

EVALUATION OF THE LEVEL OF DEPRESSION AMONG MEDICAL STUDENTS FROM POLAND, PORTUGAL AND GERMANY

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SUMMARY

Background: Depression is a serious illness affecting health, family and professional life of many people of all sectors of society. It also concerns students, regardless of their geographical location. The Beck Depression Inventory (BDI) is a proper tool to brief check of the level of depression because it has high correlation with depression. The aim of this study was to assess and compare the level of depression among medical students from Poland, Portugal and Germany.

Subjects and methods: Students from different countries were asked to fill in an electronic form containing the BDI. The form was created separately for each country, using official translation of the BDI, approved by the competent psychiatric association. Google Drive software was used for the electronic form, and Stat soft Statistica v10 software for statistical analysis.

Results: There were statistically significant differences ($p < 0.05$) in terms of average score of the BDI and of the proportion of the scores more than 10 points of medical and technology students among kinds of studies and countries. The average score of the BDI of medical students: Poland: 13.76 ± 9.99 points; Germany: 8.49 ± 7.64 points; Portugal: 7.37 ± 7.67 points. The average score of the BDI of technology students: Poland: 12.42 ± 9.66 points; Germany: 10.51 ± 8.49 points; Portugal: 9.25 ± 8.97 points. The proportion of the scores more than 10 points of medical students: Poland 56.32% (285/506) Germany 34.92% (154/441) Portugal 26.03% (82/315). The proportion of the scores more than 10 points of technology students: Poland 55.01% (368/669) Germany 43.82% (156/356) Portugal 37.57% (136/362).

Conclusions: The highest depression score among medical and technology students according the BDI was found in Poland. A proper monitoring of depression is required, as well as rapid and appropriate help for those who suffer from it.

Key words: depression - medical students - technology students - Beck Depression Inventory - BDI

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INTRODUCTION

Depression is a significant contributor to the global burden of disease and affects more, than 350 million people of all ages in the whole world (WHO 2012). In the WHO European region about 1 out of 15 people suffer from major depression every year (WHO 2013). University students are the particular group of representatives, as they have to adapt to various psychosocial changes, coping also with academic and social demands in preparing for their professional careers (Uehara 2010). The systematic review of studies of depression prevalence in university students from the period of 1990-2010 revealed, that the prevalence of depression rates ranged from 10% to 85% with a weighted mean prevalence of 30.6% (Ibrahim 2013). Studying in the medical university is especially challenging for a young person, as it is connected with workload, competition, sleep deprivation, lack of social support, "hidden curriculum" of cynicism and witnessing the suffering, deaths of patients (Dyrbye 2006). These circumstances should be mentioned as the factors having a particular impact on the development of depression of medical students. On the contrary, factors including parental support, extraversion, conscientiousness and self-efficacy are in significant negative relationship with depres-

sion (Mustafa 2010). Several studies reported substantial deterioration in medical students' mental health during the first year of medical school as compared with before medical training (Yusoff 2013, Del-Ben 2013). Further, dealing with the issue of medical students' depression is essential by the reason of the fact, that the high prevalence of depression among physicians can partly be traced back to the medical education they receive (Tjia 2005). Deliberating on depression in one country, it is important to confront the results with neighboring territory. Consequently, comparing the situation in Poland with other European countries such as Germany and Portugal could be a reasonable move.

There are various instruments constructed to measure the severity of depression. Beck Depression Inventory (BDI) created originally in 1961 by Aaron T. Beck is one of the most useful self-report rating inventory that measures characteristic attitudes and symptoms of depression (Beck 1961). Due to its popularity and availability in many languages it allows to conduct quite objective comparison of the severity and prevalence of depression regardless of the geographical location (Victorian Transcultural Psychiatry Unit 2005).

The aim of this study was to assess and compare the level of depression among medical students from Poland, Portugal and Germany.

SUBJECTS AND METHODS

Sociodemographic characteristic of participants

Two groups were established. The study group comprised medical students from Poland, Germany and Portugal. Respectively, the control group consisted of technology students from these countries. Data collection were conducted between March and May 2015. The form was sent to 3211 students and was filled in by 2649 students: 1262 medical students (Poland - 506, Germany - 441, Portugal - 315) and 1387 technology students (Poland - 669, Germany - 356, Portugal - 362). Respondents from Poland were the representants of Medical University of Silesia in Katowice and Technical University of Silesia in Gliwice. Consequently, respondents from Germany were the students of Faculty of Medicine of the University of Munich and Technische Universität Magdeburg. Eventually, respondents from Portugal were represented by the students of the medical faculty of University of Minho in Braga and technical faculty of University of Minho in Guimarães. The median value of year of studies of medical and technology students were third year (medical students: minimum 1 year maximum 6 year; technology: minimum 1 year, maximum 5 year). The median value of age of all examined students was 22 years (minimum 18 years, maximum 29 years). Exact data concerning students are presented in Table 1.

Instruments and procedures

Study was approved by Ethics Committee of Medical University of Silesia in Katowice, that it conforms to

the provisions of the Declaration of Helsinki in 1995 (as revised in Edinburgh 2000). Students from Poland, Germany and Portugal were asked to fill in an electronic, anonymous form containing the Beck Depression Inventory (BDI), a 21-item self-report inventory designed to measure the severity of depressive symptomatology (Beck 1961). The form was created separately for each country, using the official translation of BDI, approved by the competent psychiatric association (Parnowski 1977, Hautzinger 1994, Gorenstein 1996). BDI average scores <10 points were considered as normal. Higher scores were categorized into minor depression: 10–19 points, moderate depression: 20–29 points and severe depression: ≥30 points (Parnowski 1977). Scores <4 were distinguished as denial of depression. Scores >40 were distinguished as symptoms of borderline personality. The average of cognitive/ affective subscale with BDI questions 1-13 and the average of somatic subscale with BDI questions 14-21 were counted.

Statistical analysis

Google Drive software was used to create an electronic form. It was sent to each study and control group separately. The statistical analysis was performed with using Statsoft Statistica v10 software. Chi square test was used for statistical analysis of categorical variables. U-Mann Whitney test, t-student test and ANNOVA depending of number of cases and normality distribution were used for statistical analysis of quantitative variables. Results were standardized by age and gender. The values have been rounded to two decimal points. Statistical significance level was set at $p < 0.05$.

Table 1. Exact data of examined medical and technology students from Poland, Germany and Portugal

	Poland	Germany	Portugal	
		Numer of answers		p-value
All students	1175	797	677	
Medical students	506	441	315	
Technology students	669	356	362	
		% Female		
Medical students	67.98% 344/506	77.10% 340/441	73.97% 233/315	$p < 0.05$
Technology students	66.23% 443/669	76.4% 272/356	56.91% 206/362	$p < 0.05$
P-value	$p > 0.05$	$p > 0.05$	$p < 0.05$	
		Age		
Medical students	22.39±1.73	22.09±3.01	21.96±3.32	$p > 0.05$
Technology students	22.08±1.76	22.72±1.88	22.18±3.43	$p > 0.05$
P-value	$p > 0.05$	$p > 0.05$	$p > 0.05$	
		Year of studies		
Medical students	median 3	median 3	median 3	$p > 0.05$
Technology students	median 3	median 3	median 3	$p > 0.05$
P-value	$p > 0.05$	$p > 0.05$	$p > 0.05$	

RESULTS

There were statistically significant differences ($p < 0.05$) in terms of average score of the BDI in the results of medical and technology students among chosen countries. There were also the statistical differences in terms of average score of the BDI among medical and technology students of Poland, Germany and Portugal. The highest average score of the BDI belonged to the medical students in Poland. The lowest average score of the BDI was the score of medical students in Portugal. In Poland the average score of the BDI, in the case of medical students, was higher than in the case of technology students. In Germany and Portugal the average score of the BDI obtained by medical students was lower than by technology students. The average score of the BDI of medical students was illustrated in Figure 1. Among chosen countries there were statistically significant differences ($p < 0.05$) in terms of the proportion of the scores more than 10 points in the results of medical and technology students. In Germany and Portugal there were also statistical differences between medical and technology students' outcomes in terms of the proportion of the scores more than 10 points. The proportion of the scores more than 10 points of medical students is shown in Figure 2. Exact data of average score of the BDI and of the

proportion of the scores more than 10 points with p-value of medical and technology students are presented in Table 2. Distribution of minor and moderate depression of medical and technology students in Poland, Germany and Portugal was similar to distribution of average BDI. The level of severe depression of medical and technology students in Germany and Portugal was similar, but there was a significant difference ($p < 0.05$) of level of severe depression in Poland. The level of severe depression in Poland was higher than in Germany and Portugal. The exact distribution of minor, moderate and severe depression was presented in Table 3. The distribution of percentage of female and male students with depression was similar to distribution of average BDI, but in Portugal the percentage of female technology students was much more higher than from medicine studies. Question No. 14 had the highest score among the selected answers in the questionnaire. The exact distribution of female and male students with depression and the most frequently answered question of BDI questionnaire are presented in Table 4. The distribution of BDI scores < 4 , BDI Scores > 40 , the average of cognitive/affective subscale with BDI questions 1-13 and the average of somatic subscale with BDI questions 14-21 was similar to distribution of average BDI of medical and technology students from Poland Germany and Portugal.

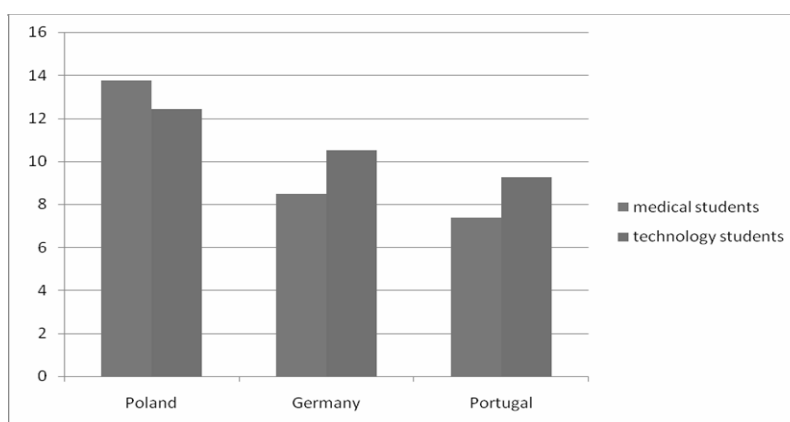


Figure 1. The average score of the BDI of medical and technology students from Poland, Germany and Portugal

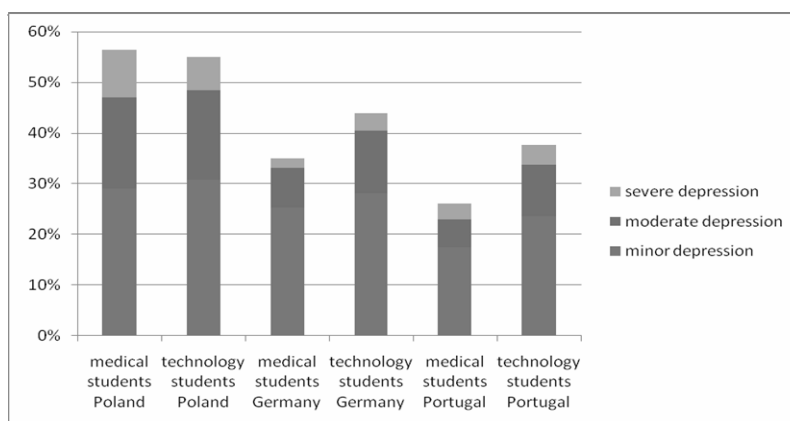


Figure 2. The distribution of minor, moderate and severe depression of medical and technology students from Poland, Germany and Portugal

Table 2. Exact data of average score of the BDI and of the proportion of the scores more than 10 points with p-value of medical and technology students from Poland, Germany and Portugal

		Poland	Germany	Portugal	p-value
Average BDI	Medical students	13.76±9.99	8.49±7.64	7.37±7.67	p<0.05
	Technology students	12.42±9.66	10.51±8.49	9.25±8.97	p<0.05
p-value		p<0.05	p<0.05	p<0.05	
BDI≥10	Medical students	56.32% 285/506	34.92% 154/441	26.03% 82/315	p<0.05
	Technology students	55.01% 368/669	43.82% 156/356	37.57% 136/362	p<0.05
p-value		p>0.05	p<0.05	p<0.05	

Table 3. The exact distribution of minor, moderate and severe depression of medical and technology students from Poland, Germany and Portugal

		Poland	Germany	Portugal	p-value
Minor depression	Medical students	29.05% 147/506	25.17% 111/441	17.46% 55/315	p<0.05
	Technology students	30.64% 205/669	28.09% 100/356	23.48% 85/362	p<0.05
p-value		p>0.05	p<0.05	p<0.05	
Moderate depression	Medical students	17.98% 91/506	7.93% 35/441	5.40% 17/315	p<0.05
	Technology students	17.79% 119/669	12.36% 44/356	10.22% 37/362	p<0.05
p-value		p>0.05	p<0.05	p<0.05	
Severe depression	Medical students	9.29% 47/506	1.81% 8/441	3.17% 10/315	p<0.05
	Technology students	6.58% 44/669	3.37% 12/356	3.87% 14/362	p<0.05
p-value		p<0.05	p<0.05	p>0.05	

Table 4. The exact distribution of female and male students with depression and the highest score among the selected answers in the questionnaire of medical and technology students from Poland, Germany and Portugal

		Poland	Germany	Portugal	p-value
Depression % female	Medical students	54.94% 189/344	36.76% 125/340	25.32% 59/233	p<0.05
	Technology students	54.85% 243/443	44.12% 120/272	44.66% 92/206	p<0.05
p-value		p>0.05	p<0.05	p<0.05	
Depression % male	Medical students	59.26% 96/162	28.71% 29/101	28.05% 23/82	p<0.05
	Technology students	55.30% 125/226	42.86% 36/84	27.67% 44/159	p<0.05
p-value		p<0.05	p<0.05	p>0.05	
The highest score among the selected answers in the questionnaire	Medical students	question 14 - 55 answers question 4 - 33 answers question 3 - 28 answers	question 14 - 29 answers question 11 - 12 answers question 8 - 10 answers question 17 - 10 answers	question 14 - 19 answers question 4 - 10 answers question 10 - 8 answers	
	Technology students	question 14 - 67 answers question 10 - 44 answers question 6 - 38 answers	question 10 - 24 answers question 2 - 16 answers question 8 - 16 answers question 16 - 16 answers question 17 - 16 answers	question 14 - 29 answers question 6 - 25 answers question 10 - 22 answers	

Table 5. Exact data of BDI scores <4, BDI scores >40, the average of cognitive/affective subscale with bdi questions 1-13 and the average of somatic subscale with BDI questions 14-21 of medical and technology students from Poland, Germany and Portugal

		Poland	Germany	Portugal	p-value
<4	Medical students	14.03% 71/506	30.16% 133/441	37.14% 117/315	p<0.05
	Technology students	17.19% 115/669	21.35% 76/356	31.21% 113/362	p<0.05
p-value		p<0.05	p<0.05	p<0.05	
>40	Medical students	2.57% 13/506	0.91% 4/441	0.63% 2/315	p>0.05
	Technology students	1.20% 8/669	1.12% 4/356	0% 0/315	p>0.05
p-value		p>0.05	p>0.05	p>0.05	
1-13	Medical students	9.05±7.27	5.09±5.15	4.57±5.03	p<0.05
	Technology students	8.73±6.65	6.42±5.75	5.93±6.17	p<0.05
p-value		p>0.05	p<0.05	p<0.05	
14-21	Medical students	4.22±3.68	3.41±2.94	2.80±3.04	p<0.05
	Technology students	3.93±3.66	4.09±3.39	3.33±3.32	p<0.05
p-value		p>0.05	p>0.05	p>0.05	

Exact data of BDI scores <4, BDI Scores >40, the average of cognitive/affective subscale with BDI questions 1-13 and the average of somatic subscale with BDI questions 14-21 are presented in Table 5.

DISCUSSION

Depression related to anxiety, stress and burnout affects medical students all around the world (Wild 2014). The conducted study confirmed this reference, revealing significant differences in the results of three different European countries. Presented results allowed to compare the prevalence of depression among the study group - students of medicine and the control group - among technical universities' students. In contrast to Poland, where the prevalence of depression in both groups reached similar values, in Portugal and Germany was much lower among medical students. It may be caused by differences in the society of those countries and different career prospects after graduation. The incidence of depression among Portuguese female students of technical university is remarkable, deviating of the rest collected data from this country.

Although the systems of education, career advancement and paths vary, students of medicine share familiar problems and dilemmas, regardless of home country. Presented results are quite intriguing, especially considering students of medicine from Poland. More than 56% of them received 10 and more points in the Beck Depression Inventory (BDI) score, which tends to reflect on the reason, why so many young, Polish future doctors suffer depression. This result is higher than among Polish society (41%) (Drózdź 2007). The answer to this question is not easy to

formulate. It has probably multifactorial background. Perhaps the reasons are similar to those suggested in the countries in which more than 50% of medical students also received the BDI 10 point or higher. Good example may be a study conducted in 2011 in Urmia University of Medical Sciences in Iran, which revealed the prevalence of depression among 52.6% of medical students. This result was explained by factors such as unemployment, economic inability to get married and to continue education (Aghakhani 2011). Extremely high incidence of depression in this specific environment have shown studies in India - giving the result of 71.25% (Kumar 2008), and Egypt - 80.5% (Ibrahim 2014) of depressed respondents. It should be noted, that in all the above-cited studies, the incidence of mild depression is approximate, within the range 22.6-31.3%. In addition, the incidence of severe depression among Polish students of medicine is more than 2 times higher than among Iranian (4%) (Aghakhani 2011, Kumar 2008, Ibrahim 2014). Even though the incidence of depression in the Brazilian study at the ABC Regional Medical School was lower (38.2%) than in Poland, the percentage of people with mild depression was comparable to Polish results, in the aforementioned range, reaching 24.9%. Moderate and severe level of depression in the case of Brazilian students is still lower than in presented study, reaching subsequently 11% and 2.3% (Baldassin 2008). Considerably lower prevalence of depression results based on BDI were obtained in Korea - 34.4% (Kim 2014) and in Dubai Medical College, United Arab Emirates - 29% (Ahmed 2009). Even lower percentage of medical students with depression was described in Ireland - 13.9% (Curran 2009).

Levine et al. emphasized the importance of conducting anonymous assessments of medical students, particularly when assessing sensitive psychological states (Levine 2003). Myers also highlighted the importance of anonymity in surveying medical student depression (Myers 2003). Surveys in presented study were distributed as online forms, instead of paper questionnaires. This method ensured higher intimacy and sincerity of answers.

Due to the widespread of depression among adepts of medicine it seems reasonable to accentuate solutions, which could reduce its level. Modification of the Educational Environment from traditional - non-integrated, teacher-centered to system-based curricula (SBC) significantly reduce the occurrence of depressive symptoms among female medical students (AlFaris 2014). Another possible method - the group logotherapy program for university students in Iran with depressive symptoms - was found to be effective in reducing depression levels (Robatmili 2015). There are attempts to conduct electroacupuncture treatment method in the case of medical students, proving efficacy in treatment their signs of depression (Dias 2014). Available sources report diversified trials undertaking prevention of depression among students of medicine, including the distribution of relaxation techniques, such as self-hypnosis (Wild 2014), encouragement of physical activity, improvement of psychiatric counseling and support services (Al-Eisa 2014). Finally, in 2011 Melo-Carrillo et al. (2012) proved in the four-year study that psychoeducation program can be an effective alternative therapy for decreasing the prevalence of depressive symptoms among medical students. Due to the high level of depression in such countries as Poland, it is worthwhile to popularize taking similar actions, and also undertake verification of their effectiveness.

The study was limited by the nature of the collected results online. The number of people who were served was limited. The work included only two universities in each country, Because conditions for collecting data in each country were similar, the anonymity of the respondents' answers and the fast possibility of collecting big amount of answers showed that an electronic survey had high utility in social surveys.

CONCLUSIONS

Depression affecting people in the prime of their lives is a serious problem among medical students, regardless the part of the world they are studying. The study revealed that highest depression level according to the BDI is present among medical and technology students in Poland. The lowest rate was among medical and technology students in Portugal. In Poland the level of depression in technical faculties is lower than in medical faculty, in contrast to Portugal and Germany where the level of depression in technical faculties was

higher than in the medical faculty. Due to the prevalence of depression among students, proper monitoring of depression is required, as well as rapid and appropriate help for those who suffer from it.

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