2.3.1. Patient health Questionnaire-9 (PHQ-9)

The PHQ-9 was used to evaluate the level of depression among physicians. With excellent validity and reliability, a PHQ-9 scale is an effective tool for measuring depression in Bangladeshi adults with Cronbach's alpha of 0.837 (Naher et al., 2021). Participants answered nine statements based on how often they experienced these problems over the last two weeks (0, 1, 2 and 3 for not at all, several days, more than half the days, nearly every day respectively). Total scores were computed using a score of 27 representing an extremely probable occurrence. The PHQ-9 scores were divided into several categories of increasing severity. Whereas a score of 0–4 is considered a minimal level of depression. Likewise, 5–9, 10–14, 15–19, and 20 or superior were assessed as mild, moderate, moderately severe, and severe depression, respectively. The PHQ-9 score alone cannot be used to diagnose or exclude depression. For moderate depression, a PHQ-9 score of 10 or higher has 88 percent sensitivity and 88 percent specificity. Because this scale is entirely based on the patient's self-reported state, the final result is completely dependent on the participants understanding and response to the questionnaire (Kroenke et al., 2001).

### 2.3.2. Satisfaction of employee in health care (SEHC)

The 18 items SEHC survey questionnaire was used to assess physician work satisfaction (Alpern et al., 2013; Chang et al., 2017). The 18 items were answered on a 4-point Likert scale, with 1 indicating "Strongly Disagree," "Disagree," "Agree," and "Strongly Agree," respectively, were 2, 3, and 4. The SEHC total score was calculated as the average of the 18 items, with higher scores indicating greater satisfaction.

### 2.3.3. Body mass index (BMI)

The BMI was estimated using the self-reported height and weight of the subjects in accordance with the WHO BMI cutoff. A BMI of less than 18.5 indicated underweight status. Historically, a BMI between 18.5 and 25 was considered a healthy weight range. A BMI of 25.0–30 and 30.0 or above was used to define overweight and obesity, respectively (Body mass index - BMI).

## 2.4. Data analysis

Initially, descriptive statistics of sociodemographic variables, smoking habit, Walk/Exercise >30 min/day, SEHC scores, and PHQ-9 scores were calculated. Then Chi-square analysis between sociodemographic variables and depression was done for adjusting purposes. The PHQ-9 scale was converted into two categories: "mild to severe depression," which includes mild, moderate, moderately severe, and severe depression, and another category is "minimal depression," which consists of a minimal level of depression. A multiple logistic regression model was performed to determine the factors associated with mild to severe depression among medical doctors. Finally, Factor analysis was done to identify the important factors associated with job satisfaction. All the analysis was performed using STATA 14.2. For all the tests, alpha ( $\alpha$ ) was set at 0.05.

## 3. Results

A total of 301 physicians were under the study. Table 1 provides a summary of the socio-demographic characteristics of the participants, including the number and percentage of each. Males comprised 49.5% of the entire sample, while females were 50.5%. The largest proportion of respondents (39.53%) was in the 24 to 27 age group, and the least proportion (5.65%) was in the 36 or older age group. Among all participants, about 50.83% were married, and 49.17% were unmarried. As the study

**Table 1.** Sociodemographic characteristics of the respondents.

	Variables	n	(%)	Variables	n	(%)	
Age	24–27 years	119	39.53	Monthly income (In BDT)	<15,000	32	10.63
	28–31 years	114	37.87		15,000–24,999	112	37.21
	32–35 years	51	16.95		25,000–39,999	59	19.6
	≥36 years	17	5.65		>40,000	98	32.56
Sex	Male	149	49.5	Living in own house	Yes	154	51.16
	Female	152	50.5		No	147	48.84
Marital status	Married	153	50.83	Living with family	Yes	221	73.42
	Unmarried	148	49.17		No	80	26.58
Religion	Muslim	271	90.03	Type of family	Nuclear	206	68.44
	Hindu	30	9.97		Joint	95	31.56
Residence	Urban	295	98.01	Smoking habit	Yes	48	15.95
	Rural	6	1.99		No	253	84.05
Types of employment	Government	33	10.96	Chronic disease	Yes	42	13.95
	Non-government	268	89.04		No	259	86.05
Designation	Doctor	258	85.71	Walk/Exercise for >30 min/day	Yes	148	49.17
	Intern doctor	43	14.29		No	153	50.83
Education level	MBBS	247	82.06	Body Mass Index	Underweight	11	3.65
	BDS	48	15.95		Normal	124	41.2
	MPH	4	1.33		Overweight	108	35.88
	Others	2	0.66		Obesity	58	19.27

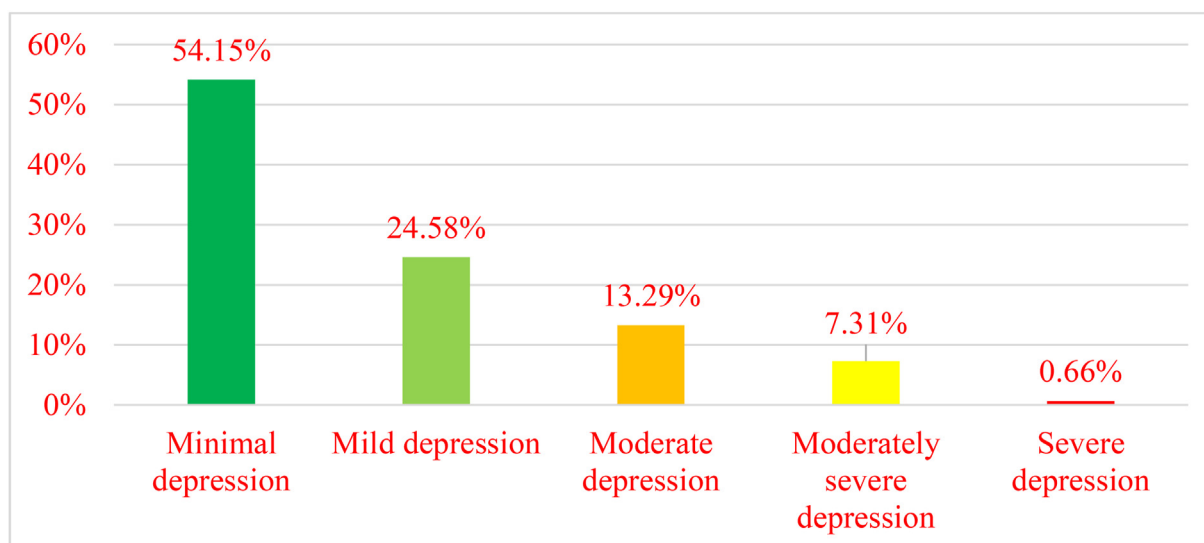
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was conducted based in Dhaka city, 98.1% of the doctors lived in urban residences. Whereas the rest of the participants lived in rural residences but worked and studied in the city areas. The most considerable portion of the doctors was employed in different private/non-government organizations. However, only 10.96% of the physician were working in government facilities. The study contains 15.29% of data from intern doctors, and the rest of them were qualified physicians. 82.06% of the doctors in this study completed the MBBS level of study. At the same time, 15.99% completed their study in BDS. Moreover, the rest of the percentages had some other professional degrees. A higher level of income (>40,000 BDT/month) was found among 32.56% of the respondents. On the contrary, 10.63% of the doctors earned less than 15,000 BDT per month. About 51.16% of the participants lived in their own properties, and 73.4% lived with their families. About two-thirds of the participants belonged to a nuclear family. Smoking habit was found among 15.95% of the physicians. It was found that 13.95% of the contributors had chronic diseases,

including diabetes, cardiovascular disease, asthma, and others. About half of the respondents were used to doing exercise or walking for more than 30 min a day in addition to their regular activities. According to respondents' self-reported height and weight, overweight and obesity were found among more than half of the respondents.

According to the PHQ-9, 24.58% of the physicians in the study sample experienced mild depression in [Figure 1](#). Around 13.29% and 7.31% of participants experienced moderate or moderately severe depression, respectively. About 0.66% of the participants had symptoms of severe depression.

[Table 2](#) shows female physicians had 116% higher odds of mild to severe depression compared to males (AOR = 2.16, 95% CI: 1.28–3.62). Moreover, compared to income less than 15000 BDT, income higher than 40000 BDT (AOR: 0.35, 95% CI 0.14–0.89) and income between 15,000–24,999 BDT (AOR: 0.36, 95% CI 0.15–0.89) was significantly associated with lower odds of mild to severe depression. Each unit

**Figure 1.** Level of depression among the study participants.

**Table 2.** Multiple logistic regression for factors associated with depression (n = 301).

Variables		Unadjusted			Adjusted		
		OR	95% CI	p-value	OR	95% CI	p-value
Sex	Male	Ref.			Ref.		
	Female	2.06	1.3–3.26	0.002	2.16	1.28–3.62	0.004
Types of employment	Government	Ref.			Ref.		
	Non-government	2.16	0.96–4.59	0.062	2.16	0.88–5.29	0.093
Monthly income (In BDT)	<15,000	Ref.			Ref.		
	15,000–24,999	0.41	0.18–0.94	0.035	0.36	0.15–0.89	0.027
	25,000–39,999	0.36	0.14–0.89	0.027	0.38	0.14–1.01	0.052
	>40,000	0.28	0.12–0.65	0.003	0.35	0.14–0.89	0.027
Body Mass Index	Underweight	Ref.			Ref.		
	Normal	0.35	0.1–1.26	0.107	0.39	0.1–1.49	0.169
	Overweight	0.51	0.14–1.85	0.306	0.54	0.14–2.08	0.373
	Obesity	0.75	0.2–2.86	0.679	0.91	0.22–3.69	0.89
Chronic disease	Yes	Ref.			Ref.		
	No	0.53	0.27–1.02	0.058	0.67	0.32–1.41	0.288
Walk/Exercise >30 min/day	Yes	Ref.			Ref.		
	No	1.53	0.97–2.41	0.07	1.53	0.92–2.54	0.102
Job Satisfaction		0.33	0.19–0.57	<0.001	0.29	0.15–0.54	<0.001

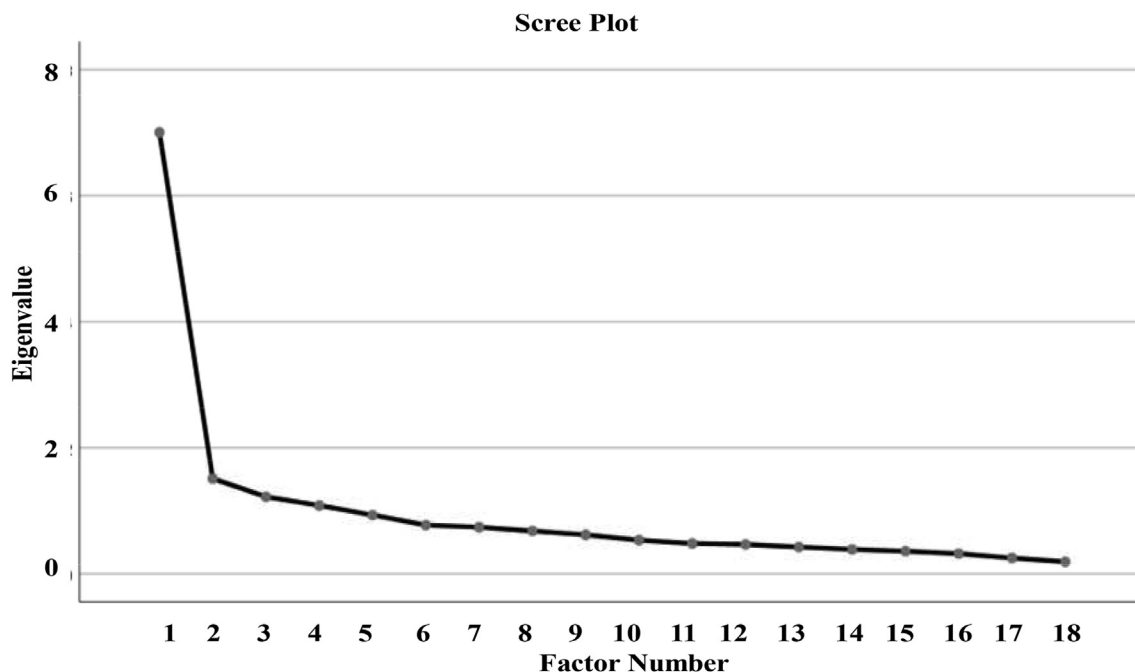
\*Depression includes mild, moderate, moderately severe, and severe depression. The full model includes main exposure variable job satisfaction score and co variates, including sex, types of employment, monthly income, body mass index, chronic disease, and walk/exercise >30 min/day.

increase in average job satisfaction score was associated with 71% lower odds of medical doctors having mild to severe depression. In comparison, we did not find any significant association for age groups, type of employment, Body Mass Index, married vs. single, smoker vs. non-smoker, rural vs. urban resident, chronic disease present vs. absent, and the educational level with depression.

Using Principal Axis Factoring (PAF) with Promax rotation, the latent structure of work satisfaction (18 items) was investigated. An initial examination of the R-matrix revealed that a significant proportion of coefficients were more than 0.30. The Kaiser-Mayer-Olkin (KMO) index was 0.886, which was higher than the recommended value of 0.6 (Kaiser, 1970), and Bartlett's Test of Sphericity (Bartlett, 1954) was statistically significant (Chi-square = 2327.276, p = 0.001), indicating that our data

were eligible for factor analysis. The initial analysis found four components with eigenvalues greater than 1, each accounting for 38.91 percent, 8.40 percent, 6.79 percent, and 6.03 percent of the variance. The Scree plot, on the other hand, indicates a break after the second or third factor, implying a two- or three-factor solution for job satisfaction in Figure 2.

Table 3 shows that fifteen items were retained for the final Job satisfaction with three latent variables, based on the best strategies for item retention mentioned at the outset. Factor 1 loaded eight items, Factor 2 had four items, and Factor 3 loaded three items. The 15 work satisfaction criteria were classified into three constructs: Factor 1 was defined as organizational rules and facilities; Factor 2 was defined as managerial/supervisor support, and Factor 3 was defined as infrastructures and logistics supply. The items were sorted from those with



**Figure 2.** The Scree Plots Generated in EFA (18 items).

**Table 3.** Factors loading from the Exploratory Factor Analysis.

Items	Factor		
	1	2	3
13. My work tasks are always specified precisely.	0.858		
11. I have a detailed job description.	0.724		
10. I have sufficient chances for professional learning and developing.	0.609		
9. I am happy with promotion opportunities.	0.570		
8. The organization guidelines make it simple to perform well.	0.494		
12. Each week's workload for me is reasonable.	0.457		
14. My work is judged by a fair set of performance standards.	0.442		
7. I get proper recognition for performing normal duties successfully.	0.308		
2. I get the correct amount of support and direction from supervisor.		1.021	
1. The organization's management is helpful for me.		0.755	
5. My supervisor encourages to make improvements and offer recommendations.		0.659	
6. Changes are made by management in response to suggestions and opinions.		0.337	
16. The workstation's buildings, grounds, and design are sufficient for performing regular tasks.			0.847
15. My department offers all resources and equipment's necessary for my responsibilities.			0.794
17. My coworkers are supportive and work together.			0.345

the highest loading from Factor 1 and listed first as item 13, "My work tasks are always specified precisely" (loading of 0.858), and with the lowest loading from Factor 1 and listed as item 7, "I receive appropriate recognition for successfully performing routine duties" (loading of 0.308). Following that, the four items with the highest loading from Factor 2 were listed in order of loading, starting with item 2, "I receive the appropriate amount of support and direction from my supervisor," which has a loading of 1.021, and ending with item 6 "Management makes changes in response to suggestions and opinions," which has a loading of 0.337. Furthermore, the three items which result in the maximum loading from Factor 3 with loading 0.847 to item 16, "The buildings, grounds, and layout of this facility are adequate for me to perform my duties," and the lowest factor loading of 0.345 to item 17 "My coworkers are supportive and work together."

#### 4. Discussions

This study aims to measure the job satisfaction and depression levels among physicians. The study's primary findings indicated that more than half of physicians experienced varying degrees of depression. A meta-analysis conducted in Australia stated the prevalence of depression among practicing physicians was between 14% and 60%, the variation in the prevalence of depression might be due to the differences in study design, method, and settings of the study (Elliot et al., 2010). Another systematic review assessed the occurrence of depression in physicians between 20.9 and 43.2 percent, depending on the measure used, and to have grown over time (Mata et al., 2015). According to research conducted by Al-Fahad in Saudi Arabia, around 22% of health care employees suffer from depression (AlFahhad, 2018). In this study, women were found to be more susceptible to depression than men. Numerous studies show that female doctors are more prone than males to suffer from depression (Bailey et al., 2018b; Obi et al., 2015). As with the previous study, we found no variations in depression by age and marital status (Xiao et al., 2014).

According to this study, there is a correlation between job satisfaction and depression. Depression was higher among the respondents with the less satisfying job. Other research has demonstrated that job satisfaction is critical for worker health, with a substantial correlation between job satisfaction and burnout, self-esteem, depression, and anxiety

(Rothmann and Cooper, 2015). However, a study on physicians in China showed the opposite result (Xiao et al., 2014). Physicians' income was also a strong predictor of depression. Depression was found to be lower among people with a higher income. Similarly, previous studies found low job satisfaction is linked to low pay, benefits, and job stability (Houkes et al., 2001). A high level of education may make it easier for them to find and keep jobs (Rambur et al., 2005). There may be an increased risk of depression and burnout as a result of bullying or harassment in the workplace (Kivimäki et al., 2003).

According to the current study, a small percentage of medical practitioners were satisfied with their job. However, the majority of them were partly satisfied with their existing job. This study also found that clear work assignments and job descriptions, supportive supervisors and management, proper infrastructure and equipment facilities in the workplace, and so on have the strongest impact on job satisfaction. Previous research has discovered that organizational support is strongly correlated with the work satisfaction of staff (Roy et al., 2017). Employee satisfaction is favorably influenced by effective managerial assistance, promotion, skill evaluation, resource availability, and career progression opportunities (Wageman, 2001). Bagheri et al. conducted a study in Iran also found that structural and managerial approaches influence the job satisfaction of health care professionals (Bagheri et al., 2012). The findings of the former study revealed that healthcare worker in the public hospital is three times more satisfied compared to their counterpart (Khatun et al., 2018). The current research discovered that physicians working in non-government facilities are twice as likely to suffer from depression as their counterparts.

Despite their awareness and understanding of depression, medical professionals may be reluctant or unwilling to seek mental health therapy (Adams et al., 2010; Elliot et al., 2010; Rotenstein et al., 2016; Schwenk et al., 2008). Based on their self-reported height and weight, more than half of the participants in this study were overweight or obese. Furthermore, approximately half of the respondents were accustomed to exercising or walking for more than 30 min every day in addition to their regular activities. This could be owing to their profession's activities and sedentary lifestyle. A significant percentage of general practitioners in this study were habitual smokers, and they also had diabetes, cardiovascular disease, asthma, and some other chronic diseases.

In limitations, first of all, the study samples were collected based on the purposive sampling method, and the samples were collected from only Dhaka city of Bangladesh. So, it is not acceptable to generalize the results for the whole population. Secondly, the causal effects between different factors and depression could not be determined because the study used a cross-sectional design. Finally, the sample size did not measure considering the population size of this study. In the future, a larger sample size and better sampling procedures may yield more conclusive findings on job satisfaction and depression.

#### 5. Conclusion

This study found a different degree of depressive symptoms among nearly half of the physicians, whereas job satisfaction, sex, and income were significantly associated with depression. This study's findings indicate that providing the most favorable employment conditions for physicians may prevent them from developing depression. Workplace systems must support physicians by providing appropriate organizational support, proper work assignments, and an adequate opportunity to develop their professional skills and career irrespective of sex to retain their self-esteem. Ultimately, this will serve to improve patient care as well as the whole health system's output.

#### Declarations

##### Author contribution statement

Md Nazrul Islam; Kawsar Ahmed: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the

data; Contributed reagents, materials, analysis tools or data; Wrote the paper. Dibhya Pravasa Dasgupta; Naznin Sultana; Farhana Yesmine: Analyzed and interpreted the data; Wrote the paper. Md. Asaduzzaman; Mst. Rokshana Rabeya: Conceived and designed the experiments; Wrote the paper.

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#### Data availability statement

Data will be made available on request.

#### Declaration of interest's statement

The authors declare no conflict of interest.

#### Additional information

Supplementary content related to this article has been published online at <https://doi.org/10.1016/j.heliyon.2022.e10589>.

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