

Association between somatic diseases and symptoms of depression and anxiety among Belgrade University students

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ABSTRACT

Aim To investigate the relationship between somatic health problems and comorbid condition of anxiety and depression.

Methods The cross-sectional study in a population of 2,000 students of the Belgrade University (four schools: Medicine, Geography, Economics, Electrical Engineering) during the period April - June 2010 was conducted. The students were randomly selected. The main instrument for data collection was a standardized epidemiological questionnaire, designed at the Institute of Epidemiology, School of Medicine in Belgrade.

Results According to the Hamilton Depression Scale (HAMD), correlation was found between the following somatic diseases and depression: diabetes ($p=0.003$), hypertension ($p=0.007$), heart disease ($p=0.001$), chronic bronchitis ($p=0.033$), neurological diseases ($p=0.013$), and gastric or duodenal ulcer ($p=0.003$). According to the Hamilton Anxiety Scale (HAMA) a correlation was found between the following somatic diseases and anxiety: diabetes ($p=0.020$), hypertension ($p<0.001$), heart disease ($p=0.000$), chronic bronchitis ($p=0.037$), bronchial asthma ($p=0.049$), gastric or duodenal ulcer ($p=0.003$).

Conclusion Depression and anxiety are common in persons with somatic diseases and have a significant association with physical health. This has considerable implications for somatic diseases management and clinical guidelines.

Key words: mental condition, chronic illness, comorbidity

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INTRODUCTION

Chronic illness can lead to anxiety and depression. Approximately one fourth of adults in the United States have a mental illness, and nearly half will develop at least one mental illness during their lifetime (1-3). The most common mental illnesses in adults are anxiety and mood disorders (1). Anxiety and depression simultaneously are more frequent associated with physical morbidity than anxiety or depression alone (4). Findings indicate that age and gender of the adolescent and duration of illness did not affect the depression score, but type of illness affected it significantly (5). Depression and generalized anxiety disorder were the most globally disabling psychiatric disorders (6). Results of previous studies have shown that in clinical practice, treatment of depression and anxiety is far from optimal as these symptoms are frequently overlooked and undertreated (7). Mental disorders were consistently reported to be more disabling than physical disorders and the degree of disability increased as the number of comorbid disorders increased. Depression, in particular, was rated consistently higher across all domains than all physical disorders. Despite high rates of mental disorders and associated disability they are less likely to be treated than physical disorders (6). Similarly, other studies have found higher prevalence rates for many psychiatric than physical disorders (8). In a Norwegian survey involving general population, about one-third of individuals reporting somatic health problems also have anxiety disorder and/or depression. Some authors have pointed out that comorbid anxiety disorder and depression are found to be more strongly associated with somatic health problems than pure anxiety disorder and pure depression (9).

The relationship between somatic health problems and comorbid condition of anxiety and depression has been given little attention in the literature, especially among university students (9). Only a small number of studies have shown that prevalence rates of mental disorders are higher in patients with chronic somatic diseases than in a physically healthy person (10). Having in mind the university students are exposed to stress, overwork and fatigue, and that students' mental health is a growing concern, we wanted to examine the association of somatic diseases and mental states in this population. Therefore, the aim of this study was to investigate the relationship between somatic health problems

and comorbid condition of anxiety and depression in Belgrade University student's population.

EXAMINEES AND METHODS

The cross-sectional study was conducted in a population of 2,000 students of the Belgrade University. Four schools (Medicine, Geography, Economics, Electrical Engineering) from which the students participating in this research were randomly selected (by computer listing), were included in the study conducted in the period April - June 2010. From each of the schools an equal number of students per academic year was examined, and they received practical training on a test day. The main instrument for data collection was a standardized epidemiological questionnaire, designed at the Institute of Epidemiology, School of Medicine in Belgrade and it has been used in similar studies. The questionnaire included questions related to demographics (gender, age, faculty and year of study, place of residence), social characteristics (education and occupation of parents, social status) and behavioral characteristics (reasons for starting practicing this habit, attitudes related to knowledge of its harmfulness). A special part of the questionnaire included questions about diagnosed somatic diseases. For the evaluation of depression and anxiety the Hamilton Rating Scale for evaluation of depression (HAMD) and Hamilton Anxiety Rating Scale (HAMA) were used. Participation was voluntary and anonymous. The Institutional Review Board approved the study. Informed consent forms were signed by all students who agreed to participate.

Statistical analysis was performed using descriptive statistics and Chi-square test and Student t-test to test group differences. For testing association between variables the Spearman rank correlation coefficient was calculated.

RESULTS

Data were collected from 2,000 students of University of Belgrade, 860 (43%) males and 1,140 (57%) females. The average age of the participants was 21.5 years. From each of the schools an equal number of students (500) per academic year was examined. Response rate was 99.8%.

Most students with diabetes were among the students of the School of Economics, five (1%), with hypertension at the School of Electrical Engineering 19 (3.9%), heart disease was found among

students of the School of Economics, 12 (2.4%), chronic bronchitis among students of the School of Medicine, 19 (3.8%). Bronchial asthma was most frequent among students at the School of Electrical Engineering, 26 (5.3%). When it comes to diagnosed neurological diseases, the majority of students were at the School of Medicine, four (0.8%). Gastric or duodenal ulcer was most frequent among the students at School of Economics, five (1%), since skin diseases prevailed at the School of Geography, 18 (3.7%), (Table 1). However, statistically significant differences among students of four surveyed schools were not found for somatic diseases.

Table 1. Distribution of students of four surveyed schools in relation to diagnosed somatic diseases

Diagnosed somatic diseases	No (%) of students				Total
	School of Medicine	School of Geography	Economics	Electrical Engineering	
Diabetes	2 (0.4)	3 (0.6)	5 (1.0)	2 (0.4)	12 (0.6)
Hypertension	16 (3.2)	17 (3.5)	12 (2.4)	19 (3.9)	64 (3.2)
Heart disease	7 (1.4)	8 (1.6)	12 (2.4)	6 (1.2)	33 (1.7)
Chronic bronchitis	19 (3.8)	17 (3.5)	15 (3.0)	13 (2.6)	64 (3.2)
Bronchial asthma	11 (2.2)	23 (4.7)	24 (4.8)	26 (5.3)	84 (4.3)
Neurological diseases	4 (0.8)	3 (0.6)	3 (0.6)	1 (0.2)	11 (0.6)
Gastric or duodenal ulcer	2 (0.4)	1 (0.2)	5 (1.0)	1 (0.2)	9 (0.5)
Skin diseases	15 (3.0)	18 (3.7)	14 (2.8)	9 (1.8)	56 (2.8)

According to the Hamilton Depression Scale (HAMD), correlation was found between the following somatic diseases and depression: diabetes ($p=0.003$), hypertension ($p=0.007$), heart disease ($p=0.001$), chronic bronchitis ($p=0.033$), neurological diseases ($p=0.013$), and gastric or duodenal ulcer ($p=0.003$) (Table 2).

Table 2. Correlation between somatic diseases and depression according to the Hamilton Depression Scale (HAMD)

Somatic diseases	p
Diabetes	0.003
Hypertension	0.007
Heart disease	0.001
Chronic bronchitis	0.033
Bronchial asthma	0.313
Neurological diseases	0.013
Gastric or duodenal ulcer	0.003
Skin diseases	0.875

According to the Hamilton Anxiety Scale (HAMA) a correlation was found between the following somatic diseases and anxiety: diabetes ($p=0.020$), hypertension ($p<0.001$), heart disease ($p<0.001$), chronic bronchitis ($p=0.037$), bronchial asthma ($p=0.049$), and gastric or duodenal ulcer ($p=0.003$) (Table 3).

Table 3. Correlation between somatic diseases and anxiety according to the Hamilton Anxiety Scale (HAMA)

Somatic diseases	p
Diabetes	0.020
Hypertension	0.000
Heart disease	0.000
Chronic bronchitis	0.037
Bronchial asthma	0.049
Neurological diseases	0.113
Gastric or duodenal ulcer	0.003
Skin diseases	0.380

Among females a correlation was found between diabetes and depression ($p=0.020$), and gastric or duodenal ulcer and depression according to the Hamilton Depression Scale ($p=0.022$). Among males the correlation was found between hypertension and depression ($p<0.001$), and neurological diseases and depression ($p<0.001$) according to the Hamilton Depression Scale. In both sexes the correlation was found between heart disease ($p=0.012$ for males and $p=0.038$ for females) and depression (Table 4).

Table 4. Correlation between somatic diseases and depression according to the Hamilton Depression Scale with respect to gender

Somatic diseases	p	
	Males	Females
Diabetes	0.090	0.020
Hypertension	0.000	0.807
Heart disease	0.012	0.038
Chronic bronchitis	0.200	0.093
Bronchial asthma	0.430	0.441
Neurological diseases	0.000	0.877
Gastric or duodenal ulcer	0.072	0.022
Skin diseases	0.635	0.759

Among females the correlation between gastric or duodenal ulcer and anxiety according to the Hamilton Anxiety Scale was found ($p=0.007$) since among males correlation was found between neurological diseases and anxiety ($p=0.000$) and hypertension and anxiety ($p=0.001$) too. In both sexes correlation was found between heart diseases ($p=0.000$ for males and $p=0.001$ for females) and anxiety according to the Hamilton Anxiety Scale (Table 5).

Table 5. Correlation between somatic diseases and anxiety according to the Hamilton Anxiety Scale (HAMA) with respect to gender

Somatic diseases	p	
	Males	Females
Diabetes	0.056	0.163
Hypertension	0.001	0.117
Heart disease	0.000	0.001
Chronic bronchitis	0.235	0.085
Bronchial asthma	0.212	0.101
Neurological diseases	0.000	0.320
Gastric or duodenal ulcer	0.136	0.007
Skin diseases	0.247	0.073

DISCUSSION

Depression and anxiety are common comorbid health problems in patients with diabetes. It is well-known that patients with depression and diabetes, compared to patients with diabetes alone, have been linked with poor self-care and adherence to medical treatment, poorer glycemetic control and more diabetes complications. Moreover, depression in diabetes patients is associated with a higher risk of morbidity and all causes of mortality (11). In our research involving the population of university students, the results indicate that diabetes affects the occurrence of depression and anxiety, as well. Key findings from eighteen surveys across 17 countries in Europe, the Americas, the Middle East, Africa, Asia, and the South Pacific indicated that the risk of both mood and anxiety disorders are moderately higher among persons with diabetes, as compared to the persons without diabetes (12). In a research in the UK the relationship between diabetes and depression was found (13), since in a research on the Dutch population depressive symptoms, but not anxiety are associated with glucose metabolism (11).

When it comes to correlation between diabetes and depression regarding gender, among females statistically significant difference was found in the present study, and among male participants it was not found, which is consistent with studies in Vietnam (14), in the Netherlands (15), in the UK (16) and also in a research on the population of European and South-Asian countries (17). Although evidence of the relationship between depression and diabetes is strong, the mechanism of the association remains unclear: depression may lead to diabetes or diabetes may lead to depression (18). In a survey on the population with diagnosed diabetes prevalence estimates of major depression ranged from 1.5% in Shanghai to 19.5% in Ukraine. When it comes to anxiety, elevated anxiety symptoms were associated with diabetes. Recent studies suggest that anxiety disorders may also be associated with less favorable glycemetic control among adults with diabetes (12).

Regarding blood pressure, a correlation with depression and anxiety was found according to the Hamilton Depression Scale as well as according to the Hamilton Anxiety Scale in this study. Moreover, depression was found among males with higher blood pressure as anxiety, too; among female students the correlation was not found between higher blood pressure and depression

and anxiety, which is consistent with studies from Norway (9) and Italy (19).

Regarding heart diseases, our results indicate that they are connected with symptoms of depression, as it has been noted by others (10,20,21). Contrary to these results in the USA research no association between depressive symptoms and unrecognized glucose intolerance was found. Moreover, as depression confers a higher risk for coronary heart disease, the risk for coronary heart disease may be additive when both diseases are present (18).

Anxiety seemed to be an independent risk factor for incident coronary heart disease and cardiac mortality (22).

In the present study a correlation between chronic bronchitis and depression was found and with anxiety as well, which is consistent with a study in Iran (23). When it comes to bronchial asthma, in the current study the correlation was not found with depression and with anxiety it is on the border of statistical significance, while according to results in Iran the correlation was found for both anxiety and depression (23). Comorbid symptoms of anxiety and depression are common in patients with chronic obstructive pulmonary disease. In a German study, results revealed significantly increased prevalence rates for depressive disorders, anxiety disorders, in chronic obstructive pulmonary disease patients. Similarly, increased prevalence rates for depressive and anxiety disorders were found in patients' spouses (24). Anxiety is common in patients with chronic obstructive pulmonary disease. It is often associated with clinical depression (25).

In the current study correlation between neurological diseases and depression was found, but there was no correlation between neurological diseases and anxiety. Results of a French nationwide survey indicate that patients with neuropathic pain had higher anxiety/depression scores than those reporting pain without neuropathic characteristics and those without pain (26). In the USA research conducted in a population of patients with neurological disorders caused by diabetes, both anxiety and depression were present (27).

In our research gastric or duodenal ulcer is associated with depression and anxiety. In a Spanish survey on the population of adolescents with diagnosed ulcer, anxiety and depression were found in 92% of the cases (28). Contrary to our results, in a survey from the USA, patients with non-ul-

cer dyspepsia are more likely to have symptoms of anxiety and depression than healthy persons or patients with ulcers (29).

In two Italian researches results revealed a connection between skin diseases and depression (30,31). In the USA survey majority of patients with psoriasis reported clinically significant psychiatric symptoms and are likely to receive psychiatric diagnoses, with both depression and anxiety (32). Also the correlation between skin diseases and depression and anxiety has been documented in a number of reports (32-34). However, our research does not corroborate this association.

The results of this investigation show that diabetes, hypertension, heart disease, chronic bronchitis, bronchial asthma and gastric or duodenal ulcer are associated with anxiety, and all of these diseases except bronchial asthma including neurological disease are associated with depression.

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Povezanost između somatskih bolesti i simptoma depresije i anksioznosti u populaciji studenata Univerziteta u Beogradu

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SAŽETAK

Cilj Istražiti povezanosti između somatskih bolesti i komorbidnih stanja anksioznosti i depresije.

Metode Sprovedena je studija prevalencije u populaciji 2000 studenata Univerziteta u Beogradu (Medicinski, Geografski, Ekonomski i Elektrotehnički fakultet), odabranih metodom slučajnog izbora, u periodu od aprila do juna 2010. godine. Osnovni instrument za prikupljanje podataka bio je standardizovani epidemiološki upitnik koji je dizajniran na Institutu za epidemiologiju Medicinskog fakulteta u Beogradu.

Rezultati Prema Hamiltonovoj skali depresivnosti (HAMD), korelacija je nađena između sledećih somatskih bolesti i depresije: dijabetesa ($p=0,003$), hipertenzije ($p=0,007$), oboljenja srca ($p=0,001$), hroničnog bronhitisa ($p=0,033$), neuroloških oboljenja ($p=0,013$) i čira na želucu ili dvanaestopalačnom crevu ($p=0,003$). Prema Hamiltonovoj skali anksioznosti (HAMA) korelacija je nađena između sledećih somatskih bolesti i anksioznosti: dijabetesa ($p=0,020$), hipertenzije ($p=0,000$), oboljenja srca ($p=0,000$), hroničnog bronhitisa ($p=0,037$), bronhijalne astme ($p=0,049$) i čira na želucu ili dvanaestopalačnom crevu ($p=0,003$).

Zaključak Depresija i anksioznost su česta komorbidna stanja kod studenata sa dijagnostikovanim somatskim oboljenjima. Ovakav nalaz ima značajne implikacije za kliničku praksu i ukazuje na potrebu šireg sagledavanja somatskih oboljenja.

Ključne reči: mentalni poremećaji, hronične bolesti, komorbiditet.