

Contributions to the Study of Depressive Phenomenon in Medical Students

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ABSTRACT Although the educational environment is unanimously recognized worldwide as having a high vulnerability to mental disorders, there is a lack of studies on a large scale concerning this matter in our professional literature. The investigation intended to prove the existence and epidemiological-clinical characterization of the depressive phenomenon in a local medicine faculty, with reference to a group of young people of similar age from non medical branches. The prospective study, compared and randomized, initiated in the Faculty of Medicine in Craiova (target group, 655 subjects), in 2008, had as control group young people of similar age belonging to the local academic and non-academic environment (310 subjects). The Zung Depression Scale (SDZ) has been used both anonymous and voluntary. At the Faculty of Medicine, the prevalence of students with scores higher than SDZ scale cutoff (i.e. ≥ 50) was $28,2 \pm 5,5\%$, and the level of the control group was $18,2 \pm 2,8\%$ ($\chi^2 = 8,88$, $p = 0,002$). Female medicine students were more significantly affected than the control group (153/512 vs. 52/231 - $\chi^2 = 4,33$, $p = 0,037$). The prevalence of responders with scores $SDZ \geq 50$ for the Medicine group showed in both sexes maximum values at the extremes of educational cycle (30,7% in the 1st and 2nd years, and 31,4% in the finishing years) and a minimum in the transition period (22,2%). For the Faculty of Medicine, compared with control groups, there has been a prevalence of the scores compatible with the mild forms of depression. There have been highlighted both individual and socio professional group particularities in circulating and aggregating the depressive symptoms in variable size clusters, from those with non clinical significance to those compatible with clinical and sub-clinical depression.

KEY WORDS depression, medicine students, Zung depression scale, epidemiology

Background

Depression and anxiety are common presences in the academic community, as shown in numerous studies and reports from various countries, all over the world. [1, 5, 24, 21, 30, 35, 41]. Medical educational environment includes a particular population segment in terms of both professional characteristics and the mental health. Several studies underline that a medical student has an increased vulnerability to mental disorders associated with stress factors acting, often combined, in very different ways in a demanding environment, competitive and appreciative, but also authoritarian, traditionalist, restrictive and with limited flexibility. [3, 6, 7, 8, 12, 13, 17, 28, 44].

Persistent exposure of the medical students at a high risk of stress [3, 6, 8, 9, 16, 19, 20, 34, 36, 43, 44] is a constant threat not only for their health but also for the performance, skills and attitudes that people expect from the new generation of medical doctors. [11, 15, 22, 23, 29, 32]

Objectives

The study originated in the lack of studies on depression among Romanian medical students, our approach aimed to identify the existence of the phenomenon in a local medical school, the

prevalence and distribution of subjects consistent with clinical depression, and weight and structural categories of the attributes of depression in the young people.

The results could support the initiation of directions and priorities for further research, the policy and institutional strategies to monitor and control the phenomenon of depression in the medical academic community. The study being ongoing, the data presented are the primary results of a large survey of the phenomenon of depression in medical students and non-medical academic peers and non-academic local young people.

Materials and methods

Prospective study, randomized, control group study, initiated in the academic year 2008/2009 in the University of Medicine and Pharmacy in Craiova (U.M.F), including students from the Faculty of Medicine (target group) and a control group consisting in young volunteer responders of similar age, randomized selected from the local non-medical academic and non-academic peers.

Among the MCQs distributed to the potential responders, outside exam periods, was also included Zung Depression Scale (ZDS), which includes 20 items aimed at the symptoms

(attributes) of depression, organized in four structural categories: pervasive affective disturbance (depressed affect, crying spells), physiologic disturbances (diurnal variation, sleep disturbances, decreased appetite, weight loss, constipation, tachycardia, fatigue, decreased libido), psychomotor disturbances (psychomotor agitation, psychomotor retardation), psychological disturbances (irritability, indecisiveness, confusion, dissatisfaction, hopelessness, emptiness, personal devaluation, suicidal rumination).

Designed in Lieckert system, the scale demands from the subjects answers quantifiable in four levels of weight, according to the presence of the depressive symptoms during the past two weeks (1 = None/a Little of the Time, 2 = Some of the Time, 3 = Good Part of the Time 4 = Most /All of the time). As a safeguard and to avoid the bias, half of the statements are equally worded symptomatically positive and negative.

The questionnaire is self-rated and requires less time to complete (5-30 minutes), is easily manipulated and quantified, suitable for statistical processing. The final aggregate score is indexed indicates the presence of symptoms that may be of clinical significance (if they are above the 50 points, the cutoff for corresponding clinical depression [46] At the same time, the scores provide information about intensity of the depressive disorder (50-59 – minimal to mild, 60-69- moderate to marked, ≥ 70 -severe to extreme depression). Zung Scale has a sensitivity of 97% and a specificity of about 67% [16] and a split-half reliability between 0.81-0.94 [7]

The questionnaires were centralized in a database, along with others converged data, and then subjected to statistical processing (Excel, MedCalc): descriptive analysis of target location (mean, median), dispersion (standard error, standard deviation), shape (variance, kurtosis, skewness), intervals of confidence, analysis of the relationship between variables (dependence) - matrix correlation and index of correlation Pearson, analysis for statistical significance - the *t* test for comparing averages of two groups χ^2 and *p*-value of significance (Fisher's exact test for small groups), one-way ANOVA test for comparing multiple media groups.

Because the self-rating scale was completed anonymously, for ethical and professional reasons, it was offered to the responders the possibility, by using a pseudonym, to request to a special email address the out coming of the evaluation together with the appropriate recommendation (e.g. opportunity to visit a specialist)

Results

From general data about the monitored groups (Table no. I), one observes a similar percentage of responders and comparable gender distribution ($\chi^2 = 0.81$, $p = 0.36$ respectively $\chi^2 1.58$ $p = 0.208$); for age, although average values are close, the difference is significantly higher in medicine, where were included individuals from all the years of study (ANOVA one-way, $df = 1$, $F = 8.29$, $p = 0.004$).

Table no. I. Responders main features

Target groups	Questionnaires distributed	Responders							
		Age (media, SD, y)		Females		Males			
		No.	%	No.	%	No.	%		
Medicine	725	655	90,3	21,7	±0,8	512	78,2	143	21,8
Preclinical years. (I+II)	225	202	89,7	19,6	±0,9	163	80,7	39	19,3
Transition years. (III+IV)	250	230	92,5	21,7	±0,9	179	77,8	51	22,2
Clinical years. (V+VI)	250	223	89,2	23,7	±0,8	169	75,8	54	24,2
Control	350	310	88,6	21,4	±2,4	231	74,5	79	25,5
Grand total/media	1075	965	89,7	22,5	±1,6	743	77	212	23

Main demographic data for the study and control groups, and medical responders grouped by level of training (preclinical, transition, clinical) are summarized in the table no. II. Comparative analysis of the data of the medical students with those of the witness shows statistically non-significant percentage differences regarding the gender distribution (OR 0.824, CI 95% 0.60 - 1.12, $\chi^2 1.14$, $p = 0.22$), child's rank (OR 1.16, 95% CI 0.70 - 1.93, $\chi^2 0.36$, $p = 0.54$), the „unmarried/bachelor” condition (OR 0.81 Ci 95% 0.57 - 1.13, $\chi^2 1.46$, $p = 0.22$) and significant in terms of membership in families with fewer children (OR 0.40 Ci 95% 0.30- 0.53, $\chi^2 40.4$, $p < 0.0001$) belonging to urban area (OR 0.58 CI 95% 0.41- 0.82, $\chi^2 9.47$, $p = 0.002$) and the divorcee condition (Fisher-t $p = 0.032$).

Characteristics of the groups pursued are comparable, as shown in the data box. I

General and on gender prevalence of the responders with scores above the cutoff of ZDS, (e.g. consistent with clinical depression) are shown in the table III

Among medical students, the percentage of those with scores ≥ 50 in the overall group was $28.2 \pm 5.5\%$, while in the control group it was $18.2 \pm 2.8\%$ (within that, only students at the University have been $16.7 \pm 1.34\%$). The

difference in prevalence between groups is dominated by medicine ($\chi^2 = 8.88$, $p = 0.002$). The medical female students' involvement was significantly higher than the control group (girls: 153/512 vs. 52/231 $\chi^2 = 4.33$ $p = 0.037$) but for the males, the percentage difference is non-significant statistically (30/143 vs 7/49 $\chi^2 = 1.05$ $p = 0.305$).

Table no. II. Main demographic data

Variables	Response type	I-II years		III-IV years		V-VI years		Medicine Group		Control Group	
		No	%	No	%	No	%	No	%	No	%
Gender	Male	39	19.3	51	22.2	54	24.2	144	22.0	79	25.5
	Female	163	80.7	179	77.8	169	75.8	511	78.0	231	74.5
Child rank	Rank I	123	60.9	124	53.9	137	61.4	384	58.6	187	60.3
	Rank II	61	30.2	83	36.1	71	31.8	215	32.8	100	32.3
	> Rank II	18	8.9	23	10.0	15	6.7	56	8.5	23	7.4
No. of siblings	Single	46	22.8	23	10.0	44	19.7	113	17.3	48	15.5
	2 children	113	55.9	140	60.9	112	50.2	365	55.7	114	36.8
	>2 children	43	21.3	67	29.1	67	30.0	177	27.0	148	47.7
Origin	Urban	170	84.2	198	86.1	195	87.4	563	86.0	242	78.1
	Rural	32	15.8	32	13.9	28	12.6	92	14.0	68	21.9
Marital status	Single	184	91.1	192	83.5	161	72.2	537	82.0	244	78.7
	Married/concubine	14	6.9	38	16.5	53	23.8	105	16.0	65	21.0
	Divorced	4	2.0	0	0.0	9	4.0	13	2.0	1	0.3

Box no. I Responders' main common features

Faculty of Medicine (about 22.5% of the students):

- Women: men ratio - 4:1
- Predominance of single or low rank children in the family (91.5%)
- Origin of the majority in families with 2 children (55.7%)
- The absolute majority of urban origin (86%)
- Absolute predominance of the unmarried people (82%)

Witness Subjects (about 35 % of the non-medical socio-professional group)

- Women: men ratio - 1:3
- Predominance of single or low rank children in the family (92.6%)
- Origin of the majority in families with 2 children (47.7%)
- The absolute majority of urban origin (78.1%)
- Absolute predominance of the unmarried people (78.7%)

Table no. III. Prevalence and gender distribution of subjects with ZDS scores above the depressive cut off

Group	ZDS score	No of subjects with ZDS score ≥ 50	%	Females		Males	
				No.	%	No.	%
Faculty of Medicine	43,4 \pm 10,1	183	28.2	153	83.6	30	16.4
Control	43,7 \pm 10,2	59	19	52	88,1	7	11,9

Concerning the prevalence of the responders with ZDS scores ≥ 50 at the Faculty of Medicine group, for both females and males, however, different values were recorded depending on years of study, with the maximum at the extremes of the educational cycle (30.7% during the preclinical, and 31.4%, respectively, in the final years) and a minimum for the transition period (22.2%). Thus, chart appearance was a "V" shaped curve (Fig. 1)

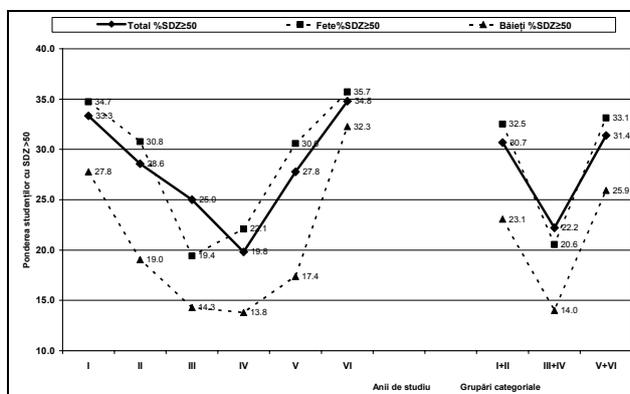


Fig. no. 1 Prevalence of the medical students with ≥ 50 ZDS scores according to years and cycles of study

If the average ZDS indexed score / subject (table III) in medical students and witnesses groups is very similar (Fisher-t = 0.627, $p = 0.534$), the responders' distribution on decimal ZDS score tier analysis showed particular aspects (table. IV).

Table no. IV. The responders' distribution by tiered decimals ZDS scores

Groups	Respo nders	Tiered decimals ZDS scores					Grand total	
		≤ 29	30-39	40-49	50-59	60-70		≥ 70
I+II years	Nr	14	84	43	44	8	9	202
	%	6.9	41.6	21.3	21.8	4.0	4.5	100.0
III-IV years	Nr	5	90	83	32	16	4	230
	%	2.2	39.1	36.1	13.9	7.0	1.7	100.0
V-VI years	Nr	14	67	72	54	14	2	223
	%	6.3	30.0	32.3	24.2	6.3	0.9	100.0
Faculty of Medicine group	Nr	33	241	198	130	38	15	655
	%	5	36.8	30.2	19.9	5.8	2.3	100.0
Control group	Nr	21	82	148	25	32	2	310
	%	6.8	26.5	47.7	8.1	10.3	0.6	100.0

One notes that 274 (41.8%) of medical responders lie between 0-39 points and they are basically those to whom most ZDS depressive symptoms are reported predominantly as "none/a little of the time", and/or "some of the time" in the period immediately preceding the test administration. In the control group, 103 responders (32.9%) meet this condition, but the superiority of the medical weight is significant ($\chi^2 = 6.55$ $p = 0.01$).

In the interim zone (i.e. around the 50 points depressive cut-off), were located 328 medical students (50.1%), and among them 130 students (19.8%) have had values between 50 and 60 points (corresponding to clinic mild depression).- In the control group, 173 responders (55.8%) were located close to the depression threshold of the scale, but without significance compared with medical students' situation ($\chi^2 = 2.77$ $p = 0.096$); of these, only 25 subjects (8.1%) were clinically compatible with mild depression symptoms. This prevalence was significantly lower than that of the medicine group. ($\chi^2 = 33.62$, $p < 0.001$).

In the zone with ZDS scores ≥ 60 points (values compatible with moderate / severe clinical depression) have been identified 53 medical students (8.1%) and 34 subjects in the control group (11.6%), but the percentage difference is not significant ($\chi^2 = 2.12$ $p = 0.14$).

Mean scores of the ZDS structural sub-categories of depressive symptoms, presented in table V according to the position of the subjects to the threshold of depression, are higher in most cases of the control group compared to those of medicine. ($p < 0.05$). An exception is in the

subcategory of psychological distress, with a higher average to medical students, but without significance in comparison with the controls (Fisher $p = 0.055$ $t = 3.71$)

Table no. V. Average scores of the structural subcategories of depressive symptoms in relationship with the ZDS cut-off

ZDS scores groups	Study groups	Pervasive affective disturbances		Physiologic disturbances		Psychomotor disturbances		Psychological disturbances		Average Zung scores	
		Media	DS	Media	DS	Media	DS	Media	DS	Media	DS
≥ 50	Faculty of Medicine	5.24	1.68	22.14	3.45	5.22	1.55	23.87	4.82	56.47	6.64
	Control group	5.75	2.01	24.80	3.61	6.59	1.51	24.60	3.16	61.71	4.96
< 50	Faculty of Medicine	3.45	1.14	15.95	3.08	3.56	1.36	15.32	3.42	38.27	5.64
	Control group	3.64	1.23	16.60	3.23	4.75	1.87	14.88	3.09	39.85	5.77

The analysis of the depressives symptoms in relation with the overall score achieved by each of the 20 included in the ZDS has allowed a classification according to the individual amount. In Table no. VI are presented in decreasing order of total value the medical responders' depressive attributes who have exceeded 10% of the general Zung score of the group and the corresponding pairs of the control group. In medical students the top is dominated by psychological disturbances and outlines a core depressive anxiety. The control group was dominated by psychological and somatic symptoms, the latter forming a somatic depressive core well-defined

Table no. VI. The main depressive symptoms in relationship with the ZDF cutoff value

No	ZDS score ≥ 50				ZDS score < 50			
	Medical students		Controls		Medical students		Controls	
	Symptoms	Score \log_{10}	Symptoms	Score \log_{10}	Symptoms	Score \log_{10}	Symptoms	Score \log_{10}
1	Indecisiveness	2.84	Sleep disturbances	2.82	Diurnal variation	3.16	Sleep disturbances	2.89
2	Irritability	2.83	Libido	2.77	Decreased appetite	3.09	Decreased libido	2.81
3	Devaluation	2.78	Psychomotor agitation	2.76	Indecisiveness	3.06	Psychomotor agitation	2.8
4	Hopelessness	2.77	Tachycardia	2.73	Devaluation	2.98	Tachycardia	2.75
5	Diurnal variation	2.76	Dissatisfaction	2.69	Hopelessness	2.96	Dissatisfaction	2.73
6	Decreased appetite	2.76	Indecisiveness	2.67	Psychomotor agitation	2.96	Psychomotor retardation	2.73
7	Confusion	2.75	Emptiness	2.67	Confusion	2.95	Indecisiveness	2.72
8	Fatigue	2.75	Confusion	2.67	Constipation	2.95	Emptiness	2.7
9	Dissatisfaction	2.73	Psychomotor retardation	2.66	Dissatisfaction	2.95	Constipation	2.68
10	Psychomotor agitation	2.72	Fatigue	2.65	Irritability	2.94	Confusion	2.68

Discussions

The study aimed to identify and describe the main epidemiological features of the depression phenomenon in the medical students' community with reference to a local group of young people of

similar age from non-medical social-professional fields. Because we did not find reliable information regarding the prevalence of depressive distress in medical students in Romania, we have referred to international data. In our study, the average prevalence of medical

students identified with ≥ 50 ZDS indexed scores was significantly higher than the control group.

In the world, college students reported higher levels of prevalence of depressive disorders than the general population mean [5, 17, 21, 30, 31, 34, 41], especially in medical faculties. [12,13,14]

In the last quarter century, in medical students were reported varied prevalence of depression, with or without anxiety. For example, in U.S we found values between 12% and 25% [9, 19, 37], in Brazil - 32% [6], in Dubai - 28.6% [2], in Beijing and Hong Kong - 33.7% and respectively 61.5% [38], Pakistan - 42.9% [25], and Nigeria -23.3% [4]. Our data were included in these limits and are over the prevalence of depression in European general population (13%) [42].

To Spiesel's observation [39], that whole process of medical education is a major stressor, one can add that the entire medical career is putting a heavy strain on the health (physical, mental, spiritual) of those who practice. Among the identified stressors over time, Goebert. D et al. qualify as frequent: busy work, sleep deprivation, difficult patients, inadequate learning environment, financial problems, pressure of the information, career planning [18]. By stressing a pressure on many of the actors in the medical field, people with various skills of resilience, result increased vulnerability to depression and anxiety. [26, 27, 33, 45].

In our study, we identified differences in prevalence of depression scores in the various stages of academic education: higher in both preclinical (I-II) and terminal (V-VI) years of study along with minimum values during transition (III-IV), with a graphical representation of the prevalence in a "V" shaped curve. Other authors have also found such differences in the prevalence of anxiety and depression correlated with academic educational attainment. [9, 33, 37, 18].

At the beginning of the college, medical students have a mental health similar with other young people of the same age but, unfortunately, over the years of studies, it often gets worse in some of them [3, 6, 8, 9, 18, 20, 32, 36] The sources of psychological stress for medical students obviously vary depending on years of study. In the first year of training, in the *emancipated identity* building period, many students are suddenly faced with leaving home and *traded separation* from the natural parents, separation from friends, but also with problems of integration into a new system of education. Just admitted - often through a rigorous selection system - young people must cope quickly with

complex academic environment and, at the same time, to integrate into a group of peers, similar in motivation and intelligence. Dissection of human bodies is a known stressor [20] but also other stress factors such as the increasing workload and learning, concern for performance, in an extremely proud and competitive educational environment, are characteristic for this transition period [40]

With the entry into clinical years, students will break the initial groups, and begin the rotations from a specialty to another, constantly changing environment, surroundings, conditions and/or requirements. Each training request a specific set of knowledge and skills, which emphasize training deficits rather than positive accumulating. The learning, program unstructured routinely, exposure to human suffering in hospitals, lack of leisure time, concerns about the financial situation, are all additional sources of psychological stress characteristic of this period [10] In the final years one add the future job worries, imposture syndrome, thoughts on starting a family or paying bank debts for the studies a.s.o.

Symptoms of depression are common to all young people, but one describes quantitative and qualitative differences between the sexes, years of study, specialization, curriculum, working milieus etc. Many students have subclinical forms of depression, according to Survive the American College Health Association, 45% of the females and 36% of the males would present in 2006 such disorders [1] From our data results that during 2008/2009, in the off exam sessions time, medical students with ZDS scores of depression had as dominant attributes: indecisiveness, irritability, personal devaluation, diurnal variation and change in appetite. The control group was dominated by: sleep disturbance, change in libido, psychomotor agitation, tachycardia and dissatisfaction.

The group of medical students with Zung scores ≥ 50 points have a core of depression with anxiety as a consequence of multiples stressors acting in the community convergent with their own vulnerabilities. . In the control groups with similar scores, the depression somatic attributes are dominant and may be the result of economic-social pressures with physiological changes, which may often be accompanied by psychological disturbances

If differences in depressive profile of communities is a recognized phenomenon in literature, when one talk about individuals depression each subject express his/her depression in a personal equivalent. Using an self-assessment, it seems natural that medical students

are prone to give different meanings or nuances, and they seemed to perceive or to be concerned with rather more abstract and subtle attributes of the psychological sphere, while their non-medical peers feel as a priority and report the somatic components of depression. These differences in presentation, reflected in the ZDS scores for structural categories, are represented by the different quality of depressive symptoms, such as intensity / persistence; a ranking of the first 10 symptoms according individual total ZDS scores per attribute confirm the importance of the type of each symptom. But quantitative aspects are also involved, the depressive attributes aggregate variable in clusters with different weight in the general depression score.

Higher values recorded in the control group are correlated with an increased intensity of the depression. In medical students - albeit with a higher prevalence - on dominates the mild forms of depression. The aspect is actually reported in the literature [24]

Final observations and conclusions

Based on the results of the screening tests on representative groups for indigenous medical students communities, the study confirms the existence on a large scale of the complex depressive phenomenon, affecting about one third of the students, beyond the level identified in other non-medical young people. Considering the sensitivity and specificity of ZDS, the dimensions of the phenomenon could be even larger.

Even if the administration of a self-rating test of depression does not allow a clinical diagnosis of certainty, in one's practice specialist interview is mandatory, the previous conclusion concerning the locally depressing phenomenon remains valid, and confirms for Romania that medical academic environment is one particular depressive and an anxiety generator

In the community of medical students, compared with control groups, dominated ZDS scores compatible with mild / moderate depression.

There are individual features but also socio-professional group related in the movement and aggregation of the depression symptoms in complex of attributes of varying sizes, ranging from those without clinical significance to those compatible with the subclinical and clinical depression.

Considering this data, it is extremely important that the managers of medical faculties and all the faculties should become aware of the importance of the phenomenon of depression and negative

consequences on the personal and professional students and young doctors evolution and participate actively in preventing and maintaining it under control.

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