CLINICAL STUDY

Prevalence and correlations of depression and anxiety among Slovak college students

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ABSTRACT

OBJECTIVES: The objective of the study was to evaluate prevalence of depression and anxiety among college students studying at Comenius University in Bratislava. The secondary aim was to evaluate the impact of depression and anxiety on various domains of social functioning.

METHODS: The data were collected through a cross-sectional online survey. The sample consisted of 1,331 students. We administered scales measuring the depression, anxiety, satisfaction with life, and social functioning as part of a larger survey.

RESULTS: When using a customary cut-off score for PHQ-9 and GAD-7, a proportion of 35.5 % and 25.5 % of students were above the threshold for depression and anxiety, respectively. When using more stringent criteria, the prevalence rates for depression and anxiety were 16.4 % and 9.3 %, respectively. Both conditions co-occur in 6.8 % of students. Symptom domains were related to satisfaction with life and social functioning.

CONCLUSION: Depression and anxiety are prevalent among college students. We found that symptoms of mood and anxiety disorders were associated with lower satisfaction with life and lower level of functioning at school as well as in social and family lives. The implications for mental health policies at universities are discussed *(Tab. 2, Ref. 27)*. Text in PDF *www.elis.sk*.

KEY WORDS: depression; anxiety, prevalence, functional outcomes, college sample

Introduction

From the public health perspective, mental health of young people is a major global problem (1). The late adolescence and early adulthood are crucial periods for the onset of serious psychiatric disorders. Approximately 75 % of all psychiatric disorders arise before the age of 24 (2). A recent large WHO study found out that one third of college students reported history of one or more mental disorders (3). A French epidemiological study used a short form of Composite International Diagnostic Interview among a sample of college students and found out that the prevalence rates of depressive episodes and any anxiety disorder were 8.5 % and 21.6 %, respectively (4). A systematic review focused on the depression found out that its mean prevalence among university students was 30.6 %, with broad range from 10 % to 85 % (5).

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The data from the Slovak epidemiological study EPID conducted on adult general population revealed a prevalence rate of 6-month major depression in 18 % and depressive symptoms in about 29 % of college students (6).

Mental disorders, namely depression, anxiety disorders, and substance use disorders are part of top 10 reasons of the burden expressed by the measure of disability-adjusted life year (DALY) in the young adult population (7), with its peak reached between 20 to 29 years of age (8). In this group, the mental health problems significantly lead to a decrease in functional outcomes such as establishing peer relationships, finding a life partner, establishing a family, and building a career (9, 10). A previous study in England showed that anxiety symptoms are often related to problems in interpersonal relationships (11). Depression was found to be a significant predictor of lower examination performance (12) while the presence of affective disorders also predicted college drop-out rates (13). Both anxiety and depression are more severe in students with sparsely developed social networks at the university (14). The tendency to seek professional help is alarmingly lower among young people than at older age, which, from the aspect of public health, represents a significant problem (15).

The aim of the current study is to evaluate the prevalence of depression and anxiety among college students. The secondary aim is to evaluate the impact of these disorders on various domains of social functioning.

Materials and methods

Sample

During September and October 2018, we conducted a cross-sectional online survey across 12 of 13 faculties at Comenius University in Bratislava. Every student received information about the survey via school e-mail address sent by faculty administrators. The completion of the questionnaire was voluntary; we have obtained no information about the reasons for not participating in the survey.

Measures

The evaluation of symptoms was performed using the standard self-report measures which have been back-translated into Slovak. They were presented to the participants in form of a web-based questionnaire with no title of scale exposed.

Patient's health questionnaire PHQ-9

PHQ-9 (16) contains nine items measuring the symptoms of depression over the past two weeks. Items correspond to DSM-IV/ICD-10 criteria for a depressive episode. The response options ranged from 0 (= not at all) to 3 (= nearly every day), while higher scores indicate a more severe depression. Based on the studies in the primary health care, the scores equal to or higher than 10 can identify depression with sufficient sensitivity and specificity. Cronbach`s alpha in current study was 0.869. PHQ-9 also enables to utilize the DSM-IV algorithm for establishing the presence of depression. The requirement for the diagnosis is, that at least five symptoms are rated at least 2 (the item of suicidal ideation can be rated only as 1), and at least one of the symptoms rated as 2 must be either loss of interest/pleasure or depressed mood.

Generalized anxiety disorder 7 (GAD – 7)

GAD – 7 (17) consisted of 7 items measuring the symptoms of anxiety during the past two weeks. The response scale is the same as in PHQ – 9. Higher scores indicate more severe symptoms of anxiety. Based on the previous studies, GAD – 7 is an effective screening for various anxiety disorders. Cronbach`s alpha in current study was 0.894.

Social functioning questionnaire – SFQ

SFQ (18) is a screening instrument to measure the impairment in social functioning. SFQ consists of eight items spanning across various domains of social functioning such as family life, relationships, sexual life and work/home duties. Each item has four response options. Higher scores are interpreted as more severe problems in social functioning. Cronbach`s alpha in current study was 0.702.

Satisfaction with life scale – SWLS

The scale (19) consists of five items measuring the overall level of satisfaction with life. Responses are evaluated on the seven-point Likert scale where the scores 1 and 7 represent 'strongly disagree' and 'strongly agree' statements, respectively. Higher scores reflect higher satisfaction with life. Previous studies have suggested sound psychometric properties of the scale. Cronbach`s alpha in current study was 0.865.

Satisfaction with functioning

The scale has been developed for the purpose of this survey. We asked the participants to rate how satisfied they were with various domains of their life (social relationships, family life, school-related issues and mental health). The scale consisted of five points while scores 1,3 and 5 represent 'totally dissatisfied', 'neither satisfied nor dissatisfied' and 'totally satisfied' statements, respectively.

Ethical aspects

The ethical review board of Faculty of Medicine and University Hospital in Bratislava approved the study. To ensure higher response rates, participants were told that they could win vouchers for buying books in a lottery if they opted to do so. Otherwise, the participation in the study was anonymous.

Statistical procedures

IBM SPSS v 20 was used for statistical analysis. Due to violation of normality, we utilized Spearman rank correlation coefficient for measuring the strength of the relationships. Linear regression was used to predict satisfaction with life and subjective functioning. In both models, GAD-7 and PHQ-9 scores were added simultaneously.

Results

The final sample consisted of 1,331 students who completed fully the questionnaire with mean age of 25.57 years (SD = 3.97), while 75 % of students were female, 92 % of students attended daily study program, 9 % were on PhD. study. 46 % were single without stable partner, 49 % were in a stable partnership, 4 % were married and 1 % were divorced; 64 % of participants were part-time or full-time employed in addition to their study.

Prevalence of depression and anxiety

When using the cut-off score greater than 9 points, which is customary for PHQ-9 and GAD-7 and represents a moderate severity of symptoms, the students scoring above this threshold were identified as suffering from depression (35.5 %) or anxiety (25.5 %). When applying more stringent criteria for severe intensity of symptoms (> 14 points), the prevalence rates dropped to 16.4 % for depression and 9.3 % for anxiety. Both depression and anxiety were identified in 21.4 % or 6.8 % of students, depending on the cut-off score used. A proportion of 20.3 % of students met the criteria for depressive episode according to the DSM-IV/ICD-10 algorithm for depression.

Impact of depression and anxiety on satisfaction with life and social functioning

Based on the correlation analysis (Tab. 1), we found that both depression (r_s = 0.609, p < 0.001) and anxiety (r_s = 0.571, p < 0.001) were strongly related to social functioning. Similar patterns of relationships were found in satisfaction with life (r_s from –0.460 to –0.551). The severity of anxiety and depression were related to the perceived satisfaction with social life, family life, and school.

Tab. 1. Correlation matrix between depression, anxiety and outcome variables.

	M	SD	PHQ-9	GAD-7	SWLS	SFQ	Social life	Family life	School	Mental Health
PHQ-9	8.54	5.81								
GAD-7	6.41	5.16	0.750**							
SWLS	22.50	6.62	-0.551**	-0.460**						
SFQ	7.33	3.69	0.609**	0.571**	-0.607**					
Social life	3.53	1.05	-0.404**	-0.391**	0.510**	-0.528**				
Family life	3.80	1.09	-0.315**	-0.249**	0.442**	-0.454**	0.413**			
School	3.39	1.03	-0.421**	-0.362**	0.428**	-0.395**	0.351**	0.272**		
Mental Health	3.29	1.21	-0.641**	-0.604**	0.579**	-0.606**	0.527**	0.401**	0.453**	

** $p < 0.001$, M – Mean, SD – standard deviation, PHQ-9 – patients health questionnaire – depression, GAD-7 – generalized anxiety disorder, SWLS – satisfaction with life scale, SFQ – social functioning questionnaire – higher scores mean more severe problems in social functioning

Tab. 2. Summary of hierarchical regression analysis for variables satisfaction with life and social functioning.

Variable	SWLS			SFQ		
	B	SE B	β	B	SE B	β
Constant	26.962	0.956	-	5.185	0.508	-
Sex	**1.486**	**0.348**	**0.097****	**-1.049**	**0.188**	**-0.121****
Age	0.007	0.038	0.004	-0.026	0.020	-0.028
Depression	**-0.579**	**0.039**	**-0.513****	**0.294**	**0.021**	**0.468****
Anxiety	**-0.114**	**0.044**	**-0.090***	**0.155**	**0.024**	**0.217****
R²		0.340			0.425	
F		**165.720****			**222.528****	

B – unstandardized regression coefficient, SE B – standard error of regression coefficient, β – standardized regression coefficient, F – F test, R – Coefficient of determination (proportion of explained variance) * $p < 0.05$, ** $p < 0.001$, SWLS – satisfaction with life scale, SFQ – social functioning questionnaire

Students with higher scores tend to perceive their mental health as less satisfying.

We utilized multiple linear regression (Tab. 2) to test whether depression and anxiety uniquely (above and beyond each other) predict satisfaction with life and social functioning. Due to the potential effect of demographic variables, sex and age were added to the model as covariates. Both regression models fit the data well. Depression and anxiety independently explained the substantial variance in SWLS and SFQ scores. Based on the comparison of standardized regression coefficients, depression seems to play a more important role in negative appraisal of satisfaction with different dimension of life and functioning.

Discussion

The aim of the study was to estimate the prevalence of the symptoms of depression and anxiety in student population. Based on our results achieved by using the cut-off score over 9 points, which represents at least moderate severity, as many as 35.5 % and 25.5 % of students have symptoms of depression and anxiety, respectively. When a more stringent criterion (cut-off score over 14) was applied, the prevalence rate dropped to 16.4 % and 9.3 %, respectively. Similarly, the comorbidity rate decreases from 21.4 % to 6.8 %. The fact that the rate for depression was detected to be higher than that for anxiety is a surprising finding. In a study from England with a similar methodology, the occurrence of anxiety was almost two-fold higher than that of depression (14). In line with the latter study, a representative epidemiological study from Eu-

rope conducted on 18–24-year-old adults also reported the incidence of anxiety disorders to be higher than that of depression (20). Nevertheless, our findings are in accordance with two Slovak epidemiological studies which found that the prevalence of depression was higher than that of anxiety disorders (6, 21).

In line with our expectations, both depression and anxiety were related to the lower level of satisfaction with life with more strong negative association for depression than for anxiety. In the student population, the most common concerns are related to academic performance, pressure to succeed, post-graduation plans, and financial concerns (22). Not exclusively, but all these areas are important in subjective evaluation of the quality of life.

Students` satisfaction with their social relationships, family life, and school and overall satisfaction with life was high in the survey. However, we have found robust associations of both depression and anxiety with the satisfaction found in these life domains. The moderate correlations for both depression and anxiety suggest that they are similarly related to these various aspects of subjective well-being.

In our study, we found that the severity of depression and anxiety were related to the level of social functioning. The analysis of particular symptom relations was beyond the scope of this study. Since not all depression symptoms equally predict problems with social functioning, future studies should look at specific symptoms (23). Previous studies found that the inability to feel pleasure (anhedonia) was a stronger negative predictor of academic success than the depressed mood. These results suggest that despite being severely depressed, many students can still remain highly functional (13).

Our results have strong implications for mental health policies at universities. One of the most important finding is the need for universities to implement a systematic and continuous method for monitoring the mental health of their students. Associated psychological counseling centers established at universities seem to be an ideal way to help identify young people with mental health problems (13, 24). The belief of young people that they can handle their problems is the most common reason for under-diagnosis of mental disorders and a most striking barrier to seeking professional help (25). Education on mental health reduces stigmatization, as well as enhances young people to seek professional help. It is an effective tool that universities can use to improve mental health of their students (26, 27).

The findings should be considered in the light of several limitations. The main limitation of current study lies in the sampling method. The invitation to participate in the study could have been easily overlooked by a substantial proportion of university students. There were also significant differences across faculties in the number of participants. We do not know anything about participants who decided not to participate in the study. Another potential limitation of the study lies in using PHQ-9. Although it is well validated for screening the depression in various contexts, the true presence of depression should be confirmed with structured interviews.

Conclusion

Depression and anxiety are highly prevalent among university students. According to DSM-IV algorithm, approximately one in five students experiences clinically important symptoms of depression. The prevalence of anxiety symptoms was slightly lower, which contradicts the findings from most previous epidemiological studies done in other countries. The severity of depression and anxiety were significantly related to various impairments in social functioning, and low satisfaction with life.

Reference

1. Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: a global public-health challenge 2007; 369: 1302–1313.

2. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of dsm-iv disorders in the national comorbidity survey replication. Arch Gen Psychiatry 2005; 62 (6): 593–602.

3. Auerbach RP, Mortier P, Bruffaerts R, Alonso J, Benjet C, Cuijpers P, et al. WHO World Mental Health Surveys International College Student Project: Prevalence and distribution of mental disorders. J Abnorm Psychol 2018; 127 (7): 623–638.

4. Kovess-Masfety V, Leray E, Denis L, Husky M, Pitrou I, Bodeau-Livinec F. Mental health of college students and their non-college-attending peers: results from a large French cross-sectional survey. BMC Psychol 2016; 4: 20. doi: 10.1186/s40359-016-0124-5.

5. Ibrahim AK, Kelly SJ, Adams CE, Glazebrook C. A systematic review of studies of depression prevalence in university students. J Psychiatr Res 2013; 47 (3): 391–400.

6. Heretik A, Novotný V, Heretik A, Pečeňák J, Ritomský A. EPID-Epidemiológia depresie na Slovensku. Psychoprof, 2003.

7. Mokdad AH, Forouzanfar MH, Daoud F, Mokdad AA, El Bcheraoui C, Moradi-Lakeh M, et al. Global burden of diseases, injuries, and risk factors for young people's health during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 2016; 387 (10036): 2383–2401.

8. Whiteford HA, Ferrari AJ, Degenhardt L, Feigin V, Vos T. The global burden of mental, neurological and substance use disorders: an analysis from the Global Burden of Disease Study 2010. PloS One 2015; 10 (2): e0116820.

9. Hunt J, Eisenberg D. Mental Health Problems and Help-Seeking Behavior Among College Students. J Adolesc Health [Internet] 2010; 46 (1): 3–10.

10. Wittchen H-U, Nelson CB, Lachner G. Prevalence of mental disorders and psychosocial impairments in adolescents and young adults. Psychol Med 1998; 28 (1): 109–126.

11. Andrews B, Wilding JM. The relation of depression and anxiety to life-stress and achievement in students. Br J Psychol 2004; 95 (4): 509–521.

12. Hysenbegasi A, Hass SL, Rowland CR. The impact of depression on the academic productivity of university students. J Ment Health Policy Econ 2005; 8 (3): 145–151.

13. Eisenberg D, Golberstein E, Hunt JB. Mental Health and Academic Success in College. BE J Econ Anal Policy 2009; 9: 40 10.2202/1935-1682.2191.

14. McIntyre JC, Worsley J, Corcoran R, Harrison Woods P, Bentall RP. Academic and non-academic predictors of student psychological distress: the role of social identity and loneliness. J Ment Health Abingdon Engl 2018; 27 (3): 230–239.

15. Rickwood DJ, Deane FP, Wilson CJ. When and how do young people seek professional help for mental health problems? Med J Aust 2007; 187 (Suppl 7): S35–39.

16. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9. J Gen Intern Med 2001; 16 (9): 606–613.

17. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med 2006; 166 (10): 1092–1097.

18. Tyrer P. The Social Functioning Questionnaire: A Rapid and Robust Measure of Perceived Functioning. Int J Soc Psychiatry 2005; 51 (3): 265–275.

19. Diener ED, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. J Pers Assess 1985; 49 (1): 71–75.

20. Alonso J, Lépine J-P, ESEMeD/MHEDEA 2000 Scientific Committee. Overview of key data from the European Study of the Epidemiology of Mental Disorders (ESEMeD). J Clin Psychiatry 2007; 68 (Suppl 2): 3–9.

21. Novotný V, Heretil A, Heretik A, Pečeňák J, Ritomský A. EPIA – Epidemiológia vybraných úzkostných porúch na Slovensku. Psychoprof; 2006. 216 p.

22. Beiter R, Nash R, McCrady M, Rhoades D, Linscomb M, Clarahan M et al. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. J Affect Disord 2015; 173: 90–96.

23. Fried EI, Nesse RM. The Impact of Individual Depressive Symptoms on Impairment of Psychosocial Functioning. Gong Q (Ed). PLoS ONE 2014; 9 (2): e90311.

24. Leppink EW, Odlaug BL, Lust K, Christenson G, Grant JE. The Young and the Stressed: Stress, Impulse Control, and Health in College Students. J Nerv Ment Dis 2016; 204 (12): 931–938.

25. Kessler RC, Berglund PA, Bruce ML, Koch JR, Laska EM, Leaf PJ et al. The prevalence and correlates of untreated serious mental illness. Health Serv Res 2001; 36 (6 Pt 1): 987–1007.

26. Gulliver A, Griffiths KM, Christensen H. Perceived barriers and facilitators to mental health help-seeking in young people: a systematic review. BMC Psychiatry 2010; 10 (1): 113.

27. Reavley N, Jorm AF. Prevention and early intervention to improve mental health in higher education students: a review. Early Interv Psychiatry 2010; 4 (2): 132–142.