Research Article

Prevalence of depressive symptoms and its determinants among staff members Minia University, Egypt

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Abstract

Background: Depression is described by prolonged and constant unhappiness, lack of interest in pleasurable events, increased or decreased desire for food, disorganized sleep and tiredness, lack of concentration and capability to perform at job as well as at home along with the feeling of uselessness. The aim of the study is to explore the prevalence of depressive symptoms and its determinants. **Methods:** This cross-sectional study established by obtaining sociodemographic, occupational data and depressive scale from staff members and their assistants in Minia University by self-administered questionnaire. **Results:** univariate regression analysis of socio-demographic data revealed that increasing number of children is considered as a protective factor against depression (OR= 0.576, C.I.95%= 0.357-0.930, P<0.001) and that increasing body mass index is considered significant risk factor of depression by CES-D depression scale (OR= 1.299, C.I.95%= 1.133-1.490, P <0.001). Also, obesity was found to be as a risk factor for depressive symptoms (OR= 3.585, C.I.95%= 1.030-12.480, P=0.045). **Conclusion:** Prevalence rate of depressive symptoms among staff members in Minia University is 88.6%. Increasing number of children is considered as a protective factor against depression and increasing body mass index is considered significant risk factor of depression.

Keywords: Depression, University staff, Cross-sectional.

Introduction

Depression is considered a multifaceted condition with diverse biological and environmental causes and has therefore been bi-directionally associated with a 1.5 to 6-fold risk to develop cardiovascular diseases, diabetes, epilepsy, stroke, Alzheimer`s dementia and cancer[1]. In its worst cases, depression can ultimately result in disability[2].

It is associated with leading causes of morbidity and mortality. As indicated in a literature review, depression shares common mechanisms (e.g. insulin resistance, higher plasma homo-cysteine levels, and endothelial dysfunction, etc.) with cardio-metabolic

disorders that could explain the link between these diseases. Depressive episodes may be recurrent or chronic and have a substantial impact on life functioning[3].

It has been estimated that 4.7 and 7.3% of adults, around the world, suffer from depressive and anxiety disorders[4].

Little is known about the extent or severity of untreated mental disorders, especially in developing countries like Egypt. About 3.5% (2995824 cases) of Egyptian people had depression according to world population review.

Depression in young people can limit employment and education opportunities and introduce potential drug and alcohol dependence. Aggression, violence and other antisocial behaviors are more likely to occur in people suffering depression and this can significantly increase the burden placed on family, friends and society in general[5].

Nearly 15% of clinically depressed and treated persons eventually die by suicide. The percentage of death by suicide is estimated to be higher among untreated individuals[6].

The pathophysiology of depression is still vague, but existing evidence suggests that it is a complicated disease caused by the interaction of genetic, biological, and environmental factors, likely involving several mechanisms[7].

The risk factors include current or past smoking [8], heavy alcohol consumption, low income [9], unemployment [10], low social support [11], perceived stress [12], physical inactivity [13], sleep deprivation, and unhealthy diet[14].

An increase in competition and workload has also been documented in academic settings, in particular, among researchers in academic universities. Yet, given the chronicity and intensity of stressful experiences in the academic setting, research findings indicate a high prevalence of negative emotions, feelings of burnout, and depressive symptoms among these workers [15].

Depression is mainly presented either by an absence of interest in all activities or a depressed mood. Moreover, depressed individuals may have decreased energy, difficulty thinking, lack of concentration, appetite or weight changes, suicide attempts, feelings of regret or uselessness, or repetitive self-destructive thoughts [16].

Methods

A cross-sectional study among University staff and their assistants, was conducted from November 2020 to January 2022 in Minia University, Minia, Egypt.

The study was conducted after obtaining the approval of the ethical committee of the Faculty of Medicine, El-Minia University.

In this study, we recruited two hundreds and ten staff members and their assistants from different faculties of Minia University.

The number of staff members and their assistants in Minia University are about four thousand persons; prevalence of depression is 22.9 among staff members[19]. Using epi info, population size (for finite population correction factor or fpc) (N): 4000, Hypothesized % frequency of outcome factor in the population (p): 22.9% +/- %5, Confidence limits as % of 100(absolute +/- %) (d): 5%, Design effect (for cluster surveys-DEFF): 1

Sample size n = [DEFF*Np (1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)]

At 95% confidence level, 194 subjects were required to establish the study.

In this study, we recruited 210 staff members and assistants, 31 from Faculty of Medicine, 64 from Faculty of Arts, 25 from Faculty of Nursing, 25 from Faculty of Tourism and Hotels, 31 form Faculty of Specific Education who agreed to participate in the study and give they were interviewed, and answered the study questionnaire.

The questionnaire included:

Socio demographic data: gender, age, marital status, personal income, number of children, residence; cigarette smoking, weight, waist circumference, residence, physical activity, caffeine intake and multivitamin use.

Occupational history: occupational position within the university (e.g., lecturer, research assistant, assistant professor, associate professor, and full professor), number of working hours and years of employment.

Personal medical history: chronic diseases, metabolic diseases and their treatment.

Center for Epidemiologic Studies – Depression (CES–D) scale

Depression was measured by the Center for Epidemiologic Studies Depression Scale (CES-D)33. This scale consists of 20 items related to characteristic symptoms and behaviors of depression, with each item rated from 0 to 3. The items (example item: "I was bothered by things that usually don't bother me") had a 4-point response option ranging from rarely or none of the time (less than 1 day) to most or all of the time (5-7 days). The total score ranges from 0 to 60, with a higher score indicating greater depressive symptoms. The standard cut point 16 or more indicates clinically relevant depressive symptoms.

Ethical approval:
The study was approved by the ethics committee of Minia University Faculty of Medicine. Informed consent was taken from all participants.

Statistical Analysis:
The collected data were coded, entered to a computer and analyzed using the software, Statistical Package for Social Science, (SPSS) version 20. Qualitative data were presented as frequency distribution with its percentage; and for quantitative data, descriptive statistics with mean and standard deviation were calculated. Appropriate significant tests such as Chi-square test, Fisher's Exact and Z (test of proportion) test were used to compare between two proportions.

Student's t-test was used to compare between two means. P-values of <0.05 were considered significant.

Univariate and multiple logistic regressions were done for detection of factors associated with CES-D scale among studied variables.

Results

This study included 210 staff members and their assistants in Minia University. The age of the subjects ranged between 25-68 years (mean age 37.7±9.6). Males construct 31% of the studied sample, while females construct 69%.

Figure (1) showed that the majority (88.6%) of the studied sample had clinically relevant depressive symptoms among all studied sample.

Table (1) showed significant decrease of number of children less than three among participants with CES-D score more than 16 versus those with score less than 16 (56.2% vs 93.4%, p <0.001 respectively).

Table (2) showed that there was significant increase of body mass index among group with CES-D depression scale more than 16 versus those with scale less than 16 where mean BMI 23.3±3.1 versus 28.4±3.5, p <0.001

Among staff members of different faculties of Minia university, those from Faculty of Arts earned the highest percent among CES-D depression scale more than 16; 32.8% versus 12.5% among CES-D depression scale less than 16, p= 0.018 while faculty of nursing had the least percent (9.2% vs 29.2%).

There was no significant difference between two groups regarding scientific degree, working state, income, duration of working, working days per week, time to reach work place.

Univariate regression of socio-demographic data revealed that increasing number of children is considered as a protective factor against depression (OR= 0.576, C.I.95%= 0.357-0.930, P<0.001) and that increasing body mass index is considered significant risk factor of depression by CES-D depression scale (OR= 1.299, C.I.95%= 1.133-1.490, P <0.001).

Also, obesity was found to be as a risk factor for depressive symptoms (OR= 3.585, C.I.95%= 1.030-12.480, P=0.045).

Both overweight and obesity were found to be risk factors for depressive symptoms (CES-D score ≥16) OR= 6.145, C.I.95% = 2.156-15.009, P<0.001
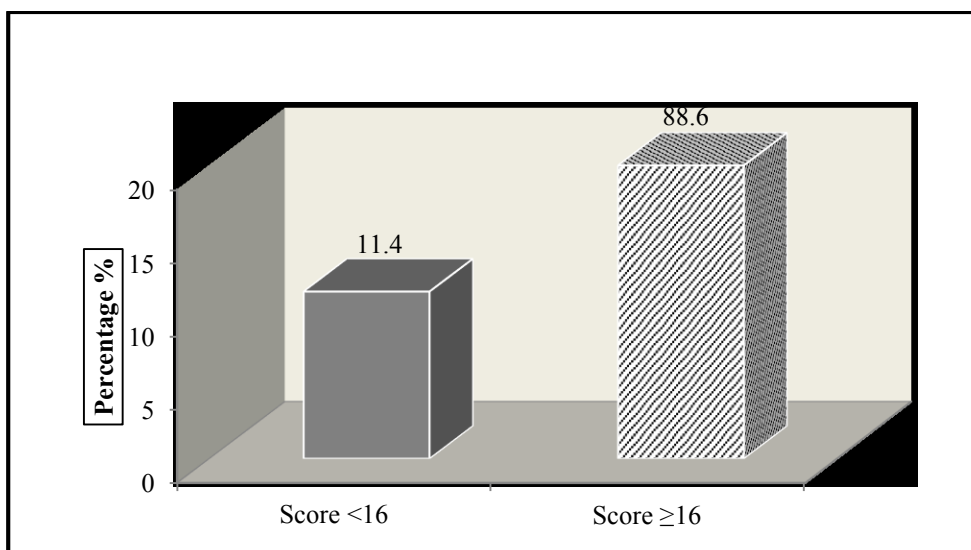

Figure (1): CES-D depression scale of the studied sample of staff members and their assistants in Minia University (October 2020 to January 2022)

Table (1): Relation of socio-demographic characteristics and CES-D score among studied staff members and their assistants in Minia University (October 2020 to January 2022)

Socio-demographic characteristics		Group I CES-D Score <16 N=24	Group II CES-D Score ≥16 N=186	Test statistic	p-value
Age (in years)	≤35 years >35 years	12(50%) 12(50%)	108(58.1%) 78(41.9%)	χ2 0.565	0.542
	Mean ±SD	39.7±11.5	37.4±9.3	(t) 1.256	.264
Sex	Males Females	9(37.5%) 15(62.5%)	56(30.1%) 130(69.9%)	χ2 0.544	0.461
Residence	Urban Rural	21(87.5%) 1(4.2%)	144(77.4%) 27(14.5%)	Fishers exact 1.819	0.412
Marital status	Single Married	7(29.2%) 17(70.8%)	63(33.9%) 123(66.1%)	χ2 0.212	0.645
BMI:	Mean ±SD	23.3±3.1	28.4±3.5	(t) 16.740	<0.001*
Number of children	Less than 3 3 or more	9(56.2%) 7(43.8%)	113(93.4%) 8(6.6%)	χ2 19.990	<0.001*
Number of persons at home	Range Mean ±SD	1-6 4.6±1.4	1-8 4.2±1.4	(t) 2.342	.127
Smoking status	Yes No	0(0%) 24(100%)	8(4.3%) 178(95.7%)	χ2 1.073	0.300
Presence of chronic disease	Yes No	5(20.8%) 19(79.2%)	29(15.6%) 157(84.4%)	χ2 0.430	0.512
Consuming fast food more than once per week	Yes No	9(37.5%) 15(62.5%)	69(37.1%) 117(62.9%)	χ2 0.001	0.969
Taking muli-vitamin supplements	Yes No	10(41.7%) 14(58.3%)	65(34.9%) 121(65.1%)	χ2 0.418	0.518
Physical activity more than one hour per week	Yes No	13(54.2%) 11(45.8%)	96(51.6%) 90(48.4%)	χ2 0.056	0.814

X^2= chi-squared, *= significant difference at <0.05

Table (2): Relation of occupational and CES-D score among studied staff members and their assistants in Minia University (October 2020 to January 2022)

Variables		Group I CES-D Score <16 N=24	Group II CES-D Score ≥16 N=186	Test statistic	p-value
Faculty	Medicine	6(25%)	25(13.4%)	Fisher exact 12.485	0.018*
	Arts	3(12.5%)	61(32.8%)		
	Specific Education	2(8.3%)	29(15.6%)		
	Nursing	7(29.2%)	18(9.7%)		
	Tourism and Hotels	1(4.2%)	24(12.9%)		
Scientific degree	Professor	2(8.3%)	14(7.5%)	Fisher exact 3.742	0.408
	Assistant professor	0(0%)	12(6.5%)		
	Lecturer	3(12.5%)	41(22%)		
	Assistant lecturer	13(54.2%)	93(50%)		
	Denominator	6(25%)	26(14%)		

Working state	Working On vacation	24(100%) 0(0%)	180(96.8%) 6(3.2%)	χ2 0.797	0.372
Income	Sufficient Insufficient	16(66.7%) 8(33.3%)	104(55.9%) 82(44.1%)	χ2 1.004	0.316
Duration of working (years)	Range Mean ±SD Median (IQR)	2-32 8.7±7.8 6(5-8)	2-34 7.7±4.1 7(5-9)	(U) -0.648	.517
Working days per week	Range Mean ±SD	2-6 3.7±1.1	1-6 3.8±1.3	(t) .003	.959
Time to reach work place (in minutes)	Range Mean ±SD Median (IQR)	10-240 55.4±60.0 47.5(20-60)	2-240 39.8±42.0 25(15-60)	(U) -1.740	.082

X^2= chi-squared, t= independent sample t-test, U= Mann-Whitney, IQR= interquartile range, SD= standard deviation, *= significant difference at <0.05

Table (3): Univariate regression of socio-demographic data (October 2020 to January 2022):

Variables	Odds ratio	95% C.I. for odds ratio	p-value
Number of children	0.576	0.357-0.930	0.024*
BMI	1.299	1.133-1.490	<0.001*
BMI categories:			
Normal	(ref)		
Overweight	5.038	1.906-13.317	0.001*
Obese	9.100	2.140-34.357	0.001*
Obesity (BMI >30)	3.585	1.030-12.480	0.045*
BMI >25	6.145	2.156-15.009	<0.001*

Discussion

To our knowledge, our study represents the first study to provide not only depressive symptoms (i.e. CES-D scale) prevalence, but also information regarding risk factors associated with depression among university staff and their assistants in Minia city, Egypt.

This study included 210 staff members and their assistants in Minia University. The age of the subjects ranged between 25-68 years (mean age 37.7±9.6). Males construct 31% of the studied sample, while females construct 69%.

Prevalence of depressive symptoms was reported at 88%, which was very high compared to other previous studies from different countries.

Consistencies on the prevalence rates of self-reported mental health conditions in the literature have shown mixed variations. A study among faculty members from the USA reported that the prevalence of depression was 28.3%, which is lower than that reported in the current study [17].

The prevalence of perceived symptoms of depression, among the respondents of staff in a Malaysian public university was 28.7% [18].

Also, university staff from Southwest Ethiopia showed lower depression (22.9%) than reported in this study[19].

Mental health surveys conducted among public university staff at different institutions found that the prevalence of depression, anxiety, and stress ranged between 21.7% and 70.5%[20,21].

Variations in the prevalence rates of depression could be attributed to the utilization of different study tools across different studies, which were adopted for a variety of study populations or occupational settings.

Our study found no significant association with age, in contrast to a study done by **Akhtar-Danesh and Landeen, 2007** [22]and found that younger aged employees were at higher odds of having depressive symptoms as compared to older age groups.

Previous studies regarding the association of age and symptoms of depression produced mixed results. While some studies found a negative relation between age and depression, studies from developed countries consistently found that the odds of depression decreased with age.

In contrast, investigations from developing countries generally did not establish any causal associations between depression and age [23]. Studies found a linear interaction between depression and age, which was most commonly seen amongst those with impaired health [24] and those with lower education in older aged groups[25]. It could be postulated that those in older age groups tend to have higher income with longer service duration, thus exhibiting lower odds of psychological conditions, which most likely may be due to financial and job stability among those older age groups [26].

There was no significant association between sex and depressive symptoms in this study in contrast to other studies from different countries, which found that women had higher odds of having symptoms of depression as compared to men [26,27].

The link between depression and women can be explained from a socioeconomic as well as from a biological point of view. The difference in socioeconomic characteristics such as education and income may have resulted in higher rates of depression among women [28]. Women and men react differently to stressors and may be more vulnerable to develop depression and anxiety related disorders [29]. Biological factors, such as hormonal imbalances, may also play a role, which could have resulted in higher odds of depression among women.

It is still not clear whether depression leads to obesity in response to changing appetite and medicines or obesity contributes to depressive disturbances.

Consistent with the literature findings, body weight (kg) and BMI (kg/m2) of the depression group were significantly higher than non-depressed group in our study.

BMI was significantly higher in women with depression but not in men, matching a study by **Oh et al** who studied the association between macronutrients intake and depression in the United States and South Korea[30]

Payne et al who did a study on a sample of older adults with depression against control group and found that the depression group reported a significant higher BMI than the control group. The majority of literature demonstrates high prevalence of depression in people with high BMI[31].

In a study conducted with 3186 adult males and 3003 adult females, depressed participants were found to have higher waist circumferences. Besides body weight and BMI, we have found that waist circumference was higher in female participants with depression compared to non-depressed group [32].

Conclusion:
Prevalence rate of depressive symptoms among staff members in Minia University is 88.6%. Increasing number of children is considered as a protective factor against depression (OR= 0.576, C.I.95%= 0.357-0.930, P<0.001) and that increasing body mass index is considered significant risk factor of depression by CES-D depression scale (OR= 1.299, C.I.95%= 1.133-1.490, P <0.001).

References
1. Lang UE, Borgwardt S. Molecular mechanisms of depression: perspectives on new treatment strategies. Cell Physiol Biochem. 2013;31(6):761-777.
2. Orsolini L, Latini R, Pompili M, et al. Understanding the Complex of Suicide in Depression: from Research to Clinics. Psychiatry Investig. 2020;17(3):207-221.
3. Sanchez-Villegas A, Martínez-González MA. Diet, a new target to prevent depression?. BMC Med. 2013;11:3. Published 2013 Jan 3.
4. Baxter AJ, Scott KM, Vos T, Whiteford HA. Global prevalence of anxiety disorders: a systematic review and meta-regression. Psychol Med. 2013;43(5):897-910. doi:10.1017/S003329171200147X
5. Burns J, Birrell E. Enhancing early engagement with mental health services by young people. Psychol Res Behav Manag. 2014;7:303-312.

Published 2014 Nov 25. doi:10.2147/PRBM.S49151

6. Milanović SM, Erjavec K, Poljičanin T, Vrabec B, Brečić P. Prevalence of depression symptoms and associated socio-demographic factors in primary health care patients. Psychiatr Danub. 2015;27(1):31-37.

7. Dana-Alamdari L, Kheirouri S, Noorazar SG. Serum 25-Hydroxyvitamin D in Patients with Major Depressive Disorder. Iran J Public Health. 2015;44(5):690-697.

8. He Q, Yang L, Shi S, et al. Smoking and major depressive disorder in Chinese women. PLoS One. 2014;9(9):e106287.

9. Salkever DS, Gibbons B, Drake RE, Frey WD, Hale TW, Karakus M. Increasing earnings of social security disability income beneficiaries with serious mental disorder. J Ment Health Policy Econ. 2014;17(2):75-90.

10. Pompili M, Innamorati M, Di Vittorio C, et al. Unemployment as a risk factor for completed suicide: a psychological autopsy study. Arch Suicide Res. 2014;18(2):181-192. doi:10.1080/13811118.2013.803449

11. Wang X, Cai L, Qian J, Peng J. Social support moderates stress effects on depression. Int J Ment Health Syst. 2014;8(1):41. Published 2014 Nov 13. doi:10.1186/1752-4458-8-41

12. Shapero BG, Black SK, Liu RT, et al. Stressful life events and depression symptoms: the effect of childhood emotional abuse on stress reactivity. J Clin Psychol. 2014;70(3):209-223. doi:10.1002/jclp.22011

13. Meng X, D'Arcy C. The projected effect of increasing physical activity on reducing the prevalence of common mental disorders among Canadian men and women: a national population-based community study. Prev Med. 2013;56(1):59-63.

14. Khosravi M, Sotoudeh G, Majdzadeh R, et al. Healthy and Unhealthy Dietary Patterns Are Related to Depression: A Case-Control Study. Psychiatry Investig. 2015;12(4):434-442.

15. Gomes AR, Faria S, Vilela C. Anxiety and burnout in young athletes: The mediating role of cognitive appraisal. Scand J Med Sci Sports. 2017;27(12):2116-2126.

16. McCall WV, Kintziger KW. Late life depression: a global problem with few resources. Psychiatr Clin North Am. 2013;36(4):475-481.

17. Meeks K, Peak AS, Dreihaus A. Depression, anxiety, and stress among students, faculty, and staff [published online ahead of print, 2021 Mar 24]. J Am Coll Health. 2021;1-7.

18. Ganasegeran K, Renganathan P, Manaf RA, Al-Dubai SA. Factors associated with anxiety and depression among type 2 diabetes outpatients in Malaysia: a descriptive cross-sectional single-centre study. BMJ Open. 2014;4(4):e004794.

19. Yeshaw Y, Mossie A. Depression, anxiety, stress, and their associated factors among Jimma University staff, Jimma, Southwest Ethiopia, 2016: a cross-sectional study. Neuropsychiatr Dis Treat. 2017;13:2803-2812.

20. Mukosolu O, Ibrahim F, Rampal L, Ibrahim N. Prevalence of Job Stress and Its Associated Factors among Universiti Putra Malaysia Staff. Malaysian J. Med. Health Science. 2015; (11); 27–38.

21. Ismail NH, Noor A. Occupational stress and its associated factors among academician in a research university, Malaysia. Malaysian Journal of Public Health Medicine. 2016;16(1):81-91.

22. Akhtar-Danesh N, Landeen J. Relation between depression and sociodemographic factors. Int J Ment Health Syst. 2007;1(1):4.

23. Kessler RC, Birnbaum H, Bromet E, Hwang I, Sampson N, Shahly V. Age differences in major depression: results from the National Comorbidity Survey Replication (NCS-R). Psychol Med. 2010;40(2):225-237.

24. Ganasegeran K, Renganathan P, Manaf RA, Al-Dubai SA. Factors associated with anxiety and depression among type 2 diabetes outpatients in Malaysia: a descriptive cross-sectional single-centre study. BMJ Open. 2014;4(4):e004794.

25. Stordal E, Mykletun A, Dahl AA. The association between age and

depression in the general population: a multivariate examination. Acta Psychiatr Scand. 2003;107(2):132-141.

26. Manaf MRA, Shaharuddin MA, Nawi AM, et al. Perceived Symptoms of Depression, Anxiety and Stress amongst Staff in a Malaysian Public University: A Workers Survey. Int J Environ Res Public Health. 2021;18(22):11874.

27. Ferrari AJ, Somerville AJ, Baxter AJ, et al. Global variation in the prevalence and incidence of major depressive disorder: a systematic review of the epidemiological literature. Psychol Med. 2013;43(3):471-481.

28. Rai D, Zitko P, Jones K, Lynch J, Araya R. Country- and individual-level socioeconomic determinants of depression: multilevel cross-national comparison. Br J Psychiatry. 2013;202(3):195-203.

29. Breslau N, Davis GC, Andreski P, Peterson EL, Schultz LR. Sex differences in posttraumatic stress disorder. Arch Gen Psychiatry. 1997;54(11):1044-1048.

30. Oh J, Yun K, Chae JH, Kim TS. Association Between Macronutrients Intake and Depression in the United States and South Korea. Front Psychiatry. 2020;11:207.

31. Payne ME, Steck SE, George RR, Steffens DC. Fruit, vegetable, and antioxidant intakes are lower in older adults with depression. J Acad Nutr Diet. 2012;112(12):2022-2027.

32. Birditt KS, Newton NJ, Cranford JA, Webster NJ. Chronic Stress and Negative Marital Quality Among Older Couples: Associations With Waist Circumference. J Gerontol B Psychol Sci Soc Sci. 2019;74(2):318-328.

33. Radloff, Lenore S. (1977). The CES-D Scale: A slf-report depression scale for research in the general population. Applied Psychological Measurement, 1, 385-401.