

## Evaluate Factors Influencing Depression in Baghdad: Using Deck-Depression Inventory

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### Abstract

**Objective:** This study goal was to screen participants from different settings in Baghdad for depression using Beck Depression Inventory (BDI) scale and identify factors influencing the levels of depression.

**Methods:** This cross-sectional study included a convenience sample of 313 people from four settings (teaching hospital, college of medicine, college of pharmacy, and high school) in Baghdad, Iraq. The participants were screened using paper survey relying on the BDI scale during spring 2018. Using multiple linear regression analysis, we measured the association between depression scores and six participant factors.

**Results:** The overall prevalence of depression in our sample was 57.2%. Female participants had higher BDI scores (depression symptoms) than male participants. Among those with depression, the majority (73.7%) had mild or moderate degree of depression. In terms of the cut-off scores, 42.8 % scored in the normal range, 20.4 % in the mild range, 7.0 % in the borderline range, 14.7 % in the moderate range, 10.5 % in the severe range and 4.5 % in the very severe range depression. Approximately 63% of the participants had sort of suicidal thoughts. The regression analysis showed significant ( $P$ -value < 0.05) association between having higher scores of depression symptoms and the presence of chronic disease(s), recent family loss, young age and female gender.

**Conclusions:** In our findings, depression was quite prevalent among people in Iraq. The study demonstrates the importance of broad screening and social/psychiatric counseling of young population. Iraqi healthcare professionals should structure specific actions for patients with chronic diseases to minimize their depression symptoms.

### Introduction

The high and increasing prevalence of depression in populations in all continents and its serious impacts make it one of the most serious public health problems of the beginning of the 21st century. According to the World Health Organization (WHO), depression is characterized by "sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration"(1). In 2015, there were 322 million people living with depression and that represent 4.4% of the global population (1). Depression is primary risk factor for suicide (1). People with depression experience higher health expenditures, work disability and substantial functional impairment, (2) lower adherence to prescribed medications and higher risk of mortality after heart surgery (3).

Depression is associated with chronic diseases and can increase the risks of developing them (4). In addition, people with chronic diseases can experience limitations in their daily life that increase their probability of having depression (5). A meta-analysis of 42 studies found association between depression, hyperglycemia and diabetic complications (6). Chronic medical illnesses are consistently associated with increased prevalence of depression (7). Sometimes,

depression may be due to the specific biologic effects of chronic diseases such as central nervous system disorders, cerebrovascular disease, and endocrine disorders (8). On the other hand, a German study conducted in 20 general practices found an association between different chronic diseases and lower health-related quality of life (HRQoL) (9). Similarly, a survey of 1000 patients found a positive association between mood disorder and low health-related quality of life (HRQL) (10). The result of a population-based study has shown strong association between depression and mortality resulting from cardiovascular disease. It reported the probability of dying among depressed patients was more than three times higher after myocardial infarction than non-depressed patients (11). Another meta-analysis of 27 studies found positive significant association between depression and diabetes complications including retinopathy, nephropathy, neuropathy, sexual dysfunction and macrovascular (cardiovascular) complications (12). Depression is clearly associated with poorer prognosis and more rapid progression of chronic illnesses, including ischemic heart disease and diabetes (11, 13).

A large number of Iraqis have been diagnosed with multiple illnesses for more than three decades of wars and economic sanction, but limited studies are available to quantify the prevalence of depression and the relationship between chronic illnesses and depression. The objective of this study was to screen participants from different settings in Baghdad for depression using Beck Depression Inventory scale (BDI) and identify factors influencing the levels of the depression.

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## Methods

A cross-sectional study was carried out between February 1 and May 1, 2018 in Baghdad, Iraq on a convenience sample from college students (college of pharmacy and college of medicine), high school students and patients at a public teaching hospital. The participants aged 17 years and above. After obtaining verbal consent, participants were administered a paper survey in-person. The study objectives were explained to the participants before beginning the study. The survey was completely optional and confidential (anonymous). To include illiterate participants in this study, two well-trained researchers (last-year pharmacy students) administered the survey in Arabic and recorded the participant responses. The paper survey included the Beck Depression Inventory Scale (BDI) items and questions regarding the participant's age, gender, marital status, chronic diseases, recent loss one of family members and life condition. The study proposal was approved by the ethical committee at Al-Rafidian University Department of Pharmacy, Baghdad.

## Study Tool

Screening for depression was conducted using a validated Arabic version of the BDI scale (14, 15). It includes 21-items and is commonly used screening tool for assessing depression symptoms. The BDI scale can be used to assess normal adults, adolescents, and people with mental illnesses. It was developed to document a variety of depressive symptoms experienced over the preceding week. Responses to the 21 items of the BDI are on a 4-point scale, ranging from 0 to 3 (16). Scores between 1 and 10 are within the range of normal; 11-16 indicate mild mood disturbance; 17-20 suggest symptoms of borderline clinical depression; 21-30 suggest moderate depression; 31-40 indicate severe depression; scores over 40 suggest symptoms consistent with extreme depression (14).

## Statistical Analyses

Means, ranges, standard deviations (SD), frequencies and percentages of participant characteristics and BDI items were calculated. The data analyses were performed utilizing the Statistical Package for the Social Sciences (SPSS) (IBM,USA) Program for Windows, version 22.0. Multiple linear regression analysis was used to measure the relationship between the independent factors (age, gender, education level, family member loss and experiencing chronic disease(s)) and the outcome variable (depression score). The statistically significant value was  $p < 0.05$ .

## Results

Of the 313 people who participated in this study, 147 (47 %) were men and 166 (53 %) were women (Table 1). Approximately two-third (63.6 %) of the participants were patients from a teaching hospital, while 29.7 % were college students and 6.7 % were high school students. The study population were relatively young people (37.7 years). According to the BDI, more than half (57.2 %) of the participants reported some level of depression symptoms. In terms of the cut-off scores, 134 (42.8 %) scored in the normal range (1-10), 64 (20.4 %) in the mild range (11-16), 22 (7.0 %) in the borderline range, 46 (14.7 %) in the moderate range (17-30), 33 (10.5 %) in the severe range (30-40) and 14 (4.5 %) in the very severe range (>40) depression. Among those with depression symptoms (N=179), the majority (73.7 %) had mild, borderline or moderate degrees of depression symptoms (Table 1).

The study showed that 54.8 % (N=98) of the participants with depression symptoms were women and 45.2 % (N=81) were men. After taking the mean of responses for each of the 21 items, the results were less than one (range was 0 to 3) which mean the participants had lower scores of depression symptoms. Three items had the highest score means of depression symptoms including worthlessness (0.93), loss of interest (0.91) and suicidal thoughts or wishes (0.91). Mild suicidal thoughts like "I have thoughts of killing myself, but I would not carry them out" were confirmed by 42.8% of participants. One-fifth (20.4%) of the participants had moderate or severe suicidal thoughts such as "I would like to kill myself"; "I would kill myself if I had the chance". In contrast, sadness symptom had the lowest score mean (0.69) among the 21 items of the BDI (Table 2).

Approximately half (47%) of the participants had one or more chronic disease(s) including anxiety, cardiovascular diseases, diabetes, chronic renal failure, chronic eye problems, arthritis, osteoporosis, obesity and chronic gastrointestinal problems (Table 1).

According to the multiple linear regression analysis, there was a significant ( $P$ -value  $< 0.05$ ) positive association between the presence of a chronic disease and higher scores on the Beck Depression Inventory scale. There was significant ( $P$ -value  $< 0.05$ ) negative association between age and symptoms of depression (i.e. the participants with younger age had higher risk of depression). There was a significant association between gender and depression symptoms (female participants had higher BDI scores than male participants). Finally, the participants with recent family member loss were more likely to experience depression symptoms (Table 3).

**Table 1: The participant characteristics and their level of depression**

Characteristics	Frequency (N)	Percent
<b>Gender</b>		
Male	147	47
Female	166	53
Total	313	100
<b>Education</b>		
Illiterate	44	14.1
Primary School	7	2.2
Middle School	46	14.7
High School	94	30
College degree or higher	122	39
With Recent Family Loss	22	7
With Chronic disease(s)*	147	47
<b>Marital Status</b>		
Married/engaged	146	46.6
Single	167	53.4
<b>Depression level</b>		
Normal	134	42.8
Mild Mood Disturbance	64	20.4
Borderline Depression	22	7.0
Moderate Depression	46	14.7
Severe Depression	33	10.5
Extreme Depression	14	4.5
Age (years)	37.7 (mean)	15.9 (ST Dev)

Total N=313, \*Chronic diseases included anxiety, cardiovascular diseases, renal failure, chronic eye problems, arthritis, osteoporosis, obesity and chronic gastrointestinal problems.

**Table 2: The participants' score means of Beck's Depression Inventory item**

Depression Symptom	Mean
Sadness	.69
Pessimism	.83
Past failure	.87
Loss of Pleasure	.83
Guilty Feeling	.90
punishment Feelings	.81
Self – Dislike	.88
Self – Criticalness	.84
Suicidal Thoughts or Wishes	.91*
Crying	.88
Agitation	.88
Loss of interest	.91*
Indecisiveness	.90
Worthlessness	.93*
Loss of Energy	.89
Changes in Sleeping Pattern	.87
Irritability	.89
Changes in Appetite	.86
Concentration Difficulty	.78
Tiredness or Fatigue	.74
Loss of interest in Sex	.74

Responses to the BDI items are on a 4-point scale: 0 = no symptoms, 1=mild symptoms, 2 = moderate symptoms and 3 = severe symptoms. \*Three items with highest means.

**Table 3: The multiple linear regression analysis of factors influencing the level of depression**

Factors	Standardized Coefficients	P-value	95.0% Confidence Interval for Beta	
	Beta		Lower Bound	Upper Bound
Chronic disease	.407	.0001*	6.728	10.946
Family Loss	.282	.0001*	7.957	15.965
Marital	.055	.274	-.948	3.330
Education	-.061	.209	-1.248	.275
Age	-.302	.004*	-.345	-.068
Gender	.367	.0001*	3.555	12.396

\*Significant (P-value < 0.05). R-square=0.306. Outcome variable=depression score.

Predictors: Gender, Chronic disease, Family Loss, Education level, Marital status, age, gender= male is the reference group.

## Discussion

This competitive era has amplified the risk of developing various mental disorders like depression. In the present study, the BDI scale was used to detect the prevalence of depression and its associated factors among people in Baghdad. Although the BDI is not designed for diagnostic purposes, its epidemiologic utility has been evaluated in several studies which concluded that it is a reliable and valid indicator of depressive disorders in general population (17-19). This survey is not a diagnostic test for depression; it is simply a tool that can measure the severity of potential symptoms of depression. The participants' scores are to measure symptoms of depression or the risk of depression rather than depression itself. An actual diagnosis of depression requires a full assessment by a physician or psychiatrist. Moderately depressed patients may need a combination of medication and psychotherapy. Patients with severe depression may not respond to psychotherapy, and they are at higher risk for suicide (20).

The study participants were relatively young people (37.7 years). The prevalence of depression symptoms was lower among male participants than female participants probably because Iraqi culture is a typical Arabic culture, which is male dominant. Arabic cultures impose more limitations on women's behaviors compared to men that may increase depression and daily stress among women.

The prevalence of depression symptoms in the whole sample was 57.2 %, and 47% of the participants had one or more chronic disease(s) such as diabetes, arthritis and asthma and cardiovascular diseases (Table 1). More than quarter of the participants were pharmacy and medical students who may experience high stress during their study-course. Since this study found suicidal thoughts among the young participants (college and high school students), we recommend providing social counselling services at schools and colleges to help those students to overcome suicidal thoughts.

Iraqis in general experience high rate of depression because of the wars, violence and economic difficulties which they have been facing for around four decades. Since 10.5 % and 4.5 % of the study, participants had depression of severe and very severe grade respectively; we suggest providing group counseling facilities within the community. Participants with chronic disease(s) had a higher significantly prevalence of depression than those without chronic disease even after adjusting for demographic and socioeconomic variables (Table 3). This may be because chronic diseases such as diabetes need life-long treatment and follow-up doctor visits, cause complications and may cause disability. Similarly, a Korean study of depression using the BDI found the participants with chronic obstructive pulmonary disease (COPD) (chronic disease) had a higher prevalence of depression than a control group (21). This result is consistent with the literature (22).

There is evidence that patients with chronic respiratory and cardiovascular diseases have higher rates of depression (9, 21, 22) , but some studies have not adequately controlled for influence of possible confounders (21).

A study in the U.S. also using the BDI found a positive relationship between depressive episodes and post myocardial infarction (MI) death which is associated with a decrease in the heart rate (23). Depression can cause insomnia and shorter sleep duration, which act as modulators of hypertension through increasing activity of the hypothalamic-pituitary-adrenal axis (24). A study of 20 general practices in Germany showed patients with different chronic diseases have lower quality of life and are more likely to experience depression (9). A meta-analysis found that depression is associated with several complications in patients with diabetes including retinopathy, neuropathy, nephropathy, sexual dysfunction and macrovascular complications (12). According to a literature review of nine depression-related studies, depression is associated with several negative consequences for diabetic patients such as lower adherence to drug therapy and healthy diets, lower quality of life and higher healthcare expenses (13). In conclusion, there is positive association between depression and chronic diseases and the evidence that people with depression experience poor outcomes for these diseases.

Whether people with depression have higher probability of developing chronic diseases or people with chronic diseases have higher prevalence of depression, it is essential that healthcare providers adopt specific policies and actions for this population to minimize depression symptoms. According to a randomized controlled trial in the U.S., a nurse-led intervention of telephonic cognitive behavioral therapy which targeted 291 patients with depression and diabetes for three months resulted in reduction of depression symptoms (25). An American study among health-related colleges in the United States found around 20% of the students experience social isolation which may lead to depression (26). A cluster randomized trial in Netherlands showed that both depression care program and proper follow-up visits by primary care professionals seem to lead to reduction in depression scale among patients with major depression (27). As recommendations, the BDI scale is helpful tool to screen depression symptoms and Iraqi universities need social counseling services to support students who experience psychological difficulties for various reasons. As a limitation, the study sample size was relatively small and may not represent Iraqi population.

## Conclusions

Depression has taken major bulk of medical and pharmacy students in its clutches. Having high score of depression symptoms are associated with chronic diseases, recent family loss, female gender and young age. The study findings

demonstrate the importance of screening of young population using a simple tool as the BDI. Health professionals, health officials, and policy makers must develop specific strategies for this vulnerable group. It is critical to recommend appropriate interventional measures to prevent the complications of depression including suicides. On an individual, community, and national level, it is time to educate Iraqis about depression and support those who are suffering from this disorder in addition to developing group counseling facilities in large cities. We also recommend providing social counselling services at schools and universities to help students to overcome suicidal thoughts. Finally, Iraqi healthcare professionals should structure specific policies and actions for patients with chronic diseases to minimize their depression symptoms.

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