ORIGINAL ARTICLE

Prevalence and Determinants of Depression Among Medical Students: A Comprehensive Investigation

Tıp Öğrencileri Arasında Depresyonun Yaygınlığı ve Belirleyicileri: Kapsamlı Bir Araştırma

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ABSTRACT

Aim: Depression is a prevalent mental health disorder globally, impacting individuals' quality of life significantly. Medical students, due to the demanding nature of their education, are particularly susceptible to depression. This study aimed to investigate the prevalence and severity of depression among medical students and explore associated factors.
Materials and Method: This cross-sectional study was conducted over three months at a tertiary healthcare institution affiliated with a university. A face-to-face questionnaire was used to assess depression levels and associated factors among medical students. The Beck Depression Inventory was utilized for depression assessment. Statistical analyses were performed using IBM SPSS Statistics.
Results: The study included the demographic characteristics, lifestyle factors, and depression scores of medical students. Female students exhibited significantly higher depression scores than male students (p=0,019). Factors such as family income, smoking habits, social media usage, and regular studying showed significant associations with depression levels (p<0.05). Additionally, students who were satisfied with their medical education and those who did not experience semester/internship loss demonstrated lower depression levels (p<0.05).
Conclusion: Several factors, such as gender, family background, lifestyle choices, and academic performance were found to influence depression levels among medical students. Notably, social media use, regular studying habits, and satisfaction with medical education emerged as significant predictors of depression. Depression among medical students is a multifaceted issue influenced by various factors. Addressing these factors through targeted interventions and support services is crucial for promoting the psychological well-being of medical students and ensuring their long-term success in the medical profession.

Keywords: Depression, Medical students, education process, Diversities

ÖZ

Amaç: Depresyon, bireylerin yaşam kalitesini önemli ölçüde etkileyen, dünya çapında yaygın bir ruh sağlığı bozukluğudur. Tıp öğrencileri, eğitimlerinin zorlu doğası nedeniyle depresyona karşı özellikle hassastır. Bu çalışmanın amacı tıp öğrencileri arasında depresyonun yaygınlığını ve şiddetini araştırmak ve ilişkili faktörleri incelemektir.
Gereç ve Yöntem: Bu kesitsel çalışma, bir üniversiteye bağlı üçüncü basamak bir sağlık kurumunda üç ay boyunca yürütülmüştür. Tıp öğrencileri arasında depresyon düzeylerini ve ilişkili faktörleri değerlendirmek için yüz yüze bir anket kullanılmıştır. Depresyon değerlendirmesi için Beck Depresyon Envanteri kullanılmıştır. İstatistiksel analizler IBM SPSS Statistics kullanılarak gerçekleştirilmiştir.
Bulgular: Çalışma tıp öğrencilerinin demografik özelliklerini, yaşam tarzı faktörlerini ve depresyon puanlarını içermektedir. Kız öğrencilerin depresyon puanları erkek öğrencilere göre anlamlı derecede yüksekti (p=0,019). Aile geliri, sigara içme alışkanlığı, sosyal medya kullanımı ve düzenli ders çalışma gibi faktörler depresyon düzeyleri ile anlamlı ilişkiler göstermiştir (p<0.05). Ayrıca, tıp eğitiminden memnun olan ve dönem/staj kaybı yaşamayan öğrencilerin depresyon düzeyleri daha düşük bulunmuştur (p<0.05).
Sonuç: Cinsiyet, aile geçmişi, yaşam tarzı seçimleri ve akademik performans gibi çeşitli faktörlerin tıp öğrencileri arasında depresyon düzeylerini etkilediği bulunmuştur. Özellikle, sosyal medya kullanımı, düzenli ders çalışma alışkanlıkları ve tıp eğitiminden memnuniyet depresyonun önemli belirleyicileri olarak ortaya çıkmıştır. Tıp öğrencileri arasında depresyon, çeşitli faktörlerden etkilenen çok yönlü bir sorundur. Bu faktörlerin hedefe yönelik müdahaleler ve destek hizmetleri aracılığıyla ele alınması, tıp öğrencilerinin psikolojik esenliğini teşvik etmek ve tıp mesleğinde uzun vadeli başarılarını sağlamak için çok önemlidir.

Anahtar Kelimeler: Depresyon, Tıp öğrencileri, Eğitim süreci, Farklılıklar

Introduction

Depression is a common mental health disorder that can have a significant impact on an individual's quality of life. According to the World Health Organization, more than 264 million people suffer from depression. This has made depression one of the leading health problems worldwide (1). Depression can manifest itself in a variety of ways, including feelings of sadness, hopelessness, and helplessness, as well as physical symptoms such as fatigue, sleep disturbances, and changes in appetite (2). Poor sleep, stress, and significant life events are key risk factors for depressed mood, while physical activity and quality of social interactions are protective factors (3,4). Despite being a common condition, many people continue to suffer in silence, either due to fear of stigmatization or a lack of access to mental health services. However, depression is a treatable condition, and there are many practical strategies and interventions available to manage its symptoms.

The demanding nature of medical education and training is a significant source of stress, leading to depression among students. Studies have shown that medical students have a higher risk of developing depression compared to their peers in other academic programs. In a meta-analysis conducted by Rotenstein et al. in 2016, they found that the overall prevalence of depression or depressive symptoms among medical students was 27.2%, which is significantly higher than that of the general population (5). Dyrbye et al. reported that approximately 11% of medical students had suicidal thoughts at some point (6).

Studies in the literature show that depression among medical students is not only a common problem but also a serious threat. Therefore, this research aims to delve deeper into depression among medical students and to elucidate the complex factors that influence this condition. By taking into account a wide range of variables such as social media usage habits, family economic status, family relationships, etc., it aims to reveal the complex dynamics underlying depression. This comprehensive analysis aims to make a significant contribution to the development of not only medical students' but also the general mental health approach, and to provide more effective and original solutions by getting to the roots of the problem.

Materials and Method

This study was conducted within three months in a tertiary healthcare institution affiliated with a university. Ethical approval for the study was obtained from the non-interventional Ethics Committee of İzmir Katip Çelebi University, dated 26.01.2023 and numbered 0004. The study was conducted using a face-to-face questionnaire method with students studying at the university's medical faculty affiliated with the hospital. The questionnaire aimed to assess the depression levels of the students and to investigate the factors associated with depression. All students except the final year of the faculty were included in the study, and students with incomplete questionnaire data and those who refused to participate were excluded from the study. Final-year students were excluded due to the lack of in-semester examinations in the last year of medical school and the possibility that additional major stress factors, such as specialty examinations and employment at the end of the faculty, might affect an objective result. By the parameters specified in the study protocol, each participant was administered a meticulously prepared questionnaire covering various sociodemographic variables. These variables included factors such as age, gender, education, marital status, employment status, income level, place of residence, dependency and health status. The classification of students' family income level was based on the poverty and hunger thresholds set by the government at the time of the study. In addition to the sociodemographic questionnaire, participants were assessed using the Beck Depression Inventory (BDI). The data obtained were recorded on forms specially designed for the study. Scores were calculated according to the answers given to the scaled questions, and the relationships between the depression levels of the participants and the factors that may cause depression were evaluated by statistical analysis.

Beck Depression Inventory

Developed in 1961 by Aaron T. Beck, the BDI has undergone several revisions and updates over the years, the most recent version being the BDI-II. The BDI-II is a 21-item questionnaire that assesses various symptoms of depression, including sadness, hopelessness, guilt, irritability, and fatigue. It has been validated in many studies and is considered a reliable and valid measure of depression severity (7). The BDI is a self-report questionnaire that individuals can complete in approximately 5–10 minutes. Each item is scored on a scale of 0 to 3, with higher scores indicating more severe symptoms of depression. The total score ranges from 0 to 63, with 0–13 indicating minimal depression, 14–19 indicating mild depression, 20–28 indicating moderate depression, and 29–63 indicating severe depression.

Statistical Analysis

Data were evaluated using the statistical package program IBM SPSS Statistics Standard Concurrent User V 26 (IBM Corp., Armonk, New York, USA). Descriptive statistics were given as number of units (n), percentage (%), mean ± standard deviation (x̄ ±ss), median (M), minimum (min) and maximum (max) values. The Shapiro-Wilk normality test evaluated the normal distribution of the data of numerical variables, and it was determined that the data did not meet the normal distribution conditions. Beck Depression Scale total score was compared with the Mann-Whitney U test in variables with two groups and the Kruskal Wallis test in variables with three or more groups. Bonferroni post hoc test was applied for multiple comparisons. The relationships between continuous data were evaluated with the Spearman correlation coefficient. $p < 0.05$ was considered statistically significant.

Results

Regarding gender distribution, 56% of the participants were female, and 44% were male. When we look at the grade distribution of the participants, it can be seen that the highest number of participants is in the first grade, with 27.9%.

Notably, 99.6% of the participants are single, and only 0.4% are married. While 20.3% of the participants live alone, 33.3% live with roommates, 29.7% live with their families, and 16.7% live in dormitories. It is observed that 89.2% of the participants' parents live together, 6.7% live separately, 1.6% of the participants' mothers, and 2.5% of the participants' fathers are decedent. While 38.6% of mothers have a bachelor's degree, this rate is 48.3% for fathers. Of the mothers, 46.8% are not working, 26.6% work for the government, 12.6% work in the private sector, and 14.0% are retired. On the other hand, 28.7% of the fathers were employed in the government, 34.6% were employed in the private sector, and 30.3% were retired. Family monthly

income level shows that 14.7% of the participants have a monthly income of <₺9,752, 59.6% have a monthly income of ₺9,752 - ₺33,754, and 25.7% have a monthly income of >₺33,754. 77.4% of the participants do not smoke, 18.3% smoke less than one pack a day, and 4.3% smoke more than one pack a day. In terms of alcohol consumption, 55.3% prefer a life without alcohol, 42.0% consume alcohol less than three days a week, and 2.7% consume alcohol more than three days a week.

Table 1: Descriptive Properties and Evaluation of the Relationship of Beck Depression Total Score with Each Variable

Variables	Statistics	Beck Depression Scale Total Score M (IQR)	Test Statistics		
	n		Test Value	p Value	%
Gender					
Female	249	13 (12)	z=2.343	0.019	56.0
Male	196	12 (12)			44.0
Grade					
1	124	13 (11)			27.9
2	65	14 (12,5)			14.6
3	71	11 (11)	H=4.775	0.444	16.0
4	62	16 (13)			13.9
5	65	13 (13)			14.6
6	58	12.5 (11)			13.0
Marital Status					
Single	443	13 (12)	z=1.726	0.084	99.6
Married	2	4 (-)			0.4
Place of Residence					
I live alone	90	13 (13)			20.3
I live with my roommate/friends	148	13 (12.75)	H=1.895	0.594	33.3
I live with my family	132	12 (12.5)			29.7
I live in a dormitory	74	14 (9.25)			16.7
Which is true about your parents?					
They live together	396	12.5 (12)			89.2
They live separately	30	16 (8.5)	H=1.467	0.690	6.7
My mother passed away	7	17 (12)			1.6
My father passed away	11	14 (13)			2.5
Mother's Education Status					
Did not go to school	32	15.5 (15.75)			7.2
Primary school graduate	80	13.5 (12.75)			18.1
Secondary school graduate	40	12 (12.5)			9.0
High school graduate	76	12 (12.25)	H=8.814	0.184	17.2
License	171	12 (11)			38.6
Master's Degree	38	16.5 (13.75)			8.6
PhD	6	19.5 (13.5)			1.4
Fathers's Education Status					
I did not go to school	8	18.5 (25.25)			1.8
Primary school graduate	58	15 (15.5)			13.1
Secondary school graduate	25	12 (12)			5.6
High school graduate	79	12 (10)	H=5.015	0.542	17.8
License	214	13 (11.25)			48.3
Master's Degree	48	13 (11.75)			10.8
PhD	11	16 (16)			2.5
Mother's Employment Status					
Not working	208	13 (12)			46.8
Working for the government	118	13 (12.25)	H=0.211	0.976	26.6
Work in the private sector	56	12.5 (12)			12.6
Retired	62	12.5 (11)			14.0
Father's Employment Status					
Not working	28	16 (16)			6.3
Working for the government	127	14 (14)	H=4.360	0.225	28.7
Works in the private sector	153	12 (10)			34.6
Retired	134	12 (11)			30.3
Family Monthly Income					
<₺9.752	65	16 (10.5)a			14.7
₺9.752 - ₺33.754	264	12 (10.75)b	H=9.695	0.008	59.6
>₺33.754	114	12 (12.5)b			25.7
Smoking					
No.	343	12 (11)a			77.4
Yes, less than 1 pack per day	81	15 (10)a	H=11.274	0.004	18.3
Yes, more than one pack per day	19	21 (22)b			4.3
Alcohol					
No.	245	13 (13)			55.3
Yes, less than three days a week	186	12 (9)	H=1.317	0.518	42.0
Yes, more than three days a week	12	15.5 (17.5)			2.7
Sport					
No.	224	13.5 (12)			50.5
Yes, less than three days a week	123	13 (10)	H=5.283	0.071	27.7
Yes, more than three days a week	97	12 (12.5)			21.8
Social Media					
No.	12	13 (12.25)a			2.7
Yes, less than 4 hours a week	243	12 (11)ab	H=13.864	<0.001	54.9
Yes, more than 4 hours a week	188	14 (12)ac			42.4
Listening to Music					
No.	12	7 (13.5)a			2.7
Yes, Less than 3 hours a day	309	12 (11)a	H=8.827	0.012	69.4
Yes, more than 3 hours a day	122	14.5 (11)b			27.5
TV series/movie					
No.	50	17 (16.5)			11.3
Yes, less than three days a week	225	13 (11)	H=3.247	0.197	50.7
Yes, more than three days a week	169	12 (11)			38.1
Video Game					
No.	213	13 (13)			48.0
Yes, less than three days a week	129	13 (10)	H=0.960	0.619	29.1
Yes, more than three days a week	102	13 (11)			23.0
Studying					
I do not study regularly	184	14 (11)a			41.3
Yes, less than 4 hours a day	184	11 (11.75)b	H=13.852	<0.001	41.3
Yes, more than 4 hours a day	75	12 (13)b			16.9
Disease History					
No	200	12 (11)	z=2.723	0.006	73.3
Yes	73	15 (12.5)			26.7
Regular Medication					
No	197	12 (10.5)	z=2.432	0.015	71.1
Yes	80	14 (13)			28.9
History of disease in first-degree relatives					
No	149	12 (11)	z=1.493	0.135	47.0
Yes	168	14 (11.75)			53.0
History of drug use due to chronic physical diseases in first-degree relatives					
No	149	12 (12)	z=0.847	0.397	49.7
Yes	151	13 (12)			50.3
Suicidal ideation					
No	317	11 (11)a			71.2
Yes, Once	46	18 (9.5)b	H=45.358	**<0.001**	10.3
Yes, more than once	82	17.5 (16)b			18.4
Suicide Attempt					
No	423	13 (12)			95.5
Yes, Once	17	17 (16.5)	H=4.009	0.135	3.8
Yes, more than once	3	2 (-)			0.7
Being Willing When Choosing a Medical Faculty					
No	83	16 (10)	z=4.549	<0.001	18.7
Yes	362	12 (12)			81.3
Being Satisfied with Choosing a Medical School					
No	133	17 (11.5)	z=6.205	**<0.001**	29.9
Yes	312	11 (11)			70.1
Choose Medicine Again					
No	138	16 (12.25)	z=4.513	**<0.001**	31.2
Yes	305	12 (11)			68.8
Loss of Period					
No	363	12 (11)	z=3.269	0.001	81.8
Yes	81	17 (15)			18.2

%: Row percentage M: Median, IQR: Interquartile Range, z: Mann Whitney U test, H: Kruskal Wallis test

Table 2: Comparison of Average Scores of Medical Faculty Grade 1 and Grade 5 Students According to Beck Depression Levels

| | BECK DEPRESSION INVENTORY LEVELS | | | | | | | | Test Statistics[†] | |
	1		2		3		4		F	p
Average Scores of Faculty of Medicine Students										
Grade 1	81.89	4.89	78.80	13.32	80.0	8.03	83.0	0	0.297	0.827
Grade 5	73.28	8.32	73.33	9.49	82.0	11.31	66,0	0	0,841	0,478
Test Statistics [‡]	7.525		1.412		0.072		1.820			
p	0.008		0.240		0.790		0.183			

x̄: mean, ss: Standard deviation. *Two-way analysis of variance in repeated measures, †: Comparisons between groups at each measurement time, A and B superscripts indicate groups with statistically significant differences in each measurement. Groups with the same superscript are statistically similar. ‡: Within-group comparisons between measurements in each group.

50.5% of the participants do not do sports, 27.7% do sports less than three days a week, and 21.8% do sports more than three days a week. It is seen that 54.9% of the participants use social media less than 4 hours a day, and 42.4% use it more than 4 hours a day. While 69.4% of the participants listen to music less than 3 hours a day, 27.5% listen to music more than 3 hours a day. 50.7% of the participants watch T.V. series/movies less than three days a week, while 38.1% watch more than three days a week. It is seen that 48.0% of the participants do not play games, 29.1% play games less than three days a week, and 23.0% play games more than three days a week. 41.3% of the participants do not study regularly, 41.3% study less than 4 hours a day, and 16.9% study more than 4 hours a day.

According to health-related data, 73.3% did not have a history of illness, while 26.7% had a history of illness. While 71.1% of the participants do not take medication, 28.9% take medication regularly. Regarding the history of illness and medication in first-degree relatives, 53.0% and 50.3% had a history of illness, while 47.0% and 49.7% had no history. 71.2% of the participants stated that they had never had suicidal thoughts, 10.3% had had suicidal thoughts once, and 18.4% had had suicidal thoughts more than once. Among the participants, 18.7% said they did not want medical education, and 81.3% said they wanted it. It was observed that 29.9% of the participants were happy, and 70.1% were unhappy with their medical education. The rate of those who intend to participate in medical education again is 68.8%. Finally, the rate of those who experienced a semester loss is 18.2%, while the rate of those who did not is 81.8%.

The Beck Depression Scale scores of female students were statistically significantly higher than those of male students (p=0.019). There is no significant difference in Beck Depression Scale scores regarding students' education period, marital status, place of residence, information about mother and father, mother and father's education level, and mother and father's working status (p>0.05). However, the Beck Depression Scale scores of students whose family monthly income is below 9.752 ₺ are statistically significantly higher than those with other income levels (p=0,008). In addition, Beck Depression Scale scores of students who smoked more than one pack of cigarettes per day were higher than the others, and this difference was statistically significant (p=0.004). Students' alcohol use and sports participation did not have a significant effect on their Beck Depression Scores (p>0.05). On the contrary, Beck Depression Scores of students (BDSS) who used social media more than 4 hours a day were statistically significantly higher than those who used social media less (p<0.001). Similarly, the BDSS of students who listened to music more than 3 hours a day were higher than those who listened to less music, and this difference was statistically significant (p=0.012). There was no significant difference between the duration of watching T.V. series/movies and playing games regarding BDSS (p>0.05). BDSS of those who did not study regularly were higher than those who studied regularly, and this difference was statistically significant (p<0.001). BDSS with a history of physical illness and regular medication use were higher (p=0.006; p=0.015). However, history of chronic physical illness in first-degree relatives and regular medication use did not have a significant effect on Beck Depression Score (p>0.05). BDSS of the students who did not have suicidal ideation were significantly lower than those who had suicidal ideation (p<0.001). There was no significant effect of having attempted suicide on the Beck Depression Score (p=0.135). Finally, the BDSS of those who did not choose medical school willingly were statistically significantly higher than those who did (p<0.001). The BDSS of the students who were not happy to be medical school students were also higher than those of students who willingly chose medical school, and this difference was statistically significant (p<0.001). Finally, the BDSS of those who experienced semester/internship loss in medical school were statistically significantly higher than those who did not experience semester/internship loss (p<0.001).

According to the table, the mean scores of Grade one students in Beck depression levels are similar (p=0.827). The mean scores of Grade five students at the Beck depression level were similar (p=0.478). The mean scores of students with Beck depression 1 level were higher in Grade one than in Grade 5 (p=0.008). The average scores of students with Beck Depression 2 were similar in Grade one and Grade 5 (p=0,240). The Grade one and Grade 5 mean scores of students with Beck Depression 3 were similar (p=0.790). The mean points of students with Beck depression level 4 in Grade one and Grade 5 were similar (p=0.183).

Discussion

In our study, depression in medical students and the factors affecting these conditions were investigated. When demographic factors were analyzed, no significant relationship was found between age and depression. The relatively narrow age range can explain this result since the study population consisted of university students. The data obtained show that the rate of depression is significantly higher in female students compared to male students. S. Nolen-Hoeksema et al. reported that women were twice as likely to experience depression than men and that stress experiences and reactions to stress played a role in making women more vulnerable to depression (8). This may support the effect of gender on depression.

It was found that increasing the number of siblings increased the depression status of the individual in our study. Having more siblings may mean that familial resources such as money, time, and parental attention are divided more among individuals. It can be predicted that this situation may increase the person's susceptibility to depression due to the difficulty in meeting individual needs. In a study conducted in 1989 on 144 university students, it was reported that the number of siblings and depression status were not related, which is inconsistent with the results of this study (9). An inadequate sample size of the study may explain this inconsistency.

In this study, it was observed that depression was higher in individuals who grew up in families with lower education levels and income. While economic difficulties create stress and pressure on individuals, limited social support networks and lack of access to mental health services may be among the parameters that trigger depression (10,11). In addition, a low educational level may reduce self-esteem and hope by limiting job opportunities and social status. Under these conditions, a person may be more prone to depression.

High amount of smoking has been found to be associated with depression. Studies in the literature also support these findings (12,13). In addition to chemical effects, the addictive feature of smoking, decreased ability to cope with stress, the effect of social and psychological factors and other independent variables may play a role in this situation.

The findings show that as the duration of social media use increases, the incidence of depression increases in parallel. In a study conducted by M. Block et al. 2014 on 19776 individuals; social media use was directly associated with significant depression, which is consistent with the results of this study (14). Social media use may lead people to compare themselves with others, which may lower self-esteem and lead to a depressive state. Long-term social media use may disrupt sleep patterns, lead to social isolation, and weaken the social support system by reducing real-world relationships. However, more in-depth research and examination of other factors may be needed to determine whether this relationship is causal.

Depression was less common in the group that listened to more music. Music may be a tool to provide emotional balance and express emotions, which may increase emotional well-being. Many studies have reported that music improves depression (15,16). S. Castillo-Perez et al. reported that music was more effective than psychotherapy in patients with low and moderate depression (17). It can be said that artistic activities such as music may help prevent depression by increasing the mental condition of the person.

In this study, the frequency of depression was found higher in students who studied regularly compared to those who did not study regularly. Medical students are relatively more achievement-oriented and competitive than the average student population. Failure to study regularly may lead to social and academic underachievement. In a study conducted among university students, Amir M. et al. reported that low academic achievement was directly related to depression, which supports this study (18). In line with these results, it can be said that academic failure or failure anxiety triggers depression by creating pressure on the student.

Students who willingly chose medical education and were satisfied with their medical education had lower rates of depression compared to the other group. In addition, depression was higher in students who lost a semester or internship during their education. In a study conducted in 2013 on 194 medical students, it was reported that medical students who passed the final exam experienced lower psychological distress and showed fewer symptoms of anxiety and depression than those who failed (19). In individuals directed to medical education due to familial and social pressures, there may be a severe lack of motivation during medical education due to failure to meet personal expectations and uncertainties in the future planning of the individual. This situation may cause pressure and stress on the individual, leading to failure and may lead to depression.

In our study, no significant difference was found between the depression levels of first-grade and fifth-grade medical students. The lack of a significant difference between first-grade and fifth-grade medical students may suggest that students are exposed to similar levels of stress and pressure at different stages of the medical education process or that these processes have similar psychological effects in both groups. In a study conducted in Pakistan, it was reported that students in the first year of medical education were more likely to be depressed than students in the final year (20). Factors such as curriculum structure, timing of clinical experiences, and cultural differences may affect the stress levels experienced by students. These differences may cause individuals to have different depression thresholds.

Our study focuses on an enriched dataset based on a large sample encompassing various sociodemographic variables and potential confounding factors. This approach enhances the methodological robustness

of the study, leading to more reliable results. However, there are certain limitations to this study. Firstly, the sample used in the data collection process is drawn only from a specific geographic region, thereby limiting the generalizability of the findings. There is a risk of subjectivity in the data based on participants' self-reports. In the future, including a broader sample from different geographic regions and using objective data collection methods could enhance the overall validity of the results.

Conclusion

It should be taken into consideration that depression in medical students is affected by many factors and that preventive and supportive interventions should be made by considering these factors. The long-term benefits and drawbacks of the psychological health of young physicians who have just started their professional lives should be considered.

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References

1.World Health Organization. (2021). depression. https://www.who.int/news-room/fact-sheets/detail/depression).

2.Fancher T, Kravitz R (2010). Depression. Annals of Internal Medicine, 152, ITC5-1. https://doi.org/10.7326/0003-4819-152-9-201005040-01005.

3.Pemberton R, Tyszkiewicz M (2016). Factors contributing to depressive mood states in everyday life: A systematic review.. Journal of affective disorders, 200, 103-10 . https://doi.org/10.1016/j.jad.2016.04.023.

4.Berk, M., Williams, L. J., Jacka, F. N., O'Neil, A., Pasco, J. A., Moylan, S., Allen, N. B., Stuart, A. L., Hayley, A. C., Byrne, M. L., & Maes, M. (2013). So depression is an inflammatory disease, but where does the inflammation come from?. BMC medicine, 11, 200. https://doi.org/10.1186/1741-7015-11-200

5.Rotenstein, L. S., Ramos, M. A., Torre, M., Segal, J. B., Peluso, M. J., Guille, C., Sen, S., & Mata, D. A. (2016). Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis. JAMA, 316(21), 2214–2236. https://doi.org/10.1001/jama.2016.17324ü

6.Dyrbye, L. N., Thomas, M. R., Massie, F. S., Power, D. V., Eacker, A., Harper, W., Durning, S., Moutier, C., Szydlo, D. W., Novotny, P. J., Sloan, J. A., & Shanafelt, T. D. (2008). Burnout and suicidal ideation among U.S. medical students. Annals of internal medicine, 149(5), 334–341. https://doi.org/10.7326/0003-4819-149-5-200809020-00008

7.BECK, A. T., WARD, C. H., MENDELSON, M., MOCK, J., & ERBAUGH, J. (1961). An inventory for measuring depression. Archives of general psychiatry, 4, 561–571. https://doi.org/10.1001/archpsyc.1961.01710120031004

8.Swift C. (1992). Book Reviews : Sex Differences in Depression. By Susan Nolen-Hoeksema. Stanford, CA: Stanford University Press, 1990,258 pp. $25.00 (hardbound). Affilia, 7, 116 - 117. https://doi.org/10.1177/088610999200700112.

9.Lester, D., & Caffery, D. (1989). Birth order, depression and suicide. Psychological reports, 64(1), 18. https://doi.org/10.2466/pr0.1989.64.1.18

10.Belle D, Doucet J. (2003). Poverty, Inequality, and Discrimination as Sources of Depression Among U.S. Women. Psychology of Women Quarterly, 27, 101 - 113. https://doi.org/10.1111/1471-6402.00090.

11.Santiago CD, Wadsworth ME, Stump J. (2011). Socioeconomic status, neighborhood disadvantage, and poverty-related stress: Prospective effects on psychological syndromes among diverse low-income families. Journal of Economic Psychology, 32(2), 218-230.

12.Covey L, Glassman A, Stetner F. (1998). Cigarette smoking and major depression.. Journal of addictive diseases, 17 1,35 46.https://doi.org/10.1300/J069V17N01_04.

13.Pasco, J. A., Williams, L. J., Jacka, F. N., Ng, F., Henry, M. J., Nicholson, G. C., Kotowicz, M. A., & Berk, M. (2008). Tobacco smoking as a risk factor for major depressive disorder: population-based study. The British journal of psychiatry : the journal of mental science, 193(4), 322–326. https://doi.org/10.1192/bjp.bp.107.046706

14.Block, M., Stern, D. B., Raman, K., Lee, S., Carey, J., Humphreys, A. A., Mulhern, F., Calder, B., Schultz, D., Rudick, C. N., Blood, A. J., & Breiter, H. C. (2014). The relationship between self-report of depression and media usage. Frontiers in human neuroscience, 8, 712. https://doi.org/10.3389/fnhum.2014.00712

15.Leubner D, Hinterberger T. (2017). Reviewing the Effectiveness of Music Interventions in Treating Depression. Frontiers in Psychology, 8. https://doi.org/10.3389/fpsyg.2017.01109.

16.Tang, Q, Huang Z, Zhou H, Ye P. (2020). Effects of music therapy on depression: A meta-analysis of randomized controlled trials. PLoS ONE, 15. https://doi.org/10.1371/journal.pone.0240862.

17.Castillo-Perez S, Gómez-Pérez V, Velasco M, Pérez-Campos E, Mayoral M. (2010). Effects of music therapy on depression compared with psychotherapy. Arts in Psychotherapy, 37, 387-390. https://doi.org/10.1016/J.AIP.2010.07.001.

18.Maliqi, A, Borinca I, Zeqaj-Maliqi A. (2015). The Correlation between Academic Success and Depressive Symptoms among Students in Kosovo. Psychology, 06, 1775-1779. https://doi.org/10.4236/PSYCH.2015.614173.

19.Yusoff, M (2013). Associations of pass-fail outcomes with psychological health of first-year medical students in a malaysian medical school.. Sultan Qaboos University medical journal, 13 1, 107-14 . https://doi.org/10.12816/0003203.

20.Khan, M. S., Mahmood, S., Badshah, A., Ali, S. U., & Jamal, Y. (2006). Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. JPMA. The Journal of the Pakistan Medical Association, 56(12), 583–586.