

Epidemiology of Youth Mental Health Problems From the Area of Osijek Using Strengths and Difficulties Questionnaire (SDQ)

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Abstract - Introduction: Mental disorders begin at an early age. Screening is the first step in early intervention for the mental health problems of children and adolescents. The aim of this study was to analyse the prevalence of mental health problems among adolescents from Osijek, to early detect the risks of possible mental disorders, and to analyse gender differences. Materials and methods: The main screening instrument was The Strengths and Difficulties Questionnaire (SDQ), which assesses the emotional and behavioural difficulties of children and adolescents, as well as the prosocial skills. Over 5 school years (2012/13- 2016/17), a total of 5787 students were examined. 5514 (95.3%) first-year students from 16 high schools and 273 (4.7%) seventh-grade students from 10 elementary schools were examined in the City of Osijek. Results: 10.4% of students had the borderline or abnormal score on the Total difficulties score. Girls had higher scores on the Total difficulties score ($p<0.01$), Emotional symptoms subscale ($p<0.01$), Prosocial behaviour subscale ($p<0.01$), and on the Hyperactivity/inattention subscale ($p<0.01$). On the Conduct problems subscale and the Peer relationships problem subscale, boys scored significantly higher than the girls ($p<0.01$). Conclusion: In the Osijek area, girls are more affected by mental problems than boys, scoring higher on the total scale, as well as on the emotional and hyperactivity scale. Whereas boys scored higher on the conduct and peer relationship scales. The data obtained through this screening allows for further planning of public health measures, preventive activities, treatment, and mental health promotion.

Keywords: mental disorders, adolescents, SDQ, screening, epidemiology, prevalence

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Introduction

Positive global trends of the mental health disorders prevalence among children and adolescents exist in recent years. Although overdiagnosis and overtreatment exist to a certain degree, underdiagnosis and undertreatment

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are still major concerns implicating notable public health issues [1,2].

Around half of all mental disorders appear before the age of 14 [3]. A recent systematic review by Polanczyk and associates [1] yielded a world-wide pooled prevalence of the mental disorders among children and adolescents of 13.4% (CI 95%, 11.3–15.9). In Croatia, only three studies were conducted, one of which was in the capital city of Zagreb, which demonstrated the prevalence of 19.3% of psychiatric symptoms, including borderline as well as severe symptoms among adolescents [4]. The other study was conducted in Rijeka and yielded a prevalence of 15.8% of borderline and severe symptoms among adolescents [4,5], while the third study was conducted in Zadar County and examined seventh-grade students from elementary schools and found that 18% students in school year 2014/2015 had moderate or severe risk for mental disorder, while 15.9% students in school year 2015/2016 had the same risk [6]. These studies used the Strengths and Difficulties Questionnaire (SDQ). There are no other epidemiological surveys that assessed mental disorders in the other parts of Croatia or in the total Croatian adolescent population.

The children's and adolescent's health and well-being are high on the global political agenda [7]. As well as in other fields, there is a necessity of improving the mental health of youth. As Signorini and associates [8] demonstrated, there is a poor child and adolescent mental health service planning in Europe. To improve service planning, there is a necessity of epidemiological surveys to provide evidence-based rational service development. To obtain the prevalence of mental disorders is beneficial not only in planning treatment services, but also in planning primary pre-

vention, resource allocation, training, and research priorities [1,9,10].

The city of Osijek is situated in Slavonia, the region which suffers from war consequences which are proven risks for mental disorder development [11]. In a decade after war occurrences, it is reasonable to expect that war left its consequences on the mental health of the population including war participants children [12]. The aim of this study was to evaluate the prevalence of mental health issues among adolescents from Osijek and to evaluate which proportion of the participants with borderline or abnormal results responds to intended further mental health assessment.

Patients and methods

We aimed to include all first-year high school students and seventh-grade students from elementary schools in the City of Osijek. The principals of these schools were contacted and asked to participate. Upon the principal's study approval, material in the form of written information about study and consent for parents were sent to schools for parents to sign them. Students who had parent's signed consent were examined by the teams from the Centre for Mental Health Protection, prevention and outpatient treatment of addiction at the Institute of Public Health Osijek-Baranja County in Osijek.

The project was implemented over 5 school years (2012/13 - 2016/17). High school students were examined during the whole study period, while elementary school students were included in the school year 2016/2017.

The main screening instrument was SDQ [13] which assesses the emotional and behavioural difficulties of children and adolescents,

as well as the strengths. The questionnaire consists of 5 subscales, each containing 5 items and assesses emotional problems, conduct problems, peer problems, hyperactivity, and prosocial behaviour. The internal reliability of the scale is satisfactory (Cronbach alpha 0.73). Correlation with other questionnaires is high ($p=0.50-0.80$) [13].

In cases of increased results, a letter was sent to the parents with a recommendation to report to the Centre for Mental Health Protection, prevention and outpatient treatment of addiction to evaluate the possibility of further processing and psychotherapy treatment. Parents of students with a total score of ≥ 16 or those with an Impact score of ≥ 3 were contacted.

Ethical approval for this study was obtained from the Institute of Public Health Osijek-Baranja County.

Results

The project was implemented over 5 school years (2012/13 - 2016/17) and involved a total of 5787 students. In the mentioned period, a total of 5514 (95.3%) first-year high school students from 16 schools and 273 (4.7%) seventh-grade students from 10 elementary schools in the City of Osijek were examined.

Of the 5787 students, 2694 (46.6%) were male, or 3091 (53.4%) were female. The information about gender was missing for two students. The average age of the students was 15.45 years (SD = 0.748). The youngest student was 12 years old and the oldest 20. The age information was missing for 2 students.

5182 (89.5%) of students, were in the average score category on the Total difficulties score, 185 (3.2%) students belong to the very high score category, and the borderline score was achieved by 418 students (7.2%). For two students, information about the Total difficulties score is missing (Table 1).

On the Emotional symptoms' subscale, 5269 students (91%) achieved average score, 234 students (4.0%) achieved a borderline score, and 281 students (4.8%) scored a very high score. For three students (0.1%) the score on the indicated scale is missing.

On the Conduct problems subscale, the average score was scored by 5088 students (87.9%), the borderline score was scored by 416 students (7.1%), and a very high score had 278 students (4.8%). For five students (0.1%) the data on the indicated scale is missing.

A total of 4,626 students (79.9%) achieved average scores on the Hyperactivity/inattention subscale. A borderline result

Table 1. Respondents with regard to the Total difficulties score

Total difficulties score	Number	%
average (0-15)	5182	89.5
borderline (16-199)	418	7.2
very high (20-40)	185	3.2
Total	5787	100

was achieved by 288 students (5%) and a very high score was achieved by 302 students (5.2%). For three students (0.1%) the data on the indicated scale is missing.

On the Peer relationships problem subscale, 5087 students (87.90%) had the average score, 566 (9.7%) students had a borderline score and 128 students (2.2%) had a very high score. For six students (0.1%) the data on the indicated scale is missing.

At the Prosocial behaviour subscale, a total of 5385 students (93%) achieved an average score. A borderline result was achieved by 236 students (4%), and 165 students (2.8%) had a very low result. One student is missing data on a specified scale.

On the Impact scale, 4756 students (82.1%) achieved a normal, average score. A marginal score was achieved by 438 students (7.5%) and 574 students (9.9%) achieved a very high score. Nineteen students (0.3%) are missing data on the indicated scale.

A t-test found a statistically significant difference between boys and girls in the overall difficulty score, where girls achieved a statistically significantly higher score than the boys ($t=-7.602$; $p<0.01$). Besides, there was a statistically significant difference between boys and girls on the Emotional symptoms' subscale, and here girls also achieved a statistically significantly higher score ($t=-22.554$; $p<0.01$). In addition, girls have a statistically significantly higher score on the Prosocial behaviour subscale than boys ($t=-16.224$; $p<0.01$), but also on the Hyperactivity/inattention subscale ($t=-3.477$; $p<0.01$). Furthermore, young boys, compared to girls, achieved a statistically significantly higher score on the Conduct problems subscale ($t=5.829$; $p<0.01$) and the Peer relationships problem subscale ($t=4.554$; $p<0.01$).

Out of 5787 students, 1,052 were invited (18.18%) for further assessment. A total of 603 students had elevated Total difficulties score and 349 students had elevated Impact score. A total of 100 students had both results elevated. A total of 420 students (39.9%) responded to an invitation for further assessment.

Discussion

Mental disorders in adolescence are highly contributing to the global burden of disease in this age category. They are risk factors for suicide and can cause emotional, behavioural, substance dependence, and severe psychiatric problems in adulthood [14,15]. It is of public health importance to assess adolescent mental health and to improve early recognition and treatment of mental disorders.

Although research indicates that the internal consistency and the structural validity of SDQ are compromised [16], Mieloo and associates propose that SDQ is an adequate questionnaire for screening purposes [17].

Using SDQ we found in our research that 18.18% of students had some difficulties, whether they had elevated Total difficulties score or Impact score. Excluding the Impact scale, there were 10.4% of students who had a borderline or abnormal score on the Total difficulties scale. Compared to the results from Zagreb, Rijeka and Zadar County survey mentioned in the introduction, these proportions are unexpectedly low. In the survey from Zagreb [4], only sixth-grade students of elementary schools were assessed. Among them, 19.3% had borderline or abnormal SDQ results, and as well as in our study, girls self-reported significantly higher results on the Emotional

symptoms subscale and on the Prosocial behaviour subscale than boys.

Bačić and associates [6] analysed seventh-grade elementary school students in the Zadar County. Results from individual subscales obtained from our study are higher compared to subscale scores from Zadar County. On the Emotional symptoms subscale, 4.0% of students achieved a borderline score, and 4.8% had a very high score, compared to 1.4% and 2% in the year 2014/15 and 3.1% and 2.6% in the year 2015/16 in the Zadar County. Similarly, on the Conduct problems subscale and the Hyperactivity/inattention subscale, we found much higher prevalence, especially for high risk of mental disorders.

Results from other countries obtained with SDQ are very variant, ranging from 13.3% of Lithuanian adolescents having a probable mental disorder [18] to 26% of youths in Iran having Total difficulties score above cut-off [19]. But as Duinhof and associates argue, cross-country comparisons of the self-report SDQ are not valid [20] so we are not able to draw strong comparisons.

Results from different subscales demonstrated that girls are more often affected by emotional problems, as well that they are better in social skills which is similar to other studies. On the other side, boys are more prone to peer relationship problems and have more conduct problems and that is also already recognized in the literature [4,21-23]. In our study we found girls to have more hyperactivity/inattention problems, which is opposite to findings from other studies [21,23].

Out of 1,052 students from our study invited for further assessment, only 40% answered to this invitation. That is similar to the study conducted in the City of Rijeka, where between 30% and 40% of participants

answered to the invitation. These proportions are low and they contribute to the deficient adolescent mental health care provision which is present worldwide. Merikangas and associates estimate that only one third of American youth with mental disorders receive the necessary treatment [24]. The study of Dutch adolescents reveals that 35.3% of adolescents with mental disorder diagnoses received specialist mental health care [25]. Reasons for such a low response could lie in the stigmatization of mental disorders which can be a significant barrier to seeking mental health treatment [26,27].

By including whole school classes and a high number of participants from almost every elementary and high school in Osijek, in this study we managed to provide a highly representative sample for the seventh-grade and first-grade adolescents from the area of Osijek. But this study still has several limitations. A major limitation was that results were not adjusted for the socioeconomic status (SES) of participants and further assessment of SES as a confounding factor was not possible. In the evaluation of students, we used only the self-report questionnaire, but not SDQ versions for parents or teachers which are available. We did not analyse characteristics of participants which respond or do not respond to the invitation for further assessment.

Screening of adolescents from the area of Osijek using SDQ demonstrated a prevalence of 10.4% of seventh-grade elementary school and first-year high school adolescents having a borderline or abnormal score. In the Osijek area, girls are more affected with mental problems than boys, scoring higher on total scales, as well as on the emotional and hyperactivity scale. Whereas boys scored higher on the conduct and peer relationship scales.

Further research is required to elucidate the impact of socioeconomic variables on the prevalence of mental problems. Since there is a low proportion of participants who answer to the invitation for further mental health assessment, research is required to analyse the underlying factors.

References

1. Polanczyk GV, Salum GA, Sugaya LS, Caye A, Rohde LA. Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *J Child Psychol Psychiatry*. 2015;56:345-65.
2. Merten EC, Cwik JC, Margraf J, Schneider S. Overdiagnosis of mental disorders in children and adolescents (in developed countries). *Child Adolesc Psychiatry Ment Health*. 2017;11:5.
3. WHO. Adolescent mental health [Internet]. 2019 [cited January 1st, 2020]. Available from: <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>.
4. Boričević Maršanić V, Zečević I, Paradžik IJ, Karapetrić Bolfan LJ. Probir i rana detekcija psihickih odstupanja/poremećaja kod djece u predškolskim ustanovama u osnovnim i srednjim školama Grada Zagreba – rezultati probnog projekta. *Soc Psih*. 2017;45:169-86.
5. Udovicich Corelli D, Božić B. Zaštita mentalnog zdravlja djece i mladih u Primorsko-goranskoj županiji - prikaz rada savjetovišta za mlade. *Hrvatski časopis za javno zdravstvo*. 2012;8:60-4.
6. Bačić A, Jurjević A, Klepac-Erštić S. Screening mentalnog zdravlja učenika sedmih razreda osnovnih škola na zadarskom području 2014./2015. i 2015./2016. *Hrvatski časopis za javno zdravstvo*. 2016;12:60-3.
7. Goldhagen JL, Shenoda S, Oberg C, Mercer R, Kadir A, Raman S, et al. Rights, justice, and equity: a global agenda for child health and wellbeing. *Lancet Child Adolesc Health*. 2020;4:80-90.
8. Signorini G, Singh SP, Boricevic-Marsanic V, Dileman G, Dodig-Curkovic K, Franic T, et al. Architecture and functioning of child and adolescent

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Conflict of Interest

The authors report no conflict of interest.

9. Costello EJ, Burns BJ, Angold A, Leaf PJ. How can epidemiology improve mental health services for children and adolescents? *J Am Acad Child Adolesc Psychiatry*. 1993;32:1106-14.
10. Ford T. Practitioner review: How can epidemiology help us plan and deliver effective child and adolescent mental health services? *J Child Psychol Psychiatry*. 2008;49:900-14.
11. Priebe S, Bogic M, Ajdukovic D, Franciskovic T, Galeazzi GM, Kucukalic A, et al. Mental disorders following war in the Balkans: a study in 5 countries. *Arch Gen Psychiatry*. 2010;67:518-28.
12. Santa Barbara J. Impact of war on children and imperative to end war. *Croat Med J*. 2006;47:891-4.
13. Goodman R. The Strengths and Difficulties Questionnaire: a research note. *J Child Psychol Psychiatry*. 1997;38:581-6.
14. Gore FM, Bloem PJ, Patton GC, Ferguson J, Joseph V, Coffey C, et al. Global burden of disease in young people aged 10-24 years: a systematic analysis. *Lancet*. 2011;377:2093-102.
15. Glantz MD, Anthony JC, Berglund PA, Degenhardt L, Dierker L, Kalaydjian A, et al. Mental disorders as risk factors for later substance dependence: estimates of optimal prevention and treatment benefits. *Psychol Med*. 2009;39:1365-77.
16. Bentley N, Hartley S, Bucci S. Systematic Review of Self-Report Measures of General Mental Health and Wellbeing in Adolescent Mental Health. *Clin Child Fam Psychol Rev*. 2019;22:225-52.
17. Mieloo C, Raat H, van Oort F, Bevaart F, Vogel I, Donker M, et al. Validity and reliability of the strengths and difficulties questionnaire in 5-6 year

- olds: differences by gender or by parental education? PLoS One. 2012;e36805.
18. Lesinskiene S, Girdzijauskiene S, Gintiliene G, Butkiene D, Puras D, Goodman R, et al. Epidemiological study of child and adolescent psychiatric disorders in Lithuania. BMC Public Health. 2018;18:548.
 19. Arman S, Keypour M, Maracy MR, Attari A. Epidemiological Study of Youth Mental Health Using Strengths and Difficulties Questionnaire (SDQ). Iran Red Crescent Med J. 2012;14:371-5.
 20. Duinhof EL, Lek KM, de Looze ME, Cosma A, Mazur J, Gobina I, et al. Revising the self-report strengths and difficulties questionnaire for cross-country comparisons of adolescent mental health problems: the SDQ-R. Epidemiol Psychiatr Sci. 2019;29:e35.
 21. Liu BJ, Engstrom K, Jadback I, Ullman S, Berman AH. Child self-report and parent ratings for the Strengths and Difficulties Questionnaire: Norms and agreement in a Swedish random population sample. Scand J Child Adolesc Psychiatr Psychol. 2017;5:13-27.
 22. Loeber R, Burke JD, Lahey BB, Winters A, Zera M. Oppositional defiant and conduct disorder: a review of the past 10 years, part I. J Am Acad Child Adolesc Psychiatry. 2000;39:1468-84.
 23. Merikangas KR, Nakamura EF, Kessler RC. Epidemiology of mental disorders in children and adolescents. Dialogues Clin Neurosci. 2009;11:7-20.
 24. Merikangas KR, He JP, Burstein Me, Swendsen J, Avenevoli S, Case B, et al. Service utilization for lifetime mental disorders in U.S. adolescents: results of the National Comorbidity Survey-Adolescent Supplement (NCS-A). J Am Acad Child Adolesc Psychiatry. 2011;50:32-45.
 25. Jorg F, Visser E, Ormel J, Reijneveld SA, Hartman CA, Oldehinkel AJ. Mental health care use in adolescents with and without mental disorders. Eur Child Adolesc Psychiatry. 2016;25:501-8.
 26. Kaushik A, Kostaki E, Kyriakopoulos M. The stigma of mental illness in children and adolescents: A systematic review. Psychiatry Res. 2016;243:469-94.
 27. Valentine SE, Dixon L, Borba CPC, Shtasel DL, Marques L. Mental illness stigma and engagement in an implementation trial for Cognitive Processing Therapy at a diverse community health center: a qualitative investigation. Int J Cult Ment Health. 2016;9:139-50.

Epidemiologija problema mentalnog zdravlja u mladima s područja Osijeka, korištenjem upitnika snaga i teškoća (SDQ)

Sažetak - Uvod: Mentalni poremećaji započinju u ranoj dobi. Probir je prvi korak u ranoj intervenciji mentalnih poremećaja djece i adolescenata. Ciljevi ove studije su bili istražiti prevalencije mentalnih poteškoća adolescenata s područja grada Osijeka, pravovremeno uočiti rizike mogućih mentalnih poremećaja te istražiti razlike među spolovima. Materijal i metode: Glavni instrument probira je bio Upitnik snaga i poteškoća namijenjen procjeni emocionalnih i poteškoća u ponašanju djece i adolescenata kao i procjeni prosocijalnih vještina. Tokom pet školskih godina (2012/13 - 2016/17), ispitano je ukupno 5787 učenika, od toga 5514 (95.3%) učenika prvih razreda 16 srednjih škola te 273 (4.7%) učenika sedmih razreda osnovnih škola grada Osijeka. Rezultati: 10.4% učenika je imalo graničan ili povišen rezultat na ljestvici ukupnih poteškoća. Djevojčice su imale viši rezultat na ljestvici ukupnih poteškoća ($p < 0.01$), na ljestvicama emocionalnih poteškoća, prosocijalnog ponašanja i hiperaktivnosti ($p < 0.01$). Na ljestvicama problema u ponašanju i problema s vršnjacima su dječaci imali viši rezultat ($p < 0.01$). Zaključak: Na području grada Osijeka, djevojčice su češće pogođene mentalnim poteškoćama, emocionalnim poteškoćama i hiperaktivnošću. Dječaci su češće pogođeni problemima u ponašanju i problemima u odnosu s vršnjacima. Podaci dobiveni ovim probirom služe u planiranju javnozdravstvenih mjera, preventivnih aktivnosti, liječenja i promocije mentalnog zdravlja.

Ključne riječi: mentalni poremećaji, adolescenti, Upitnik snaga i poteškoća, probir, epidemiologija, prevalencija

