

Prevalence of Depression in Primary Health Care Patient in Saudi Arabia, AlHassa Using PHQ-9

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Abstract

Introduction: Depression is a common medical illness with a multifactorial predisposition. The prevalence of depression in Saudi Arabia has been estimated in elderly at 1999 to be around 39% of patient that have been seen in primary health care center. There is no study conducted in AlAhsa, Therefore, this study aims to assess the prevalence of depression among patients attending Primary Health Care Centers (PHCC) in AlAhsa, Saudi Arabia, to identify the risk factors as well as the severity of depression based on PHQ-9, and to test the sensitivity and specificity of PHQ-2 and PHQ-9. **Methods:** This is a cross sectional study conducted in AlAhsa, Saudi Arabia. Participants were all patients attending primary health care centers of three different sectors in the region. Data was collected using PHQ-2 and PHQ-9 questionnaires through an individual interview carried out by trained medical students. **Results:** A total of 314 (79.6% females, 20.4% males) were screened with PHQ-9. Totally, depression was detected among 97 (30.9%) of participants. 22% had mild depression, 6.1% had moderate depression, and 2.8% had moderately severe to severe depression. Regarding determinants of depression among PHCCs attendants, it was clear that depression was detected among 75% of participants due to medications' side effect, 45.7% with a positive family history, and 36.5% was due to stressful events, Other factors including age, gender, job nature, and having chronic health problems were insignificantly associated with developing depression. In the current study we found the sensitivity for PHQ-2 of 93.8%, specificity of 72.4%. Which means that PHQ 2 is excellent tool for excluding depressive status and dependable in identifying cases. **Conclusion:** In this study, we found that depression tends to be prevalent among patients attending PHCCs in AlAhsa population. Certain factors were associated with higher chances of having depression. Furthermore, this study emphasizes on the use of PHQ 2 as a screening tool for depression, which was found to be excellent tool for ruling out and ruling in depressive cases.

Keywords: Depressive disorders; Depression self-rating; Multifactorial predisposition

Introduction

Depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel the way you think and how you act. ^[1] It is a persistent feeling of sadness, hopelessness, loss of pleasure in activities that the person usually enjoys and lack of energy. ^[2,3] The patient may suffer from sleep disturbances, malaise and decreasing or increasing in appetite. ^[1,3] Depression is a multifactorial disorder, it has genetic predisposing factors such as being female (it has 2:1 sex ratio), past family history specially among identical twins and previous history of depression. ^[1,4] Personality can play a role in depression, a person with low self-esteem, who are sensitive to stress, or who always tend to focus to the negatives in life in general are more prone to be depressed. There are also some environmental factors that may result in depression and they include chronic diseases, chronic pain, traumatic brain injury, socio-economic status, and persistent exposure to violence, abuse or being neglected. ^[1,2,4]

There is a wide difference in the prevalence of depressive

disorders according to subtype of depression which shows the highest rate in minor depression which has been estimated at 8.4% to 9.7% of the patient, major depression with 4.8% to 8.6% and dysthymia at 2.1% to 3.7% of patients that have been seen at outpatient primary health care siting. ^[5] The prevalence of depression also varies among patient in rural and urban area. ^[6] However, National Survey on Drug Use and Health (NSDUH) At 2017 report that 7.1% of all US adults has major depressive episode by using 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). ^[7] There is also a research has been done to assess the prevalence of depression in different European countries which shows that 8.56% of general population are affected with the depression, with a higher prevalence in urban Ireland and urban UK, low prevalence in

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urban Spain and medium prevalence in the remaining sites. [8] Another research has been done to estimate the prevalence of depression among Arabic female at primary health care sitting which shows 33% of them have a depression in which 18% of them have a severe depression and 14.7% of them have a moderate depression. [9] A study has done in Iran in 2016 where a total of 1006 patients were screened. In which 17.6 percent of them were males and 80.5% were females, 77% of them showed symptoms of depression. [10] Another study done in China in which a total of 823 people (51.0% women, 49.0% men) screened with PHQ-9 42.3%. Participants had no depression, 34.3% had mild depression, 16.4% had moderate depression, 5.7% had moderately severe depression and 2.4% had severe depression. [11] The prevalence of depression in Saudi Arabia has been estimated in elderly in 1999 to be around 39% of patient that have been seen in primary health care center and it shows a several factors that had a correlation with the depression. These factors include the age, gender, marital state, educational level, employment status and financial state. [12] Another research was done in 2011 at southeastern region of Saudi Arabia to estimate the prevalence of depression in primary health care center which shows that 12% of patients were affected with the depression. [13]

In January 2016, the United States Preventive Services Task Force (USPSTF) recommended screening for all adults regardless of risk factors. [14] There are many tests to screen for the presence of depression; one of them is the 20-item Zung depression self-rating scale which is less usually used. However, it is within the property right. It doesn't have adequate sensitivity to discover change over time. Therefore, it is not considered helpful for following response to treatment. [15] One more test is the ultra-short (one, two, three or four item) tests have appealed due to their simple administration, but their accuracy has not been established to determine whether ultra-short screening instruments accurately detect depression in primary care. [16] The most common screening method used in many health care systems is the Patient Health Questionnaire which is a self-administered tool of 2 (PHQ2) or 9 (PHQ9) items. [3] Those who screen positive on PHQ-2 should then be assessed with the 9-item PHQ-9.

Patient Health Questionnaire (PHQ-9) is a valid, reliable and common instrument for depression screening (3, 17). It is a simple questionnaire that takes two to five minutes to fill. [17] PHQ-9 is symptoms count instrument, assess the depression based on the depression criteria. [18] This method has an advantage over other methods as it is not only limited to screening. It can measure the severity of depression and classify it from mild to severe. Hence, this will be helpful for treatment guidance and follow up as well. [17,18] Also, it can be used as an alternative to geriatric depression scale. [19]

There are many studies have shown that depression is very common among patients with chronic disease. A study was conducted at primary health centers of Riyadh concluded that depression prevalence is high in primary care patients. [3] Another study was conducted in Jeddah among diabetic patients attending primary care centers concluded that depression among those patients is high and it affects the outcome of physician's care. [20] However, there is no study conducted in AlHassa, the

aim of this study is to assess the prevalence of depression among patients attending primary health centers.

Research Objectives

Research aim

This study aims to assess the prevalence of depression among patients attending primary health centers.

Secondary objective

1. To look for the prevalence of depression among patients attending primary health care centers.
2. To identify the risk factors associated with depression.
3. To identify the severity of depression based on PHQ-9.
4. To test the sensitivity and specificity of PHQ-2 and PHQ-9.

Research Methodology

Study design

The current study was a questionnaire based observational cross-sectional study.

Inclusion criteria

All patients who visit primary health care centers aged between 18 years and 75 years who agree to participate were included in this study.

Exclusion criteria

Patients who refused to participate, have pre-existing depression, or used antidepressant were excluded.

Sample size

A sample size of 380 was calculated using a pilot study based on the number of the city population, with an estimation of a margin error of 0.05 and confidence level of 0.95.

Sampling and data collection

Data was collected using PHQ-9 questionnaire as a screening method for depression. [3] It will include socio demographic characteristics such as gender, age, level of education, marital status, work status, income, past medical history with the duration, daily activities and exercise and family history of depression. The questionnaire was collected during the period of December 2020 and January 2021. Data was filled by an individual interviews conducted by trained medical students.

PHQ9 was used to assess the presence of depressive symptoms during the last two weeks. It consists of nine multiple choice questions. Each question has 4 options represent how many times patients have the symptoms. A score between 0 and 3 is used to represent each one of these options, not present at all=0, several days=1, more than half the days=2, nearly every day=3. Total score will be calculated then scaled from 0 to 27. Minimal depression (less than 5), mild (5-9), moderate (10-14), moderate to severe (15-19), and severe depression (20-27).

Statistical analysis

In this study, depression was considered when the score is

five and more. The entry and analysis of data was done in the Statistical Package for the Social Science (SPSS, version 23). Demographic data summarized in frequencies tables. Moreover, each question of the PHQ-9 analyzed the means, standard deviations, frequencies and percentages, where applicable. For qualitative variable chi square test was used. P-value of less than 0.05 with 95% CI was considered as significant.

Result

Data analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was completed using two-tailed tests. A p-value of less than 0.05 was statistically significant. Descriptive analysis based on frequency and percent distribution was done for all variables, including participant's personal data, medical health condition, risky behavior, exposure to painful events and depression items of PHQ-9. Scores for depression were calculated by summing up all items discrete scores of PHQ-9 scale where those who had 0-4 were considered normal, 5-9 for mild depression, 10-14 for moderate depression, 15-19 for moderately severe, and 20-27 for severe depression. The total score for each subscale was categorized reference to the cut off points mentioned in the methodology section. Cross tabulation was used to assess the distribution of participant's depression by their personal and other related data. The significance of relations in cross-tabulation was tested using the Pearson chi-square test.

The study included 314 participants who attended the PHCCs during the study period. Attendant's ages ranged from 18 years to 73 years with mean age of 38.8 years \pm 13.1 years old. Exact of 250 (79.6%) participants were females and 242 (77.1%) were married. University level of education was reported among 100 (31.8%) participants and 203 (64.6%) were not working while 10 (3.2%) were health care workers. Monthly income of less than 5000 Sr was reported by 82 (26.1%) participants and 45.2% had chronic health problem including hypertension (25.5%), DM (19.7%), and osteoarthritis (15.6%) [Table 1].

Table 1: Bio-demographic data of PHCCs attendants, Al-Hassa, Saudi Arabia.

Bio-demographic data	No	%
Age in years		
< 30	79	25.20%
30-39	92	29.30%
40-49	65	20.70%
50+	78	24.80%
Gender		
Female	250	79.60%
Male	64	20.40%
Social status		
Single	53	16.90%
Married	242	77.10%
Divorced/ widow	19	6.10%
Educational level		
Below secondary	58	18.50%
Secondary	156	49.70%
University/above	100	31.80%

Job		
Not working	203	64.60%
Non-health care provider	80	25.50%
Health care provider	10	3.20%
Student	21	6.70%
Monthly income		
<5000 SR	82	26.10%
5000-10000 SR	56	17.80%
>10000 SR	35	11.10%
Independent	141	44.90%
Chronic diseases		
None	172	54.80%
Hypertension	80	25.50%
Diabetes mellitus	62	19.70%
Hypothyroidism	2	0.60%
Osteoarthritis	49	15.60%
Anaemia	3	1.00%
Sickle cell disease	11	3.50%
Asthma	16	5.10%
Others	12	3.80%

Table 2 shows factors related to depression among PHCCs. Exact of 18 (5.8%) of the participants reported that they have medications that they know it leads to depression, and 14.6% had family history of depression who were second degree relative among 30.4% of them sister or brother among 28.3%, mother or father among 19.6%, and daughter or son among 10.9%. Doing exercise was reported by 50.6% of the participants which was for less than three days per week among 24.8%, and daily among 13.7%. Walking was the most reported type of secretcies (80.5%; 128), followed by GYM (10.1%; 16). Experiencing shock events was reported by 56.7% of the participants where sudden death of a relative was reported among 38.2%, followed by diagnosis of a relative with chronic disease (23.6%), critical illness (23.2%), and Work stress (14.6%) while educational difficulties was reported by 3.2%. Violence history was reported by 3.8% of the participants, neglect (8.6%), and 5.4% were exposed to physical or psychological abuse.

Table 3 reveals distribution of patient health questionnaire items among PHCCs attendants. Exact of 44.6% of participants felt tired or having little energy, 39.2% had trouble falling/staying asleep, sleeping too much, 35.4% felt own, depressed, or hopeless, 35% had little interest or pleasure in doing things, and 29.9% had trouble concentrating on things, such as reading the newspaper or watching television. Also, 27.1% of the participants reported that these problems made difficulty for them to do work, take care of things at home, or get along with other people. Totally, depression was detected among 97 (30.9%) participants which was mild among 69 (22%), moderate among 19 (6.1%), moderately severe to severe among 9 (2.8%) [Table 4].

Regarding determinants of depression among PHCCs attendants [Table 5], it was clear that depression was detected among 75% of participants who had medications that you know it leads to depression compared to 30.1% of others who did not with recorded statistical significance (P=.048) However the sample of the people responded with yes isn't significant. Also, 45.7% of participants with positive family history of depression had

Table 2: Factors related to depression among PHCCs, Al-Hassa, Saudi Arabia.

Factors related to depression	No	%
Do you use any medications that you know it leads to depression?		
Yes	4	1.30%
Maybe	14	4.50%
No	296	94.30%
Is there family history of depression?		
Yes	46	14.60%
No	268	85.40%
Relation degree		
Second degree relative	14	30.40%
Sister or brother	13	28.30%
Mother or father	9	19.60%
Daughter or son	5	10.90%
Grandmother or grandfather	4	8.70%
Wife	1	2.20%
Exercise days / week		
None	155	49.40%
< 3 days	78	24.80%
3-5 days	38	12.10%
Every day	43	13.70%
Type of exercise		
Walking	128	80.50%
Gym	16	10.10%
Running	10	6.30%
Football	5	3.10%
Have you been through these events?		
No	136	43.30%
Sudden death of a relative	120	38.20%
Diagnosis of a relative with chronic disease	74	23.60%
Critical illness	73	23.20%
Work stress	46	14.60%
Financial problems	40	12.70%
Car accident	30	9.60%
Divorce	25	8.00%
Educational difficulties	10	3.20%
Family problems	1	0.30%
Have you suffered from		
None	271	86.30%
Violence	12	3.80%
Physical or psychological abuse	17	5.40%
Neglect	27	8.60%

Table 3: Distribution of patient health questionnaire items among PHCCs attendants.

PHQ-9	No	%
Little interest or pleasure in doing things	Not at all	65.00%
	Several days	26.40%
	More than half the days	5.40%
	Nearly every day	3.20%
Feeling down, depressed, or hopeless	Not at all	64.60%
	Several days	25.20%
	More than half the days	6.40%
	Nearly every day	3.80%
Trouble falling/staying asleep, sleeping too much	Not at all	60.80%
	Several days	21.70%
	More than half the days	10.20%
	Nearly every day	7.30%

	Not at all	174	55.40%
Feeling tired or having little energy	Several days	91	29.00%
	More than half the days	24	7.60%
	Nearly every day	25	8.00%
	Not at all	231	73.60%
Poor appetite or overeating	Several days	59	18.80%
	More than half the days	12	3.80%
	Nearly every day	12	3.80%
	Not at all	249	79.30%
Feeling bad about yourself or that you are a failure or have let yourself or your family down	Several days	50	15.90%
	More than half the days	9	2.90%
	Nearly every day	6	1.90%
	Not at all	220	70.10%
Trouble concentrating on things, such as reading the newspaper or watching television.	Several days	72	22.90%
	More than half the days	14	4.50%
	Nearly every day	8	2.50%
	Not at all	284	90.40%
Moving or speaking so slowly that other people could have noticed. Or the opposite; being so fidgety or restless that you have been moving around a lot more than usual.	Several days	21	6.70%
	More than half the days	6	1.90%
	Nearly every day	3	1.00%
	Not at all	268	85.40%
Thoughts that you would be better off dead or of hurting yourself in some way.	Several days	37	11.80%
	More than half the days	3	1.00%
	Nearly every day	6	1.90%
	Not difficult at all	229	72.90%
If you checked off any of these problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	Somewhat difficult	55	17.50%
	Very difficult	30	9.60%

Table 4: Depression rate with severity among PHCCs attendants, Al-Hassa, Saudi Arabia.

Depression	No	%
Normal	217	69.10%
Depression	97	30.90%
Mild	69	22.00%
Moderate	19	6.10%
Moderately severe	7	2.20%
Severe	2	0.60%

Table 5: Distribution of PHCCs attendant's depression status by their bio-demographic and behavioural factors.

Factors	No	Depression		P-value
		Normal	Depression	
		No	%	
Age in years	<30	50	63.30%	0.482
	30-39	64	69.60%	
	40-49	49	75.40%	
	50+	54	69.20%	
Gender	Male	174	69.60%	0.709
	Female	43	67.20%	
Social status	Single	32	60.40%	0.234
	Married	170	70.20%	
	Divorced/ widow	15	78.90%	
Educational level	Below secondary	35	60.30%	0.103
	Secondary	116	74.40%	
	University/above	66	66.00%	
Job	Not working	141	69.50%	0.781
	Non-health care provider	57	71.30%	
	Health care provider	6	60.00%	
	Student	13	61.90%	

Monthly income	<5000 SR	55	67.10%	27	32.90%	0.077
	5000-10000 SR	40	71.40%	16	28.60%	
	>10000 SR	18	51.40%	17	48.60%	
Chronic diseases	Independent	104	73.80%	37	26.20%	0.71
	No	119	70.00%	51	30.00%	
Do you use any medications that you know it leads to depression?	Yes	98	68.10%	46	31.90%	.048*
	Maybe	9	64.30%	5	35.70%	
Is there family history of depression?	No	207	69.90%	89	30.10%	.019*
	Yes	25	54.30%	21	45.70%	
Exercise days / week	None	107	69.00%	48	31.00%	0.897
	<3 days	52	66.70%	26	33.30%	
	3-5 days	28	73.70%	10	26.30%	
Have you been through stressful events?	Every day	30	69.80%	13	30.20%	.014*
	No	104	76.50%	32	23.50%	
	Yes	113	63.50%	65	36.50%	

*P: Pearson X² test, P < 0.05 (significant)

Table 6: Validity of PHQ-2 in as screening for depression.

PHQ2	PHQ9		Sensitivity	Specificity	PPV	NPV	Accuracy
	Normal	Depression					
Normal	157	6	93.80%	72.40%	60.30%	96.30%	79%
Depression	60	91					

PPV: Positive predictive value, NPV: negative predictive value

Table 7: Area under the curve.

Test Result Variable(s): PHQ2_score					
Area	Std. Error	P-value	Asymptotic 95% Confidence Interval		
			Lower Bound	Upper Bound	
0.899	0.02	0.001	0.86	0.937	

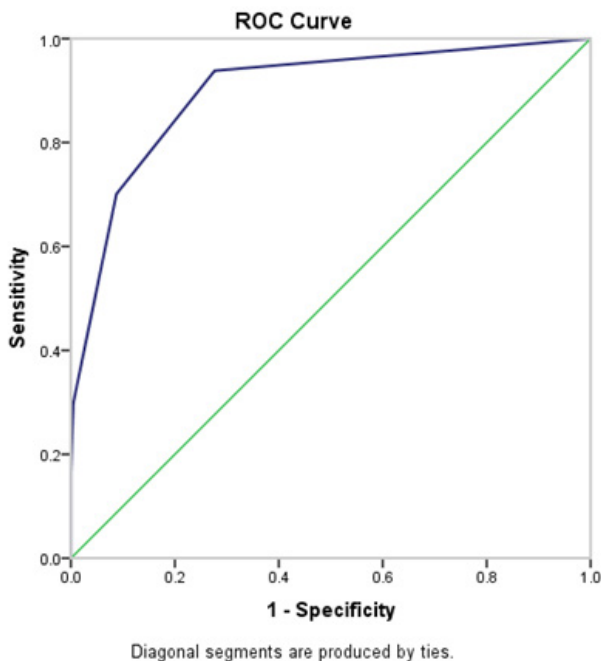


Figure 1: ROC curve for validity of PHQ2 as screening tool for depression

depression in comparison to 28.4% of those with free family history (P=.019). Exact of 36.5% of respondents who had been through stressful events had depression compared to 23.5% of those who have not (P=.014). Other factors including age,

gender, job nature, and having chronic health problems were insignificantly associated with developing depression.

Tables 6 and 7 and Figure 1 showed that a total of 91 out of 313 persons were classified as having depression by the two study tools (PHQ-2 and PHQ-9) and 157 out of 313 were defined as free of depression by the tools. This achieved sensitivity for PHQ-2 of 93.8%, specificity of 72.4%, positive predictive value of 60.3%, negative predictive value of 96.3% with classification accuracy of the persons of 79% which means that PHQ-2 is excellent tool for excluding depressive status and dependable in identifying cases. Area under curve for PHQ-2 as a screening tool for depression was 0.89 (very good) indicating it's rule to rule out and rule in cases.

Discussion

The current study aimed to assess prevalence, severity, and determinants of depression among PHCCs attendants in Al-Hassa, Saudi Arabia. In Spite of that depression attribute to a significant portion of disease burden in the clinical setting including primary health care centers, there is additional proof of that depression often remained undiagnosed. [21,22] World Health Organization report for mental health propose that undetected depression causes a weighty socio-economic burden on persons, families, and societies, through increased service needs, lost jobs, minimized productivity, poor family care with

the risk of trans generational effects and an increased burden on care givers. [23-25]

The current study revealed that one third of the PHCCs attendants in Al-Ahsa had depression which was mainly of mild degree (one fifth), and it was severe among only 2% of the participants. The major areas of depressive implication were in physical and sleep related aspects as feeling tiredness was reported by minimal bit less than half of the respondents, difficulty falling sleep reported by one third of the respondents followed by defect in their psychological health as one third of the respondents felt depressed and hopeless with feeling of less interest among nearly 29% of the respondents. The most significant determinants of depression were having medications which may induce mental disturbance, family history of depression, and being exposed to painful events or violence (physical, or psychological).

The estimated depression rate in the current study is similar to what was reported by Udedi et al. [26] among patients attending PHCCs in Metwale as authors found that his prevalence of depression among the patients was found to be 30.3% while detection rate of depression by clinician was 0%. Also, he results were agreeable with the prevalence rate of 29.6% reported among Kuwait PHC patients. [27] In Thailand where it was 29.2% in primary care setting in. [28] and the 28.4% reported among primary care attendees in South India. [29] Amusingly the prevalence is more matched with that of the international study, [30] conducted by Barkow et al. where the prevalence was 33.5%, the 31.6% prevalence rate of current major depressive episode at PHC centers in Uganda, [31] and also the 32% prevalence rate of depressive disorder at a community health centre in South Africa. [32]

In Saudi Arabia, depression among elderly subjects attending primary health care centers was estimated by Ghazwani [33] who estimated that about 64% of elderly patients had depression which is doubled the estimated rate by the current study. Mild and moderate depressions were detected among 47.5% and 14.5% of elderly patients respectively while severe depression was diagnosed among 1.8% of them (like the current study findings). In contrast to the current study, depression was higher among females, singles or divorced smokers, patients with chronic health problems and those having visual impairment. Other many studies estimated prevalence of depression among Saudi populations varying from being community based to clinical care setting-based studies. Psychiatric disorders assessed in primary care were estimated in 1995 with prevalence ranged from 30%-46% of the visiting patients. [34] In 2002, depression and anxiety disorders were detected among 18% of adults in central Saudi Arabia. [35] Ibrahim et al. revealed that the overall prevalence of depression in a systematic review among PHCCs attendants and general population was found to be about 41%. [36] Rufaie et al. found a 17% of Dammam residents were depressed. [37] Qahtani et al. in asir reported a 27% prevalence of depression in the year 2008. [38] Wahid et al. reported an overall prevalence of depression nearing 12%, with 6% as severe cases, in the south-eastern region. [39] In Riyadh Becker et al. found depression prevalence to be 20% in primary care settings. [40,41]

Unlike the current study, many researchers assessed a significant

relation between female gender and depression. Also, other studies found that depression was more likely to be associated with lesser educational level. [42-45] Though, other studies estimated that depression was associated with young age group being divorced and widow, low monthly income, and working status being employed. Regarding the sensitivity and specificity of the screening tools The PHQ-2 has been found in previous study to be up to 97% sensitive and 67% specific in adults, with a 38% positive predictive value and 93% negative predictive value. [46] It is also reported to have 74% sensitivity and 75% specificity in adolescents. [47] Another study done for 2642 patients showed Sensitivity and specificity of the PHQ-2 for diagnosing major depression were 86% and 78%, respectively.

In the current study we found the sensitivity for PHQ2 of 93.8%, specificity of 72.4%, positive predictive value of 60.3%, negative predictive value of 96.3% with classification accuracy of the persons of 79% which means that PHQ-2 is excellent tool for excluding depressive status and dependable in identifying cases. Area under curve for PHQ-2 as a screening tool for depression was 0.89% (very good) indicating it's rule to rule out and rule in cases.

Conclusion

In this study, we found that depression tends to be prevalent among patients attending PHCCs in AlAhsa population. Certain factors were associated with higher chances of having depression such as medications' side effect, positive family history, and stressful life events. Therefore, as per recommended by the United States Preventive Services Task Force (USPSTF) to screen depression for all adults regardless of risk factors, this study further emphasizes on the use of PHQ-2 as a screening tool for depression, which was found to be excellent tool for excluding depressive status and dependable in identifying cases as well as ruling out and ruling in cases [Appendix].

Ethical Considerations

The study followed ethical rules in all its procedures. The approval was taken from the Ministry of Health in AlAhsa and written informed consent was taken from the head of the centers. Verbal and written consent was taken from each participant with clarifying the aim of the study and assuring the confidentiality of provided information.

References

1. <http://www.psychiatry.org/patients-families/depression/what-is-depression>.
2. Geddes J. Psychiatry. Psychiatry (Oxford Medical Publications), 4th edition 2012.
3. Al-Qadhi W, Rahman SU, Ferwana MS, Abdulmajeed IA. Adult depression screening in Saudi primary care: Prevalence, instrument and cost. BMC Psychiatry. 2014;14:1-9.
4. <https://www.aafp.org/afp/2012/0115/p139.html>.
5. <https://www.medscape.com/viewarticle/511167>.
6. Wang JL. Rural-urban differences in the prevalence of major depression and associated impairment. Soc Psychiatry Psychiatr Epidemiol. 2004;39:19-25.
7. <https://www.nimh.nih.gov/health/statistics/major->

- depression.
8. Ayuso MJL, Vázquez B JL, Dowrick C, Lehtinen V, Dalgard OS. Depressive disorders in Europe: Prevalence figures from the ODIN study. *Br J Psychiatry*. 2001;179:308-16.
 9. Hamdan A, Hawamdeh S, Hussein A. The prevalence and correlates of depressive symptoms among Arab women in a primary health care setting. *Int J Psychiatry Med*. 2008;38:453-467.
 10. Mohit A, Jalili A, Nohesara S, Bolhari J. A study of depression screening in primary care setting of Iran. *Int. Medical J*. 2016;23:125-127.
 11. Zhang L, Zou T, Hao Y, Sorel E. A study of depression screening in primary care setting of China. *Int Medical J*. 2016;23:119-121.
 12. Al-Shammari SA, Al-Subaie, A. Prevalence and correlates of depression among Saudi elderly. *Int J Geriatr Psychiatry*. 1999;14:739-747.
 13. Abdelwahid, HA, Al-Shahrani SI. Screening of depression among patients in family medicine in Southeastern Saudi Arabia. *Saudi Med J*. 2011;32:948-952.
 14. <https://www.uspreventiveservicestaskforce.org/uspstf/document/RecommendationStatementFinal/depression-in-adults-screening>.
 15. Anderson JE. Depression in primary care: Tools for screening, diagnosis, and measuring response to treatment. *BCM J*. 2019;44:415-419.
 16. Kendrick T. Review: Diagnosing depression in primary care ultra-short screening instruments may have limited use. *Evid Based Ment Health*. 2007;10:107.
 17. Spitzer RL, Williams JB, Kroenke K. Validation and utility of a self-report version of PRIMEMD-the PHQ primary care study. *JAMA*. 1999;282:1737-1744.
 18. Nease DE, Malouin JM. Depression screening: A practical strategy. *J Fam Pract*. 2003;52:118-124.
 19. Liu SI. Validation of patient health questionnaire for depression screening among primary care patients in Taiwan. *Compr Psychiatry*. 2011;52:96-101.
 20. Alhunayni NM, Mohamed AE, Hammad SM. Prevalence of depression among type 2 diabetic patients attending diabetic clinic at primary health care centers in Jeddah, Saudi Arabia. *Psychiatry J*. 2019;20:1-7.
 21. Licht SE, Beekman ATF, Dehaan M, Van MHW. The prognosis of undetected depression in older general practice patients. A one-year follow-up study. *J Affect Disord*. 2009;114:310-315.
 22. Okello ES, Neema S. Explanatory models and help-seeking behavior: Pathways to psychiatric care among patients admitted for depression in Mulago Hospital, Kampala, Uganda. *Qual Health Res*. 2007;17:14-25.
 23. Herrman H, Kieling C, McGorry P, Horton R, Sargent J, Patel V. Reducing the global burden of depression: A Lancet-world psychiatric association commission. *Lancet*. 2019;393:42-43.
 24. Petito A, Pop TL, Namazova BL, Mestrovic J, Nigri L, Vural M, et al. The burden of depression in adolescents and the importance of early recognition. *The J Pediatr*. 2020;218:265-267.
 25. Udedi M. The prevalence of depression among patients and its detection by primary health care workers at Matawale Health Centre (Zomba). *Malawi Med J*. 2014;26:34-37.
 26. Al-Nakkas EM, Al-Mutar MS. Prevalence of depression among Kuwaiti patients attending the sawaber health center. *Kuwait Med. J*. 2004;36:113-116.
 27. Lotrakul M, Saipanish R. Psychiatric services in primary care settings: a survey of general practitioners in Thailand. *BMC Fam Pract*. 2006;7:1-7.
 28. Pothan M, Kuruville A, Philip K, Joseph A, Jacob KS. Common mental disorders among primary care attenders in Vellore, South India: Nature, prevalence and risk factors. *Int J Soc Psychiatry*. 2003;49:119-125.
 29. Barkow K, Heun R, Üstün TB, Maier W. Identification of items which predict later development of depression in primary health care. *Eur Arch Psychiatry Clin Neurosci*. 2001;251:21-26.
 30. Muhwezi WW, Ågren H, Musisi S. Detection of major depression in Ugandan primary health care settings using simple questions from a Subjective Well-Being (SWB) subscale. *Soc Psychiatry Psychiatr Epidemiol*. 2007;42:61-69.
 31. Triant VA. The recognition and determinants of depression at a South African primary care clinic, in school of medicine. Yale University. 2002.
 32. Ghazwani, Eisa, Al-Musa, Hassan. Depression among elderly subjects attending primary health care centers in Abha City, Kingdom of Saudi Arabia. *MEJFM*. 2013;11:4-16.
 33. Al Faris E, Al Hamad A, Al-Shammari SA. Hidden and conspicuous psychiatric morbidity in Saudi primary health care. *AJP*. 1995;6:162-175.
 34. Al-Khathami AD, Ogbeide DO. Prevalence of mental illness among Saudi adult primary-care patients in central Saudi Arabia. *Saudi Med J*. 2002;23:721-724.
 35. Alibrahim OA, Al-Sadat N, Elawad NA. Gender and risk of depression in Saudi Arabia, a systematic review and meta-analysis. *J Public Health Afr*. 2010;1.
 36. El-Rufaie OE, Albar AA, Al-Dabal BK. Identifying anxiety and depressive disorders among primary care patients: A pilot study. *Acta Psychiatr Scand*. 1988;77:280-282.
 37. Alqahtani MM, Salmon P. Prevalence of somatization and minor psychiatric morbidity in primary healthcare in Saudi Arabia: A preliminary study in Asir region. *J Family Community Med*. 2008;15:27.
 38. Abdelwahid HA, Al-Shahrani SI. Screening of depression among patients in family medicine in Southeastern Saudi Arabia. *Saudi Med J*. 2011;32:948-952.
 39. Becker S, Al Zaid K, Al Faris E. Screening for somatization and depression in Saudi Arabia: A validation study of the PHQ in primary care. *Int J Psychiatry Med*. 2002;32:271-283.
 40. Becker SM. Detection of somatization and depression in primary care in Saudi Arabia. *Soc Psychiatry Psychiatr Epidemiol*. 2004;39:962-966.
 41. Luni FK, Ansari B, Jawad A, Dawson A, Baig SM. Prevalence of depression and anxiety in a village in Sindh. *JAMC*. 2009;21:68-72.
 42. Shim RS, Baltrus P, Ye J, Rust G. Prevalence, treatment, and control of depressive symptoms in the United States: Results from the National Health and Nutrition Examination Survey (NHANES), 2005-2008. *JABFM*. 2011;24:33-38.
 43. Maurer DM. Screening for depression. *AFP*. 2012;85:139-144.
 44. Al-Kuwari MG, Al-Emadi N, Flamerzi S. Prevalence and determinants of depression among primary health care attendees in Qatar 2008. *MEJFM*. 2010;99:1-6.
 45. Whooley MA, Avins AL, Miranda J. Case-finding instruments for depression. Two questions are as good as many. *J Gen Intern Med*. 1997;12:439-445.
 46. Richardson LP, Rockhill C, Russo JE. Evaluation of the PHQ-2 as a brief screen for detecting major depression among adolescents. *Pediatrics*. 2010;125:1097-1103.
 47. Arroll B, Goodyear-Smith F, Crengle S, Gunn J, Kerse N, Fishman T, et al. Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. *Ann. Fam. Med.* 2010;8:348-353.