Prevalence of Depressive Symptoms among College Students and the Influence of Sport Activity

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A B S T R A C T

The present study asses the prevalence of depressive symptoms among college students in Split, Croatia, and positive influence of sport activity on decreasing the depression symptoms. Authors screened all 664 college students of the first year of study. All of them were over the 18 years and the mean age was 19.4±1.2 years. There were 466 females (70.2%) and 178 (26.8%) males. They answered The Beck Depression Inventory (BDI) and questionnaire about their sport activity (no sport activity, recreational and active in sports). For the purpose of the analysis depressive symptoms were defined as a score of >11. Chi-square and Mann-Whitney test were used for data analysis. 9.4% of the students had significant depression symptoms (score >11). No one student had score >26 (symptoms of major depression). Statistically significant lower score on BDI have students who are active in sports (score median=3) compared to group of recreational (score median=4) and in correlation to group who are not active in sports (score median=5) (Kruskal – Wallis: p<0.001). In the group of active in sports (N=254) there are only 5.5% with depressions symptoms, while in the group of non active in sports (N=60) are 18 depressive (χ²-test: p=0,005). Females are statistically more depressed than males (χ²-test: p=0.01). In the female group 49 (10.5%) are depressed, and in the male group are 9 (5%). Compared to gender in separate analysis we did not find correlation of decreasing depression symptoms and sport activity among males (χ²-test: p=0.47), while in females we find that sport activity has significant effect (χ²-test: p=0.026). Our results shoved moderate values of depression symptoms among college population in Split, Croatia. More females than males experienced depressive symptoms. While sport activity did not have significant influence on the depression in male population, it has significant influence in reducing the depression symptoms among females.

Key words: *depression, sport activity, adolescence*

Introduction

Adolescence is considered to be a period of more often manifestation of depressive mood, although depression is found more often in children before puberties, especially in girls. The risk for depression increases in adolescence[1].

The period of adolescence is between 10 to 19 years of age, according to Joint Statement of World Health Organisation (WHO), United Nations Population Fund (UNFPA) and The United Nations Children's Fund (UNICEF)[2].

Depression signifies an affective experience (mood state), a complaint (reported as a symptom) as well as a syndrome defined by operational criteria. Depressive disorders are classified as major depressive disorder (MDD), dysthymic disorder (DD), or depressive disorder not otherwise specified[3].

An overview of the research has clarified the positive effects of physical activity on mood swings, as well as its application in reducing clinical symptoms of depression[4–7].

Evaluating depressive symptoms or severity of depressive disorder can be assessed by using standardized psychometric instruments. The measuring instruments used in the diagnosis and evaluation of depressive disorders are self-report inventories or Psychiatric rating scales conducted by a trained clinician. A self-report inventory is a type of psychological test in which a person fills out a survey or questionnaire with or without the help of an investigator. The mostly used psychometric rating scales for depression are Hamilton Depression Scale (HAM-D) and Montgomery-Asberg Depression Rating Scale (MADRS)[7–9].

BDI can be used for both adults and adolescents 13 years of age and older. Beck Depression Test is a standard measure of depression used mainly in research and for the evaluation of effectiveness of depression therapies and treatments. It is not meant to serve as an instrument of diagnosis, but rather to identify the presence and severity of symptoms consistent with the criteria of the DSM-IV[9–11].

Materials and methods

In a prospective, anonymous and voluntary study during the 2010 undertaken in Split, Croatia, the authors screened the first year college students of the University of Economics Split. The survey contained questions about gender, age, experience in sports and recreational activities in the last two years and a multiple choice self-report inventory The Beck Depression Inventory (BDI). Questions of the BDI II assess the typical symptoms of depression such as mood, pessimism, sense of failure, self-dissatisfaction, guilt, punishment, self-dislike, self-accusation, suicidal ideas, crying, irritability, social withdrawal, body image, work difficulties, insomnia, fatigue, appetite, weight loss, bodily preoccupation and loss of libido. The statements describe how the subject has been feeling in the last week. The Inventory consists of twenty-one question and highest total score is 63. The standard cut-offs are divided into four groups as follows: 0–11 indicates minimal depression, 12–19 indicates mild depression, 20–26 indicates moderate depression and 27–63 indicates severe depression. Some items on the BDI have more than one statement marked with the same score.

The authors screened all the 677 first year college students. Six students were excluded because of psychiatric anamnesis or taking psychiatric drugs, as well as 7 students with traumatic experience as precipitating cause of depression, such as death or a serious illness in family, failing the academic year or breaking the emotional relationship. A total of 13 students were excluded, and 664 students remained for further analysis.

Due to the fact that there were no subjects with a score higher than 26, the subjects were divided into three groups: not depressed, mildly depressed and moderately depressed.

According to data about sport activities the subjects were divided into three groups: 1) Active in sport; means being a member of a sport club, daily training and participating in competitions and matches; 2) Recreational sport activities; we defined as at least twice a week trainings, recreational programme conducted by a trainer organised in sport clubs or recreational centres (e.g. fitness centres); 3) Without sport experience.

The data were analyzed using SPSS for Windows, version 12.0. SPSS Inc. χ^2 and Mann-Whitney test were used for data analysis. A p value <0.5 was considered statistically significant.

Results

Authors screened 664 students average age of 19.2 years. The youngest subject had 17 and the oldest 21 year. There were 466 females (72.3%) average age of 19,7 (18.8–20.3) and 178 (27.7%) males average age 19.3 (17.9–21.4). There was no statistically significant difference in the age between genders.

According to The Beck Depression Inventory (BDI) results were divided into four groups as follows: a) 0–11 indicating minimal depression, b) 12–19 indicating mild depression, c) 20–26 indicating moderate depression and d) 27–63 indicating severe depression. Among our subjects, none scored higher than 26 (severely depressed), so for the purpose of analysis, we divided subjects in two groups according to score, up to 11 (not depressed) and higher than 11 (depressed). See Table 1.

TABLE 1
PRESENTATION ACCORDING SPORT ACTIVITY, DEPRESSION AND GENDER

		Score: 0–11 (not depressed)		Score: >11 (depressed)		Total	
		M	F	M	F	M	F
Non active in sport	N	5	44	1	10	6	54
	%	83.3%	81.5%	16.7%	18.5%	100%	100%
Recreational	N	65	231	4	30	69	261
	%	94.2%	88.5%	5.8%	11.5%	100%	100%
Active in sport	N	98	142	5	9	103	151
	%	95.1%	94%	5.8%	6.0%	100%	100%
Total	N	168	417	10	49	178	466
	%	94.4%	89.5%	5.6%	10.5%	100%	100%

TABLE 2

NUMBER OF STUDENTS ACCORDING TO SPORT ACTIVITY AND DEPRESSION IN THE TOTAL SAMPLE,
AND SEPARATED AMONG MAN AND WOMAN

| | | Sport activity No (%) of students | | | |
		Active in sport	Recreational	Non active in sport	P*
All students tested		N=254	N=330	N=60	0.005
	Score ≤11	240 (94.5%)	296 (90%)	49 (82%)	
	Score >11	14 (5.5%)	34 (10%)	11 (18%)	
		Number of depressive 59 (9%)			
Men		N=103	N=69	N=6	0.47
	Score ≤11	98 (95%)	65 (94%)	5	
	Score >11	5 (5%)	4 (6%)	1	
		Number of depressive men 10 (5%)			
Women		N=151	N=261	N=54	0.026
	Score ≤11	142 (94%)	231 (88%)	44 (82%)	
	Score >11	9 (6%)	30 (11%)	10 (19%)	
		Number of depressive women 49 (11%)			

*Chi-square test

Significant depressive symptoms (Score>11) were found in 9.2% students. Significantly lower score at BDI was found in active sportsman (score median=3) in comparison to recreational (Score median=4) and those not active in sport (Score median=5) (Kruskal-Wallis: p<0.001). In the Active in sport group (n=254) there were only 5.5% of subjects with depressive symptoms, while in the Non active in sport group (n=60) there were 18% of depressed subjects (χ^2-test: p=0.005). See Table 2.

Females were significantly more depressed than males (χ^2-test: p=0.01). In the female students group 49 (10.5%) of them were depressed, and in the male students group 10 (5%) of them. Separately analysing according to the gender, we didn´t find corelation of depressive symptoms with sport acitivity among male students (χ^2-test: p= 0.47), unlike to female students where sport activity had signifficant effect (χ^2-test: p=0.0026). In the Active in sport females sample (n=151) only 6% were depressed, while in the Non active in sport females (n=54) 18.5% were depressed. See Table 2.

There is statistically significant correlation of the total scores on The Beck Depression Inventory (BDI), according to participation in sport activity. We did not present the difference in the total scores among the Non active in sport and Recreational sample (Mann-Whitney: p=0.466). The Non active in sport group had 1.7 time higher median in the total score than Active in sport group (Mann-Whitney: p<0.001). The Active in sport group had lower median than the Non active in sport and Recreational group (Figure 1).

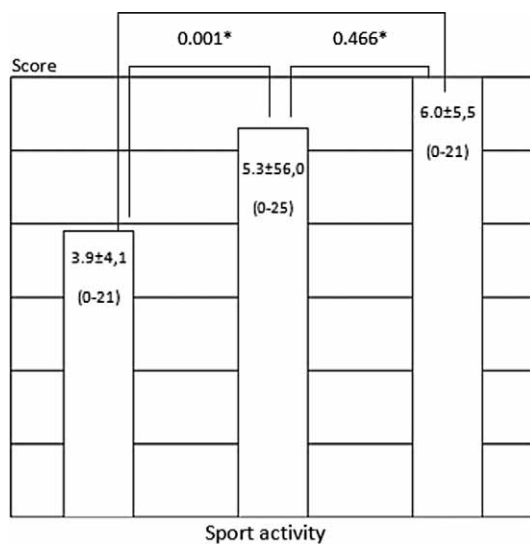## Discussion

Past research has linked physical activity and sports participation with improved mental and social well-being, including reduced risk of depression and suicidality[12].

According to De Vries physical activity reduces anxiety, enhances well coping with stress and has tranquilising, relaxing effect[13].

Chaouloff in the review »Physical exercise and brain monoamines«, discusses the link of exercise to mental health and suggests that the two are closely bound. Among the current hypotheses, those regarding the endorphin and the monoamine systems have received a great deal of attention. On that basis, the respective effects of physical exercise on brain dopamine, noradrenalin and serotonin transmission are reviewed[14].

Fig. 1. Sport activity in correlation to score (*Kruskal-Wallis test).

Regular and moderate sport activity results in many psychical and physiological benefits, while exaggerated exercises may result in weakening the immune system in coping with illness and increasing negative mood[15].

Subjects »addicted« to exercise express changes in the mood in the cases when regular schedule of training has been changed for any reason[16].

The biopsy of athlete muscles has shown correlation between decreasing of muscular glycogen and increasing mood disorders[17].

Among our subjects none scored higher than 26 (severely depressed) on The Beck Depression Inventory (BDI). Adolescents very often express atypical symptoms such as hypersomnia, increases in appetite, fear of being rejected and lethargy[18]. Symptoms of moderate depression are clinically very obvious and need psychiatric treatment, so we excluded the subjects with psychiatric anamnesis.

Jan E. Fleming and David R. Offord in their survey estimate the point prevalence of depression in adolescents being 0.4–6.4%[19] while Lewinson found 4–8%[20]. In our group of adolescents there was 9.2% of depressive subjects, which is significantly higher in comparison to other surveys. Our group of subjects is representative, because it consists of 664 subjects. We try to explain the more frequent appearance of depression in our students by the very fast and dramatic onset of the economic crisis in Croatia as well as by the psychological consequences of the recent war on our territory. The use of psychoactive

substances in a larger extent might also be one of the reasons.

In our survey females have shown higher depressive score than males, which is consistent to the data found in the literature[21,27–31]. There is higher risk of depression for females in the adolescence in comparison to the age before puberty, where no gender difference was found[22,23].

We didn't establish any connection between sport activity and depressive score in the group of male students. Female students participating in sport activities have lower score than those not participating in sports or recreation. Similar influence of sport activity on the degree of depression has been presented in other articles.

Ahmadi et al. have shown that various types of exercises in female adolescents are associated with lower mean scores on the Beck Depression Inventory BDI[24].

While physical activity is generally associated with reduced depression and suicidal ideation for males, frequent exercise may signal an elevated suicide risk in their female counterparts, possibly due to links with negative body image, low self-esteem, depression, and suicidality[25].

Compared with students not active in sports, students athletes express higher self-esteem[26] and lower depressive score[27–30].

A repeatedly measured analysis of variance indicated no significant change in mean mood state scores. Subject's scores remained fairly happy throughout the length of the course, women having significantly happier scores than men[24].

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PREVALENCIJA DEPRESIVNIH SIMPTOMA MEĐU STUDENTIMA I UTJECAJ SPORTSKE AKTIVNOSTI NA DEPRESIVNE SIMPTOME

S A Ž E T A K

Studija prikazuje prevalenciju depresivnih simptoma među studentima prve godine Ekonomskog fakulteta u Splitu, te pozitivne učinke sportske aktivnosti na ublažavanje depresivnih simptoma. Ukupan uzorak brojao je 644 studenata, svi stariji od 18 godina, prosječne dobi 19,4±1,2 godine, od čega 466 žena (70,2%) i 178 muškaraca (26,8). Primijenjen je Beck-ov indikator depresije (BDI), kao i Upitnik sportske aktivnosti (nesportaši, rekreativci i aktivni sportaši). U svrhu analize, depresivni simptomi su definirani kao skor >11. Za analizu podataka korišteni su χ^2-test i Mann-Whitney test. Signifikantne depresivne simptome (skor >11) manifestirala su 9,4% studenata. Niti jedan student nije pokazao skor >26 (simptomi teške depresije). Statistički značajno niži skor na BDI samoocjenskoj ljestvici imali su studenti aktivni u sportskim aktivnostima (median skor=3) u usporedbi sa skupinom rekreativaca (median skor=4) te u usporedbi sa studentima koji ne sudjeluju u sportskim aktivnostima (median skor=5) (Kruskal-Wallis: p<0,001). U skupini aktivnih u sportskim aktivnostima (N=254) samo je 5,5% iskazalo depresivne simptome, dok je u skupini studenata bez sportskih aktivnosti (N=60) njih 18 depresivno (χ^2-test: p=0,005). Žene su statistički više depresivne od muškaraca (χ^2-test: p=0,01). U skupini žena 49 (10,5) ih je sa signifikantnim depresivnim simptomima, dok je u skupini muškaraca 9 (5%). Odvojenom analizom prema spolu nismo dokazali povezanost depresije sa sportskom aktivnošću kod muškaraca (χ^2-test: p=0,47), za razliku od žena kod kojih je ta povezanost značajna (χ^2-test: p=0,026). Naši rezultati pokazali su umjerene vrijednosti depresivnih simptoma među studentskom populacijom u Splitu, Hrvatska. Žene su iskazale depresivne simptome više nego mulškarci. Dok sportske aktivnosti nisu imale značajan utjecaj na depresivnost u muškoj populaciji, kod žena su značajno umanjili depresivne simptome.