ORIGINAL ARTICLE

Prevalence of Depression and Anxiety Among Patients with Noncommunicable Diseases in The Kingdom of Bahrain

Wafa AlSharbati[1], Sharifa Bucheeri[1], Maha Alkawari[1], Noora Alromaihi[2*], Reham Algarf[2], Wafa Alfara[2]

[1]Public Health Consultant, Ministry of Health, P. O. Box 42, Kingdom of Bahrain.
[2]Consultant Family Physician, Primary Care Directorate, Ministry of Health, P. O. Box 42, Kingdom of Bahrain.

*Corresponding author:
Noora Alromaihi, Consultant Family Physician, Primary Care Directorate, Ministry of Health, P. O. Box 42, Kingdom of Bahrain; Tel: (+973) 39670898, Email: NRumaihi@health.gov.bh

Abstract

Background and objectives: There is a high coexistence between mental disorders and chronic noncommunicable diseases (NCD). Patients with chronic illnesses have higher rates of depression and anxiety when compared to the healthy individuals. The study aimed to estimate the prevalence of depression and anxiety and to explore the associated risk factors.

Methods: A cross sectional study conducted in the NCD clinics of five health centers in the Kingdom of Bahrain included all patients attending these clinics from January 2016 to March 2016. Hospital anxiety and depression scale (HADS) was used to screen patients for depression and anxiety. Logistic regression analyses were used to identify risk factors associated with anxiety and depression. All the analyses were conducted using STATA 12; $P<0.05$ was considered statistically significant.

Results: A total of 456 patients were included in the study. Mild and moderate to severe type of depression were observed in 71 (15.6%) and 53 (11.6%) patients, respectively. According to the multivariable model, the odds of having high depression score was significantly higher in patients aged <45 years (adjusted odds ratio (OR)=2.01; $P=0.01$), with low income (adjusted OR=1.99; $P=0.02$), with personal history of mental illness (adjusted OR=5.13; $P=0.001$), and with lower educational levels ($P=0.02$). Mild and moderate to severe anxiety scores were observed in 55 (12.1%) and 34 (7.5%) patients, respectively. According to the multivariate model, the odds of having high anxiety score was significantly higher in females (adjusted OR=2.85; $P<0.001$), patients aged <45 years (adjusted OR=2.41; $P=0.005$), in patients with low income (adjusted OR=3.62; $P<0.001$), and in those with personal history of mental illness (adjusted OR=4.5; $P=0.004$).

Conclusion: There is a high prevalence of depression and anxiety among patients attending NCD clinics in the Kingdom of Bahrain. Therefore, screening of mental health diseases should be established.

Keywords: Anxiety, Bahrain, chronic diseases, depression, noncommunicable diseases

Introduction

The World Health Organization defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity".[1] This definition illustrates the woven relationship between the physical and mental

health and confirms that there is no health without mental health. The number of people affected with mental disorders is increasing and compromising a cumulative burden on resources. Noncommunicable diseases (NCD), such as ischemic heart disease and cerebrovascular disease are among the top six causes of burden of disease. Mental health disorders (unipolar depressive disorder and alcohol use disorder) are among the 20 leading causes of burden of disease.[2]

The understanding of the relationship between chronic physical and mental illnesses has increased dramatically in the last two decades, and studies have reported a close coexistence between both the disorders.[3] Individuals with chronic illnesses have higher rates of depression and anxiety compared to the general population.[3, 4] The coexistence of chronic physical and mental problems increases the burden of physical illness, functional impairment, and medical costs.[4] In addition, it impairs the ability to selfcare and decreases the adherence to treatment regimens resulting in an increased mortality.[5, 6]

Depression and anxiety are the most common mental disorders among individuals with chronic diseases, such as cardiac and respiratory illnesses, diabetes, and cancer. It is estimated that one out of five cardiac patients and one out of four diabetic patients suffer from depressive symptoms.[7] Moreover, 15–25% of cancer patients suffer from depression, especially in the advanced stages of the disease. Depression and anxiety are closely related to unhealthy life styles, such as smoking and poor nutritional habits leading to obesity; thus, further increasing the risk of cardiovascular disease (CVD).[7]

NCD is highly prevalent in the Kingdom of Bahrain. The National Noncommunicable Diseases Risk Factors Survey conducted in the Kingdom of Bahrain in 2007 showed that the prevalence of diabetes mellitus, hypertension, and raised cholesterol level was 14.3%, 38.2%, and 40.6%, repectively.[8] In 2012, mortality due to NCD constituted about 61% of total deaths, wherein, CVD, cancer, and diabetes accounted for 21%, 10%, and 10% of the deaths, respectively.[9] A study was conducted on the prevalence of depression among diabetic patients attending diabetic clinics in primary care settings in the Kingdom of Bahrain. It revealed that around one-third were potential cases of depression and the majority were underdiagnosed and undertreated; concluding that psychosocial assessment should be a part of patient assessment criteria.[9] Another study has shown a prevalence rate of 17.3%, 19.3%, and 5.6% for generalized anxiety disorders, life time depression, and current depression, respectively, in patients attending primary health care centers in the Kingdom of Bahrain. It also showed that 7.3% of the patients had anxiety or depression in the past and only 41% of them had received treatment.[10]

All health care centers in the Kingdom of Bahrain have NCD clinics with full professional teams (doctors, nurses, and health promotion specialists). The main aim of establishing these clinics was to educate patients and help them follow healthy lifestyle in order to control the diseases.[11] The present study was conducted to estimate the prevalence and explore the factors associated with depression and anxiety among patients with NCD attending these clinics.

Materials & methods

This cross-sectional study was conducted in the NCD clinics of five health centers in the Kingdom of Bahrain from January to March 2016. Patients attending the NCD clinics during the research period were included in the study; whereas, patients who couldn't read and write Arabic or English were excluded as the questionnaire was self-filled. The study was approved by the Research Committee in the Ministry of Health. Before commencement of the study, all patients were informed about the procedure and scope of the study and informed consent was obtained.

One health center was randomly selected from each health region and patients attending NCD clinics during the study period were included until the required sample size was achieved. The sample size was calculated using the following formula:

$$n = z^2 p(1 - p)/d^2$$

where,

n, desired sample size;

z, standard normal deviate, set at 1.96 corresponding to the 95% confidence level;

d, degree of accuracy desired, set at 0.05;

p, prevalence of depression and anxiety among patients attending NCD clinics; based on literature review it was expected to be around 25%

Therefore,

$n = 3.8416 \times (0.25 \times 0.75)/(0.05^2)$

$n = 289$

To account for the design effect with cluster sampling, we multiplied the estimated sample size by 1.5, so the minimum required sample size was 434. The required sample size was distributed in the five health centers proportionate to the number of patients registered in the NCD clinics in each health region.

All study participants were asked to fill a questionnaire, which consisted of two parts: first part had questions about the demographic characteristics, type of chronic disease, and personal and family history of mental illness; second part was the screening tool (Hospital Anxiety and Depression Scale/HADS). The questionnaire was made available in two different languages—Arabic and English.

Hospital Anxiety and Depression Scale (HADS)

Hospital Anxiety and Depression Scale (HADS) is a simple and reliable screening tool for identifying depression and anxiety in patients. It is valid for the purpose of screening, while definitive diagnosis can only be reached through clinical evaluation. It is proven that it is valid when used in primary care settings.[12]

The scale consists of 7 items each for anxiety and depression. Each item is rated on a four-point scale from 0 (not at all) to 3 (very often). Possible scores for anxiety and depression range from 0 to 21.

Range of scores: 0–7, normal; 8–10, mild anxiety/depression; 11–14, moderate; and 15–21, severe anxiety or depression.[13]

Statistical analysis

Descriptive statistics were calculated for both continuous and categorical variables. The prevalence of depression and anxiety was calculated with 95% confidence interval (CI) using the Wilson method. Chi square test and Fisher's exact test were used to examine the relation between anxiety/depression and other possible factors. Logistic regression analysis was used to identify factors associated with anxiety/depression; odds ratios (ORs) and corresponding 95% CIs were calculated. Prior to regression analysis, the anxiety and depression scores were dichotomized into normal (0–7) and high (8–21) scores.[14] The following variables were analyzed using univariable logistic regression analysis for possible association with anxiety/depression: age, gender, marital status, nationality, occupation, education, income, and personal and family history of mental illness. Variables with a P value <0.2 were included in the multiple logistic regression analysis. All the analyses were conducted using STATA (version 12) and P values <0.05 were considered statistically significant.

Results

Among the 515 patients approached for participation in the study, a total of 456 agreed to participate (response rate = 88.5%). The most common chronic condition observed was diabetes followed by hypertension and dyslipidemia (Figure 1). Almost equal number of males and females were observed in the study and most belonged to the age group of 45–60 years. The age ranged between 18 and 85 years. More than 80% of the patients were of Bahraini origin, married, and earned a good income (Table 1).
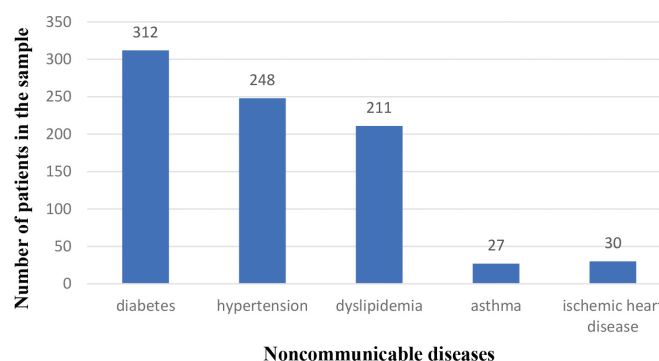
Figure 1: Chronic conditions among study participants

Table 1: Characteristics of the study participants

Variable		N(%)
Age (years)	**<45**	86 (19.6)
	45–60	238 (54.2)
	>60	115 (26.2)
Gender	**Female**	215 (48.4)
	Male	229 (51.6)
Marital status	**Single**	23 (5.2)
	Married	379 (85.2)
	Divorced	22 (4.9)
	Widowed	21 (4.7)
Nationality	**Bahraini**	385 (86.3)
	Non-Bahraini	61 (13.7)
Occupation	**Working**	156 (35.1)
	Not working	288 (64.9)
Education	**Intermediate level or below**	89 (20.1)
	Secondary level	188 (42.4)
	University or higher	166 (37.5)
Income	**Low**	74 (16.9)
	Good	354 (80.6)
	High	11 (2.5)
History of mental illness	**Yes**	21 (4.7)
	No	422 (95.3)
Family history of mental illness	**Yes**	27 (6.1)
	No	418 (93.9)

Prevalence of depression in NCD patients and the associated factors

Amidst the 456 interviewed, 71 (15.6%; 95% CI: 12.5–19.2) were diagnosed with mild depression, whereas 53 (11.6%; 95% CI: 9.0–14.9) had moderate to severe depression. Depression was significantly associated with age ($P=0.05$), marital status ($P=0.03$), education level ($P=0.01$), income ($P=0.02$), and personal history of mental illness ($P=0.001$; Table 2). Among this group of patients, there was no statistically significant difference in the prevalence of depression among different diseases (Table 2).

Table 2: The relationship between patient characteristics and depression score

Variable		Score			P value
		Normal N (%)	Mild N(%)	Moderate/ severe N (%)	
Age (years)	<45	56 (62.9)	16 (18)	17 (19.1)	0.05*
	45–60	182 (75.5)	33 (13.7)	26 (10.8)	
	>60	90 (77.6)	18 (15.5)	8 (6.9)	
Gender	Female	151 (69.6)	33 (15.2)	33 (15.2)	0.06
	Male	178 (76.1)	37 (15.8)	19 (8.1)	
Marital status	Single	15 (65.2)	4 (17.4)	4 (17.4)	0.03*
	Married	287 (74.5)	60 (15.6)	38 (9.9)	
	Divorced	11(5)	5 (22.7)	6 (27.3)	
	Widowed	15 (71.4)	1 (4.8)	5 (23.8)	
Nationality	Bahraini	285 (72.7)	64 (16.3)	43 (11)	0.25
	Non-Bahraini	45 (73.8)	6 (9.8)	10 (16.4)	
Occupation	Working	116 (72.5)	28 (17.5)	16 (10)	0.53
	Not working	211 (72.8)	42 (14.5)	37 (12.8)	
Education	Intermediate level or below	58 (63.7)	17 (18.7)	16 (17.6)	0.01*
	Secondary level	133 (69.6)	37 (19.4)	21 (11)	
	University or higher	136 (81)	16 (9.5)	16 (9.5)	
Income	Low	45 (59.2)	15 (19.7)	16 (21.1)	0.02*
	Good	268 (74.9)	54 (15.1)	36 (10.1)	
	High	10 (90.9)	0	1 (9.1)	
Diabetes	Yes	225 (72.1)	47(15.1)	40 (12.8)	0.51
	No	101 (75.4)	21 (15.7)	12 (8.9)	
Hypertension	Yes	183 (73.8)	40 (16.1)	25 (10.1)	0.47
	No	143 (72.2)	28 (14.1)	27 (13.6)	
Dyslipidemia	Yes	158 (74.9)	31 (14.7)	22 (10.4)	0.66
	No	167 (71.4)	37 (15.8)	30 (12.8)	
Asthma	Yes	18 (66.7)	5 (18.5)	4 (14.8)	0.64
	No	308 (73.5)	63 (15.0)	48 (11.5)	
Ischemic heart disease	Yes	19 (63.3)	6 (20.0)	5 (16.7)	0.39
	No	307 (73.8)	62 (14.9)	47 (11.3)	
History of mental Illness	Yes	8 (38.1)	6 (28.6)	7 (33.3)	0.001*
	No	318 (74.5)	63 (14.8)	46 (10.8)	
Family history of mental illness	Yes	18 (64.3)	5 (17.9)	5 (17.9)	0.44
	No	309 (73.2)	65 (15.4)	48 (11.4)	

*P value of chi square test or Fisher's exact test

The results of the univariable and multivariable logistic regression models are described in Table 3. According to the multivariable model, the odds of having high depression (score ≥ 8) was significantly higher in patients aged <45 years (adjusted OR = 2.01; 95% CI: 1.16–3.47; $P=0.01$), with low income (adjusted OR = 1.99; 95% CI: 1.11–3.56; $P=0.02$), and those with a personal history of mental illness (adjusted OR = 5.13; 95% CI: 1.92–13.70; $P=0.001$). Lower educational level was associated with increased odds of having higher depression score. Compared to patients with university or higher education, patients with secondary level education and those with intermediate or lower level of education had 87% and more than twice the odds, respectively of having higher depression scores.

Table 3: Multiple logistic regression analysis of factors associated with depression in patients with noncommunicable diseases

Variable		Unadjusted odds ratio	95% CI	P value	Adjusted odds ratio	95% CI	P value
Age (years)	**≥45**	1.00			1.00		
	<45	1.89	1.15–3.09	0.01	2.01	1.16–3.47	0.01
Gender	**Male**	1.00			1.00		
	Female	1.39	0.92–2.11	0.12	1.17	0.73–1.86	0.52
Marital status	**Married**	1.00			1.00		
	Single	1.56	0.64–3.80	0.33	1.38	0.52–3.64	0.52
	Divorced	2.93	1.23–6.97	0.02	2.02	0.78–5.23	0.15
	Widowed	1.17	0.44–3.10	0.75	0.94	0.30–2.92	0.92
Nationality	**Bahraini**	1.00			-	-	-
	Non-Bahraini	0.95	0.51–1.75	0.86	-	-	-
Occupation	**Not working**	1.00			-	-	-
	Working	1.01	0.66–1.56	0.95	-	-	-
Education	**University or higher**	1.00			1.00		
	Secondary Level	1.85	1.13–3.04	0.01	1.87	1.10–3.18	0.02
	Intermediate level or below	2.42	1.36–4.30	0.003	2.20	1.13–4.28	0.02
Income	**Good or high**	1.00			1.00		
	Low	2.10	1.26–3.52	0.005	1.99	1.11–3.56	0.02
History of mental illness	**No**	1.00			1.00		
	Yes	4.74	1.91–11.74	0.001	5.13	1.92–13.70	0.001
Family history of mental illness	**No**	1.00			-	-	-
	Yes	1.52	0.68–3.39	0.31	-	-	-

Prevalence of anxiety in NCD patients and the associated factors

Of the 456 interviewed, 55 patients (12.1%; 95% CI: 9.4–15.4) had mild anxiety and 34 patients (7.5%; 95% CI: 5.4–9.2) had moderate to severe anxiety scores. Anxiety was significantly associated with gender ($P<0.001$), age ($P=0.01$), marital status ($P=0.001$), income ($P<0.001$), and personal history of mental illness ($P=0.001$; Table 4). Among this group of patients, there was no statistically significant difference in the prevalence of anxiety among different diseases.

Table 4: The relationship between patient characteristics and anxiety score

Variable		Anxiety score			P value
		Normal, N (%)	Mild, N (%)	Moderate/severe, N (%)	
Age (years)	<45	62 (69.7)	14 (15.7)	13 (14.6)	0.01*
	45–60	195 (80.9)	31 (12.9)	15 (6.2)	
	>60	102 (87.9)	9 (7.8)	5 (4.3)	
Gender	Female	156 (71.9)	38 (17.5)	23 (10.6)	<0.001*
	Male	207 (88.5)	17 (7.3)	10 (4.3)	
Marital status	Single	18 (78.3)	0	5 (21.7)	0.001*
	Married	316 (82.1)	44 (11.4)	25 (6.5)	
	Divorced	15 (68.2)	7 (31.8)	0	
	Widowed	14 (66.7)	3 (14.3)	4 (19.0)	
Nationality	Bahraini	317 (80.9)	46 (11.7)	29 (7.4)	0.71
	Non-Bahraini	47 (77)	9 (14.8)	5 (8.2)	
Occupation	Working	131 (81.9)	16 (10)	13 (8.1)	0.61
	Not working	231 (79.7)	38 (13.1)	21 (7.2)	
Education	Intermediate level or below	64 (70.3)	18 (19.8)	9 (9.9)	0.08
	Secondary level	155 (81.2)	22 (11.5)	14 (7.3)	
	University or higher	142 (84.5)	15 (8.9)	11 (6.5)	
Income	Low	46 (60.5)	20 (26.3)	10 (13.2)	<0.001*
	Good	302 (84.4)	33 (9.2)	23 (6.4)	
	High	9 (81.8)	1 (9.1)	1 (9.1)	
History of mental illness	Yes	11 (52.4)	4 (19)	6 (28.6)	0.001*
	No	348 (81.5)	51 (11.9)	28 (6.6)	
Diabetes	Yes	250 (80.1)	39 (12.5)	23 (7.4)	0.82
	No	110 (82.1)	14 (10.4)	10 (7.5)	
Hypertension	Yes	200 (80.6)	29 (11.7)	19 (7.7)	0.97
	No	160 (80.8)	24 (12.1)	14 (7.1)	
Dyslipidemia	Yes	173 (82.0)	23 (10.9)	15 (7.1)	0.79
	No	186 (79.5)	30 (12.8)	18 (7.7)	
Asthma	Yes	20 (74.1)	2 (7.40)	5 (18.5)	0.09
	No	340 (81.1)	51 (12.2)	28 (6.7)	
Ischemic heart disease	Yes	22 (73.3)	4 (13.3)	4 (13.3)	0.36
	No	338 (81.2)	49 (11.8)	29 (7.0)	
Family history of mental illness	Yes	19 (67.9)	4 (14.30)	5 (17.9)	0.08
	No	342 (81)	51 (12.1)	29 (6.9)	

*P value of chi square test or Fisher's exact test

The results of the univariable and multivariable logistic regression models are described in Table 5. According to the multivariable model, the odds of having high anxiety score (≥ 8) was significantly higher in females (adjusted OR=2.85; 95% CI: 1.63–5.00; $P<0.001$), patients aged <45 years (adjusted OR=2.41; 95% CI: 1.31–4.46; $P=0.005$), patients with low income (adjusted OR=3.62; 95% CI: 1.92–6.80; $P<0.001$), and those with a personal history of mental illness (adjusted OR=4.5; 95% CI: 1.60–12.67; $P=0.004$).

Table 5: Multiple logistic regression analyses of factors associated with anxiety in patients with noncommunicable diseases

Variable		Unadjusted odds ratio	95% CI	*P* value	Adjusted odds ratio	95% CI	*P* value
Age (years)	≥ 45	1.00			1.00		0.005
	< 45	2.16	1.27-3.66	0.005	2.41	1.31–4.46	
Gender	Male	1.00			1.00		<0.001
	Female	3.00	1.82–4.93	<0.001	2.85	1.63–5.00	
Marital status	Married	1.00			1.00		0.76
	Single	1.27	0.46–3.54	0.65	0.84	0.27–2.56	
	Divorced	2.14	0.84–5.44	0.11	1.29	0.44–3.77	0.64
	Widowed	2.29	0.89–5.89	0.09	1.60	0.54–4.75	0.40
Nationality	Bahraini	1.00			-	-	-
	Non-Bahraini	1.26	0.66–2.41	0.49	-	-	-
Occupation	Not working	1.00			-	-	-
	Working	0.87	0.53–1.42	0.57	-	-	-
Education	University or higher	1.00			1.00		
	Secondary level	1.27	0.73–2.21	0.40	1.13	0.61–2.12	0.70
	intermediate level or below	2.30	1.25–4.26	0.008	1.83	0.87–3.82	0.11
Income	Good or high	1.00			1.00		
	Low	3.50	2.04–5.99	<0.001	3.62	1.92–6.80	<0.001
History of mental illness	No	1.00			1.00		
	Yes	4.00	1.64–9.76	0.002	4.50	1.60–12.67	0.004
Family history of mental illness	No	1.00			1.00		
	Yes	2.03	0.88–4.64	0.096	2.27	0.86–6.03	0.10

Discussion

This is the first study in the Kingdom of Bahrain that examined the prevalence of depression and anxiety among patients attending NCD clinics. A high prevalence of depression (27.2%) and anxiety (19.6%) were observed among the study participants. The prevalence of depression was high in asthmatic patients, followed by diabetic, hypertensive, dyslipidemia, and cardiac patients. The prevalence of anxiety in the decreasing order of occurrence in patients with other comorbidities: cardiac, asthmatic, diabetic, hypertensive, and dyslipidemia patients.

There is a wide variation in the estimated prevalence of depression and anxiety in previous studies conducted in different parts of the world. In Turkey, a study reported 29.4% and 15.5% prevalence of depressive disorder in diabetics and hypertensive patients. In addition, 16.0% and 9.5% of diabetics and hypertensive patients had common anxiety disorder.[15] According to a study conducted in three Southeast Asian countries (Cambodia, Myanmar, and Vietnam), the prevalence of anxiety in patients with diabetes, hypertension, and dyslipidemia was 18.5%, 15.6%, and 14.8%, respectively. Whereas, the prevalence of depression was 49.1%, 45.0%, and 30.9% among diabetics, hypertensive patients, and those with dyslipidemia, respectively.[16] The prevalence of depression in diabetic patients in China was estimated to be 23–39.2%. In India, the prevalence of depression ranged between 16.9% and 84%.[16]

Furthermore, studies conducted in the United States of America estimated that 17–27% patients with coronary artery disease and 9–26% patients with type 1 and type 2 diabetes mellitus have depression.[17, 18] This wide variation in the estimated prevalence of depression and anxiety across studies maybe due to true differences in different communities or different assessment or screening methods. Nevertheless, all of these studies point to a high prevalence of mental disorder in patients with chronic diseases and call for better attention to identify and manage mental disorders in patients with chronic diseases.

The high prevalence of depression and anxiety among patients attending NCD clinics in the Kingdom of Bahrain necessitates the inclusion of screening and evaluation of mental disorders in these clinics. The United States Preventive Services Task Force (USPSTF) has recommended screening of depression in adults, especially in those with risk factors of depression, including individuals with chronic illnesses.[13, 19] In the United Kingdom, the Quality and Outcomes Framework (QOF) of the General Practitioner (GP) contract encourages the screening of depression in patients with coronary heart disease and diabetes.[20] In addition, the National Institute for Health and Clinical Excellence (NICE) guidelines recommend being alert for the possibility of depression and anxiety, especially in patients with CVD and diabetes.[21]

In our study, the female gender was significantly associated with a high score of anxiety, however, not with depression screening test. Previous studies have proven that women suffer more from mental disorders in both the chronic disease as well as the general population.[15, 22, 23] According to our findings, anxiety and depression were also more common in the younger patients (<45 years of age). This contradicts the findings of the previous studies, wherein, depression was more common in patients >50 years of age.[16, 24] In our study, other factors that were significantly associated with high scores of anxiety and depression were low income and a past history of mental illness, which is consistent with previous studies.[24, 25]

Conclusion

There is a high prevalence of depression and anxiety among patients attending NCD clinics in the Kingdom of Bahrain. Accordingly, screening for mental health diseases should be an integral part of patients' initial evaluation and regular follow-up. Furthermore, appropriate guidelines should be established for the psychosocial management of patients identified during the screening.

Conflicts of interest

The authors of the study have no conflicts of interest to declare.

References

1. World Health Organization. Constitution of WHO: Principles. Available at: http://www.who.int/about/mission/en/. Accessed May 15, 2017.

2. World Health Organization. Global burden of disease. 2004. Available at: http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/. Accessed May 2, 2017.

3. World Health Organization. Investing in mental health. 2003. Available at: http://www.who.int.iris/handle/10665/42823. Accessed April 10, 2017.

4. World Health Organization. Chronic physical illness and mental health 2010. Available at: http://www.euro.who.int/en/health-topics/noncommunicable-diseases/mental-health/news/news/2010/14/chronic-physical-illness-and-mental-health. Accessed April 12, 2017.

5. Balhara YPS. Diabetes and psychiatric disorders. Indian J Endocrinol Metab. 2011;15(4):274-83.

6. Katon W, Sullivan MD. Depression and chronic medical illness. J Clin Psychiatry. 1990;51(Suppl 6):3-11.

7. Ivbijaro GO. Mental health and chronic physical illnesses: the need for continued and integrated care–World Mental Health Day 2010. Ment Health Fam Med. 2010;7(3):127.

8. Ministry of Health in Bahrain. National non-communicable diseases risk factors survey 2007. Available at: http://www.moh.gov.bh/Content/Files/Publications/x_2812013135226.pdf. Accessed June 4, 2016.

9. Nasser J, Habib F, Hasan M, et al. Prevalence of depression among people with diabetes attending diabetes clinics at primary health settings. Bahrain Med Bull. 2009;31:1-7.

10. Al Ansari A, Al Alaiwat B, Hamadeh R, et al. Treatment and prevalence of generalized anxiety disorder and depression among primary care attendees. Bahrain Med Bull. 2010;32(1):1-5.

11. Ministry of Health in Bahrain. Chronic Disease Clinic. Available at: http://www.moh.gov.bh/EN/MOHServices/Services/OurPrimaryServices/Curative/Chronic.aspx. Accessed May 4, 2016.

12. Snaith RP. The hospital anxiety and depression scale. Health Qual Life Outcomes. 2003;1(1):29.

13. Maurer DM. Screening for Depression. Am Fam Physician. 2012;85(2):139-44.

14. Collins MM, Corcoran P, Perry IJ. Anxiety and depression symptoms in patients with diabetes. Diabet Med. 2009;26(2):153-61.

15. Keskin A, Bllge U. Mental disorders frequency alternative and complementary medicine usage among patients with hypertension and type 2 diabetes mellitus. Niger J Clin Pract. 2014;17(6):717-22.

16. Peltzer K, Pengpid S. Anxiety and depressive features in chronic disease patients in Cambodia, Myanmar and Vietnam. S Afr J Psychiatr. 2016;22(1):940.

17. Rudisch B, Nemeroff CB. Epidemiology of comorbid coronary artery disease and depression. Biol Psychiatry. 2003;54(3):227-40.

18. Olver JS, Hopwood MJ. Depression and physical illness. Med J Aust. 2013;199(6):9-12.

19. Institute for clinical systems improvement. Health care guideline: Adult depression in primary care guideline. 2013. Available at: http://pcptoolkit.beaconhealthoptions.com/wp-content/uploads/2016/02/ICSI_Depression.pdf. Accessed May 12, 2016.

20. Screening for depression in primary care. Available at: http//www.patient.co.uk/doctor. Accessed October 12, 2016.

21. The National Institute for Health and Care Excellence. Common health problems: Identification and pathways to care 2011. Available at: www.nice.org.uk/guidance/cg123. Accessed November 14, 2016.

22. Bilge U, Ünlüoğlu I, Yenilmez Ç, et al. Determination of psychiatric disorders among outpatients who admitted to internal medicine clinic in a university hospital. J Neurol Sci Turk. 2012;29(2):316-28.

23. Linzer M, Spitzer R, Kroenke K, et al. Gender, quality of life, and mental disorders in primary care: Results from the PRIME-MD 1000 study. Am J Med. 1996;101(5):526-33.

24. Boing AF, Melo GR, Boing AC, et al. Association between depression and chronic diseases: Results from a population-based study. Revista de Saude Publica. 2012;46(4):617-23.

25. Clarke DM, Currie KC. Depression, anxiety and their relationship with chronic diseases: A review of the epidemiology, risk and treatment evidence. Med J Aust. 2009;190(7 Suppl):54-60.