

CLINICALLY SIGNIFICANT DEPRESSIVE DISORDER IN ADOLESCENCE; CROSS-SECTIONAL STUDY OF TWO CROATIAN COUNTIES

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SUMMARY

Background: The aim of the study was to determine whether there is a difference in the intensity of depression, suicidality, and expression of clinical features among adolescents in two different regions of Krapina-Zagorje (KZ) and Split-Dalmatia (SD).

Subjects and methods: The study was designed as a descriptive cross-sectional, the sample consisted of 200 adolescents, 100 from each region, aging 16-18 years, from various high schools. The research was conducted by psychiatrists in Split and Krapina, where school population of Split-Dalmatia County and Krapina-Zagorje County gravitates. For the assessment of depression, the Hamilton rating scale for depression with 21 items was used, which has proven in clinical practice. For the inclusion in the study, among other parameters, participants needed to satisfy the criterion that depression is clinically significant (19 or more points on the HAMD-21).

Results: The data obtained points out to statistically significant difference in the intensity of depression between the two regions ($p < 0.001$). There was no difference in suicidal impulses. For the most part, the expression of clinical features between adolescents in these regions showed no significant difference, except that guilt ($p = 0.001$), failing in the work plan and activities ($p = 0.000$) and paranoid ideas ($p = 0.013$) were significantly more expressed in adolescents of Krapina-Zagorje County and sleep disorders ($p < 0.001$) in adolescents of Split-Dalmatia County.

Conclusions: It can be concluded that depression, suicidality and much of the clinical features depend on the developmental age, i.e. the turbulent adolescent development, rather than on regional differences, although, to a lesser extent, the expression of clinical features can be influenced by milieu, lifestyle, family dynamics and educational procedures, which can partially affect the expression of clinical features.

Key words: depression – adolescents - regional differences

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INTRODUCTION

Adolescence is considered a critical phase of human life due to significant changes in a person's life that occur during that period, and refer to the biological, psychological and social functioning. In the domain of social change, adolescence is a time of development in which an individual is expanding its relations outside the family into the wider social world. Relationships with parents and the environment are dramatically changing. Adolescence is generally referred to as a critical period in relation to the psychological development of the self. This period of life can be divided into: preadolescence (10-12 yrs.), early adolescence (12-13 yrs.), middle adolescence (14-17 yrs.) and late adolescence (from 18 yrs. to the end of the functional development of the brain) (Blos 1962, Nikolić 1989, Offer et al. 1996).

Depression is one of the common medical disorders in adolescence today. It has been believed for a long time that variable and depressed mood is normal in adolescent years, but often depression first starts in adolescence and should be taken seriously. Most young people are not going through the "storm" and

are considered mentally healthy (Rao & Chen 2009). Conventional wisdom, that the highest incidence of depression is in the thirties, must be reviewed, since studies conducted at the end of the last century showed a reduction trend towards ever earlier age (Haarasilta et al. 2001, Kessler & Walters 1998). The average age for the occurrence of adolescent depression is 15 years (Kessler & Walters 1998). Prevalence shows a very wide range from one study to another, and regarding the country that carried it out. The causes are the methodological differences (Thapar et al. 2012). Numerous epidemiological studies indicate that more than 8.3% of adolescents suffer from depression. Depression in adolescents is associated with a high risk of suicidal behavior. According to some studies, 7% of them commit suicide. Adolescent psychopathology is characterized by a number of dimensions that are not easily grouped into typical symptoms and only partially correspond to that seen in adults, so today anxiety in them is one of the biggest problems in psychodiagnostics. It is about psychological problems whose clinical features are extremely heterogeneous and change in the function of maturation. In adolescents, depression is described by feelings of loneli-

ness, helplessness, anger and disappointment in the family and friends who do not understand them. In clinical features, there are different changes in boys and girls in the function of age. Depression, as a disorder in the DSM-IV classification (American Psychiatric Association, 2000), is today described in a group of mood disorders, wherein the same criteria are used in diagnostics for children and adults (Birmaher et al. 1996, Fleming & Offord 1990, Mastropalo 1972, Nikolić 1988, Nikolić 1989, Nikolić 1990, Otto 1972, Shaffer et al. 1996).

Culture is a whole which includes knowledge, beliefs, art, morals, law, customs and any other capabilities and the habits that a person has acquired as a member of society. Culture is learned and shared with others, dominates an individual who is in constant interaction with the culture, but as it affects him, forming the symptoms and characteristics, he also affects her. According to some authors, culture and not biology determines human behavior in the transitional period of life, which adolescence is. The individual is the result of cultural behavior, that shapes the personality on an ordinary, but unique way. Arabic geographer Ibn Khaldun, in the 14th century, tried to explain the differences between cultures with climate. A passionate and expressive society survive in warmer climates, while more restrained, less passionate cultures, are found in more northern climates. Since then, and probably earlier, cultural differences, regional differences, and preoccupation with them, is embedded in human consciousness and determines numerous prejudices. At the present time, under the influence of globalization, population migration, better connectivity and outermost regions, customs, values, beliefs and everything that makes a culture gradually intertwine, as one society transmits cultural features to the other (Lewis-Fernandez & Klinman 1994, Devereux 1992, Jerry 2002)

That is exactly why clinical features of depression and to what extent regional differences affect the expression of symptoms, represented the focus of our interest. The study included two different counties: one continental in the north and one coastal in the south. Marked climatic and cultural characteristics of the region result in different temperaments belonging to these areas, which we considered as to possibly be reflected on the expression of symptoms.

Aim and purpose

The aim of the study was to determine whether there is a difference in the intensity of depression, suicidality, and expression of clinical features among adolescents in two different regions of Krapina-Zagorje (KZC) and Split-Dalmatia (SDC).

The purpose of this paper is to aid development of preventive programs for adolescents with depressive disorder, and to aid prevention programs adjustment to the real requirements of our living environment.

SUBJECTS AND METHODS

Subjects

We conducted a descriptive, cross-sectional study, in two Croatian counties: Krapina-Zagorje (in the north) and Split-Dalmatia (in the south). The study included 200 participants, 100 from each county, aged 16 to 18. To ensure compatibility for age, gender and education, in every county 50 participants were female and 50 male adolescents, and the study was conducted in a variety of secondary schools: gymnasium, apprenticeship and vocational schools.

All the participants met the following inclusion criteria: being high school students, who, at the time of the study, had 16 to 18 years, who did not suffer from severe psychological or physical trauma, and who, at the time of the study, were not suffering from serious physical illness. Because they were not patients, but high school students, as well as children without chronic illness, permission for this research was provided, in accordance with applicable regulations, by the Office of the State Administration for Education and the competent authorities of the school.

Materials

Students were informed about the purpose of the study and anonymity was guaranteed to them. The form of the questionnaire contained only age and gender of the participants, without any other personal data in the questionnaire. A rating scale for depression was applied individually, using the short interview technique, focused on assessing the presence and severity of individual symptoms of depressive disorder, and after the form was filled, the number of points on the rating scale was determined. The assessment was conducted by researchers, specialists in psychiatry. When the number of 200 respondents, who represented the necessary sample size, was reached, the study was discontinued.

Assessment of depression was made based on the results of testing and scoring using the Hamilton rating scales (HAMD) with 21 items (Hamilton 1960), which has been translated and widely used in clinical practice in Croatia (Marinić et al. 2007). Its importance for adolescent psychiatry is correspondence with a comprehensive questionnaire for clinical assessment of schizophrenia and affective disorders in children and Youth K-SADS-PL, developed for the purpose of clinical studies (Williamson et al. 1992). It consists of 21 items, of which the first 17 are scored, and the remaining four are used to estimate the severity of psychotic symptoms, if present. Individual items are assessed on a scale of 0-2, and some on a scale of 0-4. Depression was assessed by examining the total number of points. The maximum number of points is 52. The result of over 23 points indicates very severe symptoms of depression, the result of 19-22 serious symptoms of depression, 14-18 medium symptoms of depression, 8-13 mild symptoms of depression, and 0-7 excludes the

presence of depressive symptoms. Depressive symptoms in mild form (8-13 points) are considered subclinical disorder, and those from 14 to 18 points on the HAMD rating scale are significant, but are less severe depressive disorders. Therefore, the focus of our interest was a major depressive episode with a score of 19 points or more on the HAMD-21 scale.

Statistical Analyses

The results obtained are presented in tables and figures. The differences will be assessed with the level of significance of 5%. For statistical data analysis, Statistica (version 7.0 SPSS Inc., Chicago, IL., USA) software package was used.

RESULTS

Results from 200 participants, aged 16 to 18, high school students from the city of Split and Krapina were processed. The average age of participants was 16.7 (SD=0.45), and respondents 16.6 years (SD=0.48). Of the total number of participants, 100 (50%) were female and 100 (50%) were male, 50 respondents from each county. The absence of depression, or its presence at a certain degree of severity, was determined by points according to HAMD-21, based on defined scoring criteria.

The test results obtained using rating scale for depression, where it is necessary to emphasize that only respondents with 19 or more points were left in this study, which represents a clinically significant depression, are summarized as follows.

The frequency of depressive disorder

See Table 1.

By analyzing the values of individual results according to the respondents, a statistically significant difference in the severity of depression was demonstrated, being assessed using a total score on the HAMD-21. In SD County the higher number of participants falls in the group of expressed depression, while on the contrary, the higher number of participants in KZ County has more than 23 points and belongs to a group with very severe depressive disorder.

The distribution of scores on the HAMD-21 for all participants

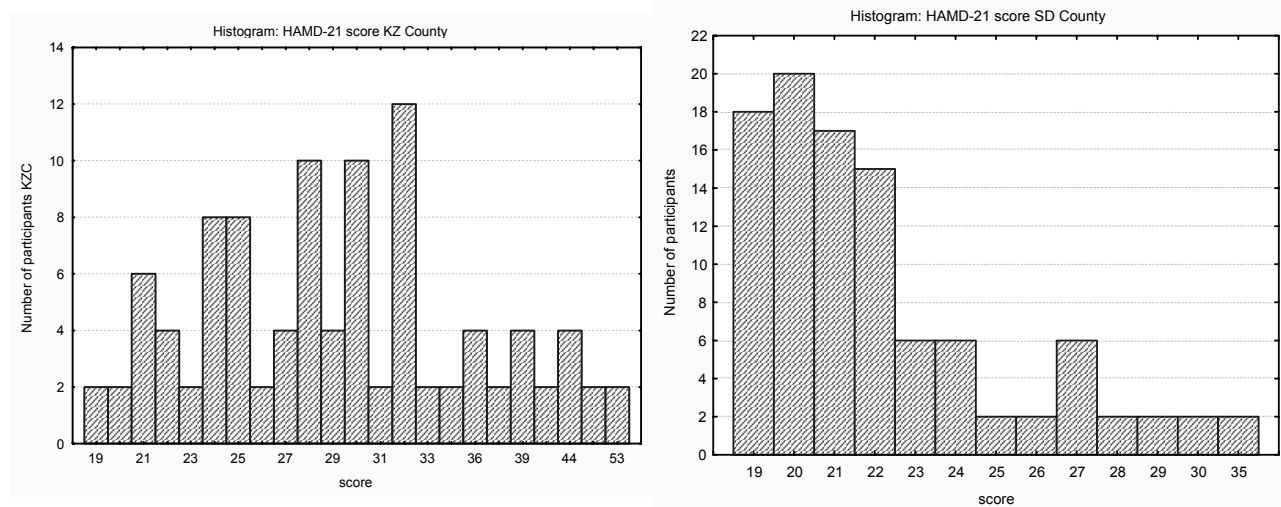
See Figure 1.

By comparing the sum of ranks, for a variable number of points on the HAMD-21, there was a statistically significant difference in the severity of depression in individual items and total (sum of ranks SDC 6433.000, sum of ranks KZC 13667.00; U-Z 1383.000 - 8.83774 at $p < 0.05$) (Figure 2).

Table 1. The frequency of depressive disorder according to severity in adolescents SD County (n=100) and KZ County (n=100), based on the rating scale for depression (HAMD-21)

Estimation of severity of depressive disorder		n of adolescents according to HAMD-21 score			p*
Number of points	Severity of disorder	Total	Adolescents SD	Adolescents KZ	
		200	100	100	
19-22	serious	84	70	14	<0.05
≥23	very severe	116	30	86	

χ^2 test - $\chi^2=64.368$ Degree of freedom (df:1) $p < 0.05$; SD – Split-Dalmatia County; KZ – Krapina-Zagorje County



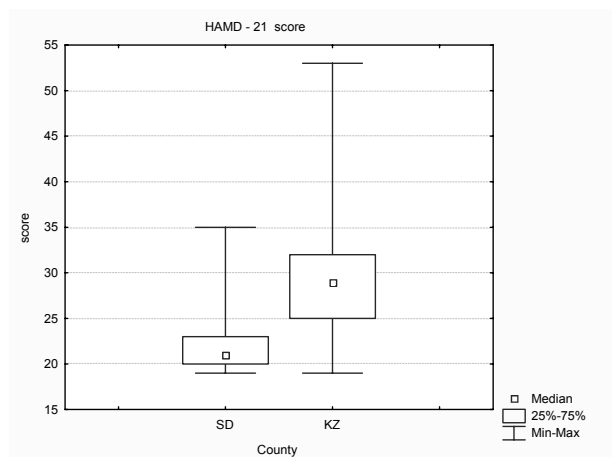
SD – Split-Dalmatia County, KZ – Krapina-Zagorje County

Figure 1. Frequency of the HAMD-21 scores in the sample, showing the distribution of scores on the HAMD-21 for participants n=100 from SD County and n=100 from KZ County

Table 2. Comparison of rank sums * per each item of HAMD-21, in all surveyed participants (n=200), by county

HAMD-21 items	Rank sum SD	Rank sum KZ	U	Z	p	Z	p	Number of participants SD	Number of participants KZ
Depressed mood	9662.00	10438.00	4612.00	-0.948	0.343	-0.991	0.322	100	100
Feelings of guilt	8729.00	11371.00	3679.00	-3.228	0.000	-3.585	0.000	100	100
Suicide	9666.00	10434.00	4616.00	-0.939	0.348	-0.971	0.332	100	100
Insomnia early	9846.00	10254.00	4796.00	-0.498	0.618	-0.558	0.577	100	100
Insomnia middle	12706.00	7394.00	2344.00	6.490	0.000	6.752	0.000	100	100
Insomnia late	10026.00	10074.00	4976.00	-0.059	0.953	-0.065	0.948	100	100
Work and activities	8238.00	11862.00	3188.00	-4.427	0.000	-4.570	0.000	100	100
Retardation: psychomotor	10547.00	9553.000	4503.00	1.214	0.224	1.303	0.192	100	100
Agitation	10004.00	10096.00	4954.00	-0.112	0.911	-0.117	0.907	100	100
Anxiety - psychic	10632.00	9468.00	4418.00	1.422	0.155	1.494	0.136	100	100
Anxiety - somatic	10182.00	9918.00	4868.00	0.322	0.747	0.351	0.725	100	100
Somatic symptoms - gastrointestinal	9876.00	10224.00	4826.00	-0.425	0.671	-0.457	0.648	100	100
Somatic symptoms - general	10270.00	9830.00	4780.00	0.538	0.591	0.592	0.554	100	100
Genital symptoms	9446.00	10654.00	4396.00	-1.476	0.140	-1.683	0.092	100	100
Hypochondriasis	9451.00	10649.00	4401.00	-1.464	0.144	-1.514	0.130	100	100
Loss of weight	9772.00	10328.00	4722.00	-0.679	0.497	-0.793	0.428	100	100
Insight	10722.00	9378.00	4328.00	1.642	0.101	1.823	0.068	100	100
Diurnal variation	10256.00	9844.00	4794.00	0.503	0.615	0.588	0.557	100	100
Depersonalization and derealization	9556.00	10544.00	4506.00	-1.207	0.228	-1.245	0.213	100	100
Paranoid symptoms	9030.00	11070.00	3980.00	-2.492	0.013	-2.686	0.007	100	100
Obsessional and compulsive symptoms	9618.00	10482.00	4568.00	-1.056	0.292	-1.154	0.248	100	100

* Mann-Whitney test; SD – Split-Dalmatia County; KZ – Krapina-Zagorje County



*Mann-Whitney test; SD – Split-Dalmatia County, KZ – Krapina-Zagorje County

Figure 2. Box plot* by total number of points on HAMD-21, for all participants n=200, out of which a 100 is from SD County, and a 100 from KZ County

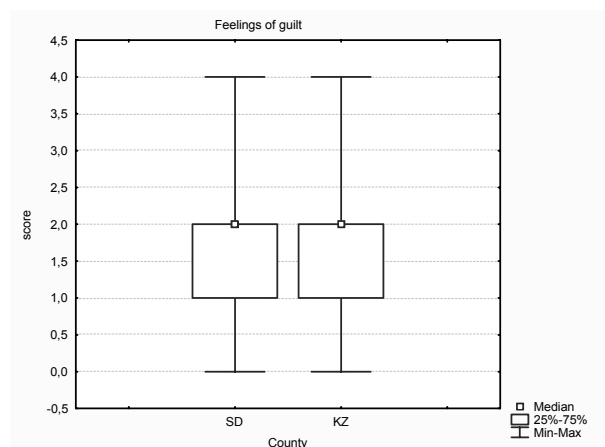
The overall analysis of results by individual particles for all participants by county

See Table 2.

By comparing the sum of ranks, it was determined that there are statistically significant differences among adolescents from two counties in four items, namely: feelings of guilt, insomnia middle, work and activities,

and quite unexpectedly, the paranoid symptoms, which belong to a group of psychotic symptoms.

By analysis of the results on the particle feelings of guilt, where rank sum analysis showed a statistically significant difference $p < 0.05$ (Mann-Whitney test), box plot shows that the appearance, i.e. degree of dispersion, interquartile range, as well as the median, are completely identical (Figure 3).



*Mann-Whitney test; SD – Split-Dalmatia County, KZ – Krapina-Zagorje County

Figure 3. Box-plot* for item feelings of guilt, for all participants n=200, out of which a 100 is from SD County, and a 100 from KZ County

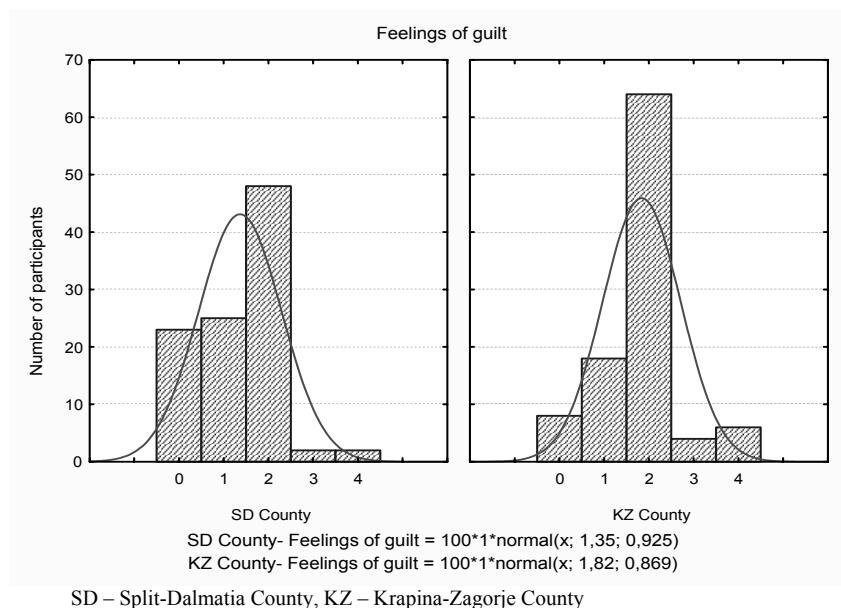
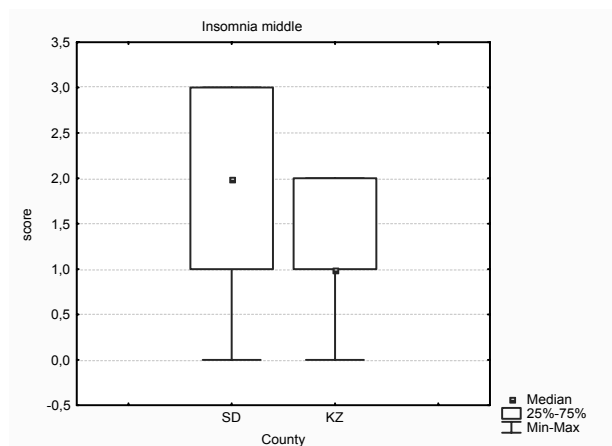


Figure 4. Frequency of the HAMD-21 scores, for item feelings of guilt, showing the distribution of scores on the HAMD-21 for participants n=100 from SD and n=100 from KZ

By analyzing the frequency of sums of points on the particle feelings of guilt, it is evident that most of the data clusters around the “2. Sense of guilt or permanent thinking about past mistakes and failures”, which was checked for 48 participants from SDC, and for 64 participants from KZC. Categories “0. Feelings of guilt are not present” and “1. Self-reproach is present” are more pronounced in SDC, while the “3. Delusions of guilt and accusing or threatening voices” was more present in KZC (Figure 4).

field of sleep. Most of the participants complain about 1. Occasional difficulties with sleep onset and 2. Everyday difficulties with sleep onset, unlike the respondents from KZC where for the majority 0. Difficulties not present was checked (Figure 5).

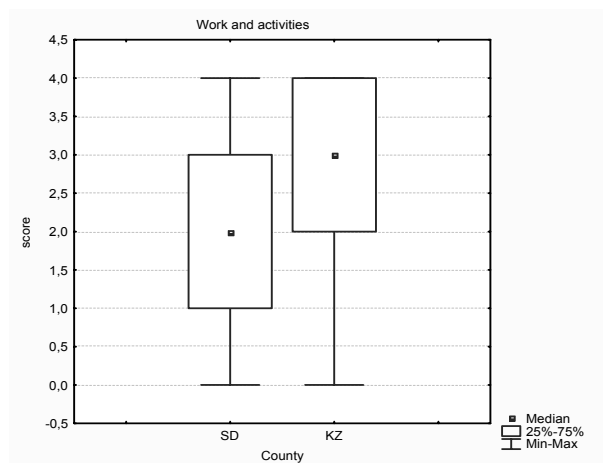
Particle Work and activities are scored 0-4, with intensity varying from 0. No difficulty, 1. A sense of incapacity, fatigue or weakness at work and leisure activities, 2. Shortening of the time required for the activity - whether it is directly or indirectly expressed in lack of agility, indecision and uncertainty (the feeling that must be forced to work and activity), 3. Shortening the time spent in activities or decrease in productivity, to 4. Termination of work because of the present illness. Significant difficulties were determined on the above mentioned particle in participants from Krapina-Zagorje County (Figure 6).



*Mann-Whitney test; SD – Split-Dalmatia County, KZ – Krapina-Zagorje County

Figure 5. Box-plot* for item insomnia-middle, for all participants n=200, out of which a 100 is from SD County, and a 100 from KZ County

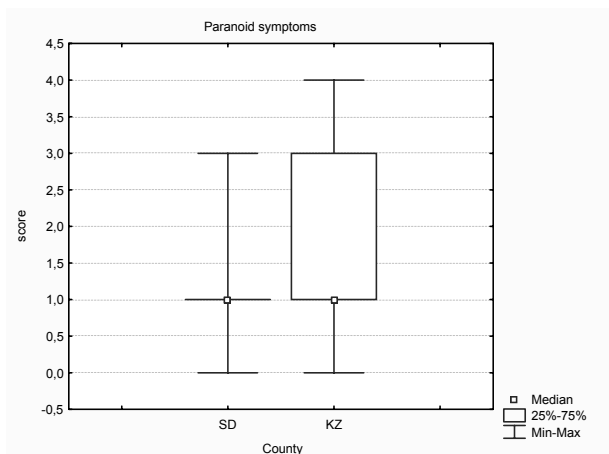
By analysis of the results on the particle insomnia - middle, where the rank sum analysis showed a statistically significant difference $p < 0.05$ (Mann-Whitney test), box plot shows that the degree of dispersion is higher in participants from SDC, as well as the median value, suggesting more pronounced disturbances in the



*Mann-Whitney test; SD – Split-Dalmatia County, KZ – Krapina-Zagorje County

Figure 6. Box plot*, for particle work and activities, for all participants n=200, out of which a 100 is from SDC, and a 100 from KZC

Particle Paranoid symptoms are scored 0-4 with intensity varying from 0. Not present, 1. Scepticism mild, 2. Suspicion strong, 3. Ideas of relationships are present and 4. Delusional ideas of relationships and persecution. Surprisingly, it was noticed that the presence of symptoms was found in the members of both groups of adolescents, with higher values, at the level of statistical significance, for adolescents from Krapina-Zagorje County (Figure 7).



*Mann-Whitney test; SD – Split-Dalmatia County, KZ – Krapina-Zagorje County

Figure 7. Box plot*, for particle paranoid symptoms for all participants $n=200$, out of which a 100 is from SDC, and a 100 from KZC

DISCUSSION

This paper compares the results of the research of expression of the clinical features, clinically significant depressive disorder, 19 and more points on the HAMD-21, between the two Croatian regions, namely: Krapina-Zagorje and Split-Dalmatia. Adolescents were all aged from 16 to 18 years, and 200 adolescents from different secondary schools in each region were tested.

Identification of clinically significant depression and intensity of difficulties by individual items, i.e. symptoms, was measured by the Hamilton Rating Scale for Depression (HAMD -21).

Once attained the size of a convenient sample, which represents a 100 adolescents (50 girls and 50 boys) from each county, who met the criteria for depressive disorder, results were analyzed and there was a statistically significant difference in the severity of depression between the two regions. Adolescents of Krapina-Zagorje County had more severe symptoms, resulting in higher aggregate scores on the applied scale. Despite the aforementioned, suicidal impulses do not show statistically significant differences between the adolescents of the two counties. Expression of clinical features, by the items, is generally the same for adolescents of both regions, except for statistically significant differences between adolescents in different counties regarding feelings of guilt (Mann-Whitney $U=916.50$, $z=-2.299$, $p=0.021$), insomnia - middle (Mann-Whitney $U=586.00$, $z=4.577$, $p=0.000005$), work and

activities (Mann-Whitney $U=791.00$, $z=-3.164$, $p=0.001$) and paranoid symptoms Mann-Whitney $U=3980.00$, $z=-2.492$, $p=0.007$).

Feelings of guilt are more intense among adolescents from Krapina-Zagorje County, as well as the difficulties associated with previous work and activities. Specifically, adolescents from Krapina-Zagorje County, who meet the criteria of depression by the HAMD-21, to a greater extent are self-reproaching, they feel guilty and that they have betrayed their environment, constantly thinking about errors and omissions. In that same county, adolescents who satisfy diagnostic criteria for depression, in a higher number and more prominently have lost interest in the work and activities.

On the contrary, in the Split-Dalmatia County increasing number of adolescents who met the diagnostic criteria for depression have sleep disturbances.

Being paranoid is surprisingly present in adolescents from both counties, with statistically significant preponderance of those from Krapina-Zagorje County. One possible explanation for the prevalence of the above mentioned symptom could be sought in terms of today's living and possibility of "control" over the internet and social networks, which certainly intensifies with the increase in depressiveness.

These results cannot be compared with the results obtained in the literature, because, although numerous studies have been done on adolescent depression, no comparison of frequencies and expression of clinical features between the different regions were done so far.

These differences could be explained by differences in the milieu in which these adolescents grow up. The family and its traditions, values, attitudes, upbringing, as well as the wider environment, are affecting the development of attitudes and value systems in adolescents. Guilt is a very destructive emotion, in any case its prevalence depends on the high ideals set, which cannot be reached, criticism, the absence of praise and reward that feed and are necessary for the development of self-esteem. Patriarchal families, extended families in which the dominant role is still run by the grandparents, or one person to whom others are subordinated, the role of victim mother with an alcoholic father and authoritative husband's parents, in any case contribute to the development of guilt in children during development. Therefore, we might speculate that, although it might be the topic of the future studies, the majority of Zagorje families (which are in higher percentage rural, compared to Dalmatian ones) just have these characteristics. Another assumption could be related to the presence of participants in relation to the urban or rural area, the participants from the Split-Dalmatia County originating from more urban, tourism-oriented areas, despite the fact that children from a wider area of the county, that is not entirely urban, gravitate to high schools in Split, as well as in Krapina.

As for the differences in the work and activities, and loss of interest in previous activities, we can assume that expressed feelings of guilt affect the decline of interest and the resultant reduction in labor and activities.

Limitations of the study were the sample size (two hundred adolescents). This might make our findings less generalizable.

CONCLUSION

Adolescents from Krapina-Zagorje County and adolescents from Split-Dalmatia County differ in the expression of clinical features of depression, in feelings of guilt, difficulties in sleeping, interest in the work and activities, and paranoid symptoms. Adolescents from Krapina-Zagorje County, who meet the diagnostic criteria for clinically significant depressive disorder, to a higher extent have lost previous interest in the work and activities and have stronger and more present feelings of guilt, and a feeling of threat from its environment, while adolescents from Split-Dalmatia County to a higher extent have sleeping disorders.

The results showed that the hypothesis is partially confirmed, that compared adolescents from different regions differ in the expression of the clinical features of depression, and that they do not differ in the incidence of suicide ideation. The hypothesis, that there is no difference in the intensity of depression in adolescents from two Croatian regions, which represent the northern and southern part of Croatia, was discarded.

A special interest of researchers was raised by the fact that the study included 200 adolescents with clinically significant depression, which were "found in secondary schools" and are uncontaminated with previous treatment. Although it was not the aim of this study, all mentioned above could indicate a high prevalence of depression among adolescent population in Croatia, for which there is no systematic research, and therefore no data for comparison. Also, it supports the fact that very few people in Croatia, so far an unidentified number of them, seeks help from psychiatrists, which only confirms the need for further systematic research and improving healthcare in the field of mental health.

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Conflict of interest : None to declare.

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