ORIGINAL ARTICLE

European Journal of Medical and Health Sciences
www.ejmed.org

Association of Depression with Academic Performance Among Final Year MBBS Students of Rawalpindi Medical University, Pakistan

Tayyab Mumtaz Khan, Somia Bibi, Eisha Shoaib, Hafiz Abu Safian,
Ali Imran Dhillon and Madeeha Mumtaz

ABSTRACT

Depression is a typical mental illness among students, particularly medical students, because of their extremely competitive learning environment. Depression negatively affect the cognitive abilities and consequently the academic performance of students later on their performance as a physician. This study aims to evaluate the association of depression with academic performance among final-year MBBS student of Rawalpindi Medical University. This may make available new opportunity to bring enhancement in academic performance of students. This descriptive cross-sectional study was conducted on final-year MBBS students of Rawalpindi Medical University in November 2019. Data was collected through Center for Epidemiologic Studies Depression Scale Revised-10 (CESD-R-10) and self-structured questionnaire which was designed to get information regarding demographic details and marks in last professional examination. Students suffering from any diagnosed physical and mental illness were excluded. Out of 335 students initially selected for study, 307 returned duly filled questionnaires so final sample size was 307. Data analysis was carried out using SPSS v.25.0. Various statistical tests including Independent sample t-test, chi-square test and Pearson's correlation, and linear regression were applied to evaluate the study variables. Statistically significant and strong negative association was observed between depression and academic performance of students (p = 0.000 for independent sample t-test). For association's direction and strength between depression and academic performance, Pearson's correlation coefficient was -0.713 (p= 0.000). Difference in depression score between male and female students (p=0.015) and between boarders and non-boarders (p=0.000) was significant. Similarly, the difference of marks in last professional examination between boarders and non-boarders (p=0.000) was significant, however it was insignificant between male and female students (p=0.135). The simple linear regression model was valid with p-value of 0.000 for F test. Unstandardized regression Coefficient (B) was -10.74. R^2 was 0.51 (51%). Our study shows an overall high prevalence of depression among final year MBBS medical students, especially among boarders and female students. Significant and strong negative association between depression and academic performance is found, which means that increase in depression decreases the academic performance of students and vice versa. So, by applying suitable interventions for alleviation of depression we can improve academic performance of students.

Keywords: Association, Depression, Academic Performance, MBBS Students, Rawalpindi Medical University.

Published Online: November 7, 2020

ISSN: 2593-8339

DOI: 10.24018/ejmed.2020.2.6.ID

Tayyab Mumtaz Khan *
Rawalpindi Medical University, Pakistan.
(e-mail: tayyab.mkhan98@gmail.com)
Somia Bibi
Rawalpindi Medical University, Pakistan.
Eisha Shoaib
Rawalpindi Medical University, Pakistan.
Hafiz Abu Safian
Rawalpindi Medical University, Pakistan.
Ali Imran Dhillon
Rawalpindi Medical University, Pakistan.
Madeeha Mumtaz
Lahore College for Women University, Pakistan.
Corresponding Author

I. Introduction

Depression is one of the frequent mental disorder clinically encountered and the prevalence of depression among undergraduate students is higher as compare to general public [1]-[2]. Although depression, stress and other mental illnesses have been significant causes of disturbance among university students irrespective of their educational fields, however, a study has shown that level of stress and depression among medical students is even higher than non-medical students [3]-[7]. A latest meta-analysis indicated that depression influences almost one third of medical students around the globe [8].

Depression in medical students is a compound problem, that is affected by numerous aspects of their lives including selection methods, the likely personalities that are interested towards medical field, evaluation procedures and the clinical surroundings. Students' inspiration to learn, their keenness, capability to take control and handle their own health also play a role [9]. There are also various coping techniques to get rid of or alleviate depression that include passive coping,

talking to friends, talking to parents/ relatives, and consulting with a religious priest, alcohol intake, use of cigarette/ stimulants, merely documenting it in their diaries, by seeking medical advice, positive thinking to avoid suffering from psychological difficulties associated with depressive symptoms such as anxiety, burnout, suicidal thoughts and substance abuse [10]-[14].

Along with different psychological difficulties because of depression that are mentioned above, depression is also associated with adverse impact on mental functioning and hence consequently it can also influence academic performance [15]-[16]. In literature, different studies have conflicting findings regarding the association between depression and academic performance. Some studies have shown that depression and academic performance are not associated at all while other studies have shown that depression and academic performance are associated with each other and the type of association is negative which means that increase in depression leads to poor academic performance [16]-[18].

Academic accomplishment is considered as a chief tool to measure the development in education [19]. Therefore, poor academic performance can bring stress in lives of students that would further worsen the academic performance [20], [21]. Moreover, continuous worsening of academic performance can even lead to increased risk of suicide attempts among students [22]. Therefore, attention must be paid towards the factors that decrease the academic performance so that unfortunate consequences of poor academic performance can be avoided.

Although many researchers have examined the relationship between depression and academic performance among university/college students across the globe [15], [16], [18]. However, in literature few studies were found that explored this kind of relationship between depression and academic performance among Pakistani Medical Students. Furthermore, locally at Rawalpindi Medical University no study has been conducted to elaborate the association between depression and academic performance. So, in the presence of few studies at national level and no study at local level particularly at Rawalpindi Medical University that describes relationship between depression and academic performance among Medical Students our study aims to assess whether there is any association between depression and academic performance and if there is, then which type of the association negative or positive. If result of our study shows an association between depression and academic performance, and particularly negative association, then by applying interventions for the reduction of depression we could improve academic performance among medical students which could give society better physicians in future.

II. Material and Methods

A. Study Design and Study Population

This descriptive cross-sectional study was conducted at Rawalpindi Medical University on final year medical students during November 2019 at Rawalpindi Medical University. Out of total of 375 students of final year, 335 students were recruited in the study on the basis of exclusion and inclusion criteria i.e. only those final year students were selected for study who were not diagnosed with any prior physical and mental health problem and were willing to participate because participants with any mental and physical illness can affect the depression score on depression scale and consequently the study results. Data collection was accomplished with help of two questionnaires. After proper elaboration of aim of study informed consent was taken from all students who were participants in the study. Then these two questionnaires were given to all enrolled students. From all 335 recruited students, only 307 students returned appropriately filled questionnaires. Hence, the response rate for present study was 91.64% (Response rate =Number of students who returned appropriately filled questionnaires divided by number of students who were recruited in study). As consequence of response rate of 91.64% final sample size for present study became 307.

B. Assessment of Characteristics of Study Population and Academic Performance

A Self-structured questionnaire was designed to get information about some demographic components and academic performance. It consisted of two sections. In first section questions were asked regarding some demographic components including age, gender and boarding status. While in second section academic performance was evaluated by asking marks in last professional exam. Students were grouped into two groups on basis of their academic performance in their last professional exam. These groups included high achievers and low achievers. High achiever were those students who managed to achieve 700 or more than 700 marks (70% and above) while low achievers were those students who got less than 700 marks (less than 70%) in their last professional exam. Total marks of professional exam were 1000.

C. Assessment of Depression

Center for Epidemiologic Studies Depression Scale Revised-10 (CESD-R-10) was used for the assessment of depression. It has been used internationally [23]. Four versions of this questionnaire are present with 4, 8, 10 and 20 items however version with 10 items was used in this study. This scale is a self-reported measure of depression. Each item could have score (0=rarely or none of time), (1=some or a little of the time), (2=occasionally or a moderate amount of time), and (3=all of the time). Scores of items 5 and 8 were reversed. Scores of individual participants could range from 0 to 30 with high scores indicating greater depression. Any participant who had score equal to or greater than 10 was considered depressed.

D. Data Analysis

A descriptive data analysis of study variables was done using SPSS version 25. A pilot study was performed on 45 participants, to assess reliability of scale (CESD-R-10). Cronbach alpha value was calculated, and it was 0.815 indicating high reliability of CESD-R-10. Differences in depression and academic performance across the gender and boarding status were evaluated using Independent sample t-test. Association and its strength and direction between depression and academic performance was assessed using

chi-square test and Pearson's correlation. Simple linear regression was used for the assessment of predictive capability of depression for professional exam marks. The value of p less than 0.05 was set statistically significant.

III. Results

For total of 307 students who participated in study, the mean age of study population was 23.15 years with standard deviation (SD) of ±1.03 and the mean score of depression was 10.57 with SD of ±5.33 while mean of marks in last professional examination was 708.26 with SD of ±80.351.

Table 1 shows the parameters of population along with their cross-tabulation with study variables and chi-square analysis for evaluation of association between depression and academic performance.

Table 2 shows gender-based and boarding status-based difference in mean score of depression on depression scale (Depression scale= Center for Epidemiologic Studies Depression Scale Revised-10 (CESD-R-10) and the difference in marks of professional examination together with results of independent sample t-test.

Table 3 indicates difference in mean score of depression on depression scale between high achievers and low achievers in company with p value of independent sample t-test. Depression mean score was higher among low achievers as compared to high achievers and this difference was statistically significant. The Pearson correlation analysis indicates statistically significant relationship between depression and academic performance which was strong and negative. This means that higher depression score was correlated with lower marks in professional examination.

Table 4 summarizes the results of simple linear regression model. This model was valid, and depression was a significant predictor of marks in professional examination because F test was highly significant with p value of 0.000. R^2 value was 0.51 (51%) which means that 51.1% variance in student's academic performance was accounted for by depression while remaining 48.9% variance could be due hidden variables that were not entered in regression model. The beta coefficient was negative for Depression scale with statistically significant p value (0.000). The value of regression coefficient, b was -10.74 which means that one unit increase in depression score would decrease 10.74 marks in professional examination of participants since value of b was negative.

TABLE 1: Population Parameters along with their Cross-tabulation with study variables and chi-square analysis

Parameter		Cross-Tabulation and chi-square analysis			
		Academic Performance		Depression	
Total =307		High Achiever	Low Achiever	Depressed	Undepressed
		167(54,5%)	140(45.6%)	146(47.6%)	161(52.4%)
Gender	Female (n=191)	104(54.4%)	87(45.6%)	94(49.2%)	97(50.8%)
	Male (n=116)	63(54.3%)	53(45.7%)	52(44.83%)	64(55.17%)
Boarding-Status	Boarder (n=147)	59(40.1%)	88(59.9%)	90(61.3%)	57(38.7%)
	Non-Boarder (n=160)	108(67.5%)	52(32.5%)	56(35%)	104(65%)

Depression and Academic Performance had Significant association (p=0.000).

TABLE 2: Difference in CESD-R-10 score and marks in professional examination with respect to gender and boarding status

Parameter	Gender			Boarding Status		
	Female	Male	Independent Sample t-test	Boarder	Non-Boarder	Independent Sample t-test
CESD-R-10 (Mean±SD)	11.11±5.71	9.67±4.50	0.015	11.94±5.15	9.31±5.20	0.000
Marks in last professional Exam (Mean±SD)	713.57±81.03	699.51±78.77	0.135	681.70±74.11	732.66±78.29	0.000

TABLE3: Pearson's Correlation of depression score with academic performance and marks in last professional examination [Depression scale= Center for Epidemiologic Studies Depression Scale Revised-10 (CESD-R-10)]

Parameters	Academic Performance			Pearson's Correlation	
	High Achievers	Low Achievers	Independent Sample t-test	Correlation coefficient (r)	p-value
CESD-R-10 Score	7.62±3.85	14.08±4.68	0.000	-0.713	0.000

TABLE4: Simple linear regression model for marks in last professional examination (Depression scale= Center for Epidemiologic Studies Depression Scale Revised-10 (CESD-R-10)

Variable	R	R^2	Unstandardized Regression Coefficient (B)	95% CI	Standardized Regression Coefficient (Beta)	t	p-value
Depression Score	0.713	0.51	-10.74	-11.93 to -9.54	-0.713	-17.73	0.000

The Regression Model was significant because F test was significant with p value of 0.000. (F= 314.50)

IV. Discussion

Our study indicates difference in depression and academic performance among students on the basis of their gender and boarding status. The results of our study also provide valuable information about the association of depression and academic performance among final year MBBS students of Rawalpindi Medical University.

First, we observed the trends of depression among students on the basis of gender and boarding status. We noticed that female students had higher prevalence and higher mean score on Center for Epidemiologic Studies Depression Scale Revised-10 which means that females had higher depression as compare to males and this difference was statistically significant (p=0.015). Similar finding has been reported by another study that females have higher depression prevalence as compare to male students [1]. Finding of higher prevalence of depression among females in our study is also supported by another study that was conducted among student population of Karolinska Institute [7]. The higher depression level among female students can be due to poor coping strategies, more complaining and doubtfulness about everyday issues. Regarding difference in depression among boarder and non-boarder students, we also observed difference in mean depression score on CESD-R-10 scale that was also statistically significant(p=0.000). Boarder students had higher depression level and prevalence as compare to non-boarder students which means boarder students had higher score on depression scale. Higher level of depression among students living in hostels, has also been noted by another study that was carried out in Kenya [24]. The higher level of depression among boarder students can be due to various additional reasons along with educational burden for example lack of familiar environment, more things to manage and lack of emotional support that is normally provided by family.

After noticing difference in depression, we noticed the difference in academic performance among participants again on the basis of gender and boarding status. We found that academic performance was better among females as compare to male students, however this difference was not statistically significant(p=0.135). Although the difference in academic performance across the gender was not significant, however, a study that was conducted among Italian students has also shown that female students academic performance was better than male students [25]. After comparing academic performance between female and male students, we found that the difference in academic performance between boarder and non-boarder students was statistically significant (0.000) with better academic performance among non-boarder as compare to boarder students. Regarding difference in academic performance among boarder and non-boarder students a study that was conducted at Aziz Fatimah Medical & Dental College, Faisalabad, Pakistan supports our finding that non-boarders perform better than boarders while another study that was carried out among students of a Nursing College of New Delhi, India shows a conflicting finding that boarder students have better academic performance as compared to non-boarders students [26], [27].

Next, we found the association between depression and academic performance in last professional examination of final year MBBS medical students of Rawalpindi Medical University. The association was significant statistically (p=0.000) and it was evaluated by applying chi-square test. To check the direction and strength of association between depression and academic performance we used Pearson's product moment correlation. We noticed strong and negative association between depression and academic performance with the correlation coefficient of -0.713. Negative value of correlation coefficient shows that increase in depression leads to decrease in academic performance. Furthermore, linear regression was used to support the results of chi-square and Pearson's product moment correlation. Regression model was valid as F test was statistically significant (p=0.000) and R^2 was 0.51 (51%) which means depression can bring 51 variation in academic performance of students. In literature, various studies have conflicting findings regarding the association of depression and academic performance of students. A study that was conducted on North Carolina College students indicates that depression and academic performance have strong and negative association and supports our study finding that depression leads to poor academic performance among students while another study with conflicting finding that was carried out among Medical students of Islamabad Pakistan, shows that depression and academic performance have no association and depression does not change the academic performance of students [16], [17]. In the presence of findings in literature regarding the association of depression and academic performance, that supports our study results, we encourage the idea that by reducing depression we may be able to improve the academic performance of students.

Our study is distinctive in its perspective. This is the first study, in which we have evaluated the association between depression and academic performance among final year medical students of Rawalpindi Medical University Rawalpindi, Pakistan. We have observed in this study, that higher depression leads to poor academic performance among students. So our study suggests that by applying various appropriate interventions we could help students to cope with depression and hence we would also be able to improve the academic performance and consequently increase self confidence level along with reduction in education related stress and suicidal thoughts among students. It should be mandatory for all educational institutions to conduct sessions that provide knowledge about non-pharmacological interventions and techniques to deal with depression. Along with session about the coping strategies, management related departments of educational institutions should arrange extra-curricular and recreational activities for all students this may help them to cope with depression and consequently improvement in Academic performance.

V. Conclusion

Results of this study shows an overall high prevalence of depression especially among medical students. Furthermore, depression is significantly and negatively associated with academic performance among MBBS medical students of Rawalpindi Medical University which means that increase in depression decreases the academic performance of students and vice versa. Depression is higher among female, and boarder students compare to male, and non-boarder students and this difference is statistically significant. Similarly, Academic performance is higher among female and non-boarder students as compare to male and boarder students. This difference in academic performance is significant between boarder and non-boarder students, however not significant between female and male students. So, our study suggests that by reduction in depression through various intervention we can improve the academic performance of students.

References

[1] Ghayas S, Shamim S, Anjum F, Hussain M. Prevalence and severity of depression among undergraduate students in Karachi, Pakistan: A cross sectional study. Tropical Journal of Pharmaceutical Research. 2014 Dec 10;13(10):1733-8.

[2] Leino EV, Kisch J. Correlates and predictors of depression in college students: Results from the spring 2000 national college health assessment. Journal of Health Education. 2005 Apr 1;36(2):66-74.

[3] Mikolajczyk RT, Maxwell AE, Naydenova V, Meier S, El Ansari W. Depressive symptoms and perceived burdens related to being a student: Survey in three European countries. Clinical Practice and Epidemiology in Mental Health. 2008 Dec 1;4(1):19.

[4] Mikolajczyk RT, Maxwell AE, El Ansari W, Naydenova V, Stock C, Ilieva S, Dudziak U, Nagyova I. Prevalence of depressive symptoms in university students from Germany, Denmark, Poland and Bulgaria. Social psychiatry and psychiatric epidemiology. 2008 Feb 1;43(2):105-12.

[5] Tavolacci MP, Ladner J, Grigioni S, Richard L, Villet H, Dechelotte P. Prevalence and association of perceived stress, substance use and behavioral addictions: a cross-sectional study among university students in France, 2009–2011. BMC public health. 2013 Dec 1;13(1):724.

[6] Behere SP, Yadav R, Behere PB. A comparative study of stress among students of medicine, engineering, and nursing. Indian journal of psychological medicine. 2011 Jul;33(2):145.

[7] Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: A cross-sectional study. Medical education. 2005 Jun;39(6):594-604.

[8] Puthran, R., Zhang, M.W., Tam, W.W. and Ho, R.C., 2016. Prevalence of depression amongst medical students: A meta-analysis. *Medical education*, *50*(4), pp.456-468

[9] Moir F, Yielder J, Sanson J, Chen Y. Depression in medical students: current insights. Advances in medical education and practice. 2018;9:323.

[10] Nwobi EA, Ekwueme OC, Ezeoke UE. Mental depression and coping strategies among medical students of University of Nigeria, Enugu campus. International Journal of Medicine and Health Development. 2009 Jan;14:42-8.

[11] Steiner-Hofbauer V, Holzinger A. How to cope with the challenges of medical education? Stress, depression, and coping in undergraduate medical students. Academic Psychiatry. 2020 Feb 20:1-8.

[12] Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. InMayo Clinic Proceedings 2005 Dec 1 (Vol. 80, No. 12, pp. 1613-1622). Elsevier.

[13] Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, Shanafelt TD. Burnout among US medical students, residents, and early career physicians relative to the general US population. Academic medicine. 2014 Mar 1;89(3):443-51.

[14] Cukrowicz KC, Schlegel EF, Smith PN, Jacobs MP, Van Orden KA, Paukert AL, Pettit JW, Joiner TE. Suicide ideation among college students evidencing subclinical depression. Journal of American College Health. 2011 Aug 1;59(7):575-81.

[15] Lundy SM, Silva GE, Kaemingk KL, Goodwin JL, Quan SF. Cognitive functioning and academic performance in elementary school children with anxious/depressed and withdrawn symptoms. The open pediatric medicine journal. 2010 Apr 14;4:1.

[16] Turner DP, Thompson ME, Brunner Huber LR, Arif AA. Depressive symptoms and academic performance of North Carolina college students. North Carolina medical journal. 2012;73(3):169.

[17] Rizvi F, Qureshi A, Rajput AM, Afzal M. Prevalence of depression, anxiety and stress (by DASS scoring system) among medical students in Islamabad, Pakistan. Journal of Advances in Medicine and Medical Research. 2015 Apr 18:69-75.

[18] Hysenbegasi A, Hass SL, Rowland CR. The impact of depression on the academic productivity of university students. Journal of mental health policy and economics. 2005 Sep 1;8(3):145.

[19] Tabbodi M, Rahgozar H, Makki Abadi MM. The relationship between happiness and academic achievements. European Online Journal of Natural and Social Sciences: Proceedings. 2015 Feb 19;4(1 (s)):pp-241.

[20] Shah M, Hasan S, Malik S, Sreeramareddy CT. Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school. BMC medical education. 2010 Dec 1;10(1):2.

[21] Soliman M. Perception of stress and coping strategies by medical students at King Saud University, Riyadh, Saudi Arabia. Journal of Taibah University Medical Sciences. 2014 Mar 1;9(1):30-5.

[22] Richardson AS, Bergen HA, Martin G, Roeger L, Allison S. Perceived academic performance as an indicator of risk of attempted suicide in young adolescents. Archives of Suicide Research. 2005 Mar 9;9(2):163-76.

[23] Kehnt, L.N., 2018. *Perceived Child Regard, Parenting Stress, and Depressive Symptoms of Nonresidential and Residential Stepmothers* (Doctoral dissertation, Walden University).

[24] Khasakhala LI, Ndetei DM, Mutiso V, Mbwayo AW, Mathai M. The prevalence of depressive symptoms among adolescents in Nairobi public secondary schools: association with perceived maladaptive parental behaviour. African journal of psychiatry. 2012;15(2):106-13.

[25] Castagnetti C, Rosti L. Effort allocation in tournaments: The effect of gender on academic performance in Italian universities. Economics of Education Review. 2009 Jun 1;28(3):357-69.

[26] Altaf B, Rehman A, Ali FA. Comparison of Academic Performance among Boarders and Day-Scholars. Journal of Aziz Fatimah Medical & Dental College. 2019 Nov 19;1(2):60-2.

[27] Jacob AM, Kaushik A. A Comparative Study to Assess the Health Status and Academic Progress among Day Scholars and Hostellers in a Selected College of Nursing in New Delhi. Int. J. Nurs. Midwif. Res. 2017;4(2).