

Depression among Polish medical students and its lifestyle-linked predictors

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Abstract

Introduction and objective. Depression is a common mental disorder that affects over 264 million people worldwide. Medical students are at a particularly high risk of this disease. The aim of the study was to investigate the prevalence of depression among Polish medical students and to determine predictors of this disease that are related to student's lifestyle. **Material and method.** A total of 1023 medical students took part in the study. The research tool included a Polish version of the PHQ-9 questionnaire and author's questions which concerned sociodemographic characteristics of the investigated group and analyzed factors. Answers were collected in the April of 2020. **Results.** About a half of the students (51.61%, 95% CI: 48.50 – 54.72) were found to have major depression (PHQ score ≥ 10). 30.21% of the students had mild depressive symptoms, 26.00% – moderate depressive symptoms and 15.05% – moderately severe depressive symptoms. 10.56% of the participants had symptoms of severe depression. A statistically significant relationship was found between major depression and: frequent feelings of loneliness, not doing sports regularly, not getting enough sleep, not participating in social meetings often enough, having problems with maintaining stable body weight, using alcohol in order to relieve stress or negative emotions and being non-religious. **Conclusions.** Depression among medical students in Poland is common. There are many lifestyle-linked predictors which are associated with this disease in the above-mentioned group. It is crucial to take actions aimed at reducing the high prevalence rates of depression among medical students in Poland, such as introducing routine screening for depression and creating resources that would enable students to obtain help.

Key words: medical students; depression

Introduction

Depression is a common mental disorder which affects over 264 million people worldwide [1]. Despite its prevalence and the fact that effective ways of treatment are known, from 76% to 85% of people who suffer from mental diseases, including depression, in low and middle income countries do not receive appropriate treatment [2]. The problem of depression particularly affects medical students. An analysis based on research conducted in 43 countries showed that 27.2% of medical students suffer from depression or show depressive symptoms and 11.1% of them experience suicidal ideation. At the same time, only 15.7% of students with depression seek professional help [3]. A lack of desire to seek help can have many causes, including lack of time, a fear of documentation on academic records and a fear of unwanted intervention [4]. There are many factors that contribute to the occurrence of depressive symptoms among medical students. One of them is worrying about academic performance [5]. Research shows that students satisfied with their academic performance are less likely to become depressed [6]. Among other factors one can distinguish: bad relationship with a partner, friends or classmates, presence of a chronic disease or a recent major life event, low self-assessment of mental health status, financial status, social life and religious commitment, low physical activity level and trouble with sleeping [7, 8, 9, 10, 11]. Furthermore, graduation does not always resolve the problem. Resident doctors are even more likely to experience burnout and depression than medical students [6].

Aim of the study

The aim of the study was to assess the prevalence of depression among Polish medical students and to determine its lifestyle-linked predictors.

Material and method

The research tool included a Polish version of the PHQ-9 questionnaire and author's questions which concerned sociodemographic characteristics of an investigated group and analyzed factors. Answers were collected in the April of 2020. The research tool was placed on official groups dedicated to medical students on Facebook social networking site. The questionnaire was anonymous, and participation in the research was voluntary. Collected data was analyzed statistically. To assess a relationship between two variables, the Chi-square test of independence was used. The level of significance was set at $p < 0.05$.

Results

Demographic characteristics of the group

The study was carried out among a group of 1023 medical students. Among respondents there were students from each of the 18 Polish universities that offer medical education. Women constituted 75.56% ($n = 773$) of the participants and men – 24.44% ($n = 250$). Among respondents there were students from each year of medical education: 34.41% ($n = 352$) of the participants studied in the 1st year, 25.51% ($n = 261$) – in the 2nd year, 18.77% ($n = 192$) – in the 3rd year, 10.36% ($n = 106$) – in the 4th year, 7.04% ($n = 72$) – in the 5th year and 3.91% ($n = 40$) – in the 6th year. The age of participants ranged from 18 to 31 years, mean age was 21.55 ± 1.87 years and median age was 21 years. 44.57% ($n = 456$) of the students stated that they frequently feel alone and 45.65% ($n = 467$) don't do sports regularly. 43.30% ($n = 443$)

of the respondents claimed that they participate in social meetings often enough, whereas 42.62% (n = 436) don't sleep enough. 60.90% (n = 623) of the participants stated that they don't have problems with maintaining stable body weight. Half of the students (49.76%, n = 509) happened to reach for alcohol in order to de-stress or discharge negative emotions. 44.38% (n = 454) of the respondents defined themselves as religious. (Table 1).

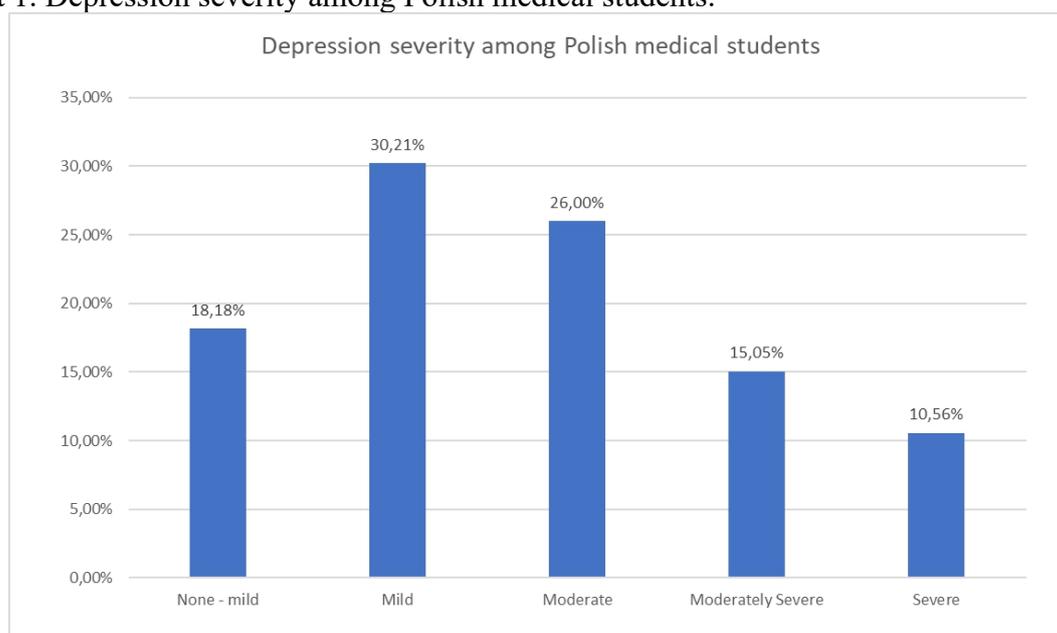
Table 1. Demographic data of the participants.

Sociodemographic characteristics	n (%)
Gender	
Female	773 (75.56%)
Male	250 (24.44%)
Year of studies	
1 st	352 (34.41%)
2 nd	261 (25.51%)
3 rd	192 (18.77%)
4 th	106 (10.36%)
5 th	72 (7.04%)
6 th	40 (3.91%)
Do you often feel lonely?	
Definitely yes/ Rather yes	456 (44.57%)
Hard to tell	247 (24.14%)
Definitely not/ Rather not	320 (31.26%)
Do you do sports regularly?	
Definitely yes/ Rather yes	420 (41.06%)
Hard to tell	136 (13.29%)
Definitely not/ Rather not	467 (45.65%)
Do you participate in social meetings often enough?	
Definitely yes/ Rather yes	443 (43.30%)
Hard to tell	204 (19.94%)
Definitely not/ Rather not	376 (36.75%)
Do you sleep enough?	
Definitely yes/ Rather yes	419 (40.96%)
Hard to tell	168 (16.42%)
Definitely not/ Rather not	436 (42.62%)
Do you have problems with maintaining stable body weight?	
Definitely yes/ Rather yes	314 (30.69%)
Hard to tell	86 (8.41%)
Definitely not/ Rather not	623 (60.90%)
Have you ever reached for alcohol in order to de-stress or discharge negative emotions?	
Definitely yes/ Rather yes	464 (45.36%)
Hard to tell	50 (4.89%)
Definitely not/ Rather not	509 (49.76%)
Are you religious?	
Definitely yes/ Rather yes	454 (44.38%)
Hard to tell	118 (11.53%)
Definitely not/ Rather not	451 (44.09%)

Depression

The PHQ score ranged from 0 to 27, with a mean score of 10.52 and median score of 10 (interquartile range 6 - 15). Overall, 837 (81.82%, 95% CI: 79.32 – 84.14) of the respondents had signs of depression with a different degree of severity (PHQ score > 4). 30.21% (n = 309) of the students had mild depressive symptoms, 26.00% (n = 266) – moderate depressive symptoms and 15.05% (n = 154) – moderately severe depressive symptoms. Approximately 1 in 9 of the participants (10.56%, n = 108) had symptoms of severe depression. About a half of the students (51.61%, 95% CI: 48.50 – 54.72, n = 528) were classified as having major depression (PHQ ≥ 10). (Chart 1).

Chart 1. Depression severity among Polish medical students.



Factors associated with depression

No relationship was found between major depression and: gender and year of studies (Table 2).

Table 2. Presence of major depression and gender and year of studies.

Sociodemographic characteristics	Presence of major depression, n (%)		Statistical analysis
	Yes	No	
Gender			$\chi^2 = 2.13$ df = 1 p = 0.14
Female	409 (52.91%)	364 (47.09%)	
Male	119 (47.60%)	131 (52.40%)	
Year of studies			$\chi^2 = 7.22$ df = 5 p = 0.20
1 st	195 (55.40%)	157 (44.60%)	
2 nd	133 (50.96%)	128 (49.04%)	
3 rd	102 (53.13%)	90 (46.88%)	
4 th	49 (46.23%)	57 (53.77%)	
5 th	29 (40.28%)	43 (59.72%)	
6 th	20 (50.00%)	20 (50.00%)	

A relationship was found between major depression and: frequent feelings of loneliness, not doing sports regularly, not sleeping enough, not participating in social meetings often enough,

having problems with maintaining stable body weight, reaching for alcohol in order to de-stress or discharge negative emotions and being non-religious ($p < 0.05$). (Table 3).

Table 3. Presence of major depression and sociodemographic characteristics.

Sociodemographic characteristics	Presence of major depression, n (%)		Statistical analysis
	Yes	No	
Do you often feel lonely? Definitely yes/ Rather yes Hard to tell Definitely not/ Rather not	338 (74.12%) 112 (45.34%) 78 (24.38%)	118 (25.88%) 135 (54.66%) 242 (75.63%)	$\chi^2 = 191.47$ df = 2 p = 0
Do you do sports regularly? Definitely yes/ Rather yes Hard to tell Definitely not/ Rather not	166 (39.52%) 71 (52.21%) 291 (62.31%)	254 (60.48%) 65 (47.79%) 176 (37.69%)	$\chi^2 = 46.01$ df = 2 p = 0
Do you participate in social meetings often enough? Definitely yes/ Rather yes Hard to tell Definitely not/ Rather not	173 (39.05%) 109 (53.43%) 246 (65.43%)	270 (60.95%) 95 (46.57%) 130 (34.57%)	$\chi^2 = 56.98$ df = 2 p = 0
Do you sleep enough? Definitely yes/ Rather yes Hard to tell Definitely not/ Rather not	154 (36.75%) 98 (58.33%) 276 (63.30%)	265 (63.25%) 70 (41.67%) 160 (36.70%)	$\chi^2 = 63.94$ df = 2 p = 0
Do you have problems with maintaining stable body weight? Definitely yes/ Rather yes Hard to tell Definitely not/ Rather not	220 (70.06%) 47 (54.65%) 261 (41.89%)	94 (29.94%) 39 (45.35%) 362 (58.11%)	$\chi^2 = 66.68$ df = 2 p = 0
Have you ever reached for alcohol in order to de-stress or discharge negative emotions? Definitely yes/ Rather yes Hard to tell Definitely not/ Rather not	279 (60.13%) 24 (48.00%) 225 (44.20%)	185 (39.87%) 26 (52.00%) 284 (55.80%)	$\chi^2 = 24.92$ df = 2 p = 0.000004
Are you religious? Definitely yes/ Rather yes Hard to tell Definitely not/ Rather not	211 (46.48%) 65 (50.08%) 252 (55.88%)	243 (53.52%) 53 (44.92%) 199 (44.12%)	$\chi^2 = 8.65$ df = 2 p = 0.01

Discussion

Our research was carried out among Polish medical students. Similar studies were conducted in other countries: Malaysia (prevalence rates of anxiety and depression were 33% and 11% respectively), Brazil (systematic review showed that 30.6% of medical students had depression), Republic of South Africa (36.4% of future physicians had noticed symptoms of major depression, whereas 45.9% – symptoms of anxiety), Portugal (prevalence of depression among medical students of 4th and 5th year was 6.1% and of suicidal behavior - 3.9%), Denmark (30.5% of medical students reported depressive symptoms) [12,13,14,15,16]. Our analysis showed that gender is not linked with major depression. Similar results were obtained by Pradeep Kumar Sahu et. al. who made his research on the University of the West Indies [17]. Results obtained in our analysis were opposite to the one presented by Ying Mao et. Al.. In a meta-analysis and systematic review they stated that the prevalence of depression among female medical students was higher than among male medical students [18]. Similarly, Mohamed Fawzy with Sherifa A Hamed wrote about depression among Egyptian medical students [19]. Same link we can find in a research by Lúcia Damásio Moutinho et. al. which was carried out among Brazilian medical students [20].

Our research didn't find a link between the year of studies and major depression. Different results were obtained by Zaid A Mahroon et. al. It was noticed that the year of study could be related to depressive symptoms and the most exposed group are students from the first three years of medical studies [21]. Whereas in a research concerning Portugal medical students of 4th and 5th year of studies no such link was found [15]. Also in a research carried out among Pakistani medical students it was noticed that there exists a link between symptoms of depression and a year of study [22].

Our research showed a statistically significant relationship between frequent feelings of loneliness and major depression. According to the literature, social support has an important role in buffering the negative impact of perceived stress [23]. A relationship between feelings of loneliness and depression was investigated previously among medical students and many other social groups. A similar link was found by Liu H et al. among medical students of the Tianjin Medical University in China. In the above-mentioned study, feeling of loneliness at the baseline was linked to the occurrence of depressive symptoms among female medical students. In this research an analogical relationship among male medical students was not statistically significant ($p>0.05$) [24]. A research carried out among 300 Polish high school students showed a link between feeling of emotional loneliness (described by a lack of satisfying social relationships) as well as social loneliness (described by a lack of social gatherings) and depression, anxiety, and aggressive behaviors [25]. Anuradha R et al. in their study including 700 medical students from India stated the feeling of loneliness as one of the two most important psychosocial stressors (the second one was family problems) [26].

Our research showed a statistically significant link between not doing sports regularly and major depression. Elsayy WIF et al. in a research including 390 4th-, 5th-, and 6th-year medical students of the Alexandria University showed that among respondents who didn't practice any sport, the prevalence of moderate or severe depression was 49.4% [27]. An analysis carried out by Bertani DE et al. among 459 Italian medical students showed a link between doing sports regularly and a lower level of anxiety as well as comorbid anxiety-depressive symptoms. However, in the same study a link between doing sports and depression was not statistically significant [28]. According to an analysis carried out among 193 nursing and 168 medical students from Great Britain, a significant part of the students (48% and 38% respectively) didn't reach recommended levels of physical activity (at least 30 minutes of moderate activity for 5 days a week). The most frequent reasons for not doing sports

regularly were claims that physical exercises are tiring, time-consuming, and cause fatigue [29].

Depression may be associated with sleeping disorders. Problems with initiating and maintaining sleep are common among depressed individuals. The typical symptom is waking up early (3:00 a.m. – 5:00 a.m.) with or without a possibility of falling asleep again - depending on a severity of depression. Patients may also suffer from excessive daytime or nightly sleepiness and difficulties with waking up [30]. Our research found a link between subjective feeling of not sleeping enough and major depression. A similar relation was found by Fang Y et al. in a research including 2115 medical doctors during the first year of internship. Authors found a link between depressive symptoms and a reduction of daily sleeping time, going to sleep late, a high variability of daily sleeping time and a high variability of waking up time [31]. In a longitudinal study carried out by Ball S and Bax A authors found a link between excessive daytime sleepiness at the beginning of the first semester of the first year and depression in the half of the first semester. A similar link was also found in a study carried out by Shao R et al. among 2057 Chinese medical students from the Chongqing University [23]. Similar conclusions were made by Shen Y et al. in a study including 4882 Chinese medical students from the Hunan province. In the above-mentioned study depression was linked with excessive daytime sleepiness [33].

Our study showed a link between a subjective feeling of not participating in social meetings often enough and major depression. A link between depression and social loneliness (described by a lack of social gatherings) was found by Dziejczak B among 300 Polish high-school students [25]. An analogical correlation was found among medical students in a study carried out by Silva V et al. who found a link between low satisfaction from social gatherings and persistent depression [34]. A study conducted among Italian medical students showed that satisfactory frequency of social gatherings was linked with lower level of anxiety as well as lower level of comorbid anxiety-depressive symptoms, whereas no such link was not found with depression [28]. In a longitudinal study Ball S and Bax A found that low frequency of social meetings during the beginning of the first semester of the first year of studies was a predictor of depression during the first half of the first semester [32].

Depression is linked with an increased risk of obesity. Moreover, a relationship between depression and obesity is two-directional and depression is linked with a higher risk of obesity as well [35]. Our research showed a link between having problems with maintaining stable body weight and major depression. Vijayalakshmi P et al. who investigated depression among nursing and medical students in India showed that it was linked with unstable eating habits [36]. Similar results were obtained by Chang WW et al. in a study which included 1107 female medicine students from Anhui province in China. Authors showed that eating disorders were linked with depression [37].

Our research revealed that drinking alcohol in order to discharge negative emotions is linked with major depression. A link between depression and drinking alcohol was shown in a paper by Eric R. Jackson et. al. which was carried out among medical students from the USA [38]. Also, very curious results can be found in other research which concerned first-year female medical students - not quantity, but the consequences of drinking increase the probability of depression [39]. Whereas a research carried out by M. Pickard et. al. points that even high levels of depression and anxiety aren't correlated with drinking alcohol and taking drugs in high doses [40].

According to our study there exists a link between major depression and being non-religious. Similar results were obtained in a research by Ramzi Shawahna et. al., where it was established that Palestinian medical students with low religious commitment had higher levels of depressive symptoms [41]. A meta-analysis by Sedighe Forouhari showed that there exists a weak link between religious commitment and lower level of depressive and anxiety

symptoms [42]. Research by Jurema Ribeiro Luiz Gonçalves carried out among medical and nursing students showed that religiousness is associated with lower levels of anxiety, but not depression [43].

Limitations

Our survey was held among Polish medical students in the April of 2020. During that time the world was struggling with the CoVID-19 pandemic and students in Poland were facing epidemiological restrictions such as a switch to online education. A link between the CoVID-19 pandemic and a higher prevalence of depressive symptoms was previously described among students of many fields [44,45,46]. According to the above-mentioned publications, student status was linked with a higher impact of the CoVID-19 pandemic on mental health and higher level of perceived stress, anxiety, and depression compared to university workers and general population [45,46]. Therefore, further studies need to be conducted beyond the times of pandemic and restrictive lockdown in order to investigate the above-mentioned relationships more precisely.

Conclusions

Depression among Polish medical students is common. The research suggests that lifestyle-linked predictors of depression are: frequent feelings of loneliness, not doing sports regularly, not sleeping enough, not participating in social meetings often enough, having problems with maintaining stable body weight, reaching for alcohol in order to de-stress or discharge negative emotions and being non-religious.

High prevalence rates of depression among medical students in Poland is a problem worth paying closer attention to by clinical and academic environments. It is crucial to raise awareness on this issue as well as to introduce routine screening for depression among medical students and to create resources which would enable them to obtain help.

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