

# Depresivnost, anksioznost i stres adolescenata prije i za vrijeme četvrtog vala COVID-19 pandemije

## */ Depression, Anxiety and Stress of Adolescents Before and During the Fourth Wave of the COVID-19 Pandemic*

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U ovoj transverzalnoj studiji trenda uspoređena je izraženost internaliziranih problema adolescenata u Gradu Zagrebu prije pandemije COVID-19 i u vrijeme 4. vala COVID-a. U istraživanju su sudjelovale dvije skupine srednjoškolaca: (1) učenici 1. razreda srednjih škola 2016. godine ( $N=267$ ,  $M_{dob}=15,16$ ,  $SD_{dob}=0,468$ , 61,6 % djevojke) i (2) učenici 1. razreda srednjih škola 2021. godine ( $N=353$ ,  $M_{dob}=14,78$ ,  $SD_{dob}=0,468$ , 45,9 % djevojke). Korištenjem upitnika DASS-21 utvrđen je trend rasta internaliziranih problema. U prosincu 2021. godine ozbiljne i vrlo ozbiljne simptome depresivnosti imalo je 20,6 % učenika u odnosu na 15,0 % učenika 2016. godine. Ozbiljne i vrlo ozbiljne simptome anksioznosti imalo je 2016. godine 13,4 % učenika, a 2021. čak 33,0 %. Simptomi stresa ove razine 2016. godine bili su prisutni kod 20,2 % učenika, a 2021. godine kod 25,4 %. Kod djevojaka je utvrđena viša razina depresivnosti, anksioznosti i stresa kao i kod učenika čije su obitelji pretrpjele materijalnu štetu u zagrebačkom potresu. Također, učenici slabijeg imovinskog statusa izvještavaju o značajno višim doživljenim razinama anksioznosti i stresa. Neadaptabilne strategije suočavanja sa stresom su značajni prediktori depresivnosti, anksioznosti i stresa. Značajni prediktor depresivnosti je i niže samopoštovanje, roditeljsko odbijanje i veće nezadovoljstvo tjelesnim izgledom predviđaju višu anksioznost, a ženski rod viši stres. Podatci pokazuju da je mentalno zdravlje zagrebačkih srednjoškolaca bilo pod visokim rizikom i prije pandemije COVID-19 i potresa, a ove nepovoljne okolnosti su povećale taj rizik.

*/ This cross-sectional trend study compared the intensity of internalised problems of adolescents in the City of Zagreb before the COVID-19 pandemic and during its 4th wave. Two groups of secondary school students participated in the research: (1) 1st grade secondary school students in 2016 ( $N=267$ ,  $M_{age}=15.16$ ,  $SD_{age}=0.468$ , 61.6% females) and (2) 1st grade secondary school students in 2021 ( $N=353$ ,  $M_{age}=14.78$ ,  $SD_{age}=0.468$ , 45.9% females). Using the DASS-21 questionnaire, a growing trend of internalised problems was identified. In December 2021, 20.6% of students had severe and very severe symptoms of depression compared to 15.0% of students in 2016. In 2016 and 2021, 13.4% and as many as 33.0% of students, respectively, had severe and very severe symptoms of anxiety. Symptoms of this level of stress were present in 20.2% of students in 2016, and in 25.4% in 2021. A higher level of depression, anxiety and stress was found in females, as well as in students whose families suffered material damage in the Zagreb earthquake. Students of lower financial status reported significantly higher levels of anxiety and stress. Maladaptive coping strategies are significant predictors of depression, anxiety and stress. A significant predictor of depression is also lower self-esteem, parental rejection and greater dissatisfaction with physical appearance predict higher anxiety, and female gender higher stress. The data show that the mental health of Zagreb secondary school students was at high risk even before the COVID-19 pandemic and earthquakes, and these adverse circumstances increased that risk.*

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Unatrag dvije godine na živote mladih globalno, pa tako i u Hrvatskoj, utjecala je pandemija COVID-19. Donošene su razne epidemiološke mjere koje su u značajnoj mjeri utjecale na adolescente i uvelike mijenjale njihove dotadašnje navike i živote – zatvarane su škole, nastava se odvijala online, ograničavalo se kretanje, poticala se socijalna izolacija i održavanje fizičke distance. Svakodnevna rutina bila je u potpunosti promijenjena, a promjene su bile evidentne i u mnogim drugim aspektima poput odnosa u obitelji, vršnjačkih odnosa ili prestanka vanškolskih aktivnosti. Također, za mnoge je dodatni izvor stresa bio strah od zaraze, bojazan za oboljele bliske osobe ili njihova smrt, promjena dinamike odnosa u obitelji. Djeca i mladi svih uzrasta i iz svih socioekonomskih okruženja izvještavala su o osjećaju socijalne izolacije, usamljenosti, frustracije, dosade, zbunjenosti i tjeskobe, nedostajanju rutine i bivanja s prijateljima te preuzimanju stresa iz obitelji (1-5). Uzevši u obzir osjetljivo i rizično razvojno razdoblje adolescencije, negativne posljedice za mentalno zdravlje mladih u tim su okolnostima bile očekivane. To su potvrdila mnoga svjetska istraživanja i meta-analize kojima je utvrđena povišena prevalencija psihičkih poteškoća i poremećaja kod mladih u odnosu na razdoblje prije potpunog zatvaranja (engl.

**INTRODUCTION**

The lives of young people globally, including in Croatia, were severely affected by the COVID-19 pandemic. Various epidemiological measures had a significant impact on adolescents and greatly changed their previous habits and lifestyle – schools were closed, classes were held online, and social isolation and maintaining physical distance were encouraged. Daily routine was entirely transformed, and changes were also evident in many other aspects, such as family relationships, peer relationships or the interruption of free-time out-of-school activities. For many, an additional source of stress was the fear of infection, fear for the closest ones, and changes in the dynamics of relationships in the family. Children and young people of all ages and from all socioeconomic backgrounds reported feelings of social isolation, loneliness, frustration, boredom, confusion and anxiety, lack of routine and not being with friends, and of taking over stress from the family (1-5). Taking into account the sensitive and risky developmental period of adolescence, negative consequences for the mental health of young people were expected in these circumstances. This has been confirmed by many worldwide studies and meta-analyses, which have demonstrated the increased prevalence of psychological difficulties and disorders in young people compared to the period before the full lockdown, significantly in-

*lockdown*), značajno povišene razine posttraumatskih simptoma (7,8) anksioznosti (4,7-12), depresivnosti (1,4,7-9,11,12) i stresa (10,12).

Uz pandemiju, zagrebački adolescenti u proteklom su razdoblju doživjeli dva snažna potresa – zagrebački 22. ožujka 2020. i potrese u sisačko-moslavačkoj županiji 28. i 29. prosinca 2020. To je također moglo izazvati osjećaje nesigurnosti, neizvjesnosti i intenzivnog straha te potencijalno djelovati nepovoljno na njihovo mentalno zdravlje (13,14). Naime, dobro je poznato da je izloženost prirodnim katastrofama povezana s povećanim rizikom od problema mentalnog zdravlja (15,16). Specifičnije, istraživanja pokazuju kako su kod adolescenata koji su doživjeli potres snažnijeg intenziteta evidentirane povišene razine posttraumatskog stresa (15,17-19), depresivnosti (15,17-19) i anksioznosti (17,19). Ti su simptomi bili izraženi i godinu dana nakon potresa (20), a posttraumatski simptomi i depresivnost i nakon 30 mjeseci (18). Također, simptomi su bili izraženiji u djevojaka (19) te u mladih iz obitelji nižeg socioekonomskog statusa (17).

U proteklom razdoblju i u Hrvatskoj je provedeno više istraživanja kojima je obuhvaćeno mentalno zdravlje djece u kontekstu specifičnih pandemijskih okolnosti. U publikaciji Poliklinike za zaštitu djece i mladih Grada Zagreba predstavljani su rezultati probira mentalnog zdravlja djece u Zagrebu (21). Istraživanje je provedeno u siječnju i veljači 2021. godine, prikupljeni su podatci za čak 22.020 djece osnovnoškolske i srednoškolske dobi, temeljem roditeljskih iskaza u *online* upitnicima. Prema rezultatima, roditelji su uočili kod 9 % djece prisutnost anksiozne i/ili depresivne simptomatologije, a prema njihovim procjenama 15 % djece suočavalo se sa značajnom razinom simptoma posttraumatskog stresa.

U okviru projekta „Nacionalno praćenje učinaka pandemije bolesti COVID-19 na sustav odgoja i obrazovanja u Republici Hrvatskoj“ (22) Institut za društvena istraživanja proveo

creased levels of post-traumatic symptoms (7, 8), anxiety (4, 7-12), depression (1, 4, 7-9, 11, 12) and stress (10, 12).

In addition to the pandemic, Zagreb's adolescents experienced two strong earthquakes – the Zagreb earthquake on 22 March 2020 and the earthquakes in Sisak-Moslavina County on 28 and 29 December 2020. This also potentially caused feelings of insecurity, uncertainty and intense fear which could have adverse effects on their mental health (13, 14). It is well known that exposure to natural disasters is associated with an increased risk of mental health problems (15, 16). More specifically, research shows that adolescents who have experienced an earthquake of greater intensity have higher levels of post-traumatic stress (15, 17-19), depression (15, 17-19) and anxiety (17, 19). These symptoms were expressed one year after the earthquake (20), and post-traumatic symptoms and depression were present even after 30 months (18). Symptoms were more pronounced in young females (19) and in young people from families of lower socioeconomic status (17).

Several studies have been conducted in Croatia covering the mental health of children in the context of specific pandemic circumstances. The Zagreb Child and Youth Protection Centre presented the results of the mental health screening of children in Zagreb (21). The research was conducted in January and February 2021, data were collected for as many as 22,020 children of primary and secondary school age, based on parental assessments in online questionnaires. According to the results, the parents reported the presence of anxiety and/or depressive symptoms in 9% of the children, and, in their perception, 15% of the children expressed a significant level of post-traumatic stress symptoms.

As part of the project “National Monitoring of the Effects of the COVID-19 Pandemic on the Education System in the Republic of Croatia” (22), the Institute for Social Research conducted an extensive study in May and June 2021,

je opsežno istraživanje u svibnju i lipnju 2021. godine usmjereno na mentalno zdravlje djece osnovnoškolske (šesti i osmi razredi) i srednjoškolske dobi (drugi i završni razredi). Istraživanje je provedeno u 161 školi s više od 27 000 učenika, 417 stručnih suradnika i 4796 učitelja i nastavnika. Očekivano, 39,6 % učenika osmih razreda navelo je kako je pandemija negativno ili izrazito negativno utjecala na njihovo mentalno zdravlje, 46,2 % učenika drugih razreda srednjih škola te čak 52,4 % maturanata. Istovremeno, stručni suradnici procjenjuju kako u odnosu na razdoblje prije pandemije primjećuju znatno više depresivnih stanja kod 26,2 % učenika, anksioznih stanja kod 25 %, fobija i strahova kod 19,8 %, vršnjačkog nasilja u virtualnom okruženju kod 18,8 % te znatno više provala bijesa kod 10 % učenika.

Na Odsjeku za psihologiju Filozofskog fakulteta Sveučilišta u Zagrebu u okviru istraživačkog projekta „Kako smo? Život u Hrvatskoj u doba korone“ ispitano je i iskustvo djece za vrijeme pandemije COVID-19 u Hrvatskoj (23). U istraživanju je sudjelovalo 1.400 učenika od prvog razreda osnovne škole do četvrtog razreda srednje škole iz ukupno 97 škola (57 osnovnih i 40 srednjih škola) iz svih regija Hrvatske. Prema rezultatima, svaki peti dječak (21,6 %) i svaka treća djevojčica (37 %) izvijestili su o teškoćama mentalnog zdravlja. Pritom starija djeca i djevojčice iskazuju više simptoma teškoća mentalnog zdravlja, pesimističniji pogled na svijet, zabrinutiji su za vlastitu budućnost i manje su zadovoljni životom nego što su to mlađa djeca i dječaci. Dio istraživanja usmjerio se i na roditeljske procjene teškoća svoje djece (24). Upitnik snaga i teškoća za svoju djecu u dobi od 4 do 18 godina ispunio je 171 roditelj (20 očeva i 151 majka) te je 17 % roditelja procijenilo prisutnost klinički značajnih emocionalnih teškoća djece, 11 % klinički značajne teškoće u ponašanju te klinički značajne teškoće s pažnjom i hiperaktivnošću 9 %. Pritom je važno napomenuti da podacima čiji su izvor roditelji

with focus on the mental health of primary school children (sixth and eighth grade) and those of secondary school age (second and final grades). The research was conducted in 161 schools with more than 27,000 students, 417 school psychologists and pedagogues and 4,796 teachers. As expected, 39.6% of eighth-grade students, 46.2% of second-grade secondary school students and as many as 52.4% of final year secondary school students stated that the pandemic had a negative or extremely negative impact on their mental health. At the same time, school psychologists and pedagogues, compared to the period before the pandemic, noticed significantly more depressive moods in 26.2% of students, anxiety moods in 25%, phobias and fears in 19.8%, peer violence in the virtual environment in 18.8%, and significantly more outbursts of anger in 10% of students.

At the Department of Psychology of the Faculty of Humanities and Social Sciences of the University of Zagreb, as part of the research project “How Are We? Life in Croatia at the Time of Corona”, the experience of children during the COVID-19 pandemic was also examined (23). A total of 1,400 students, from the first grade of primary school to the fourth grade of secondary school from a total of 97 schools from all regions of Croatia participated in the research (57 primary and 40 secondary schools). According to the results, every fifth boy (21.6%) and every third girl (37%) reported mental health difficulties. At the same time, older children and females showed more symptoms of mental health difficulties, a more pessimistic view of the world, were more worried about their future, and were less satisfied with life than younger children and male students. Part of the research focused on parents' assessments of their children's difficulties (24). In all, 17% of parents assessed that their children express clinically significant emotional difficulties, 11% observed clinically significant behavioural difficulties, and 9% reported clinically significant difficulties with

treba pristupiti s oprezom, jer je iz prethodnih istraživanja poznato da su roditelji skloni socijalno poželjnom odgovaranju i umanjivanju postojećih problema djece (25).

Istraživanje subjektivne dobrobiti djece u Hrvatskoj (26) provedeno je 2019. godine kao dio međunarodnog projekta „*Children's World's Subjective Well-Being*“ na reprezentativnom uzorku djece (8,10 i 12 godina). Istraživanje je ponovljeno u školskoj godini 2020./2021. u deset osnovnih škola Grada Zagreba i Zagrebačke županije s učenicima četvrtih, šestih i osmih razreda iz istih odjeljenja koji su sudjelovali u istraživanju godinu ranije. U velikom broju indikatora subjektivne dobrobiti nije bilo značajnih razlika, no 2019. godine učenici su češće bili u ugodnom raspoloženju u odnosu na neugodno, imali su bolje odnose u obitelji, bili su optimističniji oko budućnosti i zadovoljniji osjećajem vlastite sigurnosti u odnosu na godinu kasnije. Promjenama u načinu života bili su pogođeniji učenici mlađe dobi i djevojčice, a svi pokazatelji subjektivne dobrobiti bili su niži kod učenika koji su pretrpjeli štetu zbog potresa. Kod učenika je primijećena izražena potreba za stabilnim školskim okruženjem te visoka razina zabrinutosti koju autorice naglašavaju kao potencijalni rizik za razvoj anksioznosti, depresivnosti i agresivnosti. To je u skladu sa spoznajama da je zadovoljstvo životom povezano s mentalnim zdravljem, pogotovo s anksioznosti i depresivnosti (npr. 27,28).

Kratki prikaz ovih istraživanja pokazuje da su se potvrdili očekivani negativni učinci pandemije COVID-19 na mentalno zdravlje adolescenata, ali i da zbog metodoloških razloga postoji rizik precjenjivanja ili podcjenjivanja teškoća mladih u razdoblju pandemije ovisno o izvoru procjene (roditelji, nastavnici ili sama djeca), mjernim instrumentima (nevalidirana pitanja, prigodne ljestvice procjene ili standardizirani instrumenti) i vremenskoj točki kad je provedeno istraživanje (u vrijeme porasta boja zaraženih i visokih mjera ograničenja uključujući

attention and hyperactivity. At the same time, it is important to note that data sourced from parents should be approached with caution, as previous research showed that parents are inclined towards socially desirable responses or to downplay their children's problems (25).

Research on the subjective well-being of children in Croatia (26) conducted in 2019 as part of the international project “*Children's World's Subjective Well-Being*” on a representative sample of children (8, 10 and 12 years of age) provides relevant pre-COVID referent data. The research was repeated in the 2020/2021 school year in primary schools of the City of Zagreb and Zagreb County with students from the same classes that had participated in the year before the COVID-19 pandemic. There were no significant differences in a large number of indicators of subjective well-being, but in 2019 students were more often in a pleasant mood than in an unpleasant one, had better family relationships, were more optimistic about the future and were more satisfied with their sense of security compared to the following year. Younger students and female students were more affected by lifestyle changes, and all indicators of subjective well-being were lower in students who suffered damage due to the earthquake. Among the students, a pronounced need for a stable school environment was observed, as well as a high level of worry, which the authors emphasise as a potential risk for the development of anxiety, depression and aggression. This is in line with the findings that life satisfaction is related to mental health, especially anxiety and depression (e.g., 27, 28).

A brief presentation of these studies shows that the expected negative effects of the COVID-19 pandemic on the mental health of adolescents have been confirmed, but also that due to methodological reasons there is a risk of overestimating or underestimating the difficulties faced by young people during the pandemic, depending on the source of assessment (parents, teachers or the children themselves),

obrazovanje *online* ili u vrijeme normalizacije života i otvaranja škola uz odgovarajuće epidemiološke mjere).

Koliko nam je poznato, ono što nedostaje u hrvatskim istraživanjima je usporedba istih ključnih pokazatelja mentalnog zdravlja adolescenata prije i za vrijeme pandemije COVID-19. Polazeći od toga u ovom radu ćemo se usmjeriti na izraženost internaliziranih problema adolescenata – učenika prvih razreda zagrebačkih srednjih škola – prije pandemije COVID-19 i na vrhuncu četvrtog vala, u studenom i prosincu 2021. godine (29). U tu svrhu koristimo rezultate koje smo dobili u istraživačkom projektu „Ekonomске teškoće obitelji, psihosocijalni problemi i obrazovni ishodi adolescenata u vrijeme ekonomske krize“ (FEHAP)<sup>1</sup> na uzorku učenika prvih razreda zagrebačkih srednjih škola i srednjih škola iz područja središnje Hrvatske 2016. godine, koje ćemo usporediti s podacima zagrebačkih srednjoškolaca, također učenika prvih razreda srednjih škola, a koji su dobiveni u studenom i prosincu 2021. u okviru probne faze istraživačkog projekta „Međugeneracijski prijenos rizika za mentalno zdravlje adolescenata“ (INTRAD)<sup>2</sup>. Dakle, upotrijebili smo mogućnost da koristimo podatke dva neovisna istraživanja kako bismo provjerili promjene u nekim značajnim pokazateljima mentalnog zdravlja na uzorcima iste populacije, a to su učenici 1. razreda srednjih škola Grada Zagreba, mjerenih istim standardiziranim trijažnim instrumentom DASS-21 (30) koji je korišten u brojnim međunarodnim i nacionalnim istraživanjima (31-35). To nam je omogućilo da temeljem dvaju transverzalnih istraživanja provedenima na uzorku iste populacije s istim mjernim instrumentima u razmaku od 5 godina napravimo tzv. transverzalnu studiju trenda i provjerimo je li za vrije-

the measuring instruments (non-validated questions, appropriate assessment scales or standardised instruments) and the point in time when the research was conducted (at the time of an increase in the number of infected persons and tight restriction measures including online education, or at the time of the normalisation of life and opening of schools with appropriate epidemiological measures).

To the best of our knowledge, a comparison of the same key indicators of adolescent mental health before and during the COVID-19 pandemic with comparable samples is missing in Croatia. This paper tries to bridge that gap by focusing on the intensity of internalised problems of adolescents – students in the first grade of Zagreb secondary schools – before the COVID-19 pandemic and at the peak of the 4th wave, in November and December 2021 (29). For this purpose, we use the results obtained in the research project “Family Economic Hardship, Psychosocial Problems and Educational Outcomes of Adolescents in the Time of Economic Crisis” (FEHAP)<sup>1</sup> on a sample of students in the first grade of Zagreb secondary schools and secondary schools from central Croatia in 2016, which we compare with the data from students in the first grade of Zagreb secondary schools, which were obtained in November and December 2021 as part of the pilot phase of the research project “Intergenerational Transmission of Risk of Adolescent Mental Health” (INTRAD).<sup>2</sup> We took advantage of the opportunity to use the data of two independent studies to assess the changes in some significant indicators of mental health on samples of the same population, namely students of the first grade of secondary schools in the City of Zagreb, measured with the same standardised triage mental health instrument DASS-21 (30), which has been used in numerous

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me pandemije COVID-19 došlo do očekivanog pogoršanja mentalnog zdravlja zagrebačkih srednjoškolaca.

## CILJ

Cilj ovog istraživanja je dobiti uvid u izraženost internaliziranih problema adolescenata u Gradu Zagrebu u vrijeme 4. vala pandemije COVID-19 2021. godine u usporedbi s adolescentima Grada Zagreba 2016. godine.

Polazeći od toga istraživačke hipoteze su:

Kod zagrebačkih srednjoškolaca 2021. godine bit će izraženiji internalizirani problemi u odnosu na uzorak zagrebačkih srednjoškolaca 2016. Internalizirani problemi će biti izraženiji kod djevojaka, mladih nižeg socioekonomskog statusa i onih čije su obitelji pretrpjele materijalnu štetu u potresima.

Ženski rod, pohađanje strukovnih škola, neprikladni roditeljski postupci, lošije samopoimanje i vršnjački odnosi te češće korištenje neadaptivnih strategija suočavanja sa stresom značajno će pridonositi izraženosti internaliziranih problema zagrebačkih srednjoškolaca.

## METODA

### Sudionici

Podatci prikazani u ovom radu odnose se na dvije skupine srednjoškolaca: (1) uzorak učenika 1. razreda srednjih škola Grada Zagreba iz 2016. godine, i (2) uzorak učenika 1. razreda srednjih škola Grada Zagreba iz 2021. godine.

Podatci za prvu skupinu prikupljeni su u sklopu istraživačkog projekta FEHAP - „Ekonomске teškoće obitelji, psihosocijalni problemi i obrazovni ishodi adolescenata u vrijeme ekonomske krize“. Radi se o dvoetaptom nepro-

international and national studies (31- 35). This enabled us to make a cross-sectional trend study based on two transversal studies conducted on a sample of the same population with the same measuring instruments, five years apart, to check whether during the COVID-19 pandemic there was an expected deterioration in the mental health of Zagreb secondary school students.

## AIM

The aim of this study was to gain insight into the intensity of internalised problems of adolescents in the City of Zagreb during the 4th wave of the COVID-19 pandemic in November and December 2021 compared to adolescents in the City of Zagreb in 2016.

Specifically, the research hypotheses are:

Internalized problems will be more intense in Zagreb high school students in 2021 compared to the sample of Zagreb high school students in 2016. Internalized problems will be more intense in females, young people of lower socioeconomic status and those whose families suffered material damage in the earthquakes.

Female gender, attendance of vocational schools, inappropriate parenting practices, poorer self-concept and peer relationships, as well as more frequent use of non-adaptive coping strategies will significantly predict the intensity of internalized problems among Zagreb high school students.

## METHOD

### Participants

The data presented in this paper refer to two groups of secondary school students: (1) sample of 1st grade secondary school students of the City of Zagreb from 2016, and (2) a sample of 1st grade secondary school students of the City of Zagreb from 2021.

porcionalno stratificiranom klaster uzorku učenika 1. razreda srednjih škola provedenih u pet županija središnje Hrvatske i Gradu Zagrebu. U prvoj etapi odabrane su srednje škole (trogodišnje i četverogodišnje strukovne škole te gimnazije), a u drugoj etapi odabrana su razredna odjeljenja – klasteri koji su uključeni u uzorak. U istraživanju je sudjelovalo ukupno 1096 ispitanika, od tog 267 učenika prvih razreda srednjih škola Grada Zagreba ( $M_{dob} = 15,16$ ,  $SD_{dob} = 0,468$ , 61,6 % djevojke). Podaci za drugu skupinu sudionika prikupljeni su u sklopu probnog istraživanja za istraživački projekt „Međugeneracijski prijenos rizika za mentalno zdravlje adolescenata“. Radi se o prigodnom uzorku, a sudjelovali su također učenici prvih razreda srednjih škola Grada Zagreba ( $N=353$ ,  $M_{dob} = 14,78$ ,  $SD_{dob} = 0,468$ , 45,9 % djevojke) iz tri škole. Od toga su učenici iz trogodišnje i četverogodišnje strukovne škole bili iz škola čiji su učenici sudjelovali i u prvom istraživanju 2016., dok su gimnazijalci bili iz škole koja nije bila uključena u prvo istraživanje. Obilježja uzorka prikazana su u tablici 1.

Data for the first group were collected in 2016 as part of the research project FEHAP. It is a two-stage disproportionately stratified cluster sample of 1st grade secondary school students conducted in five counties of central Croatia and the City of Zagreb. A total of 1,096 students participated in the research, of whom 267 were students from the 1st grade of secondary schools in the City of Zagreb ( $M_{age} = 15.16$ ,  $SD_{age} = 0.468$ , 61.6% females). Data for the second group of participants were collected in November and December 2021 as part of a pilot study for the research project “Intergenerational Transmission of Risk of Adolescent Mental Health”. This was a convenient sample, which also included students of the 1st grade of secondary schools in the City of Zagreb ( $N=353$ ,  $M_{age} = 14.78$ ,  $SD_{age} = 0.468$ , 45.9 % females) from three schools. Students from three-year and four-year vocational schools were from same schools whose students participated in the first research in 2016, while gymnasium students were from a school that was not included in the first research. The characteristics of the sample are presented in Table 1.

**TABLICA 1.** Karakteristike uzorka istraživanja  
**TABLE 1.** Characteristics of the research sample

Grupa / Group	Rod sudionika / Gender		
	Mladići / Male		Djevojke / Female
2016.	38,4%		61,6%
2021.	54,1%		45,9%
	Vrsta škole / Type of school		
	Strukovna škola / Vocational school		Gimnazija / Gymnasium
2016.	49,4%		50,6%
2021.	56,4%		43,6%
	Socioekonomski status / Socioeconomic status		
	Niži / Lower	Prosječan / Average	Viši / Higher
2016.	12,1%	65,3%	22,6%
2021.	7,4%	64,7%	27,9%
	Veličina mjesta stanovanja / Size of place of residence		
	Selo / Village		Grad / City
2016.	19,0%		81,0%
2021.	20,5%		79,5%



## Instrumenti

Za procjenu izraženosti internaliziranih problema kod srednjoškolaca korištena je Ljestvica depresivnosti, anksioznosti i stresa – DASS 21 (30). Upitnik se sastoji od 21 čestice na koje sudionici odgovaraju na ljestvici od 0 (uopće se nije odnosilo na mene) do 3 (gotovo uvijek ili uvijek se odnosilo na mene). Sve čestice odnose se na doživljaje sudionika u proteklom tjednu, a primjer čestice je „*Bilo mi je teško smiriti se*“. Upitnik se sastoji od tri podljestvice – depresivnost, anksioznost i stres te je na svakoj moguće postići od 0 do 21 bod. Veći broj bodova označava veću izraženost problema. Rezultate je moguće kategorizirati prema kategoriji izraženosti simptoma u 5 kategorija – normalno, blago, umjereno, ozbiljno i vrlo ozbiljno.

Prediktorski sklop za internalizirane probleme kao kriterijsku varijablu su sociodemografska obilježja, roditeljska ponašanja, samopoimanje adolescenata te njihovo suočavanje sa stresom.

Za ispitivanje roditeljskih ponašanja korišten je Upitnik socijalnog konteksta roditeljstva – PASCQ (38), forma za djecu. Ovaj upitnik služi kao mjera za procjenu temeljnih značajki roditeljskog stila. Sudionici na ljestvici od 4 stupnja (1 – Uopće nije točno, 4 – U potpunosti je točno) procjenjuju točnost pojedinih roditeljskih ponašanja, zasebno se procjenjuju ponašanja svakog roditelja. Upitnik se sastoji od 24 tvrdnje koje se grupiraju u šest faktora: 1) toplina, 2) odbijanje, 3) struktura, 4) nekonzistentnost, 5) potpora autonomiji i 6) prisila. Pritom viši rezultat znači izraženije roditeljsko ponašanje na određenom faktoru.

Samopoimanje je mjereno Marshovim upitnikom samoopisivanja II – SDQ II (37). Iz upitnika smo za potrebe ovog istraživanja preuzeli četiri podljestvice. Podljestvica Odnosi s vršnjacima istog roda mjeri se sa 10 čestica (primjer čestice: „*Lako sklapam prijateljstva s osobama svog roda*“), podljestvica Odnosi s vršnjacima

## Instruments

The Depression, Anxiety and Stress Scale – DASS 21 (30) was used to assess the severity of internalised problems in secondary school students. The questionnaire consists of 21 items to which the participants answer on a scale from 0 (did not apply to me at all) to 3 (almost always or always applied to me). All items refer to the experiences of the participants in the past week, and an example of an item is “I found it difficult to calm down”. The questionnaire consists of three subscales – depression, anxiety and stress, each of which can be scored from 0 to 21 points. A higher number of points indicates a greater severity of the problem. The results can be categorised according to the severity of symptoms in five categories – normal, mild, moderate, severe and very severe.

The predictor set for internalised problems as a criterion variable is sociodemographic characteristics, parental behaviours, self-concept of adolescents and their coping with stress.

The Parents as Social Context Questionnaire – PASCQ (36), a form for children, was used to examine parenting behaviours. This questionnaire serves as a measure to assess the basic features of parenting style. On a scale of 4 (1 – It is not true at all, 4 – It is completely true), participants assess the accuracy of individual parental behaviours, and the behaviours of each parent are assessed separately. The questionnaire consists of 24 statements that are grouped into six factors: (1) warmth, (2) rejection, (3) structure, (4) inconsistency, (5) autonomy support, and (6) coercion. A higher score means a more pronounced parental behaviour on a certain factor.

Self-concept was measured by the Marsh Self-Description Questionnaire II – SDQ II (37). For the purposes of this research, we included four subscales from the questionnaire. The subscale Relationships with peers of the same gender included 10 items (example of an

suprotnog roda sa 8 („*Imam puno prijatelja suprotnog roda*“), Samopoimanje tjelesnog izgleda također se mjeri s 8 čestica („*Nitko ne misli da dobro izgledam*“) i Opće samopoimanje s 10 čestica koje se temelje na česticama Rosenbergove ljestvice samopoštovanja („*Većinu toga što radim, uradim dobro.*“). S obzirom na spomenuto u prikazu i raspravi rezultata podljestvicu Općeg samopoimanja imenovali smo kao Samopoštovanje koje je pojmovno bliže našem kontekstu, a kako je i sam autor naziva u kasnijim radovima (npr. 38,39). Sudionici na tvrdnje odgovaraju na ljestvici od šest stupnjeva gdje je 1 – netočno, uopće me ne opisuje, a 6 – točno, u potpunosti me opisuje. Rezultat za svaku podljestvicu računa se kao suma odgovora na pojedinim česticama, a pritom se one koje su u negativnoj formi (npr. „*Ružan sam*“) obrnuto boduju. Na podljestvicama Odnosi s vršnjacima suprotnog roda i Samopoimanje tjelesnog izgleda moguće je postići od 8 do 48 bodova, a na podljestvicama Odnosi s vršnjacima istog roda i Samopoštovanje od 10 do 60 bodova, pritom veći broj bodova označava pozitivniju samopercepciju.

Suočavanje sa stresom mjereno je njemačkim upitnikom suočavanja za djecu i adolescente – SVF-KJ (40). Upitnikom se mjere adaptabilne strategije suočavanja – usmjerenost na problem (kontrola situacije, pozitivne samoupute, traženje socijalne podrške) i suočavanje usmjereno na emocije (distrakcija/rekreacija i umanjivanje) te neadaptabilne strategije suočavanja (pasivno izbjegavanje, ruminacija, ravnodušnost i agresija). Upitnik se sastoji od ukupno 36 tvrdnji (4 za svaku podljestvicu) koje opisuju različite načine suočavanja sa stresom (primjer: „*Radim plan kako riješiti problem.*“), a na koje sudionici daju odgovore na Likertovoj ljestvici od 5 stupnjeva, od 0 – nikada do 4 – gotovo uvijek. Na svakoj podljestvici moguće je ostvariti rezultat od 0 do 16, pritom viši rezultat znači veću učestalost korištenja određenog načina suočavanja.

item: „*I easily make friends with people of my own gender*“), the subscale Relations with peers of the opposite gender comprised 8 items („*I have a lot of friends of the opposite gender*“), the subscale Self-concept of physical appearance also contains 8 items („*Nobody thinks I look good*“) and General self-concept has 10 items („*Most of what I do, I do well*“). Considering that the authors in their later works referred to General self-concept as self-esteem (e.g., 38, 39), in the present study we use also the concept of self-esteem. Participants respond to the statements on a 6-point scale where 1 is false, it does not describe me at all, and 6 is true, it describes me completely. The result for each subscale is calculated as the sum of responses on individual items, while those that are in a negative form (e.g., „*I'm ugly*“) are scored in reverse. On the subscales Relations with peers of the opposite gender and Self-concept of physical appearance, it is possible to achieve 8 to 48 points, and on the subscales Relations with peers of the same gender and Self-esteem 10 to 60 points, where a higher number of points indicates a more positive self-perception.

Coping with stress was measured by the German Stress and Coping Questionnaire for Children and Adolescents – SVF-KJ (40). The questionnaire measures adaptive coping strategies – problem-focused (control of the situation, positive self-instructions, seeking social support) and emotion-focused coping (distraction/recreation and minimizing), and maladaptive coping strategies (passive avoidance, rumination, indifference and aggression). The questionnaire consists of a total of 36 statements (4 for each subscale) that describe different ways of coping with stress (example: „*I'm making a plan to solve the problem*“), to which the participants give answers on a 5-point Likert scale, from 0 – never, to 4 – almost always. On each subscale, it is possible to achieve a score from 0 to 16, where a higher score means a higher frequency of using a certain way of coping.

Prije provedbe obih istraživanja dobiveno je odobrenje Ministarstva znanosti i obrazovanja (MZO) Republike Hrvatske kojem je prethodilo odobrenje Etičkog odbora Pravnog fakulteta Sveučilišta u Zagrebu. Podatci za 2016. godinu prikupljeni su u razdoblju od veljače do svibnja. Podatci za 2021. godinu prikupljeni su tijekom studenog i prosinca. To je bilo razdoblje tzv. četvrtog vala pandemije COVID-19, a vrhunac je zabilježen 10. studenog 2021. godine kada je u Hrvatskoj evidentiran najveći broj oboljelih u jednom danu (7.315 zaraženih osoba) (29). Ipak Stožer CZ RH je, polazeći od činjenice da je u RH tada bilo cijepljeno više od 50 % odrasle populacije, ublažio mjere vezane uz okupljanja u odnosu na prva tri vala epidemije (29). U skladu s tim, MZO je odlučio 8. studenog 2021. godine da se odgojno-obrazovni rad za sve učenike osnovnih i srednjih škola Grada Zagreba organizira prema tzv. modelu A, odnosno uživo u školama. To je omogućilo da se istraživanje provede neposredno u razrednim odjeljenjima. U razdoblju kad je provedeno istraživanje došlo je do pada broja zaraženih pa je tako 14. studenog 2021. 14-dnevna stopa potvrđenih slučajeva za Grad Zagreb bila 2.044 slučaja, a u 12.12. 2021. cca 20 % slučajeva manje odnosno 14-dnevna stopa potvrđenih slučajeva 1.634<sup>3</sup>. Dakle, iako je u navedenom razdoblju došlo do popuštanja epidemioloških mjera, uključujući ponovno i odvijanje nastave uživo, COVID-19 je bio još uvijek vrlo ozbiljan zdravstveni problem.

Prije provedbe, stručni suradnici u školama održali su roditeljske sastanke u svim odabranim razredima s ciljem informiranja roditelja o svrsi istraživanja, dok su članovi istraživačkog tima educirali terenske istraživače za provedbu

<sup>3</sup> [https://www.koronavirus.hr/uploads/14\\_11\\_2021\\_izvjesce\\_tjedno\\_novo\\_zadnje\\_3\\_docx\\_d0969633c4.pdf](https://www.koronavirus.hr/uploads/14_11_2021_izvjesce_tjedno_novo_zadnje_3_docx_d0969633c4.pdf)  
[https://www.koronavirus.hr/uploads/12\\_12\\_2021\\_izvjesce\\_tjedno\\_novo\\_3e8a811eb1.pdf](https://www.koronavirus.hr/uploads/12_12_2021_izvjesce_tjedno_novo_3e8a811eb1.pdf)

Prior to the implementation of both studies, the approval of the Ministry of Science and Education (MSE) of the Republic of Croatia was obtained, which was preceded by the approval of the Ethics Committee of the Faculty of Law of the University of Zagreb. Data for 2016 were collected in the period from February to May. Data for 2021 were collected during November and December 2021, which was the period of the 4th wave of the COVID-19 pandemic, where the peak was recorded on 10 November 2021 when Croatia recorded the highest number of patients in one day (7,315 infected persons) (29). Nevertheless, based on the fact that more than 50% of the adult population were vaccinated in the Republic of Croatia at the time, the Civil Protection Headquarters of the Republic of Croatia eased the measures related to gatherings as compared to the first three waves of the pandemic (29). In accordance with this, the MSE decided on 8 November 2021 that schooling for all students at primary and secondary level in the City of Zagreb was to be organised live in schools. This allowed the research to be carried out directly in classrooms. In the period when the research was conducted, the number of infected people had decreased, so on 14 November 2021, the 14-day rate of confirmed cases for the City of Zagreb was 2,044 cases, and on 12 December 2021 there were approximately 20% fewer cases, i.e., the 14-day rate of confirmed cases was 1,634.<sup>3</sup> So, although the epidemiological measures were eased, including the resumption of face-to-face classes, COVID-19 was still a very serious health problem in the mentioned period.

Before the implementation, school staff held parent meetings in all selected classes with the aim of informing parents about the purpose of the research, while members of the research team educated field researchers, senior social work stu-

<sup>3</sup> [https://www.koronavirus.hr/uploads/14\\_11\\_2021\\_izvjesce\\_tjedno\\_novo\\_zadnje\\_3\\_docx\\_d0969633c4.pdf](https://www.koronavirus.hr/uploads/14_11_2021_izvjesce_tjedno_novo_zadnje_3_docx_d0969633c4.pdf)  
[https://www.koronavirus.hr/uploads/12\\_12\\_2021\\_izvjesce\\_tjedno\\_novo\\_3e8a811eb1.pdf](https://www.koronavirus.hr/uploads/12_12_2021_izvjesce_tjedno_novo_3e8a811eb1.pdf)

istraživanja. Terenski istraživači informirali su sudionike o istraživanju, prikupili njihove suglasnosti za sudjelovanje te provodili istraživanja u odabranim razredima.

Podatci su analizirani korištenjem SPSS programskog paketa. Za odgovaranje na istraživačke probleme korištena je deskriptivna statistika, t-test, te hijerarhijska regresijska analiza u četiri koraka.

## REZULTATI

### Izraženost internaliziranih problema

Kako bi se provjerila razlika u izraženosti internaliziranih problema zagrebačkih srednjoškolaca u prvoj polovini 2016. i krajem 2021. korišten je t-test za nezavisne uzorke (tablica 2), koji je pokazao statistički značajnu razliku u izraženosti simptoma anksioznosti. Zagrebački srednjoškolci su 2021. godine u prosjeku izvještavali o izraženijim simptomima anksioznosti u odnosu na zagrebačke srednjoškolce 2016.

Analiza ovih istih podatka provedena je i na drugačiji način pri čemu je umjesto središnjih vrijednosti korištena kategorizacija podataka. Tako su sukladno uputama za primjenu DASS-a dobiveni bruto rezultati kategorizirani u pet kategorija (1 – normalna razina izraženosti simptoma, 2 – blaga razina izraženosti simptoma, 3 – umjerena razina izraženosti simptoma, 4 – ozbiljna razina izraženosti simptoma, 5 – vrlo ozbiljna razina izraženosti simptoma) te su potom spojene dvije kategorije koje se odnose

na kako implementirati istraživanje. Poljski istraživači informirali su sudionike o istraživanju, prikupili njihove suglasnosti za sudjelovanje te provodili istraživanja u odabranim razredima.

The data were analysed using the SPSS software package. Descriptive statistics, t-tests and hierarchical regression analyses in 4 steps were used to answer the research problems.

## RESULTS

### Expression of internalised problems

In order to check the difference in the intensity of internalised problems of Zagreb secondary school students in the first half of 2016 and at the end of 2021, a t-test for independent samples was used (Table 1), which showed a statistically significant difference only in the intensity of anxiety symptoms. In 2021, Zagreb secondary school students on average reported more pronounced symptoms of anxiety compared to their peers in 2016.

Analysis of these same data was also carried out in a different way, where, instead of mean values, data categorisation was used. In accordance with the instructions for the application of the DASS, the obtained gross results were divided into five categories (1 – normal level of symptom expression, 2 – mild level of symptom expression, 3 – moderate level of symptom expression, 4 – severe level of symptom expression, 5 – very severe level of symptom expression) and then the two categories related to severe and

**TABLICA 2.** Izraženost internaliziranih problema zagrebačkih srednjoškolaca 2016. i 2021.

**TABLE 2.** Intensity of internalised problems of Zagreb secondary school students in 2016 and in 2021

	Depresivnost / Depression			Anksioznost / Anxiety			Stres / Stress		
	N	M	SD	N	M	SD	N	M	SD
Zagreb 2016.	264	5,72	5,467	264	5,05	5,373	264	7,75	5,744
Zagreb 2021.	330	5,64	5,728	330	5,90	5,649	331	7,90	5,887
t		0,36			-1,989*			-0,485	

\*p<.05

na ozbiljnu i vrlo ozbiljnu izraženost simptoma. Kao što se može uočiti iz histograma (slika 1) primjetan je trend rasta internaliziranih problema. Dobiveni rezultati ukazuju da je u prosincu 2021. godini o ozbiljnim i vrlo ozbiljnim simptomima depresivnosti izvještava svaki peti učenik (20,6 %) u odnosu na 15,0 % učenika 2016. godine. O ozbiljnim i vrlo ozbiljnim simptomima anksioznosti izvještavalo je 2016. godine 13,4 % učenika, dok je 2021. o tome izvještavao čak svaki treći učenik (33,0 %). Ozbiljni i vrlo ozbiljni simptomi stresa 2016. godine bili su prisutni kod svakog petog učenika (20,2 %), a 2021. godine kod svakog četvrtog (25,4 %).

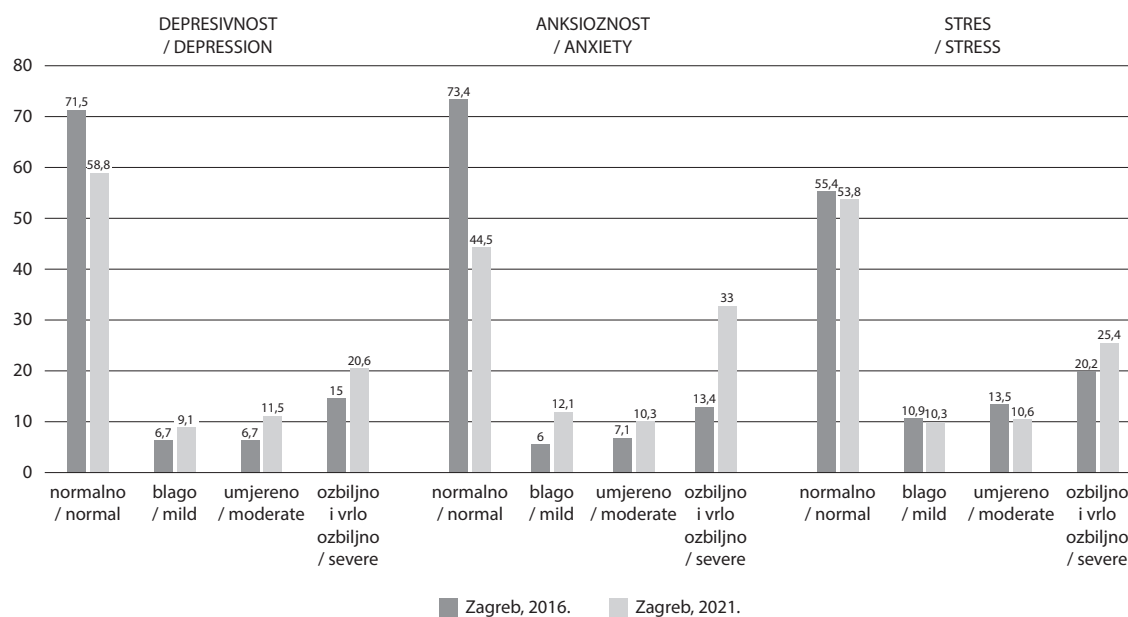
Kako bi se identificirala sociodemografska obilježja mladih u osobitom riziku testirane su rodne razlike, razlike u obrazovnim programima te materijalnim mogućnostima sudionika s obzirom na izraženost internaliziranih problema. Očekivano, rezultati t-testa ukazuju na veću izraženost internaliziranih problema u djevojaka u odnosu na mladiće (tablica 3). Djevojke izvještavaju o višim razinama depresivnosti, anksioznosti i stresa.

Jednostavna analiza varijance za nezavisne uzorke pokazala je da nema razlike u depresiv-

very severe symptoms were combined. As can be seen from the histogram (Figure 1), there is a noticeable trend of growth of internalised problems. The obtained results indicate that at the end of 2021, every fifth student (20.6%) reported severe and very severe symptoms of depression compared to 15.0% of students in 2016. In 2016, 13.4% of students reported severe and very severe symptoms of anxiety, while in 2021, every third student (33.0%) reported this. Severe and very severe stress symptoms were present in every fifth student (20.2%) in 2016, and in every fourth student (25.4%) in 2021.

In order to identify the sociodemographic characteristics of young people at particular mental health risk, gender differences, and financial conditions of the participants were tested with regard to the intensity of internalised problems. As expected, the results of the t-test indicate a higher prevalence of internalised problems in female students compared to males (Table 2). Female students reported higher levels of depression, anxiety and stress.

A simple analysis of variance for independent samples showed that there was no difference in depression, but that there was a statistically sig-



**SLIKA 1.** Izraženost simptoma depresivnosti, anksioznosti i stresa kod zagrebačkih srednjoškolaca 2016. i 2021.

**FIGURE 1.** Expression of symptoms of depression, anxiety and stress among Zagreb high school students in 2016 and 2021.

**TABLICA 3.** Rodne razlike u izraženosti internaliziranih problema u grupi zagrebačkih srednjoškolaca. Podatci za 2021.**TABLE 3.** Gender differences in the intensity of internalised problems among secondary school students

	Depresivnost / Depression			Anksioznost / Anxiety			Stres / Stress		
	N	M	SD	N	M	SD	N	M	SD
Djevojke / Females	159	7,48	6,054	158	7,97	6,034	159	10,35	5,731
Mladići / Males	171	3,94	4,831	172	4,00	4,514	172	5,63	5,079
t		5,894***			6,806***			7,929***	

\*\*\*p&lt;.001

nosti, ali da postoji statistički značajna razlika u anksioznosti i doživljenom stresu učenika ovisno o procijenjenim materijalnim mogućnostima (tablica 4). *Post hoc* testiranjem testom Bonferroni utvrđeno je da na anksioznosti i stresu učenici koji procjenjuju kako njihova obitelj ima manje novaca u odnosu na druge obitelji postižu statistički značajno više rezultate u odnosu na ostale dvije skupine. Između druge dvije skupine (prosječne i iznadprosječne mogućnosti) nije pronađena značajna razlika u izraženosti internaliziranih simptoma. Ako pogledamo deskriptivne podatke možemo vidjeti kako i rezultati za depresivnost prate isti trend, no po svemu sudeći nije se mogla postići razina statističke značajnosti zbog malog broja sudionika u skupini „manje od drugih“. Tome u prilog idu i rezultati koji se odnose na pretrpljenu materijalnu štetu u potresu i izraženost internaliziranih problema (tablica 5). Oni učenici čije su obitelji pretrpjele materijalnu štetu u zagrebačkom potresu izvještavaju o višim razinama depresivnosti, anksioznosti i stresa u odnosu na njihove vršnjake čije obitelji nisu imale materijalnu štetu zbog potresa.

nificant difference in students' anxiety and perceived stress depending on the reported financial situation (Table 3). *Post hoc* testing with the Bonferroni test revealed that regarding anxiety and stress, students who assessed that their family had less money compared to other families achieved statistically significantly higher results compared to the other two groups. Between the other two groups (average and above-average conditions) no significant difference was found in the expression of internalised symptoms. If we look at the descriptive data, we can see that the results for depression follow the same trend, but apparently the level of statistical significance could not be reached due to the small number of participants in the "less than others" group. This is supported by the results related to material damage sustained in the earthquake and the intensity of internalised problems (Table 4). Those students whose families suffered material damage in the Zagreb earthquake reported higher levels of depression, anxiety and stress than their peers whose families did not suffer material damage from the earthquake.

**TABLICA 4.** Razlike prema procijenjenim materijalnim mogućnostima obitelji u izraženosti internaliziranih problema u grupi zagrebačkih srednjoškolaca. Podatci za 2021.**TABLE 4.** Reported family financial situation as related to the intensity of internalised problems among secondary school students. Data for 2021.

Koliko novaca ima tvoja obitelj u odnosu na druge? / How much money does your family have compared to others?	Depresivnost / Depression			Anksioznost / Anxiety			Stres / Stress		
	N	M	SD	N	M	SD	N	M	SD
Manje od drugih / Less than others	23	8,30	7,320	22	8,64	7,094	24	10,58	6,613
Kao i drugi / Like others	208	5,39	5,439	209	5,56	5,569	208	7,42	5,751
Više od drugih / More than others	90	5,47	5,728	90	6,21	5,372	90	8,32	5,813
F		2,771			3,085*			3,468*	

\*p&lt;.05

**TABLICA 5.** Razlike prema pretrpljenoj materijalnoj šteti u zagrebačkom potresu u izraženosti internaliziranih problema u grupi zagrebačkih srednjoškolaca. Podatci za 2021.

**TABLE 5.** Differences of material damage suffered in the Zagreb earthquake in the intensity of internalised problems among secondary school students. Data for 2021.

Materijalna šteta ZG potres / Material damage ZG earthquake	Depresivnost / Depression			Anksioznost / Anxiety			Stres / Stress		
	N	M	SD	N	M	SD	N	M	SD
Da / Yes	102	6,61	6,018	102	7,08	5,760	102	9,25	6,012
Ne / No	228	5,21	5,552	228	5,38	5,531	229	7,31	5,742
t		2,058*			2,564*			2,809**	

\*p<.05; \*\*p<.01

## Prediktori internaliziranih problema

Prije hijerarhijskih regresijskih analiza analizirana je matrica korelacija odabranih varijabli (tablica 6). Pokazalo se da su odabrane varijable povezane s pojedinim kriterijem u očekivanom smjeru u niskim do visokim međusobnim korelacijama. Zanimljivo je da varijabla koja se odnosi na nekonstruktivno suočavanje sa stresom jedina ima statistički značajnu povezanost sa svim drugim varijablama.

Kako bi se dobio odgovor na treći problem istraživanja provedene su tri hijerarhijske regresijske analize (HRA). Pritom su u prvi korak stavljene sociodemografske varijable (kao *dummy* varijable zbog svoje kategorijalne prirode), u drugi karakteristike roditeljskih ponašanja, treći samopoimanje adolescenata i u četvrti obrasci suočavanja sa stresom.

Rezultati (tablice 7,8 i 9) pokazuju da odabrani skupovi prediktora objašnjavaju 57,2 % varijance depresivnosti, 56,8 % anksioznosti i 59,2 % stresa. Što se tiče internaliziranih problema, od sociodemografskih varijabli značajnim se pokazuje samo ženski rod i to za sva tri kriterija, no ta se značajnost za depresivnost gubi uvođenjem varijabli samopoimanja adolescenata, za anksioznost uvođenjem varijabli suočavanja sa stresom, a jedino se za kriterij stresa ova varijabla održala kao značajni prediktor u svim koracima HRA. Također, za kriterij stresa u prva dva koraka značajnim se pokazala varijabla veličine mjesta života adolescenata

## Predictors of internalised problems

Before the hierarchical regression analyses, the correlation matrix of the selected variables (Table 6) was analysed. The selected variables were shown to be related to a particular criterion in the expected direction in low to high mutual correlations. It is interesting that the variable related to non-constructive, maladaptive coping with stress is the only one that has a statistically significant connection with all the other variables.

In order to answer to the third research problem, three hierarchical regression analyses (HRA) were performed. Sociodemographic variables (as dummy variables due to their categorical nature) were entered in the 1st step, parental behaviour characteristics in the 2nd step, adolescent self-concept in the 3rd step, and stress coping patterns in the 4th step.

The results (Table 7, 8 and 9) show that the selected sets of predictors explain 57.2% of the variance in depression, 56.8% in anxiety, and 59.2% in stress. As far as internalised problems are concerned, of the sociodemographic variables, only the female gender is significant for all three criteria, but this significance is lost for depression by the introduction of the variables of adolescent self-concept, for anxiety by the introduction of the variables of coping with stress, and only for the stress criterion is this variable maintained as a significant predictor through all the HRA steps. For the stress criterion in the first two steps, the variable of the size of the ad-

**TABLICA 6.** Matrica korelacija varijabli uključenih u HRA  
**TABLE 6.** Correlation matrix of variables included in HRA

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	
Depresivnost / Depression	1																		
Anksioznost / Anxiety	,783**	1																	
Stres / Stress	,778**	,809**	1																
Rod / Gender	-,309**	-,352**	-,401**	1															
Mjesto života / Place of residence	0,103	,120*	,168**	-,156**	1														
Škola / School	0,090	,125*	,197**	-,316**	,300**	1													
Roditeljska toplina / Parental warmth	-,389**	-,307**	-,238**	0,021	0,062	,149*	1												
Roditeljsko odbijanje / Parental rejection	,482**	,465**	,418**	-0,061	-0,073	-0,095	-,493**	1											
Roditeljska struktura / Parental structure	-,313**	-,282**	-,212**	0,106	-0,012	-0,120	,515**	-,348**	1										
Roditeljska nekonzistentnost / Parental inconsistency	,442**	,400**	,403**	-0,053	0,122	-0,033	-,387**	,630**	-,238**	1									
Roditeljska potpora autonomiji / Parental support for autonomy	-,403**	-,352**	-,290**	0,033	-0,082	0,079	,700**	-,537**	,585**	-,475**	1								
Rodiljska prisila / Parental coercion	,381**	,285**	,330**	0,079	0,075	-0,076	-,367**	,588**	-,202**	,701**	-,481**	1							
Samopoštovanje / Self-esteem	-,602**	-,515**	-,462**	,247**	-0,084	-0,027	,369**	-,385**	,337**	-,313**	,402**	-,245**	1						
Zadovoljstvo izgledom / Satisfaction with physical appearance	-,419**	-,388**	-,300**	,159**	0,069	0,044	,256**	-,243**	,266**	-,150*	,239**	-,145*	,700**	1					
Odnos s vršnjacima istog roda / Relationship with peers of the same gender	-,456**	-,369**	-,300**	,195**	-0,043	0,068	,353**	-,341**	,299**	-,263**	,314**	-,163*	,696**	,550**	1				
Odnos s vršnjacima suprotnog roda / Relationship with peers of the opposite gender	-,303**	-,316**	-,263**	,209**	-0,096	-,139*	,206**	-0,119	,283**	-0,072	,161*	-0,014	,536**	,552**	,552**	1			
Adaptabilne strategije suočavanja sa stresom / Adaptive strategies for coping with stress	-,125*	-0,087	0,025	-0,094	-0,038	,167**	,259**	-,213**	,205**	-0,072	,344**	-,179**	,354**	,272**	,255**	,151*	1		
Neadaptabilne strategije suočavanja sa stresom / Maladaptive strategies for coping with stress	,657**	,674**	,749**	-,465**	,206**	,346**	-,175*	,290**	-,235**	,399**	-,254**	,251**	-,501**	-,339**	-,279**	-,288**	,129*	1	

\*p<.05; \*\*p<.01

prema čemu mladi koji žive u gradu Zagrebu doživljavaju više razine stresa u odnosu na one koji pohađaju zagrebačke srednje škole, ali žive u manjim sredinama.

Kada je riječ o roditeljskim ponašanjima, roditeljska toplina kao poželjno roditeljsko ponašanje pokazuje se kao zaštitni čimbenik za depresivnost, ali se taj efekt gubi uvođenjem varijable samopoimanja adolescenata. Nekon-

olescent's place of residence proved to be significant, according to which young people who live in the city of Zagreb experience higher levels of stress compared to those who attend Zagreb secondary schools but live in smaller communities.

When it comes to parental behaviours, parental warmth as a desirable parental behaviour is a protective factor against depression, but this effect is lost when the adolescent self-concept



**TABLICA 7.** Rezultati hijerarhijske regresijske analize predviđanja depresivnosti  
**TABLE 7.** Results of hierarchical regression analysis in the prediction of depression

Varijabla / Variable	$r_{pk}$	vif	Korak 1 / Step 1	Korak 2 / Step 2	Korak 3 / Step 3	Korak 4 / Step 4
Rod sudionika / Gender of participants	-,309**	1,411	-,261**	-,210**	-,078	,000
Mjesto života / Place of residence	,103	1,263	,063	,049	,029	,014
Obrazovni program / Educational programme	-,233**	1,464	-,004	-,015	-,070	,018
Roditeljska toplina / Parental warmth	-,389**	2,236		-,218*	-,148	-,149
Roditeljsko odbijanje / Parental rejection	,482**	2,225		,014	,014	,017
Roditeljska struktura / Parental structure	-,313**	1,774		-,089	-,048	-,018
Roditeljska nekonzistentnost / Parental inconsistency	,442**	2,636		,289**	,249**	,098
Roditeljska potpora autonomiji / Parental support for autonomy	-,403**	2,907		-,007	,080	,026
Roditeljska prisila / Parental coercion	,381**	2,322		,081	,057	,061
Samopoštovanje / Self-esteem	-,602**	3,691			-,367**	-,217*
Samopimanje tjelesnog izgleda / Self-concept of physical appearance	-,419**	2,307			-,190*	-,152
Odnos s vršnjacima istog roda / Relationship with peers of the same gender	-,456**	2,328			-,013	-,059
Odnos s vršnjacima suprotnog roda / Relationship with peers of the opposite gender	-,303**	1,826			,086	,093
Adaptabilne strategije suočavanja sa stresom / Adaptive strategies for coping with stress	-,125*	1,498				-,025
Neadaptabilne strategije suočavanja sa stresom / Maladaptive strategies for coping with stress	,657**	2,328				,423**
$R$			,315	,617	,709	,777
$R^2$			,099	,381	,502	,603
$\Delta R^2$			,099***	,281***	,121***	,101***
$R^2_{corr}$			,086	,353	,469	,572

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Varijabla rod sudionika kodirana je na način  $\bar{Z}=1$ ,  $M=2$ ; mjesto života: selo=1, grad=2; obrazovni program: strukovna škola=1, gimnazija=2.

/ Variables are coded as follows, the participant's gender:  $F=1$ ,  $M=2$ ; place of residence: village=1, city=2; educational program: vocational school=1, gymnasium=2.

zistentnost u ponašanju roditelja pokazuje se kao rizični čimbenik za anksioznost i stres, no i taj se efekt gubi uvođenjem obrazaca suočavanja sa stresom. Za razliku od navedenog, roditeljsko odbijanje pokazuje se kao značajni prediktor anksioznosti i uz uvođenje varijabli u zadnjem koraku.

Iako su u razdoblju adolescencije iznimno značajni vršnjaci, odnosi s vršnjacima istog i suprotnog roda se nisu se pokazali kao značajni prediktori ni u jednom koraku, ni za jedan od pokazatelja mentalnog zdravlja.

variable is introduced. Inconsistency in parents' behaviour is a risk factor for anxiety and stress, but this effect is also lost by the introduction of patterns of coping with stress. In contrast to the above, parental rejection is revealed to be a significant predictor of anxiety even with the introduction of variables in the last step.

Although peers are extremely important in the period of adolescence, relationships with peers of the same or opposite gender did not prove to be significant predictors in any step, or for any of the indicators of mental health.

**TABLICA 8.** Rezultati hijerarhijske regresijske analize predviđanja anksioznosti  
**TABLE 8.** Results of hierarchical regression analysis in the prediction of anxiety

Varijabla / Variable	$r_{pk}$	Korak 1 / Step 1	Korak 2 / Step 2	Korak 3 / Step 3	Korak 4 / Step 4
Rod sudionika / Gender of participants	-,352**	-,350**	-,276**	-,217**	-,121
Mjesto života / Place of residence	,120*	,099	,085	,096	,044
Obrazovni program / Educational programme	-,278**	-,049	-,082	-,100	,022
Roditeljska toplina / Parental warmth	-,307**		-,132	-,122	-,127
Roditeljsko odbijanje / Parental rejection	,465**		,179	,201*	,205*
Roditeljska struktura / Parental structure	-,282**		,008	,032	,068
Roditeljska nekonzistentnost / Parental inconsistency	,400**		,227*	,211*	,014
Roditeljska potpora autonomiji / Parental support for autonomy	-,352**		-,097	-,032	-,110
Roditeljska prisila / Parental coercion	,285**		-,077	-,132	-,127
Samopoštovanje / Self-esteem	-,515**			-,110	,073
Samopoimanje tjelesnog izgleda / Self-concept of physical appearance	-,388**			-,293**	-,251**
Odnos s vršnjacima istog roda / Relationship with peers of the same gender	-,369**			,046	-,010
Odnos s vršnjacima suprotnog roda / Relationship with peers of the opposite gender	-,316**			,075	,086
Adaptabilne strategije suočavanja sa stresom / Adaptive strategies for coping with stress	-,087				-,059
Neadaptabilne strategije suočavanja sa stresom / Maladaptive strategies for coping with stress	,674**				,534**
$R$		,358	,599	,660	,754
$R^2$		,128	,359	,435	,568
$\Delta R^2$		,128***	,231***	,076***	,133***
$R^2_{corr}$		,115	,330	,397	,568

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Varijabla rod sudionika kodirana je na način  $\bar{Z}=1$ ,  $M=2$ ; mjesto života: selo=1, grad=2; obrazovni program: strukovna škola=1, gimnazija=2.

Variables are coded as follows, the participant's gender:  $F=1$ ,  $M=2$ ; place of residence: village=1, city=2; educational program: vocational school=1, gymnasium=2.

Od čimbenika samopoimanja adolescenata, za depresivnost i anksioznost značajnim se prediktorima pokazuju niže samopoštovanje i lošije samopoimanje tjelesnog izgleda, no uz dodavanje zadnjeg koraka HRA za depresivnost se značajnim održalo samo samopoštovanje adolescenata, a za anksioznost samopoimanje tjelesnog izgleda.

U zadnjem koraku, kao značajni prediktor za sva tri kriterija pokazuje se češće korištenje neadaptabilnih strategija suočavanja sa stresom.

Regarding adolescent self-concept factors, lower self-esteem and a worse self-concept of physical appearance are significant predictors of depression and anxiety, but with the addition of the last step of the HRA, only adolescent self-esteem remained significant for depression, and, for anxiety, the self-concept of physical appearance.

In the last step, the more frequent use of non-constructive, maladaptive strategies of coping with stress is shown as a significant predictor for all three criteria.

**TABLICA 9.** Rezultati hijerarhijske regresijske analize predviđanja stresa  
**TABLE 9.** Results of hierarchical regression analysis in the prediction of stress

Varijabla / Variable	$r_{pk}$	Korak 1 / Step 1	Korak 2 / Step 2	Korak 3 / Step 3	Korak 4 / Step 4
Rod sudionika / Gender of participants	-,401**	-,356**	-,307**	-,250**	-,142*
Mjesto života / Place of residence	,168**	,182*	,151*	,129	,074
Obrazovni program / Educational programme	-,332**	-,047	-,078	-,100	,061
Roditeljska toplina / Parental warmth	-,238**		-,077	-,048	-,053
Roditeljsko odbijanje / Parental rejection	,418**		,079	,092	,095
Roditeljska struktura / Parental structure	-,212**		-,022	-,002	,036
Roditeljska nekonzistentnost / Parental inconsistency	,403**		,244**	,228*	-,012
Roditeljska potpora autonomiji / Parental support for autonomy	-,290**		,016	,049	-,054
Roditeljska prisila / Parental coercion	,330**		,146	,134	,145
Samopoštovanje / Self-esteem	-,462**			-,185	,018
Samopojmanje tjesnog izgleda / Self-concept of physical appearance	-,300**			-,037	,006
Odnos s vršnjacima istog roda / Relationship with peers of the same gender	-,300**			,042	-,023
Odnos s vršnjacima suprotnog roda / Relationship with peers of the opposite gender	-,263**			-,008	,004
Adaptabilne strategije suočavanja sa stresom / Adaptive strategies for coping with stress	,025				,007
Neadaptabilne strategije suočavanja sa stresom / Maladaptive strategies for coping with stress	,749**				,620**
$R$		,417	,610	,653	,789
$R^2$		,174	,372	,426	,622
$\Delta R^2$		,174***	,198***	,054**	,196***
$R^2_{corr}$		,162	,343	,387	,592

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < 0.01$

Varijabla rod sudionika kodirana je na način  $\bar{Z}=1$ ,  $M=2$ ; mjesto života: selo=1, grad=2; obrazovni program: strukovna škola=1, gimnazija=2.

/ Variables are coded as follows, the participant's gender:  $F=1$ ,  $M=2$ ; place of residence: village=1, city=2; educational program: vocational school=1, gymnasium=2.

## RASPRAVA

Polazna hipoteza o pogoršanju internaliziranih problema kao pokazatelja mentalnog zdravlja je tek djelomično potvrđena. Naime, rezultati pokazuju da je na razini prosječnih vrijednosti došlo do statistički značajnog pogoršanja samo jednog od tri pokazatelja mentalnog zdravlja – anksioznosti - u razdoblju 4. vala pandemije COVID-19 kod zagrebačkih adolescenata učenika 1. razreda srednje škole u odnosu na njihove vršnjake u razdoblju prije pandemije i potresa. U izraženosti simptoma depresivnosti i stresa ta razlika nije dobivena. Ipak, iako ta razlika nije statistički značajna, postoji uočljiv trend

## DISCUSSION

The initial hypothesis about the worsening of internalised problems as an indicator of mental health was only partially confirmed. The results show that, at the level of average values, there was a statistically significant deterioration of only one of the three indicators of mental health – anxiety – in the period of the 4th wave of the COVID-19 pandemic among Zagreb adolescents in the 1st grade of secondary school compared to their peers in the period before the pandemic and earthquakes. Nevertheless, although this difference is not statistically significant, there is a noticeable trend of an in-

porasta izraženosti simptoma svih internaliziranih problema kada se koristi kategorijska analiza dobivenih podataka. Tako je u odnosu na 2016. godinu, kada je o ozbiljnim i vrlo ozbiljnim simptomima depresivnosti izvještavalo 15,0 % učenika, anksioznosti 13,4 % i stresa 20,2 %, krajem 2021. godine čak ih je 20,6 % izvještavalo o ozbiljnim i vrlo ozbiljnim simptomima depresivnosti, 33,0 % o anksioznosti i 25,4 % stresa. Slično povećanje internaliziranih simptoma u odnosu na razdoblje prije pandemije dobili su kod kineskih adolescenata Zhang i sur. (41).

U cjelini podatci pokazuju da je mentalno zdravlje zagrebačkih srednjoškolaca bilo ozbiljno ugroženo i prije pandemije COVID-19, koja je samo povećala taj rizik. To ne iznenađuje, jer su anksioznost i depresivnost već godinama prepoznate kao značajni zdravstveni rizik (42), a ograničenja i promjene života koje je potaknuo COVID-19 su samo povećali socijalnu anksioznost i druge čimbenike rizika za mentalno zdravlje (43). To su potvrdila i istraživanja provedena u Hrvatskoj prije pandemije COVID-19. Tako je npr. u istraživanju Edukacijsko rehabilitacijskog fakulteta u okviru projekta „Pozitivan razvoj adolescenata u Hrvatskoj“ (32) kojim je obuhvaćeno 10 138 učenika u dobi od 14 do 19 godina iz pet većih hrvatskih gradova (Zagreb, Split, Osijek, Pula, Varaždin), pokazalo da su ozbiljno i vrlo ozbiljno izraženi simptomi depresivnosti kod 21,3 % učenika, anksioznosti kod 32,5 % te stresa kod 20,3 %.

Iako su rezultati u skladu s navedenim istraživanjima vezanim uz COVID-19, na pogoršanje mentalnog zdravlja zagrebačkih adolescenata u proteklom razdoblju značajan su utjecaj mogli imati i doživljeni potresi. I u tom kontekstu su rezultati u skladu s dosadašnjim istraživanjima koja ukazuju na povišenu razinu simptoma PTSP-a, anksioznosti i depresivnosti u adolescenata nakon potresa (12,15,17,20). Također, podatak da srednjoškolci čije su obitelji pretrpjele materijalnu štetu u potresu i više

crease in the expression of symptoms of all internalised problems when a categorical analysis of the obtained data is used. Thus, compared to 2016, when severe and very severe symptoms of depression were reported by 15.0% of students, anxiety by 13.4% and stress by 20.2%, at the end of 2021 as many as 20.6% of them reported severe and very severe symptoms of depression, 33.0% reported anxiety and 25.4% stress. A similar increase in internalised symptoms compared to the period before the pandemic was found in Chinese adolescents by Zhang et al. (41).

Overall, the data show that the mental health of Zagreb's secondary school students was seriously threatened even before the COVID-19 pandemic, which only increased that risk. This is not surprising since anxiety and depression have been recognised as significant health risks for more than ten years (42), and the restrictions and life changes caused by COVID-19 only increased different mental health risk factors (43). This was also confirmed by research conducted in Croatia before the COVID-19 pandemic. For example, in the study of the Faculty of Education and Rehabilitation as part of the project "Positive Development of Adolescents in Croatia" (32), which included 10,138 students aged 14 to 19 from five major Croatian cities, symptoms of depression were severe and very severe in 21.3% of students, anxiety in 32.5%, and stress in 20.3%.

Although the results are in line with the research related to COVID-19, the deterioration of the mental health of Zagreb's adolescents in the past period could have also been significantly impacted by the experienced earthquakes. Namely, previous research indicated an increased level of PTSD symptoms, anxiety and depression in adolescents after an earthquake (12, 15, 17, 20).

Further, the fact that secondary school students whose families suffered material damage in the earthquake have more compromised

od godinu i pol od velikog potresa u Zagrebu imaju ugroženije mentalno zdravlje od svojih vršnjaka, ne iznenađuje. To je u skladu s međunarodnim istraživanjima koja su pokazala da oštećenja kuća i materijalne štete imaju utjecaj na prisutnost poteškoća mentalnog zdravlja i psihijatrijskih simptoma kod adolescenata (44-46). U tim istraživanjima se naglašava značenje angažmana država u obnovi s obzirom na produljeni rizik za mentalno zdravlje adolescenata.

Ovo istraživanje je pokazalo da su svi simptomi internaliziranih problema izraženiji u djevojaka, mladih iz obitelji nižih materijalnih mogućnosti te onih čije su obitelji pretrpjele materijalnu štetu u potresu. Što se tiče rodni razlika i prethodno spomenuta istraživanja (31,32) pokazala su da su ovi simptomi izraženiji kod djevojaka. Što se tiče siromaštva kao čimbenika rizika za mentalno zdravlje i tu se dosljedno pokazuje da je psihosocijalna dobrobit djece i mladih koji odrastaju u siromaštvu ugrožena (npr. 31,48). O učincima socioekonomske deprivacije, ali i drugih kulturalnih razlika, sve se češće govori u suvremenom pogledu na razvoj problema mentalnog zdravlja (42,43). To su kontekstualne varijable koje je nužno pratiti kako u istraživanjima tako i u neposrednom radu s mladima koji imaju poteškoća mentalnog zdravlja (43,44).

Zanimljiv je i podatak da se za stres u prva dva koraka HRA kao značajni prediktor pokazala veličina mjesta života adolescenata, što pokazuje da su mladi koji žive u Gradu Zagrebu u potencijalno većem mentalno-zdravstvenim riziku od svojih suučelnika koji također pohađaju zagrebačke srednje škole, ali žive u manjim sredinama, što nije u skladu s polaznim hipotezama. Razina urbanizacije kao čimbenik rizika pokazala se i u našem prethodnom istraživanju iz 2016. godine. Tada su kod zagrebačkih srednjoškolaca bili statistički značajno izraženiji svi internalizirani problemi u odnosu na njihove vršnjake iz središnje Hrvatske (47). Na urbanizaciju kao čimbenik rizika za mentalno zdravlje

mental health than their peers even more than a year and a half after the strong earthquake in Zagreb is not surprising. This is in accordance with international research that has shown that house and property damage have an impact on the mental health difficulties and psychiatric symptoms in adolescents (44-46). In these studies, the lack of government involvement in reconstruction was recognised as a risk factor for the mental health of adolescents.

The current study shows that all symptoms of internalised problems were more pronounced in females, young people from families with lower financial means and those whose families suffered material damage in the earthquake. Regarding gender differences, there is already well-established evidence that internalised problems are more pronounced in young females (e.g., 31, 32). As for poverty as a risk factor for mental health, it has been consistently shown that the psychosocial well-being of children and young people who grow up in poverty is at risk (e.g., 31, 48). The effects of socioeconomic deprivation, as well as other cultural differences, are increasingly discussed in the contemporary explanations of the development of mental health problems (42, 43). These are contextual variables that must be taken into consideration both in research and in direct work with young people who have mental health difficulties (43, 44).

An interesting fact is that, the size of the adolescent's place of residence proved to be a significant predictor for the level of stress in the first two steps of the HRA, which shows that young people who live in the City of Zagreb are possibly at a greater mental health risk than their classmates who also attend Zagreb secondary schools but live in smaller communities. This was not in accordance with the initial hypothesis. The level of urbanisation as a risk factor was also recognised in our previous research from 2016. At that time, all internalised problems were statistically significantly more pronounced among

jasno ukazuje analiza recentnih svjetskih istraživanja koju su proveli Hoare, Jacka i Berk (49). Njihova analiza je pokazala da pojedinci koji žive u urbanim područjima imaju povećan rizik od depresije zbog složene interakcije izvanjskih čimbenika koji uključuju povećanu izloženost buci, svjetlu i onečišćenju zraka, lošu kvalitetu stanovanja, smanjenu kvalitetu prehrane, sjedilački način života i tjelesnu neaktivnost, ekonomski napor i smanjene društvene mreže s jedne strane te povećano korištenje tehnologija s druge strane. U ovom je kontekstu potrebno napomenuti kako je taj prediktor u trećem koraku analize izgubio značajnost, no kako nije u korelaciji s novouvedenim prediktorima (varijable samopoimanja). Razlog tome je vjerojatno njegova granična značajnost u prva dva koraka i samo uvođenje većeg broja novih varijabli što je dovelo do gubitka stupnjeva slobode u cjelokupnoj analizi i povećanja p vrijednosti. Neovisno o tome, s obzirom na značajnu korelaciju samog prediktora i kriterija te spomenute rezultate istraživanja, svakako se radi o konstruktivnom daljnjem istraživanju. Polazeći od toga buduća bi istraživanja trebala identificirati jedinstvene rizike adolescenata, pogotovo ranjivih podskupina, povezane s razinom urbanizacije.

Rezultati HRA ukazuju na to kako niže samopoštovanje predviđa višu depresivnost, roditeljsko odbijanje i veće nezadovoljstvo tjelesnim izgledom višu anksioznost te ženski rod viši stres. Neadaptabilne strategije suočavanja sa stresom jedina su varijabla koja predviđa sva tri kriterija – depresivnost, anksioznost i stres. Ovi nalazi su u skladu s istraživanjem Zhang i sur. (41) koji su na uzorku kineskih adolescenata također utvrdili da su pasivne strategije suočavanja prediktori depresivnosti, anksioznosti i stresa mjereni upitnikom DASS-21. Doduše, kod kineskih adolescenata se pokazalo da aktivni, pozitivni obrasci suočavanja imaju zaštitnu ulogu, što se nije pokazalo u našem istraživanju. Kao i u našem istraživanju, neki

secondary school students from Zagreb compared to their peers from smaller communities in central Croatia (47). Urbanisation, as a risk factor for mental health, is clearly indicated by the meta-analysis (49) that shows that individuals living in urban areas have an increased risk of depression due to the complex interplay of external factors that include increased exposure to noise, light and air pollution, poor housing quality, reduced dietary quality, sedentary lifestyles and physical inactivity, economic strain and reduced social networks on the one hand and increased use of information technologies on the other. It should be noted that this predictor lost its significance in the third step of the HRA, and the reason for this is probably its marginal significance in the first two steps and the mere introduction of a larger number of new variables, which led to a loss of degrees of freedom in the overall analysis and an increase in the p value. Regardless of that, the significant correlation between the urbanisation predictor and the criteria and the aforementioned research results, indicates that this construct is worthy of further mental health research. Based on this, future research should identify the unique mental health risks of adolescents, especially vulnerable subgroups e.g., adolescents living in poverty, related to the level of urbanisation.

The HRA results indicate that lower self-esteem predicts higher depression, and parental rejection and greater dissatisfaction with body appearance predict higher anxiety, and female gender predicts higher stress. Maladaptive coping strategies such as passive avoidance, rumination, indifference and aggression are the only variable that predicts all three criteria – depression, anxiety and stress. These findings are consistent with the research of Zhang et al. (41) who, in a sample of Chinese adolescents, also determined that passive coping strategies were predictors of depression, anxiety and stress measured with the DASS-21 questionnaire. Admittedly, active, positive coping patterns were shown to have a

od čimbenika povezanih s povećanom anksioznošću su bili ženski rod, život u urbanim područjima i stil suočavanja usmjeren na emocije. No njihovo istraživanje je identificiralo i neke specifične čimbenike koji su bili povezani s pojačanim simptomima depresije kao što je npr. „ovisnost o pametnom telefonu“ i “ovisnost o internetu”. Po svemu sudeći to su varijable koje je potrebno unijeti u buduća istraživanja. Činjenica kako se adaptabilne strategije suočavanja koje se odnose na usmjerenost na problem (kontrola situacije, pozitivne samoupute, traženje socijalne podrške) i suočavanje usmjereno na emocije (distrakcija/rekreacija i umanjivanje) nisu pokazale kao značajan čimbenik zaštite upućuje da one možda još nisu dovoljno razvijene u ovom razdoblju adolescencije te bi se u budućim preventivnim programima mentalnog zdravlja trebalo usmjeriti na njih.

Podatak da su najsnažniji prediktori internaliziranih problema tri obilježja adolescenata - niže samopoštovanje, nezadovoljstvo tjelesnim izgledom i neadaptabilni, nekonstruktivni obrasci suočavanja sa životnim poteškoćama, te roditeljsko odbijanje, ponovno otvara prostor nužnosti sustavnog planiranja zaštite mentalnog zdravlja djece i mladih koje treba sezati od ranog djetinjstva i to u dva smjera: jedan je usmjeren na roditelje i na razvoj podražavajućeg, pozitivnog roditeljstva od ranog djetinjstva kao što je npr. program „Rastimo zajedno“ (50,51), a drugi na djecu i sustavni razvoj niza vještina kao što su to npr. emocionalna regulacija, vještine suočavanja sa životnim poteškoćama, socijalna osjetljivost i spremnost na pomaganje, što će sve pridonijeti pozitivnom samopoimanju i samopoštovanju kao moćnim čimbenicima zaštite mentalnog zdravlja u kriznim i visoko stresnim situacijama i razdobljima.

Istraživanje ima i određena ograničenja. Jedno od njih su relativno mali uzorci te manje razlike u njihovoj strukturi s obzirom na rod, vrstu škole i socioekonomski status sudioni-

protective role in Chinese adolescents, which was not seen in our research. As was the case in the present study, in Zhang et al. (41) study some of the factors associated with increased anxiety were the female gender, living in urban areas, and an emotion-focused coping style. But they also identified some specific factors that were associated with increased symptoms of depression during the COVID-19 pandemic, such as “smartphone addiction” and “internet addiction”. It is highly likely that these are variables that need to be included in future research. The fact that adaptive coping strategies which refer to problem-focused (situation control, positive self-instructions, seeking social support) and to emotion-focused coping (distraction/recreation and reduction) were not a significant protective factor in our study may indicate that they have not been sufficiently developed in this period of adolescence, and that mental health prevention programmes should focus on them.

The fact that the strongest predictors of internalised problems are three characteristics of adolescents: lower self-esteem, dissatisfaction with physical appearance and maladaptive, non-constructive patterns of coping with life's difficulties, and parental rejection, highlights the need for planning interventions for promoting the mental health well-being of children and young people that should begin from early childhood in two directions. One is focused on parents and on the development of positive parenting from early childhood, such as the “Growing Up Together” programme (50, 51). The second is aimed at children and the systematic development of a life-relevant skills such as emotional regulation, skills of coping with life's difficulties, empathy, all of which will contribute to a positive self-concept and self-esteem as general powerful factors in mental health protection which is especially important in crisis and in highly stressful situations.

The research also has certain limitations. One of them is the relatively small size of the sam-

ka. S obzirom na to kako je u uzorku 2016. bio nešto veći udio djevojaka i mladih nižeg socioekonomskog statusa, što su rizični faktori za poteškoće mentalnog zdravlja adolescenata (52,53), moguće je kako je to utjecalo na rezultate zbog čega nije potvrđena statistička značajnost vidljivih razlika u izraženosti internaliziranih simptoma. Uz to, bez obzira na to što je u uzorku 2021. bio nešto veći broj mladih iz strukovnih škola, u analizu nisu bili uključeni učenici iz onih škola koje su nam se u prethodnim istraživanjima pokazale najrizičnijima i u kojima bismo očekivali najlošije rezultate. Također, prediktorski skup varijabli, zbog opsežnosti upitnika, nije mogao obuhvatiti sve relevantne varijable, npr. povijest poteškoća i poremećaja mentalnog zdravlja, povijest traume i mentalne bolesti roditelja ili visoka uznemirenost roditelja/skrbnika (41,44). Ograničenje je i činjenica da se ne radi o klasičnom longitudinalnom istraživanju već o studiji trenda te to što iz naših podataka nije moguće razgraničiti utjecaj pandemije i potresa na dobivene rezultate. S druge strane, u usporedbi s velikom većinom istraživanja provedenih tijekom pandemije COVID-19, prednost istraživanja je da su podatci u obje točke mjerenja prikupljeni „uživo“, istim mjernim instrumentom i na uzorku iste populacije.

Ovo istraživanje jasno ukazuje na moguća unaprjeđivanja i proširenja u budućim istraživanjima. Tako je npr. u nužnom post-COVID praćenju ključno voditi računa o mentalno zdravstvenom statusu i poteškoćama za vrijeme pandemije, usmjeriti se na neke potencijalno nove ranjive skupine kao što su npr. adolescenti kod kojih je dijagnosticiran post-COVID sindrom ili njegovi pokazatelji.

S obzirom na njihovu razvojnu ranjivost, mentalno zdravlje adolescenata treba sustavno pratiti i u post-COVID razdoblju, tim više što tzv. krivulja emocionalne epidemije ukazuje na veliku vjerojatnost povećanja problema mentalnog zdravlja u postpandemijskoj eri (54).

ples and minor differences in their structure with regard to the gender, type of school and socioeconomic status of the participants. The fact that in 2016 sample there was a slightly higher proportion of females and young people of lower socioeconomic status, which are risk factors for mental health problems (52, 53) might cause that in a relatively small sample the visible differences was not confirmed as significant. As well, the analysis did not include students from schools that in previous research showed to be at greater risk. In addition, due to the extensiveness of the questionnaire, we did not include all relevant predictor variables, e.g., a history of mental health difficulties and disorders, a history of trauma and parental mental illness, or high parental/caregiver distress (41, 44). Another limitation is that this was not a classical longitudinal study but a trend study. On the other hand, compared to the great majority of research conducted in COVID-19 times, the advantage of this study is that the data at both measurement time points were collected “live”, with the same measuring instrument and on a sample of the same population.

This work indicates the possibilities for improvement and expansion of future research. Thus, for example, in the post-COVID follow-up, it is crucial to take into account the mental health status and difficulties during the pandemic and to focus on some potentially new vulnerable groups such as, for instance, adolescents who have been diagnosed with post-COVID syndrome.

The results of this study also support the need for systematically monitoring the mental health of adolescents generally, and especially in the post-COVID period, since the so-called emotional epidemic curve indicates a high probability of an increase in mental health problems in the post-pandemic era (54). Childhood and adolescence are critical phases of life for the mental health and well-being of individuals in the long term. This is not only be-



Djetinjstvo i adolescencija su kritične faze života za mentalno zdravlje i dobrobit pojedinaca u životnoj perspektivi. Ne samo zato što tada mladi ljudi razvijaju autonomiju, samokontrolu, socijalnu interakciju i socijalno učenje, već i zbog toga što sposobnosti formirane u tom razdoblju izravno utječu na njihovo mentalno zdravlje do kraja života (43).

U cjelini ovi podatci pokazuju da je mentalno zdravlje zagrebačkih srednjoškolaca bilo pod visokim rizikom i prije pandemije COVID-19 i potresa, a ograničenja i promjene u svakodnevnom životu mladih zbog pandemije te izloženosti visokostresnim događajima su samo povećali taj rizik. Pri tome su posebno ugrožene djevojke, adolescenti čije su obitelji pretrpjele materijalnu štetu u zagrebačkom potresu, te čije obitelji imaju slabiji socioekonomski status. Neadaptabilne strategije suočavanja sa stresom su značajni prediktori depresivnosti, anksioznosti i stresa. Dodatni značajni prediktor depresivnosti je niže samopoštovanje, roditeljsko odbijanje i veće nezadovoljstvo tjelesnim izgledom prediktori anksioznosti te ženski rod prediktor stresa.

Dobiveni podatci su u skladu s međunarodnim istraživanjima u kojima se naglašava da je globalno pandemija COVID-19 pridonijela značajnom porastu poteškoća mentalnog zdravlja kako u općoj populaciji, tako i kod ranjivih skupina. Upravo su adolescenti prepoznati kao jedna od najranjivijih skupina (11,42,53,54). Također, u skladu je i s istraživanjima negativnih posljedica potresa na mentalno zdravlje adolescenata (15,17,18,20) te je utjecaj navedenih iznimnih stresogenih faktora u ovom istraživanju nemoguće razlučiti.

## ZAKLJUČAK

Nisu svi adolescenti imali nepovoljne ishode za mentalno zdravlje. Istraživanje čimbenika zaštite pokazalo je da psihološka otpornost, kon-

cause at this time young people develop autonomy, self-control, social interaction and social learning, but also because the abilities formed during this period directly affect their mental health for the rest of their lives (43).

The data obtained are in line with international research, which emphasises that the global COVID-19 pandemic has contributed to a significant increase in mental health problems both in the general population and among vulnerable groups. Adolescents are recognised as one of the most vulnerable groups (11, 42, 53, 54). It is also consistent with research on the negative consequences of earthquakes on the mental health of adolescents (15, 17, 18, 20), and it is not possible to distinguish the influence of these exceptional stressogenic factors in this research.

## CONCLUSION

Overall, the data show that the mental health of Zagreb's secondary school students was at high risk even before the COVID-19 pandemic and earthquakes, and restrictions and changes in the everyday life due to the pandemic and exposure to high-stress events additionally increased that risk. Females, adolescents whose families suffered material damage in the Zagreb earthquake, and those whose families have a weaker socioeconomic status are particularly at risk. Maladaptive coping strategies such as passive avoidance, rumination, indifference and aggression are significant predictors of depression, anxiety and stress. An additional significant predictor of depression is lower self-esteem, while parental rejection and greater dissatisfaction with physical appearance are predictors of anxiety, and female gender significant stress predictor. Still, not all adolescents had adverse mental health outcomes. Research into protective factors has shown that psychological resilience, constructive coping strategies and good family relationships could be key in

struktivne strategije suočavanja i dobri obiteljski odnosi mogu biti ključni u zaštiti mentalnog zdravlja djece i adolescenata. Te spoznaje treba koristiti u planiranju prevencije namijenjene svim adolescentima i planiranju širokog raspona ciljanih intervencija osnaživanja adaptabilnih strategija suočavanja što se odnosi na suočavanje usmjereno na problem (kontrola situacije, pozitivne samoupute, traženje socijalne podrške) i suočavanje usmjereno na emocije (distrakcija/rekreacija i umanjivanje), osobito za one najranjivije, a to su, kako je pokazalo ovo i druga istraživanja, u prvom redu djevojke i mladi koji odrastaju u siromaštvu. Sustavno se treba pristupiti i smanjivanju učinaka čimbenika rizika kao što su siromaštvo, prethodno identificirane teškoće mentalnog zdravlja, socijalna isključenost, razina urbanizacije i slično.

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protecting the mental health of children and adolescents. This knowledge should be used in the planning of prevention aimed at all adolescents and in planning of a wide range of targeted interventions aimed at strengthening adaptive coping strategies which refer to problem-focused (situation control, positive self-instructions, seeking social support) and to emotion-focused coping (distraction/recreation and minimizing). Especially for the most vulnerable ones, which, as this and other research has shown, are primarily females and young people growing up in poverty. A systematic approach should also be taken to reduce the effects of risk factors such as poverty, previously identified mental health difficulties, social exclusion, the level of urbanisation, and the like.

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