RESEARCH ARTICLE

PREVALENCE AND DETERMINANTS OF DEPRESSION AMONG ELDERLY PATIENTS ATTENDING AL-ADL PRIMARY HEALTH CARE CENTER IN MAKKAH AL-MUKARRAMAH, 2018

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ARTICLE INFO	ABSTRACT
	Background: Depressive symptoms are common among older people and are associated with disability, morbidity, and mortality. Its prevalence in primary care varies between 15.3-22%, with global prevalence up to 13% and between 17-46% in Saudi Arabia. Elderly persons are more vulnerable to depression. By the year 2020 depression would be the second major cause of disability adjusted life years lost, as reported by the World Health Organization. Depressive symptoms depressive disorders in elderly patients are associated with significantly higher health care costs, even after adjustment for chronic medical illness. Elderly persons sometimes dismiss less severe depression as an acceptable response to life stress or a normal part of aging. The elderly population with depression is on the rise in all communities. **Aim**: To estimate the prevalence and determinant of depression among elderly attendants in Al-Adl PHC center in Makkah Al-Mukarramah. **Method:** A cross sectional study conducted at outpatient clinics in Al-Adl primary health care center in Makkah Al-Mukarramah, 2018. **Results:** There were 345 participants, and the majority age were 60-70years. The majority were male65.2%. Most of the participants were widow58.8% while married were 41.2%. Illiterate were43.2%, primary education were30.1%. All the relations between depression and socio-demographic data were statistically significant except educated elderly patients not statistically significant. **Conclusion**: Depression is common among elderly persons and the point prevalence of depression is high in primary care visitors in Saudi Arabia. Gender and higher level of education were found to be significantly associated with screened depression. The majority of cases were mild to moderate, in utility and that screening for depression in a primary care setting is cost saving. Individuals providing healthcare to elderly persons must be to identify depression and take appropriate action; elderly persons with chronic diseases impairment deserve special attention.

INTRODUCTION

Comprehensively, in excess of 350 million individuals of any age experience the ill effects of depression. Old people are progressively powerless against depression.[1] In Saudi Arabia, there is restricted information regarding commonness of depression among grown-ups. The global health association evaluated that the quantity of depression issue in Saudi Arabia is around 1,339,976 patients, which speaks to about 6.5% from the Saudi population [2]. The prevalence of comorbid depression is higher among patients with diabetes mellitus (DM) when contrasted with non-diabetics.[3] Life expectancy has increased drastically over the previous century, and therefore the elderly individual are more than children.[4]

The extent of the total populace more than sixty years will twofold from about 11% in the year 2000 to 22% by 2050. Indisputably the number of individuals matured 60 years, or more is required to increment from 605 million to 2 billion over the equivalent period.[5] Over 6 decades prior, the World Health Organization (WHO) characterized health as "a complete state of physical, mental and social wellbeing, and not merely the absence of disease or infirmity" [6] As antecedently mentioned, the psychological state is a vital part of people's health that affects his mood and performance. There are many illnesses affecting the psychological state, the most common of them globally is depressive disorders which cause poor functionality in daily living activities [7]. The all-out number of individuals living with depression in the world is 322 million [8]. By2050, 80% of the world's older individuals will be living in low-and middle-income countries.[9] Older people are especially inclined to mental issues; depression is the commonest mental turmoil revealed in the elderly.[10]

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Between 45-95% (overall 69%) of patients with depression present with corporal symptoms[11]. Depression has various hidden hazard factors, for example, chronic medical disease, stress, chronic pain, family history, female gender, low salary, work misfortune, substance misuse, low confidence, absence of social help, previous history, being single, separated or bereaved and awful cerebrum injury[12]. Studies have utilized different scales and instruments to survey the depression knowledge and treatment [13]Most developed world countries have the age of sixty five years as a meaning of 'old' or more established individual. At the instant, there's no international organization numerical model however, the UN concurred cutoff is 60+ years to refer to the older in individual [14]. Depression is a growing public wellbeing challenge because of an increase within the population of aged and forceful changes within the socio-cultural atmosphere. There is a lack of data concerning depression among aged patients attending primary health care [12]. By the year 2025, it is normal that the world will have 1.2 billion individuals aged and ascending to 1.9 billion in 2050.[12]

In late years, there has been an expanding universal familiarity with medical problems regarding aging populations. Older individuals are regularly seen as lonely, hopeless, and sad. Although numerous old are confronting mounting physical afflictions, mental pressure, social misfortunes, and expanded reliance at the finish of life, most more established individuals are well adjusted emotionally for the majority of their later years.[15]Mood messes in the old age are normal, adversely affect alternative other medical conditions, and may prompt intellectual and practical decline.[16]Geriatric depression in this manner stays a productive region for clinical, translational and fundamental science research. [17] In Saudi Arabia there are not a lot of research regarding depression among older patients as indicated by analyst information. A research conducted in Abha city by Eisa Y. Ghazwani et al. in 2013 among four hundred older patients, demonstrated that the assessed commonness of depression among members, paying little mind to depression seriousness, was 63.7%[18]. Another research led likewise in Abha city in 2001 by M AnAboalfotouh et al. among 810 old people, evaluated the prevalence of depression as 17.5% among participants [19]. Additional research was led in Riyadh in 2014, by Abdulaziz U. Joury et.al, and was not restricted to the Saudi populace including individuals who communicate in Arabic or English matured 15 years or more, indicated that 59% of the member were characterized between moderate to extreme depression[20].

Geriatric Depression Scale (GDS), first made by Yesavage, et al., has been tried and utilized widely with the older age population to measure depression [21]. The GDS Long Form is a 30-thing survey in which members are approached to react by yes or no regarding how they felt over the previous week. A Short Form GDS comprising of 15 inquiries was created in 1986. The Short Form is all the more effectively utilized by physically unwell and gently to moderately mad patients who have limited ability to focus as well as feelhandily exhausted. It takes around 5 to 7 minutes to finish. With respect to arrangement of the short type of GDS, the most noteworthy conceivable score is 15 were a score of 0 to 4 is viewed as typical, and a score 5 or above recommends depression [22].

In another research directed by Mulugeta Girma et al. in Ethiopia in 2016 about geriatric depression prevalence among 352 patients. By utilizing GDS-15 the pervasiveness of sadness was 28.5% among participant [23].Additionally, in a study directed in Sudan by S.M. Assil et al. in 2011 about the commonness of depression among 300 older patients. The research found the prevalence of depression was 47.5%. Depression was altogether connected with age (P = 0.002), level of training (P = 0.015), occupation (P < 0.001), the issues of living (P= 0.026), and social issues (P < 0.001)[24].

Rationale: Depression is a major problem in our society and most patients do not seek medical advice[20]. By conducting this study, it will help to estimate the level of this problem in Makkah Al-Mukarramah since there are no recent studies conducted to evaluate this problem.

Aimof the study: To estimate the prevalence and determinant of depression among elderly attendants in Al-Adl PHC center in Makkah Al-Mukarramah.

Objectives

⌡ To determine the prevalence of depression among elders attending Al-Adl primary health care center in Makkah Al-Mukarramah, 2018**.**

⌡ To identify the possible factors associated with depression among elders attending Al-Adl primary health care center in Makkah Al-Mukarramah, 2018.

METHODOLOGY

Study area: The study has been carried out in Makkah Al-mukarramh is the holy city of every Muslim in the world. Makkah is a modern city and has many hospitals in addition to King Abdullah Medical city which is a tertiary center. Also, it has 85 PHC centers under the supervision of the Directorate of Health Affairs of Makkah Al-Mukarramah. These centers are distributed under 7 health care sectors and each sector contain around 10 – 14 primary health care centers. Three health care sectors inside Makkah Al-Mukarramah city (urban) with 37 primary health care centers underneath and four sectors are outside Makkah (rural) with 48 primary health care centers. The three healthcare sectors inside Makkah Al-Mukarramah are Al-Ka'akya with 11 primary healthcare centers, Al-Adl with 12 primary healthcare centers and Al-Zahir with 14 primary healthcare centers (annexes 1)

Study population: Elderly patients (60 years old or older) attending Al-Adl primary health care center in Makkah Al-Mukarramah, throughout the period of the study and accept to participate in the study.

Study design: Cross-sectional, analytic study.

Inclusion criteria: All Saudi elderly patients (males and females) attending Al-Adl primary health care center in Makkah Al-Mukarramah.

⌡ Patients who can write and read in the Arabic Language.

Exclusion criteria

- Patients who refuse to participate in the study
- Persons who have reported severe mental disabilities.

Sample size: The total number of elderly patients attending Al-Adl primary health care center (under Al-Adl health care sector) in one month is 1711. Based on this information sample size was calculated using a website (raosoft.com). The estimated sample size is 345 elderly patients. The confidence interval is 95% and the margin of error is 5%. The estimated prevalence used is 50% to calculate the maximum sample size.

Sampling technique: Regarding health care center selection, there are three health care sectors inside Makkah Al-Mukarramah which are Al-Ka'akya, Al-Zahir, and Al-Adl. By using simple random sample technique (by using randomizer.org), Al-Adl health care sector was selected. There are 12 primary health care centers under Al-Adl health care sector which were enumerated from 1 to 12. Again, by using simple random sample technique Al-Adl primary health care center was selected (by using randomizer.org website). Regarding patients' selection, the total number visiting Al-Adl PHC is 1711 per month and the sample size is 345. The data collection period is 20 days (four weeks minus weekends). Every day nearly 85 patients are attending in Al-Adl PHC in both section (male and female sections). To collect data from sample size, it needs nearly 18 patients per day. It has been selecting every 4th patient to cover the sample size during data collection period .

Data collection tool :Geriatric depression scale (GDS) was used which is a tool designed first by Yesavage et al., to study the depression among geriatrics. The Arabic version of this tool used since there is study conducted to validate the Arabic version[25]. The short form with the 15 questions was used. The questionnaire has three parts. The first part is about socio-demographic data. The second part is the short-translated form of GDS. The third part is about possible risk factors. The GDS score has been calculated, where a score of 0-4 is considered normal, and a score of 5 and above is suggesting depression.

Data collection technique :The Arabic version of the questionnaire was used since the target population is the Saudi elderly[25]. (annexes 2) The questionnaire has been distributed to all patients attending Al-Adl primary health care center during the data collection period (which is 20 days initially). The questionnaire has been distributed equally between the male and female sections because it is separate departments. The researcher trained 2 nurses to optimize the inter-rater reliability. The researcher has been select the patients in the waiting area and give them the questionnaire in the waiting area in the male section then waiting for them to complete it and after that has been collecting it from them while in the female section, the trained nurse was do the same in the female waiting area. After that, the researcher was collecting the paper daily from the nurse for data entry and analysis after thanking the participants for their precious time and effort

The services: the researcher has been providing the participants with gifts as an appreciation for their participation in the study, after collecting the questionnaire from them.

Variables

Dependent variables: Prevlance of depression among elderly patients

Independent variable

- Age
- Gender
- Marital status
- Educational level
- Monthly income
- Occupation
- Presence of chronic disease
- Presence of disabilities (cognitive, motor)
- Social problems (e.g. separation, neglect)
- Living condition (with family, alone)
- Losing a close person
- Drug history
- Family history of depression

Data entry and analysis: Statistical analysis has been performed using SPSS software program (Statistical Package for Social Sciences), version 24.0. Descriptive using listing and frequency and analytic statistics using chi-square testand t-test to analyze the association and the difference between two categorical variables or using other statistical tests if needed. P value less than 0.05 as the level of significance.

Pilot Study: A pilot study on 35 participants representing 10% of the study sample size (out of study area) has been conducted to explore the methodology tool and envirnoment and plan to overcome these problems.

Ethical considerations

- Permission from the Directorate of Health Affairs of the Holy Capital Primary Health Care has beenobtained.
- Permission from the administration of public health in Makkah Al-Mukarramah has beenobtained.
- Permission from the health care sectors administrator has beenobtained.
- Permission from the health care center administrator has beenobtained
- Written consents from all participants in the questionnaire has beenobtained.
- All information will be confidential, and a result has been submitted to the department.

Limitations: Possible limitations: Time limitation.

Budget: The research has beenself-funded.

RESULTS

Regarding clinical variables the Chronic diseasesis the most common clinical variables followed by takes medicines continuously. Study results show that 62.3% participants have negative depression, and 130(37.7%) have positive depression, and the data ranged from0to 15by mean+ SD (5.736±2.828).

Table 1. The socio-demographic details of study participants of depression among elderly patients attending to primary health care center (n=345)

	N	%
Age		
60-70	238	69.0
70-80	72	20.9
>80	35	10.1
Gender		
Female	120	34.8
Male	225	65.2
Marital status		
Married	142	41.2
Widow	203	58.8
Education		
Illiterate	149	43.2
Primary	104	30.1
Preparatory	32	9.3
Secondary	60	17.4

Table 2. Distribution of participants by clinical variables (Chronic diseases, physical or mental disabilities, social problems, family history of depression and medicines continuously)

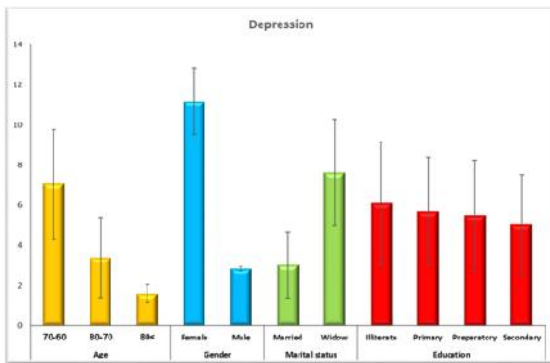|	N	%
Chronic diseases	274	79.4
Physical or mental disabilities	178	51.6
Social problems	239	69.3
Family history of depression	147	42.6
Medicines continuously	252	73.0

Figure 1. Distribution the relation between depression and socio-demographic data (age, Gender, Marital status and education)among elderly patients
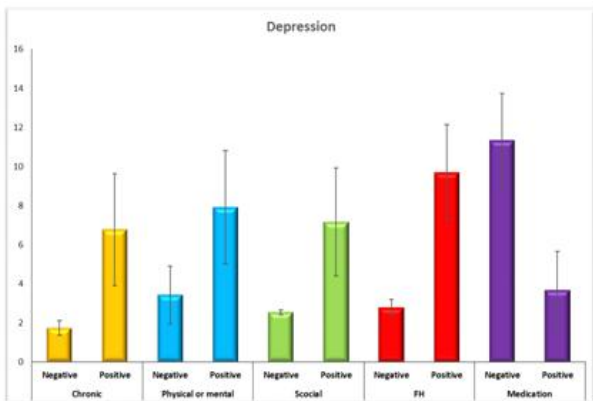

Figure 2 Distribution the relation between depression and clinical variables (Chronic diseases, physical or mental disabilities, social problems, family history of depression and medicines continuously)among participants elderly patients

Table 3 and figure 1 show that is a significant relation between depression and increase age,female gender, and widow. Regarding the education is no significant relation between depression and education. Table 4 and figure 2 show that there is a significant relation between depression and Chronic diseases, the Physical or mental disabilities, Social problems, family history of depression, and the medicines they continuously using. Study results showed that the final model is affect by explain the regression by R2 (83.10%) a significant relation between depression and independent variables . Were X2(325.168) and P-value=0.001. Regarding history of Chronic diseases a significant Positive affect of Chronic diseases and depression were P-value=0.004, and(Odd = 10.450, 95%CI = 2.134-51.180). while(B=2.347, S.E.=0811 and Wald=8.380). Regarding Physical or mental disabilities a significant Positive affect of Physical or mental disabilities and depression were P-value=0.001, and (Odd = 29.874, 95%CI = 7.697-115.950). while (B=3.397, S.E.= 0.692 and Wald=24.102). Regarding Social problems a significant Positive affect of Social problems and depression were P-value=0.001, and (Odd = 23.920, 95%CI = 5.117-111.809). while (B=3.175, S.E.= 0.787 and Wald=16.282). Regarding family history of depression a significant Positive affect of family history of depression and depression were P-value=0.001, and(Odd = 155.126, 95%CI = 40.737-590.722). while(B=5.044, S.E.= 0.682 and Wald=54.671. Regarding medicines continuously a significant Negative affect of medicines continuously and depression were P-value=0.001, and (Odd = 0.148, 95%CI = 0.053 -0.411). while(B=-1.913, S.E.= 0.522 and Wald=13.424.

DISCUSSION

Growth in the average life expectancy of people in the KSA is increasing with 5 percent of the population (1.2 million individuals) classified as being elderly[26]. This indicates that the elderly population in the country is increasing every year, with all the economic and social implications this has. in our study there were 345 participants, and the majority age was(69.0%) in (60-70)years, the majority of them were male(65.2%), while the female(34.8%). Most of the participants were widow (58.8%) have no education Illiterate(43.2%).(See table 1) Aging is affected by the development of a variety of psychiatric illnesses, the most prevalent among them being depression. The proportion of depression among elderly patients attending Al -Adl primary health care center in Makkah Al-Mukarramah, 2018. The setting in this study was found to be 37.7% have positive depression. Similar findings were reported by Sathyanath SM et al i.e. 36.5%[27] whereas Bodhare TN et al reported it as 45%.[28]

The possible explanation for this variation could be attributed to differences in the screening instruments used and social and cultural factors. Of the five rural Indian community-based studies, three reported a high prevalence of depression among elderly persons. All these studies used the shorter version of the Geriatric Depression Scale-15 (GDS-15) for diagnosis of depression, which has a high sensitivity but low specificity. Therefore, there is a possibility of overestimating the true prevalence due to high false-positiveresults.[29] A cross-sectional community-based study conducted by Maulik et al. among 82 persons aged over 60 years in a rural area of Hooghly district of West Bengal estimated the prevalence of depression as 53.7%[30].

Table 3. Distribution the relation between depression and socio-demographic data (age, Gender , Marital status and education)among elderly patients

Items		N	Depression			F or T	ANOVA or T-test	
			Mean	±	SD		test value	P-value
Age	60-70	238	7.050	±	2.722	F	36.228	<0.001*
	70-80	72	3.403	±	1.988			
	>80	35	1.600	±	0.452			
Gender	Female	120	11.175	±	1.638	T	76.116	<0.001*
	Male	225	2.836	±	0.114			
Marital status	Married	142	3.035	±	1.643	F	-18.263	<0.001*
	Widow	203	7.626	±	2.661			
Education	Illiterate	149	6.094	±	3.068	F	0.722	0.539
	Primary	104	5.702	±	2.703			
	Preparatory	32	5.500	±	2.752			
	Secondary	60	5.033	±	2.491			

Table 4. Distribution the relation between depression and clinical variables (Chronic diseases, physical or mental disabilities, social problems,   family history of depression and medicines continuously)among participants elderly patients

Items		N	Depression			T-test	
			Mean	±	SD	t	P-value
Chronic diseases	Negative	71	1.746	±	0.381	-14.727	<0.001*
	Positive	274	6.770	±	2.865		
Physical or mental disabilities	Negative	167	3.419	±	1.491	-17.888	<0.001*
	Positive	178	7.910	±	2.905		
Social problems	Negative	106	2.538	±	0.126	-17.108	<0.001*
	Positive	239	7.155	±	2.775		
Family history of depression	Negative	198	2.793	±	0.402	-39.412	<0.001*
	Positive	147	9.701	±	2.423		
Medicines continuously	Negative	93	11.344	±	2.387	30.075	<0.001*
	Positive	252	3.667	±	1.990		

This high prevalence may be explained by the small sample size and the tool (Bengali version of the GDS-15)used to identify depression. Reddy et al. estimated the prevalence of depression as 47% from the rural area of Valadi of TamilNad.[31] Deshpande et al. conducted a community-based study among elderly persons in six villages in Maval Taluka of Pune, Maharashtra and estimated the prevalence as 41.1%.[32]The high prevalence of depression among elderly persons in the above studies could be due to the use of GDS-15, a screening tool, while we used a diagnostic interview to confirm the diagnosis. Based on GDS-30 (screening tool) in our study, the prevalence of depression was 19.2% (95% CI 15.7%–23.4%), which was similar to the estimated prevalence for Indian studies (21.9%) in the meta-analysis done by Barua et al. as well as the prevalence found in the study conducted by Barua and Kar in rural areas of Udupidistrict of Karnataka (21.7%).[33]

 The Saudi culture and traditional social values dictate high respect for and care of the elderly by members of the extended family[34]The association between more privacy and depression can be explained by the tendency of the elderly in the extended family system of Saudi Arabia to associate more privacy with alienation and neglect by other family members. The finding of more depression in the widowed is in keeping with numerous other studies. [32] In the present study, age was a significant predictor for depression in multivariate analysis which isdiffers from other support by other studies reporting no effect of age on depressive symptomatology.[23] Depression was higher among illiterates compared to literates in this study. Similar findings were reported by Stanley P et al and Sidik MS et al. [35]These observations strengthen the fact that poor educational background is an important risk factor for depression.

Though the prevalence of depression decreased with increase in educational level, it was not statistically significant. There is a significant relation between depression and chronic diseases,physical or mental disabilities, social problems, family history of depression, and medicines continuously . Similar to The presence of chronic medical illness has been found to increase the risk of depression in studies reported by Jainand Aras from Mumbai,[36] Jariwala et al. from Surat,[37] Gupta et al.from Chandigarh,28 and Liu et al. from China. The prevalence of depression in the current study was 62.3%and even in Saudi Arabia (AlShammari, 1999 who reported a figure of 39%).[38]Moreover, a prevalence of 17.5% has been reported by Abolfotouh, et al in Abha, 2008.[39]

Conclusion

 Depression is common among elderly persons. Individuals providing healthcare to elderly persons need to be trained to identify depression and take appropriate action; elderly persons with chronic diseases deserve special attention, there is a need to screen them for depression. Around one third of elderly patients attending the primary health care setting were found to be suffering from depression .Depressive symptoms are prevalent among the elderly attending the health centers. Family physicians should be trained to screen for and to manage depression in highly susceptible groups . Depression in elderly females attending these centers was high and associated with multiple medical and socioeconomic characteristics, which is a cause of concern we conclude that depressive symptoms are common and higher in Saudi elderly women and are associated with significant physical, psychological, and socioeconomic risk factors

List of Abbreviations

KSA: Kingdom of Saudi Arabia.
PHC: Primary Health Care.
GDS: Geriatric Depression Scale.
UN: United Nations.

REFERENCES

1. World Health Organization. 2012 . *World Health Day 2012: ageing and health: toolkit for event organizers* No. WHO/DCO/WHD/2012.1 . World Health Organization.

2. World Health Organization. 2017 . *Depression and other common mental disorders: global health estimates* No. WHO/MSD/MER/2017.2 . World Health Organization.

3. Lai, C., Filippetti, G., Schifano, I., Aceto, P., Tomai, M., Lai, S., ... &Maranghi, M. 2019 . Psychological, emotional and social impairments are associated with adherence and healthcare spending in type 2 diabetic patients: an observational study. *Eur. Rev. Med. Pharmacol. Sci*, 23, 749-754.

4. Sartorius, N. 2018 . Depression and diabetes. *Dialogues in clinical neuroscience*, 20 1 , 47.

5. Zhao, D., Hu, C., Chen, J., Dong, B., Ren, Q., Yu, D., ... & Sun, Y. 2018 . Risk factors of geriatric depression in rural China based on a generalized estimating equation. *International Psychogeriatrics*, 30 10 , 1489-1497.

6. World Health Organization, World Health Organization. Global Observatory for eHealth, & WHO Global Observatory for eHealth. 2006 . *Building foundations for eHealth: progress of Member States: report of the WHO Global Observatory for eHealth*. World Health Organization.

7. Biella, M. M., Borges, M. K., Strauss, J., Mauer, S., Martinelli, J. E., &Aprahamian, I. 2019 . Subthreshold depression needs a prime time in old age psychiatry? A narrative review of current evidence. *Neuropsychiatric Disease and Treatment*, 15, 2763.

8. Mdawar, B., Ghossoub, E., & Khoury, R. 2020 . Selective serotonin reuptake inhibitors and Alzheimer's disease. *Neural regeneration research*, 15 1 , 41.

9. Schwarz, A. 2003 . Old age security and social pensions. *World Bank: Human Development Social Protection Hub: Processed*.

10. Shetty, P. 2012 . Grey matter: ageing in developing countries. *The Lancet*, 379 9823 , 1285-1287.

11. Petersen, A. 2011 . Authentic self-realization and depression. *International Sociology*, 26 1 , 5-24.

12. Berger-Jenkins, E., McCord, M., Gallagher, T., &Olfson, M. 2012 . Effect of routine mental health screening in a low-resource pediatric primary care population. *Clinical pediatrics*, 51 4 , 359-365.

13. Szanto, K., Mulsant, B. H., Houck, P. R., Dew, M. A., Dombrovski, A., Pollock, B. G., & Reynolds III, C. F. 2007 . Emergence, persistence, and resolution of suicidal ideation during treatment of depression in old age. *Journal of affective disorders*, 98 1-2 , 153-161.

14. David-Neto, E., Romano, P., Triboni, A. H. K., Ramos, F., Agena, F., Ebner, P. A. R., ... &Lemos, F. B. C. 2017 . Longitudinal pharmacokinetics of tacrolimus in elderly compared with younger recipients in the first 6 months after renal transplantation. *Transplantation*, 101 6 , 1365-1372.

15. Scheibe, S., & Carstensen, L. L. 2010 . Emotional aging: Recent findings and future trends. *The Journals of Gerontology: Series B*, 65 2 , 135-144.

16. Smith, G. S., Gunning-Dixon, F. M., Lotrich, F. E., Taylor, W. D., & Evans, J. D. 2007 . Translational research in late-life mood disorders: implications for future intervention and prevention research. *Neuropsychopharmacology*, 32 9 , 1857-1875.

17. Birrer, R. B., &Vemuri, S. P. 2004 . Depression in later life: a diagnostic and therapeutic challenge. *American family physician*, 69 10 , 2375-2382.

18. Ghazwani, E. Y., & Al-Musa, H. M. 2013 . Depression among elderly subjects attending primary health care centers in Abha City, Kingdom of Saudi Arabia. *World Family Medicine Journal: Incorporating the Middle East Journal of Family Medicine*, 99 1141 , 1-13.

19. Alic, A., Pranjic, N., Selmanovic, S., Alibasic, E., Alic, F., Ramic, E., &Spahic-Sarajlic, S. 2014 . Screening for depression patients in family medicine. *Medical Archives*, 68 1 , 37.

20. Joury, A. U., AlAtmi, A. A., AlBabtain, S. A., Alsharif, M., Al Babtain, N. A., Mogbil, A. B., &AlRuwaili, M. A. 2014 . Prevalence of depression and its association with socio-demographic characteristics among the general population. *International Journal of Modern and Alternative Medicine Research*, 2 2 , 8-15.

21. Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., &Leirer, V. O. 1982 . Development and validation of a geriatric depression screening scale: a preliminary report. *Journal of psychiatric research*, 17 1 , 37-49.

22. Greenberg, S. A. 2012 . The geriatric depression scale GDS . *Best Practices in Nursing Care to Older Adults*, 4 1 , 1-2.

23. Girma, M., Hailu, M., Wakwoya, A., Yohannis, Z., & Ebrahim, J. 2016 . Geriatric depression in Ethiopia: Prevalence and associated factors. *Journal of Psychiatry*, 20 400 .

24. Assil, S. M., &Zeidan, Z. A. 2013 . Prevalence of depression and associated factors among elderly Sudanese: a household survey in Khartoum State. *EMHJ-Eastern Mediterranean Health Journal, 19 5 , 435-440, 2013*.

25. Chaaya, M., Sibai, A. M., El Roueiheb, Z., Chemaitelly, H., Chahine, L. M., Al-Amin, H., &Mahfoud, Z. 2008 . Validation of the Arabic version of the short Geriatric Depression Scale GDS-15 . *International psychogeriatrics*, 20 3 , 571.

26. Al-Ghamdi S. Saudi Arabia. More health-care facilities for the elderly planned. Middle East Healthcare intelligence, 2010 Cited .

27. Sanjay, T. V., Yannick, P. P., Madhusudan, M., Masthi, N. R. R., &Gangaboraiah, B. 2017 . Depression and its associated factors among elderly patients attending rural primary health care setting. *International Journal of Community Medicine and Public Health*, 4 2 , 471.

28. Padma, K., Bele, S. D., Bodhare, T. N., &Valsangkar, S. 2012 . Evaluation of knowledge and self-care practices in diabetic patients and their role in disease management. *National journal of community medicine*, *3* 1 , 3-6.

29. Almeida, O. P., & Almeida, S. A. 1999 . Short versions of the geriatric depression scale: a study of their validity for the diagnosis of a major depressive episode according to ICD 10 and DSM IV. *International journal of geriatric psychiatry*, *14* 10 , 858-865.

30. Maulik, S., & Dasgupta, A. 2012 . Depression and its determinants in the rural elderly of West Bengal-a cross sectional study. *Int J Biol Med Res*, *3* 1 , 1299-1302.

31. Reddy, N. B., Pallavi, M., Reddy, N. N., Reddy, C. S., Singh, R. K., &Pirabu, R. A. 2012 . Psychological morbidity status among the rural geriatric population of Tamil Nadu, India: A cross-sectional study. *Indian journal of psychological medicine*, *34* 3 , 227.

32. Deshpande, S. S., Gadkari, M., &Raje, S. S. 2011 . Screening for depression and its risk factors in geriatric population: A rural community based study. *Asian Journal of Psychiatry*, *4* 4 , 284-287.

33. Barua, A., & Kar, N. 2010 . Screening for depression in elderly Indian population. *Indian journal of psychiatry*, *52* 2 , 150.

34. El-Islam, M. F. 1983. Cultural change and intergenerational relationships in Arabian families. *International Journal of Family Psychiatry*.

35. Rajkumar, A. P., Thangadurai, P., Senthilkumar, P., Gayathri, K., Prince, M., & Jacob, K. S. 2009 . Nature, prevalence and factors associated with depression among the elderly in a rural south Indian community. *International psychogeriatrics*, *21* 2 , 372-378.

36. Jain, R. K., & Aras, R. Y. 2007 . Depression in geriatric population in urban slums of Mumbai. *Indian JPublic Health*, *51* 2 .

37. Jariwala V, Bansal RK, Patel S, Tamakuwala B. A study of depression among agedin Surat city. Natl J Commun Med 2010;1:47–9.

38. Al Shammari, S. A., & Al Subaie, A. 1999 . Prevalence and correlates of depression among Saudi elderly. *International journal of geriatric psychiatry*, *14* 9 , 739-747.

39. Abolfotouh, M. A., Daffallah, A. A., Khan, M. Y., Khattab, M. S., &Abdulmoneim, I. 2001 . Psychosocial assessment of geriatric subjects in Abha City, Saudi Arabia. *EMHJ-Eastern Mediterranean Health Journal, 7 3 , 481491, 2001.*