

## ORIGINAL RESEARCH

# The prevalence of depression and its related factors among taxi drivers in Tehran city during 2017-2018

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**Abstract:** **Background:** Depression is amongst the most significant causes responsible for loss of life, worldwide. It also increases the likelihood of accidents which may lead to unpleasant outcomes. **Aim:** This paper was aimed to measure the prevalence and related factors of depression amongst taxi drivers in Tehran city, from 2017 to 2018. **Methods:** This cross-sectional study was conducted on 350 taxi drivers. Cluster sampling was applied. Standard questionnaires, including Beck-21 items questionnaire, to measure depression, and job satisfaction questionnaire (JDI), were applied. Statistical analyses were performed using SPSS version 24 using Odds Ratios (OR) by logistic regression models. Significant level was considered 5% at all analyses. **Results:** The prevalence of depression was 43.3% and mean (SD) of job satisfaction score was 188.1 (54), with a median and interquartile range (70±193) for the highest and lowest level of job satisfaction were 350 and 60, respectively. The odds of having depression were 2.2 times higher in drivers with low job satisfaction (OR=2.2; 95%CI:1.3,3.8), 6.2 times higher in drivers who reported bad/very bad economic status (OR=6.2; 95%CI:2.1,18.3), and 1.8 times higher in cigarette smokers (OR=1.8; 95%CI:1.0,3.4). The odds also increased by 2.6 times in drivers who reported average self-rated health (OR=2.6; 95%CI: 1.5, 4.5), and by 10.1 times in drivers who reported bad self-rated health (OR=6.2; 95%CI: 1.5, 65.0). Furthermore, having a history of depression amongst first degree family members, increased the odds by 2.6 times (OR=2.6; 95%CI: 1.5, 4.5). **Conclusion:** We found that 43% of taxi drivers in Tehran city suffer from varying degrees of depression. It seemed that cigarette smoking, family history of depression, job dissatisfaction, and poorer economic status were important contributors of depression in our investigation.

**Keywords:** Job satisfaction; Depression; Taxi drivers; Tehran

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## 1. Introduction

Proper attention to the well-being of the different classes and communities within a society is a crucial factor in enhancing the quality of life of the society members. One of the communities which has received increased attention lately is the working class. Undeniably, the health and welfare of any country's members of the working class is of utmost importance. Especially, since the occurrence of any difficulties and/or disturbances in workers communities can lead to a drastic decrease in their efficiency and productivity. Likewise, physical and/or mental disorders can decrease per-

formance and may even increase unemployment (1). As a result, in this day and age, a great deal of emphasis is placed on individuals' mental health in workplace. According to some studies, the production loss and damage incurred due to workers' poor performance, arising from depression, reaches a staggering 44 billion dollars per year, only in the United States (2). Drivers often belong to a social class that is constantly under severe strains due work-related problems. These can include interacting with passengers of different backgrounds and attitudes, and coping with varying degrees of traffic on a daily basis. Consequently, drivers tend to develop unhealthy and unsustainable behaviours including smoking to alleviate the work pressure, physical inactivity due to sedentary job, unhealthy diet, and excess weight gain. Therefore, they are exposed to a high risk of adopting a wide range of mental and physical conditions including de-

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pression (3). This is more alarming as these individuals are subject to poor social and economic conditions (4). Additionally, they constantly have to worry about issues such as verbal engagement and confrontation with passengers, police officers, and traffic infringements (5). In a metropolitan area like Tehran, taxi drivers also have to deal with air-pollution (6, 7), inadequate medical insurance coverage (8), as well as chronic diseases such as cardiovascular diseases, hypertension (9), cancer (10), and diabetes (3, 5). Furthermore, depression, as a form of chronic and disabling disease, can take a serious toll on the taxi drivers' families. In saying that, it can lead to dire consequences such as suicide and overall discontent. These can be followed by a drop in efficiency and productivity, and possibly an increase in unemployment (5).

Arguably, depression is the current primary global health concern. It is estimated that in 2020, illnesses associated with depression will comprise half of the incidents cases of diseases, after ischemia heart diseases across the planet (11). Depression disorders - typically linked to stress related external elements - include changes in mood and emotional responses, with or without the display of anxiety or acts of hysteria (4). Work pressure, which is often associated with the risk of depression, is considered to be a serious health problem. Despite the fact that it is a preventable condition, it can result in harm and unpleasant outcomes if left unaddressed. In reality, the social pattern of the work-related depression is consistent with the social pattern of mental illness, signifying the negative role of work-related pressure in triggering depression (12). The spread of depression-related disorders is estimated to have affected 10.9 million people or 3% of the total population in the North American countries, in 2000. Depression is a diagnosable disorder that can be treated through basic healthcare means, often by non-specialists. Yet, most people who require such care, do not receive it (5). There are numerous challenges and massive degrees of pressure that taxi drivers face in their every day work, and there is a great risk of mental health problems in this occupation group such as depression. Furthermore, taxi drivers suffer from lack of proper infrastructure to conveniently access health care centers. This matter adds up to the scarcity of relevant epidemiologic studies, which motivated us to conduct the current study. Thus, this study attempted to estimate the prevalence of depression and its associated factors among taxi drivers in Tehran city.

## 2. Material and methods

The current research was conducted using the cross-sectional methodology. The required samples were collected using the cluster method, with the clusters being selected based on the parameters put forward by the City of Tehran's

Taxi Organization management from late fall 2017 to late winter 2018. The participants were selected among Tehran's inner-city taxi drivers, who were at least eighteen years of age, and had been legally authorized to drive a taxi. To collect the necessary subjects, a list of all taxi terminals throughout Tehran was first obtained. Subsequently, city's north, west, and southeast terminals with larger densities of drivers were selected following the advise of the office of Tehran's Taxi management. After obtaining informed consent, all drivers were asked to fill out the study questionnaire. Additionally, a part of the study was done at the Taxi Management & Supervision Organization Scientific & Applied Education Centre's building, where there was admission to an introductory training course for all the registered drivers. This was done to include those drivers whose access to the research team was limited and/or did not have sufficient means of communication. The required data was gathered through a demographic checklist, the Beck Inventory questionnaire, and questionnaire of Job Descriptive Index (JDI). The standard questionnaire of 21-items Beck inventory was used to measure different depression-associated symptoms such as sadness, feeling down and defeated, pessimism, discontent, feeling of guilt, self-censure, lack of self-interest, expectation of punishment, crying, anger, social withdrawal, suicide tendency, indecisiveness, imagining body changes, slowness, insomnia, and fatigue. These symptoms are organised into three categories, with each one associating with specific indicators, such as motivational and cognitive, emotional and behavioural, and physical and vegetative. The questionnaire included thirteen multiple choice questions, each of which had 4 choices. The scores range from 0 to 3 with a total score ranges from 0-39. The score categorization is as follows: no or insignificant depression (scores: 0-4), mild depression (scores:5-7), medium depression ( scores:8-15), and severe depression (score:>16). The questionnaire was previously validated satisfactory in Iranian population (13).

A checklist was designed to measure participant's demographic characteristics including age, marital status, number of children, educational level, history of cyclical unemployment, cigarette and/or hookah smoking, number and type of vehicle accidents within the past year, status of physical activity, chronic diseases, consumption of special medications, and history of depression in the first degree family. The standard questionnaire of Job Descriptive Index (JDI) was first designed by Smith, Kendall, and Hulin in 1969. This was used to measure participants' level of satisfaction at work (14). The questionnaire is compiled of 70 questions, covering 6 different domains. It contains 22 questions regarding the nature of work (attitude toward the job), 7 questions on promotion opportunities, 14 questions concerning supervision, 11 questions related to colleagues, 9 questions about salary and benefits, and 7 questions aimed to investigate the work-

place conditions. All the questions are presented with Likert scale options ranging from 'completely disagree' to 'completely agree'. The job satisfaction questionnaire was translated by Zahedi et.al, and its validity and reliability were calculated to be 0.94 and 0.96 in Iranian population, respectively (15).

The data was analysed using SPSS software version 24. The odds of having depression was calculated using multiple logistic regression models, including predictor variables such as job satisfaction, chronic diseases, previous diagnosis of depression in first degree family members, financial status, smoking status, history of accidents, physical activity, history of unemployment, and marital status. The Hosmer and Lemeshow approach was applied to yield the adjusted estimates for each independent variable used from the multiple logistic regression model. The significant level of  $>0.05$  was considered statistically significant for the entire analysis.

### 3. Results

A total of 350 taxi drivers (response rate=87.7%) took part in the survey. The mean (standard deviation) for the age was 46.44 (10.3), with a minimum of 25 and a maximum of 74. The highest proportion of participants ( $n=123$ , 35.1%) were in the age group of 44-54. Around 43.4% of the taxi drivers showed some degrees of depression (mild, medium, severe, extremely severe). This included 72 drivers (20.69%) and 64 drivers (18.39%) suffering from mild and medium depression, respectively. Most of the participants (93.71%) were married. Also, high school diploma was the highest educational degree reported by the participants.

The mean (standard deviation) for the number of children, work history, and job satisfaction, were 2(1.2) children, 13.11(11.65) years, and 188.1(54) points, respectively. Furthermore, the average and interquartile range ( $70\pm 193$ ) for the highest and lowest levels of job satisfaction were 350 and 60, respectively. Eighty drivers (22.9%) were smokers and another 29 drivers (8.4%) regularly used hookah. The other basic characteristics are illustrated in Table 1.

The final logistic model showed that compared to baseline categories, the odds of depression among the taxi drivers were 2.3 times higher (95% CI: 1.3-3.8) in those who were dissatisfied with their jobs, 5.8 times higher (95% CI: 2.16-01.8) in those with bad self-reported financial status, and 1.7 times higher (95% CI: 0.97-3.2) in smokers. The odds also increased by 2.5 times (95% CI: 1.4-4.3) in average self-rated health group, 9.4 times (95% CI: 1.1-58.4) in poor or extremely poor self-rated health group, and 2.1 times (95% CI: 1.4-03.6) in respondents who reported depression in first degree family members (parents, siblings, children).

### 4. Discussion

The purpose of this study conducted in 2017-2018, was to estimate the prevalence of depression and its associated factors among Tehran's taxi drivers. The results indicated a depression (mild, medium, severe, extremely severe) proportion of 43.4%. It can be concluded that individuals with less job satisfaction are more prone to depression. However, with an increase in self-reported financial status and family health status, the likelihood of depression decreases. Still, smoking and a history of depression in the first-degree family members can increase the odds of depression. Other factors such as marital status, history of unemployment, lack of physical activity, vehicle accident history, prior diagnosis of depression in the individual, any particular mental and/or physical conditions, and work history, did not have any significant effect on the odds of depression.

In line with the findings of our study, other researchers such as Anna E. with her work on bus drivers, Silva Junior's on truck drivers, and a Spanish-based study on drivers of other vehicles, also reached the conclusion that this subpopulation is exposed to a high risk of developing severe depression (2, 5, 7-10, 14). Similar to our results, other studies indicated that individuals' awareness and acknowledgement of their state coupled with their satisfaction at work. In addition, reasonable increase in salary could help the prevention of depression (12). In respect to drivers' financial status and good self-rated health, the other studies have also concluded that factors such as belief in oneself and one's abilities are extremely crucial in improving the state of depression. Accordingly, these studies argue that people suffering from depression-related disorders are more prone to negative notions, which clearly signals the existence of a positive linear relation between depression and negative spontaneous thoughts (16, 17). Indeed, believing in oneself and what one is capable of achieving, greatly improves the person's mental and physical health, and thereby facilitates the promotion of self-sufficiency, morale stability, and appropriate conduct. This, in return, enables individuals to prepare for facing as well as overcoming hardships and challenges. Thus, it would empower individuals to better control their responses to stressful events and circumstances (18).

In another study conducted on taxi drivers in China by Yan Yang et al., an estimate of one third (35.3%) of the drivers evaluated their general health condition as "good" or "excellent" (19). This is while more than half (59.4%) of the drivers in our study expressed their satisfaction regarding their overall health, and consequently reported it as either "good" or "excellent". In spite of this, it is important to consider that self-rated health measure is merely to measure a state of mental well-being, and does not represent a tangible measurement of an objective health status (19-21). Numerous



**Table 1:** Demographic characteristics of study participants in 2017-2018

Variable	No. (%)		
	subgroups	No.	%
Age	18-29	10	2.86
	30-44	125	41.43
	>44	195	55.71
Depression	No	199	56.86
	Yes	151	43.14
Marital Status	S/D/W	22	6.29
	Married	328	93.71
Academic Degree	Less than diploma	155	44.29
	Diploma	144	41.14
	Higher than diploma	51	14.57
History of unemployment	Yes	174	49.71
	No	176	50.29
Physical activity	Yes	185	53.16
	No	162	46.55
Past record of accident with other vehicles or pedestrians	Yes (1, 2 or 3 times)	72	20.75
	No	275	79.25
Cigarette smoking	Yes	80	22.86
	No / I quit	270	77.14
Hookah smoking	Yes	29	8.38
	No	316	91.33
Self-rated health status	Excellent/Good	208	59.4
	Average	133	38
	Poor/Extremely poor	9	2.6
Self-rated financial status	Excellent/Good	47	13.43
	Average	225	64.29
	Poor/Extremely poor	78	22.29
History of depression diagnosis by a physician	Yes	23	6.57
	No	327	93.43
History of depression diagnosis in first line family members	Yes (parents/Siblings/Children)	47	13.43
	No	303	86.57
No. of children	Less than 2 or 2	269	77.30
	More than 2	79	22.70
family size	Less than 4 or 4	301	86
	More than 5	49	14
Suffering from special diseases	No	280	80
	Yes (I do not know)	70	20
Job satisfaction	Less than average (188)	163	46.6
	More than average (188)	187	53.4
Work history	Under 10 years	173	49.4
	Over 11 years	177	50.6

other factors such as stress, smoking and physical inactivity, and exposure to air-pollution are believed to directly affect the individual's level of self-reported health status(20).

In confirmation to our findings, the results obtained by another study also indicated that depression disorder is a common phenomena among those individuals whose parents suffer from depression. In fact, mental health problems - including depression - can be passed on from one generation to the another. The severity of parents' state of depression markedly increases the risk of depression development in the offspring. Treatment of depression in first-degree family members can effectively prevent the transmission of the dis-

order to other family members. Nonetheless, seeking medical treatment is not a routine practice of people with depression, let alone many medical seeking behaviors usually lead to unsuccessful treatments. (22, 23). Moreover, aligned with our conclusion, one study by Amanda R. Mathew et al. in 2016, also demonstrated that smoking has a strong influence on depression. With an unknown underlying mechanism for the effects of smoking on mental health disorders, depression and smoking, along with other forms of substance abuse, are regarded as serious health concerns (24-27). Although, numerous studies have proven that sports and physical activity can help elevate mental health disorders (19), our study's

**Table 2:** The results of the univariate logistic regression model for depression among taxi drivers in Tehran, 2017-2018

Variable	Depression OR (95% CI)			P value*
	subgroups	OR	95%CI	
Age	29-18	Reference		
	30-44	0.88	0.24-3.18	0.849
	44<	0.66	0.18- 2.37	0.532
Marital Status	Married S/D/W	Reference 0.36	0.13- 1.01	0.054
Academic Degree	Less than diploma	Reference		
	Diploma	1.20	0.76-1.90	0.42
	Higher than diploma	0.8	0.42-1.57	0.55
History of unemployment	No	Reference	4(7/5%)	
	Yes	1.66	1.08-2.55	0.019
Physical activity	Yes	Reference		
	No	1.85	1.20-2.84	0.005
Past record of accident with other	No	Reference		
	Yes	1.65	0.98- 2.78	0.059
Cigarette smoking	No / I quit	Reference		
	Yes	2.60	1.55-4.34	<0.001
Hookah smoking	Yes	Reference		
	No	0.70	0.32- 1.51	0.36
Self-rated health status	Excellent/Good	Reference		
	Average	3.78	2.39-5.99	<0.001
	Poor/Extremely poor	8.24	1.66- 40.79	0.01
Self-rated financial status	Excellent/Good	Reference		
	Average	3.67	1.57- 8.55	0.003
	Poor/Extremely poor	14.54	5.66-37.32	<0.001
History of depression diagnosis by a physician	No	Reference		
	Yes	7.01	2.33- 21.09	<0.001
History of depression diagnosis in first line family members	No	Reference		
	Yes (parents/Siblings/Children)	2.39	1.27- 4.49	0.007
No. of children family size	Less than 2 or 2, More than 3	Reference 0.81	0.48- 1.35	0.431
	Less than 4 or 4, More than 5	Reference 0.81	0.43- 1.50	0.50
Suffering from special diseases	No	Reference		
	Yes	1.75	1.03- 2.97	0.037
Job satisfaction	Less than average (188)	Reference		
	More than average (188)	3.26	2.10- 5.08	<0.001
Work history	Under 10 years	Reference		
	Over 11 years	0.77	0.50- 1.18	0.24

findings did not show any correspondence between physical activity level and depression.

A cohort study by Harvey in 2018 on over 33, 909 individuals, demonstrated that regular exercise is effective in reducing the risk of depression. The authors also concluded that even one hour of light physical activity per week can help prevent twelve percent of the chance of future depression (28). Here, we would like to suggest that the non-existent link between physical activity and depression in our finding, could be due to the fact that the study was cross-sectional and temporal associations were not detected.

#### 4.1. The Advantages of the Study

The attention we granted to the individual perspectives of our members of study population who shared different aca-

demical backgrounds and age range, is a significant advantage of this study. To ensure the generalizability of our sampling strategy, we used a roster of all taxi from the Taxi Management & Supervision Organization's Scientific & Applied Education Centre. The roster included all taxi drivers who were referred to the Centre, from all across the city, to fulfil their periodic examinations and attend 'training while you work' programs. This research is one of the few that solely concentrated on taxi drivers, and the extent and severity of depression amongst them.

#### 4.2. The Limitations of the Study

Certain influences, as listed below, imposed limitations throughout our study:

Unanswered questions, i.e. unobtained information, due to



**Table 3:** The results of the Multivariate logistic regression model for depression among taxi drivers in Tehran, 2017-2018

Variable	subgroups	Univariate			Multivariate		
		OR	95%CI	P-Value*	OR	95%CI	P-Value*
<b>Marital Status</b>	Married	Reference	0.13- 1.01	0.054	0.46	0.14-1.58	0.24
	S/D/W	0.36					
<b>History of unemployment</b>	No	Reference					
	Yes	1.66	1.08-2.55	0.019	1.42	0.86- 2.35	0.16
<b>Physical activity</b>	Yes	Reference					
	No	1.85	1.20-2.84	0.005	1.27	0.75-2.15	0.36
<b>Past record of accident with other vehicles or pedestrians</b>	No	Reference					
	Yes	1.65	0.98- 2.78	0.059	1.46	0.79- 2.69	0.21
<b>Cigarette smoking</b>	No / I quit	Reference					
	Yes	2.60	1.55-4.34	<0.001	1.79	0.97-3.28	0.059
<b>Self-rated health status</b>	Excellent/Good	Reference					
	Average	3.78	2.39-5.99	<0.001	2.54	1.48- 4.36	<0.0001
	Poor/Extremely poor	8.24	1.66- 40.79	0.01	9.42	1.51- 58.45	0.016
<b>Self-rated financial status</b>	Excellent/Good	Reference					
	Average	3.67	1.57- 8.55	0.003	2.11	0.81-5.47	0.12
	Poor/Extremely poor	14.54	5.66-37.32	<0.001	5.82	2.01-16.81	<0.0001
<b>History of depression diagnosis by a physician</b>	No	Reference					
	Yes	7.01	2.33- 21.09	<0.001	2.47	0.70-8.64	0.15
<b>History of depression diagnosis in first line family members</b>	No	Reference					
	Yes (parents/Siblings/Children)	2.39	1.27- 4.49	0.007	2.19	1.03- 4.65	0.04
<b>Suffering from special diseases</b>	No	Reference					
	Yes	1.75	1.03- 2.97	0.037	0.97	1.38- 3.86	0.929
<b>Job satisfaction</b>	Less than average (188)	Reference					
	More than average (188)	3.26	2.10- 5.08	<0.001	2.31	0.50-1.87	<0.0001

some participants' mistrust. This was despite the fact that they had been thoroughly briefed on study's goals and objectives, as well as its level of participant confidentiality. Obstruction of the process, and the slow rate at which drivers completed the questionnaires at some taxi terminals. This was primarily caused by the present air and noise pollution in those terminals as well as excessive traffic during specific hours.

Taxi drivers' tight schedules which often did not allow for the opportunity to establish communication with them.

Respondents' advanced age, poor vision, lack of access to reading glasses, and lack of concentration, made it necessary for some questionnaires to be completed through the assistance of a research team member.

### 4.3. Suggestions for Further Research

It seemed that poor lifestyle choices such as poor diet, inadequate sleep, and physical inactivity, play an important role in the development of mental health disorders, including depression amongst taxi drivers. Therefore, design and implement certain extracurricular activities at taxi stations across Tehran city, might help the prevention and/or treatment of such disorders. Furthermore, religious and sport-oriented programs, such as local tournaments or pilgrimage tours, would be beneficial.

In terms of study methodology, we used a cross-sectional de-

sign to find the prevalence of depression among taxi drivers. It seems that more advanced study designs, which entail analytic approaches such as case-control design, would appreciate the importance of various risk factors in the prevention and control of depression amongst this group.

### 4.4. The Generalizability of Conclusions

The questionnaire was completed by taxi drivers, all of whom shared different academic background and age range, from different neighbourhoods across Tehran. However, due to factors such as the existent air-pollution and the heavily congested traffic, the study's generalizability may not be true for other parts of the country, whose residents do not face the same challenges as those working in the metropolitan area.

## 5. Conclusion

Taxi drivers, particularly those who smoke, have someone in their first-degree family members with a history of depression, and are dissatisfied with their jobs and earnings, have a higher chance of developing depression. Consistently, efforts to improve taxi drivers' financial wellbeing and means of livelihood coupled with the proper actions to promote their satisfaction at work, can effectively lower the likelihood and/or severity of depression.

## 6. Appendix

None.

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### 6.2. Authors Contributions

M.FG and S. N designed the study; M. FG analyzed the data; M. FG drafted the article. M.FG and S.N reviewed the manuscript critically; and approved the manuscript.

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The funding was provided by the Research Committee at Tehran University of Medical Sciences. The funding body had no contribution in the design, conduction, and/or interpretation, of this study.

### 6.4. Conflict of Interest

The authors declare that they have no competing interests.

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