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Prevalence of depression and the use of antidepressants among Iraqi medical students

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ABSTRACT
Background: Health, as defined by the World Health Organization (WHO), is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."
Objective: This research aims to explore the frequency of depression among medical students in Iraq
Design: This is a cross-sectional study with the participation of Iraqi medical students (n=1725) conducted in Iraq medical population using a multi-item questionnaire over 6 months (From March 2024 – September 2024). Beck's Depression Inventory was used as a tool for gathering the responses of the participants.
Results: The results of the study showed the superiority of women over men in having depression Women constituted 65.9% (n = 866) of those with depressive symptoms compared to 56.4% (n = 232) of those without depression. The most prevalent antidepressant was Fluoxetine (37.9%) followed by Sertraline (27.6%) and Escitalopram *(*22.4%). In general the results revealed the increased prevalence of depression among Iraqi medical students.
Conclusion: Depression is a major mental health issue for future doctors in Iraq. Many students report a variety of symptoms, including sorrow, worry, weariness, difficulty in concentration, and lack of enthusiasm, suggesting that depression is common among this demographic. More research is needed to understand the complex processes that lead to depression in this demographic, but some studies have identified potential risk factors.

Keywords: Depression, Medical students, Antidepressants

INTRODUCTION

The major mental health disorder known as depression can have a negative impact on an individual's emotions, thoughts, and behavior.[1] Because of the academic and personal pressures they face while they are obtaining their medical degrees, the likelihood of medical students developing depression is significantly increased.[2] This is especially true in Iraq, where medical students encounter a distinct and varied set of obstacles in a society that is undergoing fast social, political, and economic transformation.

According to the findings of recent research, the incidence of clinical depression among Iraq's medical students is significantly higher than average.[3] According to the findings of a study that was carried out in 2018, roughly 29% of Iraqi medical students exhibited symptoms consistent with depression. This is in line with the findings of studies conducted in other countries, which have shown that the prevalence of depression among medical students is consistently higher than that of the general population.[4]

There is a wide variety of interconnected factors that can lead to depression among Iraq's medical students. It's possible that the stresses of medical school, social expectations of success, and the demands of an ever-evolving healthcare system could all contribute to the development of depression in a student. [5]

In addition, the political instability and conflict in Iraq have created a tough atmosphere for medical students, which have led to a rise in stress and anxiety levels among Iraqi medical students.[6]

Because untreated depression can lead to major negative outcomes, including academic failure, social isolation, and even suicide, it is crucial to address the issue of depression among Iraqi medical students.[7]

Students' mental health should be given top priority at medical schools in Iraq. This can be accomplished by the implementation of programs that concentrate on the early diagnosis and treatment of depression, as well as the provision of counseling services and other resources to support students' mental health.[8]

The purpose of this study is to explore the frequency of depression among medical students in Iraq. This study aims to provide insights into the mental health of this vulnerable population by analyzing the prevalence of depression among Iraqi medical students. These insights will then be used to inform the development of effective preventative and intervention methods.

MATERIAL AND METHODS

Study Design

This is a cross-sectional study with a convenience sample conducted in Iraq medical population using a multi-item questionnaire over 6 months (From March 2024 – September 2024). Beck's Depression Inventory was used as a tool for gathering the responses of the participants. The inventory contains 21 questions. The scale used to screen for depression based on self-report. The answers were collected by an online questionnaire that was aimed at the medical students' population. The test link was distributed amongst medical studentsgroups and answers were limited to one response.

Sample of the study

The study encountered the participation of 1725 medical students. The following flow chart show the total number of medical students who participated in the study.

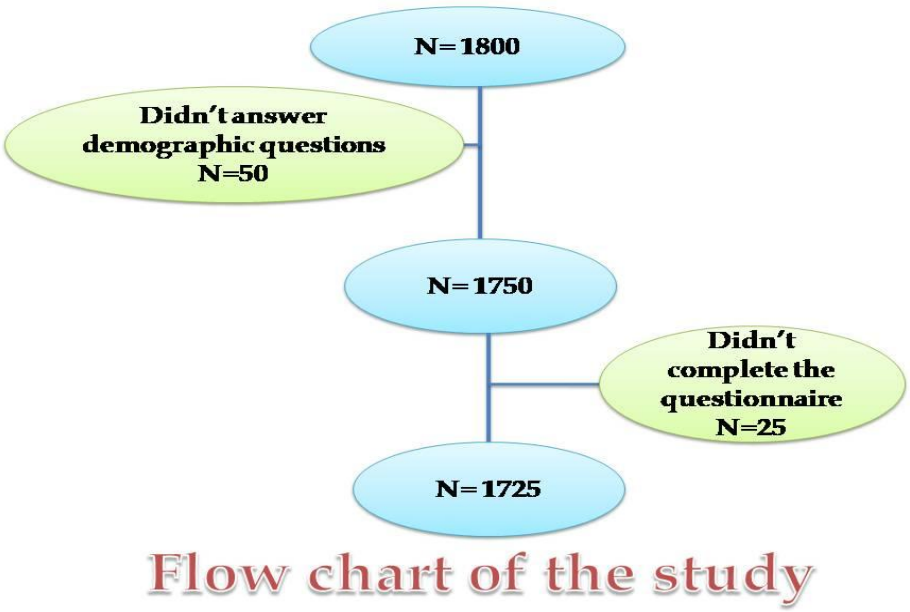

Figure 1: Flow chart of the study

Statistical analysis

Data was expressed by using frequencies and percentages of participant characteristics. The data analyses were performed utilizing the Statistical Package for the Social Sciences(SPSS)(IBM,USA)Program for Windows, version 22.0. Chi-Square test was used to examine the relationship between two qualitative variables. Monte Carlo test was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells.Multiple linear regression analysis was used to measure the relationship between the independent factors (age, gender, marital status, and family history with depression. the outcome variable (levels of depression). The statistically significant value was $P < 0.05$.

RESULTS

The sample of the study aged between 19 to32 years old. Male and female medical students participated in the study with percentage of (36.3%) and (63.7%) respectively. 87.6% of the participants had no family history of depression, while 12.4% had depression history. Figure (1). Prevalence of depression among Iraqi medical students was demonstrated in Figure (2). The used antidepressants varied among medical students. The results revealed that the most prevalent antidepressant was Fluoxetine (37.9%) followed by Sertraline (27.6%) and Escitalopram(22.4%)

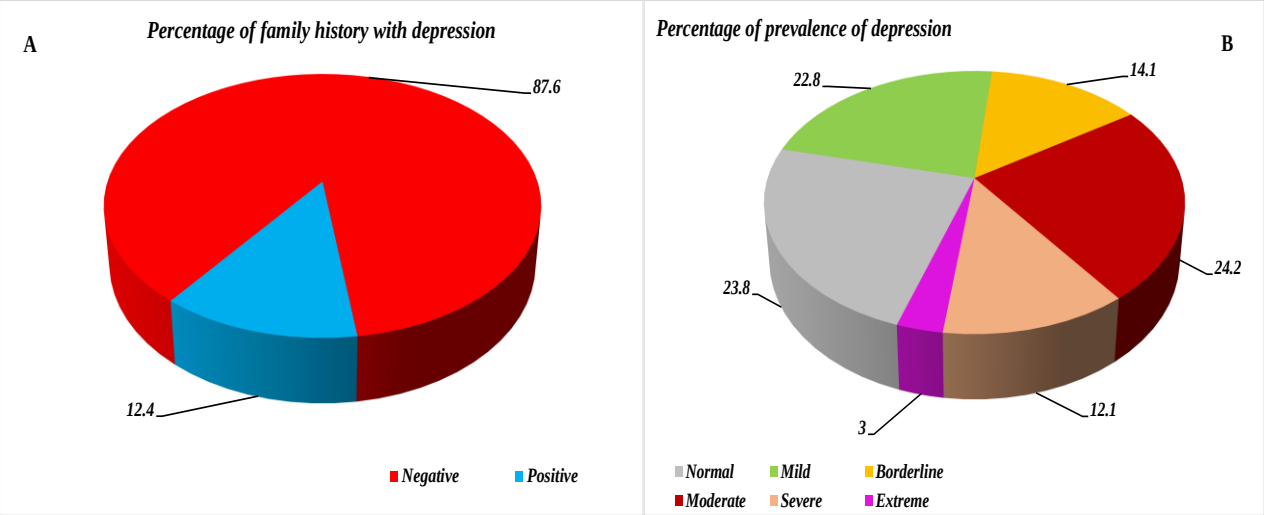

Figure 2: (A) Family history with depression among Iraqi medical students. (B) Prevalence of depression among Iraqi medical students

The study participants were young people as more than 90% less than 26 years. The study included 63.7% females and 36.3% males. The family history of depression was 12.4% of participants. According to the BDI, 76.2 % of the participants reported some level of depression symptoms. 411 (23.8 %) scored in the normal range, 393 (22.8 %) in the mild range, 243 (14.1 %) in the borderline range, 417 (24.2 %) in the moderate range, 209 (12.1 %) in the severe range and 52 (3.0 %) in the extreme range depression. Table (1)

Table 1: The participant characteristics among Iraqi medical students

	Iraqi medical students n = 1725	
	Number	**Percent**
Age		
19 – 25	1621	94.0
26 - 32	104	6.0
Gender		
Male	627	36.3
Female	1098	63.7
Marital status		
Single	1654	95.9
Married	66	3.8
Other	5	0.3
Diagnosed with depression	**151**	**8.8**
Using antidepressants	**58**	**38.4**
Treatment n = 58		
Citalopram	7	12.1
Desipramine	2	3.4
Escitalopram	13	22.4
Fluoxetine	22	37.9
Nortriptyline	1	1.7
Paroxetine	1	1.7
Sertraline	16	27.6
Venlafaxine	1	1.7
Other treatment	20	34.5
Family history with depression		
No	1511	87.6
Yes	214	12.4
Prevalence of depression		
Normal	411	23.8
Mild mood Disturbance	393	22.8
Borderline Depression	243	14.1

Moderate Depression	417	24.2
Severe Depression	209	12.1
Extreme Depression	52	3.0

The study showed that was statistically significant difference between student with depression and non-depression regarding to gender, Women constituted 65.9% (n = 866) of those with depressive symptoms compared to 56.4% (n = 232) of those without depression.The study showed that no association between depression and students age, also showed no association between depression and marital status, 96.0% from depressions were singlesand95.4% from non-depression were singles. Table (2)

Table 2: Association depression with demographic data

	Depression		**Chi-Square p-value**
	Normaln = 411	**Abnormaln = 1314**	
	N. (%)	**N. (%)**	
Age (years)			
19 - 25	387 (94.2%)	1234 (93.9%)	Chi-Square=0.034 p-value=0.853
26 - 32	24 (5.8%)	80 (6.1%)	
Gender			
Male	179 (43.6%)	448 (34.1%)	Chi-Square=12.11 p-value=0.001*
Female	232 (56.4%)	866 (65.9%)	
Marital status			
Single	392 (95.4%)	1262 (96.0%)	Chi-Square=1.980 Monte-Carlo p-value=0.342
Married	19 (4.6%)	47 (3.6%)	
Other	0 (0.0%)	5 (0.4%)	

*: Significant <0.05

Table 3: Sense of failure, loss of pleasure, and guilt among Iraqi medical students

	Iraqi medical students (n = 1725)	
	Number	**Percent**
Sense of failure		
I do not feel like a failure	762	44.2
I feel I have failed more than the average person.	711	41.2
As I look back on my life, all I can see is a lot of failures.	149	8.6
I feel I am a complete failure as a person.	103	6.0
Loss of pleasure		
I get as much satisfaction out of things as I used to	397	23.0
I don't enjoy things the way I used to.	792	45.9
I am dissatisfied or bored with everything	107	6.2
I don't get real satisfaction out of anything anymore.	429	24.9
Guilt		
I don't feel particularly guilty	318	18.4
I feel guilty a good part of the time.	830	48.1
I feel quite guilty most of the time.	187	10.8
I feel guilty all of the time.	390	22.6

The study presented answers for question of suicidal ideas, 69.7 of participants answered “I don't have any thoughts of killing myself”, 20.7% of answers was “I have thoughts of killing myself, but I would not carry them out”, 6.7% of answers was “It's better for me to die”, 1.5% of answers was “It's better for my family to die”, 1% from answers was “I would kill myself if I had the chance”, and 0.5% of answers was “I have a definite plan to suicide” . Table (4)

Table 4: Suicidal ideas among Iraqi medical students

	Iraqi medical students (n = 1725)	
	Number	**Percent**
Suicidal ideas		
I have a definite plan to suicide	8	0.5
It's better for my family to die	26	1.5
It's better for me to die	115	6.7

I would kill myself if I had the chance.	17	1.0
I have thoughts of killing myself, but I would not carry them out.	357	20.7
I don't have any thoughts of killing myself.	1202	69.7

Table 5: Irritability and social withdrawal among Iraqi medical students

	Iraqi medical students (n = 1725)	
	Number	**Percent**
Irritability		
I am no more irritated by things than I ever was.	423	24.5
I feel irritated all the time	106	6.1
I am slightly more irritated now than usual.	734	42.6
I am quite annoyed or irritated a good deal of the time.	462	26.8
Social withdrawal		
I have not lost interest in other people	1082	62.7
I have lost most of my interest in other people.	498	28.9
I have lost allof my interest in other people	145	8.4

The study showed that was statistically significant difference between patients with and without depression regarding to difficulty of concentration, fatigue, health of medical students, According to students with depression had difficult of concentration, 40.5% from answer was “I have to push myself very hard to do anything”, 34.7% was “It takes an extra effort to get started at doing something”, 16.4% was “I can work about as well as before.”, and only 8.4% were answered “I can't do any work at all” . Figure (2)

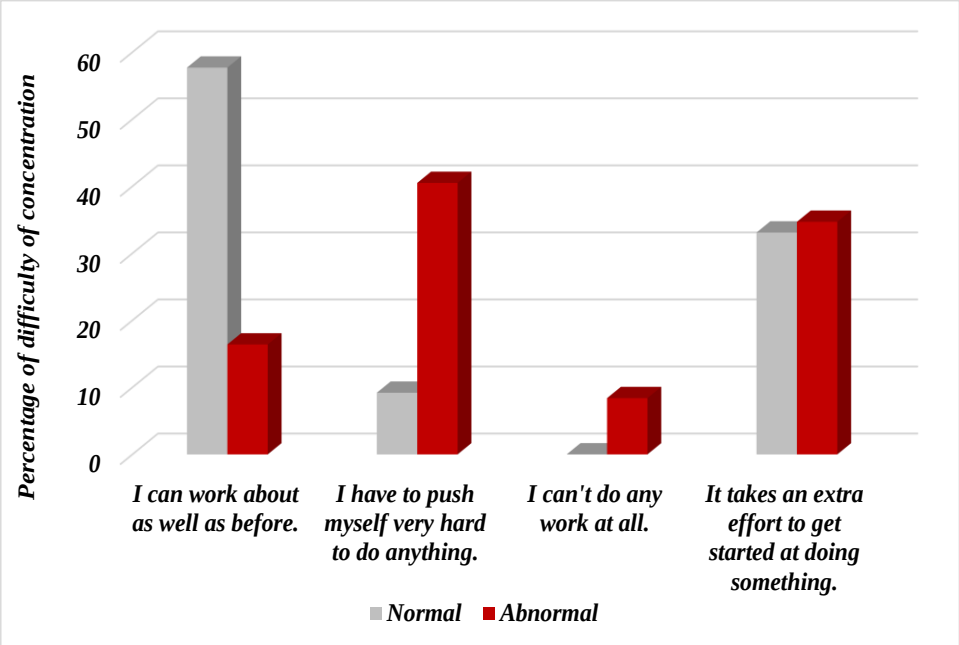

Figure 3: Association of depression with difficulty of concentration

According to fatigue 43.8% of students with abnormal depression answered“I get tired more easily than I used to” compared to 37.5% of students with no-depression, 28.2% of students with abnormal depression answered “I get tired from doing almost anything” compared to 3.6% students with no-depression, 16.3% of students with abnormal depression answered “I don't get more tired than usual” compared to 58.9% students with no-depression, and 11.6% of students with abnormal depression answered“I am too tired to do anything” compared to 0.0% students with no-depression. Figure (3)

Figure 4: Association of depression with fatigue

According to health questions50.1% of students with abnormal depression answered "I am no more worried about my health than usual" compared to 81.5% of students with no-depression, 29.0% of students with abnormal depression answered "I am worried about physical problems like aches, pains, upset stomach, or constipation"compared to 17.8%students with no-depression, 14.8% of students with abnormal depression answered "I am very worried about physical problems and it's hard to think of much else" compared to 0.2% students with no-depression, and 6.1% of students with abnormal depression answered "I am so worried about my physical problems that I cannot think of anything else" compared to 0.5% students with no-depression. Table (6), figure (4)

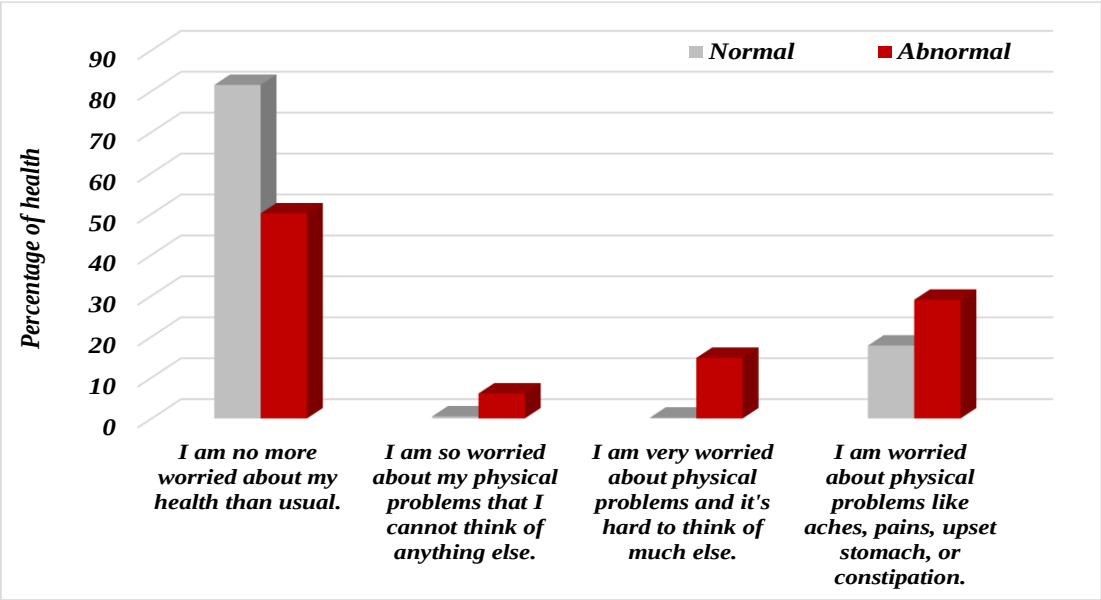

Figure 5: Association of depression with health.

Table 6: Association depression with difficulty of concentration, fatigue, health of doctors

	Depression			
	Normal n = 411		**Abnormal n = 1314**	
	Number	**Percent**	**Number**	**Percent**
Difficulty of concentration				
I can work about as well as before.	237	57.7	215	16.4
I have to push myself very hard to do anything.	38	9.2	532	40.5
I can't do any work at all.	0	0.0	111	8.4
It takes an extra effort to get started at doing something.	136	33.1	456	34.7
Test (p)	**Chi-Square=331.248,p<0.001***			

Fatigue				
I don't get more tired than usual.	242	58.9	214	16.3
I get tired more easily than I used to.	154	37.5	576	43.8
I am too tired to do anything	0	0.0	153	11.6
I get tired from doing almost anything	15	3.6	371	28.2
Test (p)	**Chi-Square=350.291,p<0.001***			
Health				
I am no more worried about my health than usual.	335	81.5	658	50.1
I am so worried about my physical problems that I cannot think of anything else.	2	0.5	80	6.1
I am very worried about physical problems and it's hard to think of much else.	1	0.2	195	14.8
I am worried about physical problems like aches, pains, upset stomach, or constipation.	73	17.8	381	29.0
Test (p)	**Chi-Square=148.120,p<0.001***			

*: Significant <0.05

According to the multiple linear regression analysis, the result of interaction between age, gender, marital status, and family history showedthat female most association with higher scores on the Beck Depression Inventory scale.

Table 7: The multiple linear regression analysis of factors influencingthe level ofdepression

Factors	**Standardized Coefficients Beta**	**P-value**	**95.0% Confidence Interval for Beta**	
			Lower Bound	**Upper Bound**
Age	0.046	0.058	-0.009	0.582
Gender	0.123	<0.001*	0.233	0.520
Marital status	0.045	0.065	-0.022	0.712
Family history	-0.001	0.977	-0.212	0.206

*Significant (P-value < 0.05). Age: (19-25 is the reference), Gender:(Male is the reference), Marital status (Married is the reference) Level of expressions (Normal=0, Mild =1, Borderline=2. Moderate=3, Severe=4, Extreme =5)

DISCUSSION

Although medical students are more likely to experience depression than the general population, the prevalence of depression among medical students varies widely across studies.[9]The rate of depression or depressive symptoms among medical students was anywhere from 10% to 60%.[10]

Another study conducted in the United States found that 24.5 percent of medical students experienced depressive symptoms.[11]

Several factors can contribute to the development of depression in medical students, including but not limited to: stress from schoolwork and other obligations[12]; financial difficulties[13]; long hours[14]; fatigue[15]; lonelinessand isolation[16]. Long hours of study and clinical rotations can cause medical students to feel overwhelmed and depressed.[17]

There is a higher rate of burnout and suicidal thoughts among medical students than among the general population.[18]Medical students' academic performance, social lives, and professional futures have all been found to suffer significantly when students struggle with depression.[19]

People with this illness are more likely to have co-occurring mental health issues like anxiety and substance abuse.[20]Primary research showed that between 1.4% to 80.6% of medical students experience depression symptoms.[21]Systematic reviews and meta-analyses have revealed the overall prevalence of such symptoms, accounting for variables including age, sex, geographic region, and sample size.[22]

Our findings corroborate those of recent studies showing a greater propensity for women than males to suffer from depression. Anxiety and sadness are more common among female college students, according toAl Amin M, et al.[23]

Our results also demonstrated that neither age nor marital status was linked to an increased risk of depression. However, there has been conflicting research on this topic in the recent past. In 2021, for instance, researchers discovered that older college students had a greater risk of depression than their younger counterparts.[24] However, a study conducted on college students and published in 2023 showed no correlation between marital status and depression.[25]

According to Hashmi AM, et al.,[26]family history of depression is a known risk factor for developing depression among medical students. More precisely, the study found that the likelihood of depression among students who came from families with a history of depression was higher than among students who did not originate from such households.

Depression is characterized by a number of common symptoms, one of which is an inability to concentrate or find the drive to do things.[27] According to the findings of our study; a considerable number of students who suffer from depression also experience these symptoms to a significant degree.

According to Donoso F, et al.,[28] antidepressant medicines have been demonstrated to be beneficial in lowering the symptoms of depression, including difficulties with focus and motivation. These medications are included among the therapy choices for depression.

On the other hand, some students might find that non-pharmacological treatments, such cognitive-behavioral therapy or mindfulness meditation, are more effective than pharmaceutical options.[29]Both clinical and non-clinical groups have showed positive responses to these therapies, including reductions in depressive symptoms and improvements in cognitive performance.[30]

Zugic M.[31]found thatFluoxetine was the most effective antidepressant that is used for the treatment of depression among his clinical samples. As well as many other studies that referred to Fluoxetine as an effective antidepressant. Antidepressants like fluoxetine, which blocks the reuptake of serotonin, are categorized as SSRIs. Depression, OCD, and bulimia are just some of the conditions that it's used to treat.The chemical serotonin is the key to its effectiveness. It has been hypothesized that serotonin positively affects disposition, emotions, and slumber.Many people get relief from depression after using fluoxetine, which also has fewer negative effects than other antidepressants.

Sertraline is an SSRI, the neurotransmitter serotonin, which is increased by the medicine, is responsible for its beneficial effects on mood, energy, and anxiety.[32]it may affect gastrointestinal tract according to Oliva V, et al. [33]

When compared to traditional antidepressants, escitalopram and SSRIs present a lower risk of adverse effects. However, they have major risks associated with them. Sleeplessness, sexual dysfunction (most often low libido, anorgasmia, and male ejaculatory latency), nausea, increased perspiration, exhaustion, and somnolence are the most often reported negative side effects. Rare yet serious side effects of escitalopram include QT prolongation and serotonin syndrome. [34]

Perhaps because of the medical background of the study sample and their awareness of the side effects of each drug, the majority chose Fluoxetine (37.9%) followed by Sertraline (27.6%) and Escitalopram (22.4%) due to the common side effects in the latest two over Fluoxetine.

CONCLUSION

In conclusion, depression is a major issue in the mental health of future doctors in Iraq. Many students report experiencing a variety of symptoms, including sorrow, worry, weariness, difficulty concentrating, and lack of enthusiasm, suggesting that depression is common among this demographic. A greater understanding of the complex processes contributing to depression in this demographic is needed, but some studies have identified potential risk factors for depression among medical students in Iraq, such as academic stress and financial demands. Counseling and other mental health services, as well as other forms of support, should be made available to medical students who are experiencing depression. It is important to take care of medical students' mental health so that they can continue to thrive as professionals and give their patients the best care possible.

REFERENCES

1. Foulkes L, Andrews JL. Are mental health awareness efforts contributing to the rise in reported mental health problems? A call to test the prevalence inflation hypothesis. New Ideas in Psychology. 2023 Apr 1;69:101010.https://doi.org/10.1016/j.newideapsych.2023.101010
2. Rich A, Viney R, Silkens M, et al. UK medical students' mental health during the COVID-19 pandemic: a qualitative interview study. BMJ Open 2023;13:e070528. doi: 10.1136/bmjopen-2022-070528
3. Mohammed MA, Memmedova K. Prevalence of Mental Health Problems among Iraqi University Students during the COVID-19 Pandemic. Sustainability. 2023 Jan 17; 15(3):1746. https://doi.org/10.3390/su15031746
4. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. New England journal of medicine. 2004 Jul 1;351(1):13-22.DOI: 10.1056/NEJMoa040603
5. Kathem SH, Al-Jumail AA, Noor-Aldeen M, Najah N, Khalid DA. Measuring depression and anxiety prevalence among Iraqi healthcare college students using hospital anxiety and depression scale. Pharmacy Practice (Granada). 2021 Apr-Jun;19(2):2303. doi: 10.18549/PharmPract.2021.2.2303.

6. Lafta R, Al-Ani W, Dhiaa S, Cherewick M, Hagopian A, Burnham G. Perceptions, experiences and expectations of Iraqi medical students. BMC medical education. 2018 Dec;18(1):1-8. https://doi.org/10.1186/s12909-018-1156-8
7. Wimsatt LA, Schwenk TL, Sen A. Predictors of depression stigma in medical students: potential targets for prevention and education. American Journal of Preventive Medicine. 2015 Nov 1;49(5):703-14.https://doi.org/10.1016/j.amepre.2015.03.021
8. Ecker A, Berenson AB, Gonzalez SJ, Zoorob R, Hirth JM. Depression among medical students in the United States during the COVID-19 pandemic: the role of communication between universities and their students. Disaster Medicine and Public Health Preparedness. 2023;17:e145.doi:10.1017/dmp.2022.56
9. Abdel Aziz, K., Stip, E., Al-Sanadi, A. et al. Prevalence and correlates of health anxiety among medical students: a cross-sectional study from the United Arab Emirates. Middle East Curr Psychiatry 30, 3 (2023). https://doi.org/10.1186/s43045-022-00273-2
10. Lee KC, Huang R, Tal IR, Downs N, Zisook S. Comparison of Suicidal Ideation and Depressive Symptoms Between Medical and Pharmacy Students. American Journal of Pharmaceutical Education. 2023 Mar 1;87(2).DOI: https://doi.org/10.5688/ajpe8881
11. Healy C, Ryan Á, Moran CN, Harkin DW, Doyle F, Hickey A. Medical students, mental health and the role of resilience–A cross-sectional study. Medical Teacher. 2023 Jan 2;45(1):40-8. https://doi.org/10.1080/0142159X.2022.2128735
12. Rajar HA, Shoukat F. Depression, Anxiety, And Stress Among The Teachers Of Private Medical Universities. A Cross Sectional Sectional Study From Karachi.
13. Tao X. The Influence of Family Factors on The Mental Health of Medical Students and Suggestions. International Journal of Education and Humanities. 2023;6(1):12-5. https://doi.org/10.54097/ijeh.v6i1.2939
14. Bolakale-Rufai IK. Depression and suicidal ideation among medical students: A literature review. Journal of Global Medicine. 2023:e87-.https://doi.org/10.51496/jogm.v2.87
15. Wang J, Fitzke RE, Tran DD, Grell J, Pedersen ER. Mental health treatment-seeking behaviors in medical students: A mixed-methods approach. The Journal of Medicine Access. 2023 Jan; 7:27550834221147787.https://doi.org/10.1177/27550834221147787
16. Keiner C, Nestsiarovich A, Celebi J, Zisook S. Loneliness Among Medical Students, Physician Trainees and Faculty Physicians. Academic Psychiatry. 2023 Apr 10:1-7.https://doi.org/10.1007/s40596-023-01780-y
17. Minshew LM, Bensky HP, Zeeman JM. There's no time for no stress! Exploring the relationship between pharmacy student stress and time use. BMC Medical Education. 2023 Apr 24;23(1):279.https://doi.org/10.1186/s12909-023-04266-5
18. Ley AF, Han JJ, Hare E, Sikorskii A, Taylor JR, Shahed A, Guro C. Beyond burnout: a four-year survey of osteopathic medical student mental health and the implications for the development of wellness and mental health programs. Journal of Osteopathic Medicine. 2023 Feb 27(0).https://doi.org/10.1515/jom-2022-0179
19. Slavin SJ. Resilience and mental health: How we can help medical students flourish. Medical Teacher. 2023 Jan 2;45(1):3-5.https://doi.org/10.1080/0142159X.2022.2136930
20. Andersson HW, Mosti MP, Nordfjaern T. Inpatients in substance use treatment with co-occurring psychiatric disorders: a prospective cohort study of characteristics and relapse predictors. BMC psychiatry. 2023 Dec;23(1):1-0.https://doi.org/10.1186/s12888-023-04632-z
21. Depression in Medical Students Research Group., Zatt, W.B., Lo, K. et al. Pooled prevalence of depressive symptoms among medical students: an individual participant data meta-analysis. BMC Psychiatry 23, 251 (2023). https://doi.org/10.1186/s12888-023-04745-5
22. Costantini L, Pasquarella C, Odone A, Colucci ME, Costanza A, Serafini G, Aguglia A, BelvederiMurri M, Brakoulias V, Amore M, et al. Screening for depression in primary care with Patient Health Questionnaire-9 (PHQ-9): A systematic review. J Affect Disord. 2021;279:473–83. https://doi.org/10.1016/j.jad.2020.09.131
23. Al Amin M, Rahman MM. Factors Affecting Depression And Suicidal Tendency Among The Students For The Educational Process: A Study On Sylhet, Bangladesh. HISTORICAL: Journal of History and Social Sciences. 2023 Mar 13;2(1):1-5.
24. Nicholson J, Marcum C, Higgins GE. Prevalence and Trends of Depression among Cyberbullied Adolescents--Youth Risk Behavior Survey, United States, 2011–2019. International Journal of Cybersecurity Intelligence & Cybercrime. 2023;6(1):45-58.

25. Mahdavi P, Valibeygi A, Moradi M, Sadeghi S. Relationship between achievement motivation, mental health and academic success in university students. Community Health Equity Research & Policy. 2023 Apr;43(3):311-7.
26. Hashmi AM, Aftab MA, Naqvi SH, Sajjad W, Mohsin M, Khawaja IS. Anxiety and depression in Pakistani medical students: a multicenter study. Health Med. 2014;8(7):813-20.
27. Priya A, Garg S, Tigga NP. Predicting anxiety, depression and stress in modern life using machine learning algorithms. Procedia Computer Science. 2020 Jan 1;167:1258-67.https://doi.org/10.1016/j.procs.2020.03.442
28. Donoso F, Cryan JF, Olavarría-Ramírez L, Nolan YM, Clarke G. Inflammation, Lifestyle Factors, and the Microbiome-Gut-Brain Axis: Relevance to Depression and Antidepressant Action. Clinical Pharmacology & Therapeutics. 2023 Feb;113(2):246-59. https://doi.org/10.1002/cpt.2581
29. Alipour R, Hadinafard H, Aflakseir A, Molazadeh J. Investigating the efficacy of aromatherapy-based mindfulness and cognitive behavioral therapy on improving depression symptoms. Journal of Psychological Science. 2023 Apr;22(121).DOI: 10.52547/JPS.22.121.55
30. De Diego-Adeliño J, Crespo JM, Mora F, Neyra A, Iborra P, Gutiérrez-Rojas L, Salonia SF. Vortioxetine in major depressive disorder: from mechanisms of action to clinical studies. An updated review. Expert Opinion on Drug Safety. 2022 May 4;21(5):673-90.https://doi.org/10.1080/14740338.2022.2019705
31. Zugic M. Preventative association of antidepressant treatment in pregnant women with eating disorders on antenatal mental outcomes-results from the Norwegian Mother, Father, and Child Cohort Study (Master's thesis).
32. Fricke HP, Hernandez LL. The Serotonergic System and Bone Metabolism During Pregnancy and Lactation and the Implications of SSRI Use on the Maternal-Offspring Dyad. Journal of Mammary Gland Biology and Neoplasia. 2023 Dec;28(1):7.https://doi.org/10.1007/s10911-023-09535-z
33. Oliva V, Lippi M, Paci R, Del Fabro L, Delvecchio G, Brambilla P, De Ronchi D, Fanelli G, Serretti A. Gastrointestinal side effects associated with antidepressant treatments in patients with major depressive disorder: a systematic review and meta-analysis. Progress in Neuro-Psychopharmacology and Biological Psychiatry. 2021 Jul 13;109:110266.https://doi.org/10.1016/j.pnpbp.2021.110266
34. Landy K, Rosani A, Estevez R. Escitalopram. [Updated 2022 Oct 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK557734/