Longitudinalno istraživanje heterogenosti simptoma adolescentske depresije

/ A Longitudinal Study of the Heterogeneity of Adolescent Depression Symptoms

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Adolescenti imaju povećan rizik za razvoj psihičkih poremećaja uključujući depresiju. Malo je istraživanja koja su longitudinalno ispitivala heterogenost depresije u populaciji adolescenata. Ovo istraživanje ispitalo je postojanje različitih profila depresivnih simptoma među adolescentima te kako pojedinci prelaze između tih profila tijekom vremena. Istraživanje je provedeno na velikom probabilističkom uzorku adolescenata, koji su na početku istraživanja bili u prvom i drugom razredu srednje škole. Ispunili su upitnik za procjenu DSM-5 simptoma depresije u tri vremenske točke, s razmakom od šest mjeseci (n_{t1} = 1338, n_{t2} = 1214, n_{t3} = 1331). Analizom prijelaza latentnih profila identificirana su četiri različita i mjerno invarijantna profila kroz sve valove: „Bez simptoma", „Niski simptomi", „Somatsko-vegetativni simptomi" i „Visoko izraženi simptomi depresije". Adolescenti koji su pripadali profilu "Somatsko-vegetativni simptomi" izvijestili su o povišenoj razini umora, poremećajima spavanja i problemima s apetitom, ali ne i o povećanoj suicidalnosti. Nasuprot tome, oni u profilu „Visoko izraženi simptomi depresije" pokazivali su povišene razine gotovo svih depresivnih simptoma. Iako su profili pokazali određenu vremensku stabilnost, uočeni su i prijelazi između profila. Tako su neki adolescenti prelazili iz profila Niski simptomi u profil „Somatsko-vegetativni simptomi" ili čak u profil „Visoko izraženi simptomi depresije". S druge strane, mnogi su adolescenti prelazili iz težih profila u blaže, primjerice iz „Visoko izraženi simptomi depresije" u „Somatsko-vegetativni simptomi" ili „Niski simptomi". U odvojenim analizama provedenima na djevojkama i mladićima dodatno je identificiran profil „Simptomi suicidalnosti" koji je upućivao na taj povišeni simptom. Ovi nalazi naglašavaju dinamičnu prirodu depresivne simptomatologije u adolescenciji i ističu važnost uzimanja u obzir različitih profila simptoma u dijagnostici i intervencijama.

/ Adolescents are at an increased risk of developing mental disorders, including depression. Few studies have longitudinally examined the heterogeneity of depression in the adolescent population. This study investigated the existence of different depressive symptom profiles among adolescents, as well as the ways in which individuals transition between these profiles over time. The study included a large probabilistic sample of adolescents, who were in their first and second year of high school at the study onset. They completed a questionnaire designed to assess depression symptoms according to DSM-5 criteria at three time points, each six months apart (n_{p1} = 1338, n_{p2} = 1214, n_{p3} = 1331). Using latent profile transition analysis, four distinct and measurement invariant profiles were identified across all waves: No Symptoms, Low Symptoms, Somatic-Vegetative Symptoms, and Severe Depression Symptoms. Adolescents in the Somatic-Vegetative Symptoms profile reported elevated levels of fatigue, sleep disturbances and appetite problems, but no increased suicidality. In contrast, those in the Severe Depression Symptoms profile exhibited elevated levels of nearly all depressive symptoms. Although the profiles demonstrated a degree of temporal stability, transitions between profiles were also observed. Notably, some adolescents transitioned from the Low Symptoms profile into the Somatic-Vegetative Symptoms or even the Severe Depression Symptoms profile. Conversely, many adolescents transitioned from more severe profiles to less severe ones, for example, from Severe Depression Symptoms profile to Somatic-Vegetative Symptoms or Low Symptoms profile. In separate analyses conducted on girls and boys, an additional profile, Suicidality Symptoms, was identified, which pointed to that elevated symptom. These findings underscore the dynamic nature of depression symptomatology in adolescence and highlight the importance of considering different symptom profiles in both the diagnostic and intervention efforts.

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UVOD

Adolescencija je razdoblje intenzivnog fizičkog i neurološkog razvoja (1) kao i socijalnog, kognitivnog, emocionalnog i moralnog razvoja (2). Turbulentnost ovog razdoblja povećava osjetljivost adolescenata na različite psihičke poremećaje. Ova povećana osjetljivost nadograđuje se na prethodne čimbenike rizika poput stresa u ranom životu, odnosno traume, nasilja i drugih oblika zlostavljanja (3) te autoritativnog roditeljstva i negativnih iskustava u školi (4). Stoga značajan broj adolescenata razvija simptome depresije. Depresija je jedan od najčešćih poremećaja, a u jednoj meta-analizi procijenjeno je da je oko 8 % adolescenata (95 % CI = 5 % – 12 %) na globalnoj razini patilo od depresije unutar posljednje godine (5). Nadalje, prevalencija povišenih simptoma depresije kod adolescenata porasla je između 2001. i 2010., te ponovno između 2011. i 2020. godine (5).

Adolescentska depresija težak je poremećaj koji može imati ozbiljne posljedice poput rizičnih ponašanja i školskih problema (6), interpersonalnih teškoća (7), lošijeg tjelesnog zdravlja (8) te samoozljeđivanja i samoubojstva (9). Podatci Svjetske zdravstvene organizacije (10) pokazuju da je depresija četvrti vodeći uzrok bolesti i invaliditeta među adolescentima, dok je samoubojstvo treći vodeći uzrok smrti.

Depresija je u DSM-5 definirana putem devet simptoma (11) od kojih barem jedan mora biti

INTRODUCTION

Adolescence is a period of intense physical and neurological development (1), as well as social, cognitive, emotional, and moral development (2). The turbulence of this period increases the sensitivity of adolescents to various mental disorders. This increased sensitivity builds on the prior risk factors such as early life stress, i.e. trauma, violence and other forms of maltreatment (3), authoritative parenting and negative school experiences (4). Consequently, a substantial number of adolescents develops symptoms of depression. Depression is one of the most common disorders, and it was estimated in a meta-analysis that around 8% of adolescents (95% CI = 5% – 12%) globally have suffered from depression within the last year (5). Furthermore, the prevalence of elevated depression symptoms in adolescents increased in the period between 2001 and 2010, and again between 2011 and 2020 (5).

Adolescent depression is a debilitating disorder which can have severe consequences such as risky behaviors and academic problems (6), interpersonal problems (7), poorer physical health (8), and self-harm and suicide (9). The data published by the World Health Organization (10) indicate that depression is the fourth leading cause of illness and disability among adolescents, while suicide is the third leading cause of death.

Depression is defined by nine symptoms in DSM-5 (11), of which at least one must be either depressed mood or loss of interest and pleasure.

depresivno raspoloženje ili gubitak interesa i zadovoljstva. Ostali simptomi uključuju gubitak ili povećanje tjelesne težine, nesanicu ili pretjeranu pospanost, umor ili gubitak energije, osjećaje bezvrijednosti, smanjenu koncentraciju ili neodlučnost te suicidalnost. Depresija se tradicionalno promatrala kao jedinstven konstrukt pri čemu upravo taj konstrukt uzrokuje promjene u simptomima depresije. Često se koristi analogija s medicinskim bolestima poput prehlade ili gripe kod kojih simptomi poput povišene temperature ili curenja nosa ukazuju na zajednički uzrok, tj. samu bolest. Ta je perspektiva i dalje duboko ukorijenjena u psihijatriji, gdje se psihički poremećaji često shvaćaju kao bolesti mozga (12).

Istraživanja su osporila ovu pretpostavku pokazujući da različiti simptomi depresije imaju različite čimbenike rizika (13) te da je teško pronaći robustne i valjane biomarkere za psihičke poremećaje općenito, a posebno za depresiju (14). Ti nalazi se nadovezuju na mrežnu teoriju (15) koja pretpostavlja da psihički poremećaji proizlaze iz međudjelovanja samih simptoma te interakcija između simptoma i unutarnjeg i vanjskog okruženja, a ne iz zajedničkog uzroka. Mrežna teorija pretpostavlja kako postoje kauzalne veze između simptoma koje mogu imati različite osnove (15) kao što je biološka osnova (problemi sa spavanjem uzrokuju umor) ili psihološka osnova (osjećaj depresije i beznađa uzrokuje poteškoće s koncentracijom). Ipak, ona ne propisuje kako bi simptomi depresije konkretno trebali uzrokovati jedni druge, dijelom i zato što se pretpostavlja da se interakcije simptoma razlikuju za različite osobe.

Povezana s tim je i ideja kako je depresija heterogena, što već dulje vrijeme pokazuju istraživanja (16). Fried i Nesse (12) su izračunali kako je 3703 pacijenata s depresijom imalo ukupno 1030 različitih kombinacija simptoma koji su činili njihove kliničke slike. Posljedica takve heterogenosti je to da tretman nije učinkovit za mnoge osobe s depresijom. Na primjer, dobiveno je kako psihološki tretman depresije ima skromne učinke kod djece i adolescenata (17).

The other symptoms include weight loss or gain, insomnia or hypersomnia, fatigue or loss of energy, feeling worthless, decreased concentration or indecisiveness, and suicidality. Depression was traditionally seen as a unitary construct, whereby this very construct causes changes in depression symptoms. An analogy is often used, referring to medical diseases such as a cold or the flu, in which symptoms such as fever or a runny nose point to a common cause, i.e. the disease itself. This perspective is still deeply rooted in psychiatry, where mental disorders are often viewed as brain dysfunctions (12).

Studies have challenged this assumption by showing that different symptoms of depression have different risk factors (13), and that it is difficult to find robust and valid biomarkers for common mental disorders in general, and for depression in particular (14). These findings build on the network theory (15), which posits that mental disorders arise from interactions between the symptoms themselves, as well as interactions between symptoms and the internal and external environments, and not from a common cause. The network theory assumes that there are causal connections between symptoms, which may be grounded in different mechanisms (15) such as biological mechanisms (sleep problems cause fatigue) or psychological mechanisms (feelings of depression and hopelessness cause concentration difficulties). However, it does not prescribe how depression symptoms should specifically cause one another, partly because it is assumed that symptom interactions differ across individuals.

Related to that is the idea that depression is heterogenous, which has been observed in studies for a long time (16). Fried and Nesse (12) calculated that among the 3703 examined patients with depression, there were 1030 different symptom combinations which made up their clinical pictures. A consequence of such heterogeneity is ineffectiveness of treatment in numerous depressive patients. It has been found, for example, that psychological depression treatment produces only modest effects in children and adolescents

Druga istraživanja pokazala su kako podtipovi depresije dobiveni istraživanjima imaju različitu terapijsku prognozu, odnosno da reagiraju na tretman kognitivno bihevioralnom terapijom s različitim ishodima (18).

Različita druga istraživanja koristila su analizu latentnih klasa kako bi identificirala moguće podtipove depresije (16). Sistematski pregled literature pokazao je kako kod osoba s depresijom nisu identificirani konzistentni podtipovi depresije (16). Ipak, uključena istraživanja su rijetko koristila svih devet DSM-5 simptoma depresije i pregled literature nije uključio istraživanja provedena na osobama mlađima od 18 godina. Na uzorku depresivnih adolescenata Loadesova i sur. (18) identificirali su tri klastera, odnosno klasa simptoma: Ozbiljni simptomi, Umjereni simptomi i Povišeni „Somatsko-vegetativni simptomi". Tri klase pokazale su sličan odgovor na tretman, ali sudionici u klasi sa somatsko-vegetativnim simptomima nisu se nastavili oporavljati nakon završetka tretmana.

Ovi nalazi su vrijedni, ali je također potrebno proučiti podtipove depresije na uzorku adolescenata iz opće populacije, gdje samo manji broj adolescenata ispunjava kriterije za dijagnozu depresije. Naime, moguće je da postoje adolescenti kojima ne bi bila dijagnosticirana depresija, ali pokazuju neke klinički značajne simptome. Klinička istraživanja uoči izlaska DSM-5 pokazala su kako je pouzdanost dijagnoze depresije vrlo niska, čak oko 0,30 (19) te je moguće da se depresija u nekih adolescenata i ne dijagnosticira točno. Vremenska dimenzija je također bitna pa tako neki adolescenti mogu tek kasnije razviti depresiju. Istraživanja također pokazuju da se psihički poremećaji u adolescenciji često ne prepoznaju jer ih okolina pogrešno shvati kao posljedicu stresa ili prolaznu fazu te se tako procjenjuje da se depresija dijagnosticira kod svega 50 % ili i manje adolescenata prije odrasle dobi (5). Većina istraživanja koristila je kros-sekcijski pristup pri čemu su analizirala samo trenutno zatečeno stanje.

(17). Other studies have shown that subtypes of depression observed in studies have different therapeutic prognoses, i.e. they have different outcomes following cognitive behavioral therapy (18).

Various other studies have thus used latent class analysis to identify the possible subtypes of depression (16). A systematic literature review showed that no consistent depression subtypes have been identified in individuals with depression (16). However, the included studies rarely used all nine DSM-5 depression symptoms, and the literature review did not include studies conducted on individuals under 18 years of age. On a sample of adolescents with depression, Loades et al. (18) identified the following three clusters, i.e. classes of symptoms: Severe Symptoms, Moderate Symptoms, and Elevated Somatic-Vegetative Symptoms. A similar treatment response was observed in these three classes, however the recovery of participants in the class with somatic-vegetative symptoms did not continue after the completion of treatment.

These insights are valuable, but it is also necessary to examine the depression subtypes on a sample of adolescents in the general population, where only a smaller number of adolescents meets the criteria for depression diagnosis. Namely, it is possible that there are adolescents who would not be diagnosed with depression, but who exhibit some clinically relevant symptoms. The results of clinical studies conducted ahead of the DSM-5 publication showed that the reliability of depression diagnosis is very low, as low as 0.30 (19), and it is possible that some adolescents may not be correctly diagnosed with depression. The temporal dimension is important as well, as some adolescents could transition into depression only later. Research has also shown that mental disorders in adolescence often go unrecognized because those in their surroundings mistakenly interpret them as stress-related or as a passing phase. As a result, it is estimated that depression is diagnosed in only about 50% or fewer adolescents before adulthood (5). Most studies utilized a cross-sec-

Nekoliko longitudinalnih istraživanja (npr. 20, 21) identificiralo je različite putanje adolescentskih simptoma depresije, poput Stabilno niski, Rano visoki ili Rastući. Ipak, ta istraživanja nisu proučavala heterogenost simptoma depresije u svakoj vremenskoj točki. Analiza prijelaza latentnih profila (engl. *Latent transition profile analysis (* 22)) prikladna je za takvo istraživačko pitanje jer omogućuje proučavanje ne samo podtipova adolescentske depresije, već i njihovih razvojnih putanja. Prema saznanjima autora ovog rada, samo je jedno istraživanja do sad slijedilo ovaj pristup (23). Istraživači su otkrili tri profila u koje su se grupirali adolescenti s obzirom na simptome depresije. Adolescenti koji su pripadali posljednjim dvama profilima imali su povišene simptome depresije i također su otkrivene značajne vjerojatnosti prelaska iz profila u profil. Ipak, istraživači su koristili 20 indikatora za mjerenje depresivnosti, koji se nisu u potpunosti slagali sa simptomima depresije iz DSM-5. Također, zbog velikog broja indikatora koji je korišten kako bi se adolescenti grupirali u profile, bilo je teže interpretirati rezultate.

Cilj ovog istraživanja bio je istražiti obrasce depresivne simptomatologije među adolescentima s posebnim naglaskom na mogućnost postojanja različitih profila i njihovu promjenu kroz vrijeme. Dodatni cilj bio je istražiti obrasce depresivne simptomatologije odvojeno na djevojkama i mladićima.Korišten je upitnik depresije koji mjeri DSM-5 kriterije i veliki, probabilistički uzorak adolescenata. Ovo je bilo eksploratorno istraživanje te stoga nisu unaprijed postavljene hipoteze.

METODE

Postupak i sudionici

Podatci su prikupljeni kao dio većeg istraživačkog projekta *Longitudinalna studija stresa u adolescenciji* (STRESS LOAD). Istraživanje je odobrilo etičko povjerenstvo Instituta društvenih

tional approach, where they only analyzed the current situation.

Several longitudinal studies (e.g. 20, 21) identified different trajectories of adolescent depression symptoms, such as Stable Low, Early High or Increasing. However, these studies did not examine the heterogeneity of depression symptoms at each time point. Latent profile transition analysis (22) is appropriate in this research context, as it allows an examination of not only the subtypes of adolescent depression, but also of their developmental trajectories. According to this author's knowledge, only one study so far has followed this approach (23). The researchers identified three profiles of adolescents based on their depression symptoms. Adolescents belonging to the last two profiles had elevated depression symptoms, and significant probabilities of transitioning between profiles were discovered as well. However, the researchers used 20 indicators for measuring depression, which did not completely correspond to the DSM-5 depression symptoms. Furthermore, due to the high number of indicators used to group the adolescents into profiles, findings were more difficult to interpret.

The aim of this study was to examine the patterns of depressive symptoms among adolescents, with particular emphasis on the possible existence of different profiles and their change over time. An additional aim was to explore the patterns of depressive symptoms in boys and girls separately. A depression questionnaire that measures the DSM-5 criteria was used, along with a large, probabilistic sample of adolescents. This was an exploratory study, therefore no a-priori hypotheses were set.

METHODS

Procedure and participants

Data were collected as part of a larger research project entitled *Longitudinal Adolescent Stress Study* (STRESS LOAD). The study was approved by the Ethics Committee of the Ivo Pilar Institute

znanosti Ivo Pilar (Broj odluke: 11-73/20-479). Svaki sudionik uključen u istraživanje dao je svoj informirani pristanak. Za sudionike mlađe od 16 godina dobiven je i pristanak roditelja elektroničkom poštom. Uzorak je definiran kao probabilistički klaster uzorak javnih srednjih škola u Zagrebu, stratificiran prema dominantnom tipu nastavnog programa (gimnazije ili strukovne škole). Od ukupno 55 javnih srednjih škola u Zagrebu konačni uzorak uključivao je 7 od 20 gimnazija i 9 od 35 strukovnih škola. Nekoliko je škola odustalo zbog drugih obaveza te su zamijenjene sličnim zamjenskim školama. To nije utjecalo na reprezentativnost uzorka s obzirom na dob i spol. U svakoj školi planiralo se uključiti 10 razreda ili oko 200 učenika, ali se taj broj razlikovao ovisno o izostancima učenika i spremnosti škola da uključe toliki broj razreda. U prosjeku je između 10 % i 20 % učenika izostalo s nastave zbog bolesti ili drugih izvanrednih okolnosti, no od prisutnih učenika otprilike 95 % sudjelovalo je u istraživanju. Učenici su sudjelovali u istraživanju ispunjavajući upitnike na svojim pametnim telefonima.

Podatci su prikupljeni u tri vala istraživanja, s razmacima od otprilike šest mjeseci. Korišten je razmak od šest mjeseci između mjerenja budući da su u ovom istraživanju korišteni podatci iz većeg istraživačkog projekta u kojem je interval od šest mjeseci procijenjen kao optimalan za opažanje promjena u različitim konstruktima mentalnog zdravlja kod adolescenata, uključujući i depresiju. Dodatno, interval mjerenja poklapao se i s polugodištima u srednjim školama te je školama uključenima u istraživanje bilo prihvatljivo osigurati jedan termin za mjerenje po razredu u svakom polugodištu. Analize su provedene na sudionicima koji su sudjelovali u najmanje dva od tri vala istraživanja i uspješno prošli pitanja za provjeru pažnje. U svakom valu nalazila su se tri pitanja za provjeru pažnje, koja su od sudionika tražila da odaberu određeni odgovor kako bi pokazali da pažljivo čitaju pitanja (npr. „Odaberi broj 4 na ovom pitanju kako bi pokazao da čitaš pitanja."). Konačni uzorak uključivao je n_{t1}

of Social Sciences (Ref. No. 11-73/20-479). Informed consent was obtained from every participant involved in the study. For participants under 16 years of age, parental consent was obtained via e-mail as well. The sample was defined as a probabilistic cluster sample of public high schools in Zagreb, stratified according to the dominant type of curriculum (gymnasiums or vocational schools). Out of a total of 55 public high schools in Zagreb, the final sample included 7 out of 20 gymnasiums, and 9 out of 35 vocational schools. Several schools dropped out due to other commitments and were replaced by similar substitute schools. This did not affect the representativeness of the sample with regards to age and sex. It was planned that 10 classes or around 200 students would be included in each school, however this number varied depending on the students' absences and the readiness of the schools to include this many classes. On average, between 10% and 20% of students were absent from class due to illness or other extraordinary circumstances, while approximately 95% out of those who were present participated in the study. The students participated in the study by filling out the questionnaires on their smartphones.

The data were collected in three study waves which were set apart by approximately six months. A six-month interval between measurements was used because this study used data from a larger research project in which a six-month interval was estimated as optimal for observing changes in various mental health constructs among adolescents, also including depression. In addition, the measurement interval coincided with school semesters in high schools, and it was acceptable to the participating schools to provide one measurement session per class in each semester. The analyses were conducted on those participants who participated in at least two out of three study waves, and successfully passed the attention check questions. Within each wave there were three attention check questions, asking the participants to select a specific answer to prove that they were reading the questions attentively (e.g. "Select number 4 on this question to show

= 1338 sudionika u prvom valu, n_{t2} = 1214 sudionika u drugom valu i n_{t3} = 1331 sudionika u trećem valu, koji su na početku istraživanja pohađali prvi ili drugi razred srednje škole. U prvom valu uzorak je činilo 43 % mladića i 57 % djevojaka (prosječna dob = 15,8; *SD* = 0,66), u drugom valu 41 % mladića i 59 % djevojaka (prosječna dob = 16.4; *SD* = 0,66), a u trećem valu 39 % mladića i 61 % djevojaka (prosječna dob = 16,8; *SD* = 0,67). Razlika u dobi manja od šest mjeseci koja se opaža između drugog i trećeg vala istraživanja je posljedica toga da su u nekim školama prihvatljivi termini za provođenje istraživanja bili nešto ranije nego što bi bilo potrebno da se ispuni interval od šest mjeseci. Anonimnost sudionika u ovom istraživanju pažljivo je čuvana budući da je istraživanje provedeno aplikacijom koju je za potrebe ovog istraživanja razvila tvrtka za razvoj aplikacija. Sudionici su se u svakom valu ulogirali svojom elektroničkom adresom te su na taj način automatski spajani njihovi rezultati iz pojedinih valova, a te elektroničke adrese nisu bile dostupne istraživačima. Aplikacija je uključivala i automatski generiranu povratnu informaciju na kraju istraživanja, koja se aktivirala ako bi sudionik prešao granični rezultat na korištenom upitniku depresivnosti. Povratna informacija upućivala je sudionika kako bi bilo dobro razgovarati s bliskom osobom i/ili potražiti stručnu pomoć te su navedene neke mogućnosti traženja stručne pomoći. U slučaju vrlo visokih simptoma depresivnosti sudioniku je prikazana verzija povratne informacije koja je dodatno naglašavala potrebu za traženjem stručne pomoći.

Instrumenti

Za mjerenje simptoma depresije korišten je *Upitnik o zdravlju pacijenta - 9 (*engl.. *Patient Health Questionnaire -9)*(PHQ-9) (24). Riječ je o instrumentu samoprocjene u kojem sudionici procjenjuju u kojoj mjeri su doživjeli svaki od DSM-IV-TR dijagnostičkih kriterija u posljednja dva tjedna (25) (npr. „Mali interes ili zadovoljstvo u obavljanju stvari“), na ljestvici od 0 that you are reading the questions.”). The final sample included n_{p1} = 1338 participants in the first wave, n_{p2} = 1214 in the second wave, and n_{p3} = 1331 participants in the third wave, who were in first or second grade of high school at the beginning of the study. The first wave comprised 43% of boys and 57% of girls (M_{age} = 15.8, *SD*= 0.66), the second wave comprised 41% of boys and 59% of girls (M_{age} = 16.4, *SD*= 0.66), while the third wave had 39% of boys and 61% of girls (M_{age} = 16.8, *SD*= 0.67). The age difference of less than six months observed between the second and third waves of the study was due to the fact that in some schools the acceptable time slots for conducting the study were somewhat earlier than would have been required to meet the six-month interval. Participant anonymity in this study was carefully safeguarded, as the research was conducted through an application developed by a software company specifically for this study. In each wave, the participants logged in with their e-mail address, which automatically linked their results across the waves, but these e-mail addresses were not accessible to the researchers. The application also included automatically generated feedback at the end of the survey, which was activated if a participant exceeded the cutoff score on the depression questionnaire used. The feedback suggested to the participant that they could benefit from talking to a close person and/or seeking professional help, and listed several possibilities for accessing professional help. In case of very high depressive symptoms, participants were shown a version of the feedback that placed additional emphasis on the need to seek professional help.

Instruments

The *Patient Health Questionnaire-9* (PHQ-9) (24) was used to measure depression symptoms. This is a self-report instrument in which participants rate themselves on each of the DSM-IV-TR diagnostic criteria in the past two weeks (25) (e.g. “Little interest or pleasure in doing things.”) on a scale from 0 (“Not at all”) to 3 (“Nearly every

(„Uopće ne“) do 3 („Gotovo svaki dan“). Dijagnostički kriteriji iz DSM-IV-TR koji se mjere ovim instrumentom odgovaraju i kriterijima iz DSM-5 za depresiju (11). PHQ-9 je najraširenij instrument za procjenu depresije u istraživanjima i u kliničkoj praksi diljem svijeta (26). Pouzdanost upitnika u tri vala istraživanja bila je dobra do izvrsna: α_{t1} = .90, α_{t2} = .88 i α_{t3} = .88.

REZULTATI

Prije provođenja glavnih analiza izračunati su postotci sudionika koji su premašili granične vrijednosti na PHQ-9 upitniku (24) u svakom valu istraživanja (tablica 1).

Može se primijetiti kako je postotak sudionika s teškom depresijom opadao tijekom tri vala, dok su postotci onih s umjerenim i umjereno teškim simptomima depresije ostali otprilike isti. Umjereno teški i teški simptomi depresije bili su znatno zastupljeniji kod djevojaka nego kod mladića.

Kako bi se ispitala heterogenost simptoma depresije tijekom vremena, podatci su analizirani analizom prijelaza latentnih profila (LPTA) (22). Pri izgradnji i procjeni pristajanja modela korišteni su postupci opisani u literaturi (27,28). U prvom koraku odvojeno su odabrani najprikladniji modeli za svaku vremensku točku primjenom latentne analize profila (LPA; tablica 2).

day”). The DSM-IV-TR diagnostic criteria measured with this instrument also correspond to the DSM-5 criteria for depression (11). PHQ-9 is the most widely used instrument worldwide for the assessment of depression in research and clinical practice (26). Scale reliability estimates for the three study waves were good to excellent: α_{p1}=.90, α_{p2}=.88 and α_{p3}=.88.

RESULTS

Before conducting the main analyses, the percentages of participants who surpassed the cutoff scores on the PHQ-9 questionnaire (24) in each study wave were computed (Table 1).

It can be observed that the percentage of severely depressed participants decreased across the three waves, whereas the percentages of those exhibiting moderately and moderately severe depression symptoms remained roughly the same. Moderately severe and severe depression symptoms were substantially more common in girls than in boys.

In order to examine the heterogeneity of depression symptoms over time, the data were analyzed using the latent profile transition analysis (LPTA) (22). The procedures described in (27) and (28) were used while building and evaluating the model fit. In the first step, the most suitable models for each time point were separately selected by using latent profile analysis (LPA; Table 2).

TABLICA 1. Postotci adolescenata koji su prešli graničnu vrijednost na upitniku PHQ-9 u tri vala istraživanja
TABLE 1. Percentages of adolescents who exceeded the cut-off scores on the PHQ-9 across all three study waves

Val / Wave	Umjereno depresivni / Moderately depressed (PHQ-9: 10 – 14)			Umjereno teško depresivni / Moderately severely depressed (PHQ-9: 15 – 19)			Teško depresivni / Severely depressed (PHQ-9: 20 – 27)		
	Svi / All	D / G	M / B	Svi / All	D / G	M / B	Svi / All	D / G	M / B
Prvi val / Wave 1	19.4	23.4	14.4	11.5	16.3	4.96	9.1	12.6	4.08
Drugi val / Wave 2	20.4	24.4	14.9	11.4	14.2	7.66	7.6	10.2	3.43
Treći val / Wave 3	18.9	21.8	14.3	11.3	14.7	5.87	5.2	7.05	2.35

Napomena: Vrijednosti u tablici izražene su u postotcima. Svi = cijeli uzorak, D = djevojke, M= mladići.Prosječna dob svih sudionika u prvom valu bila je *M*= 15.8 (*SD* = 0.66), u drugom valu *M* = 16.4 (*SD* = 0.66), a u trećem valu *M* = 16.8 (*SD* = 0.67).Prosječna dob djevojaka u prvom valu bila je *M*= 15.8 (*SD* = 0.66), u drugom valu *M* = 16.3 (*SD* = 0.67), a u trećem valu *M* = 16.8 (*SD* = 0.67).Prosječna dob mladića u prvom valu bila je *M* = 15.9 (*SD* = 0.65), u drugom valu *M* = 16.4 (*SD* = 0.64), a u trećem valu *M* = 16.9 (*SD* = 0.67).

/ *Note*: The values in the table are expressed as percentages. All = total sample, G = girls, B = boys. The mean age of all participants in the first wave was *M* = 15.8 (*SD* = 0.66), in the second wave it was *M* = 16.4 (*SD* = 0.66), while in the third wave it was *M* = 16.8 (*SD* = 0.67). The mean age of girls in the first wave was *M* = 15.8 (*SD* = 0.66), in the second wave it was *M* = 16.3 (*SD* = 0.67), while in the third wave it was *M* = 16.8 (*SD* = 0.67). The mean age of boys in the first wave was *M* = 15.9 (*SD* = 0.65), in the second wave it was *M* = 16.4 (*SD* = 0.64), while in the third wave it was *M* = 16.9 (*SD* = 0.67).

TABLICA 2. Rezultati LPA u svakoj točki mjerenja
TABLE 2. The results of the LPA at each time point

	AIC	BIC	VLMR-LRT	BLRT	Entropija / Entropy	DF	PP
Prva točka mjerenja / Time point 1							
2 profila / 2 profiles	29598.90	29744.47	<.001	<.001	.919	28	.98, .96
3 profila / 3 profiles	28371.15	28568.71	<.001	<.001	.915	38	.94, .97, .99
4 profila / 4 profiles	27957.12	28206.70	.015	<.001	.933	48	.95, .95, .97 ,.95
5 profila / 5 profiles	27346.53	27648.07	<.001	<.001	.950	58	.94, .97, .95, .99, .97
6 profila / 6 profiles	27088.11	27441.64	.066	<.001	.871	68	.93, .89, .97 ,.96, .96, .99
Druga točka mjerenja / Time point 2							
2 profila / 2 profiles	26592.86	26735.77	<.001	<.001	.909	28	.98, .96
3 profila / 3 profiles	25817.54	26011.40	<.001	<.001	.854	38	.90, .94, .95
4 profila / 4 profiles	25340.79	25585.67	.069	<.001	.932	48	.97, .94, .97, .95
5 profila / 5 profiles	24922.17	25218.06	<.001	<.001	.865	58	.92,.91, .98, .87, .98
6 profila / 6 profiles	24762.05	25108.97	.148	<.001	.862	68	.90, .98, .86, .83, .89, .98
Treća točka mjerenja / Time point 3							
2 profila / 2 profiles	28410.45	28555.89	<.001	<.001	.907	28	.98, .95
3 profila / 3 profiles	27591.76	27789.15	.210	<.001	.824	38	.94, .89, .94
4 profila / 4 profiles	27029.06	27278.39	.002	<.001	.921	48	.89, .94, .97, .96
5 profila / 5 profiles	26502.03	26803.31	<.001	<.001	.864	58	.87, .92, .90, .94, .97
6 profila / 6 profiles	25922.72	26275.94	<.001	<.001	.884	68	.91, .96, .92, .85, .96, 1.00

Napomena: AIC = Akaikeov informacijski kriterij, BIC = Bayesijanski informacijski kriterij, VLMR-LRT = Vuong-Lo-Mendell-Rubin test omjera, BLRT = Bootstrapirani test omjera vjerojatnosti, DF = stupnjevi slobode, PP = prosječna posteriorna vjerojatnost klasifikacije u profile – prvi broj odnosi se na prvi profil, drugi broj na drugi profil i tako dalje.
/ *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, VLMR-LRT = Vuong-Lo-Mendell-Rubin Likelihood Ratio Test, BLRT = Bootstrapped Likelihood Ratio Test, DF = degrees of freedom, PP = average posterior classification probability – the first number on the left refers to the first profile, the second to the second profile, and so on.

Testirani su modeli s dva do šest latentnih profila. Razmatrani su različiti statistički pokazatelji za određivanje optimalnog rješenja (29): Akaikeov informacijski kriterij (AIC) i Bayesijanski informacijski kriterij (BIC) koji ukazuju na relativnu prikladnost modela, Vuong-Lo-Mendell-Rubinov test omjera vjerojatnosti (VLMR-LRT) i *bootstrapirani* test omjera vjerojatnosti (BLRT), koji se koriste za izravnu usporedbu dvaju rješenja s k i k-1 profila. Korištena je prosječna posteriorna prediktivna vjerojatnost latentnih profila, koja označava preciznost klasifikacije sudionika u profile, te entropija, koja mjeri općenitu točnost klasifikacije.

Uz statističke kriterije u obzir je uzeta i interpretabilnost te smislenost profila (30). BLRT

The models with two to six latent profiles were tested. Different statistical indicators were considered to determine the optimal solution (29), as follows: the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) which indicate relative model fit, the Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR-LRT) and Bootstrapped Likelihood Ratio Test (BLRT), which are used to directly compare the two solutions pertaining to k and k-1 profiles. Average latent profile posterior predictive probability was used, indicating the precision of the classification of participants into profiles, as well as entropy, which measures the general certainty of classification.

In addition to statistical criteria, the interpretability and meaningfulness of the profiles was considered

je bio statistički značajan za sva testirana rješenja zbog čega taj kriterij nije uzet obzir, jer nije pružao dodatne informacije (30). Rješenja s četiri i pet profila imala su najbolje statističke pokazatelje u svim vremenskim točkama. Rješenje s pet profila imalo je bolju prikladnost prema VLMR-LRT testu u svakoj vremenskoj točki, kao i niži AIC i BIC. Međutim, rješenje s četiri profila imalo je veću entropiju i više posteriorne vjerojatnosti klasifikacije pojedinaca u profile, gotovo uvijek više od idealne vrijednosti od 0,9 (29). Rješenje s četiri profila bilo je također smislenije, lakše za interpretaciju i *parsimoničnije* zbog čega je i odabrano.

U drugom koraku analize (27,28) rješenje s četiri profila primijenjeno je na sve vremenske točke te je testirana njegova mjerna invarijantnost (tablica 3).

Premda je hi-kvadrat test razlike bio značajan, poznato je da se vrijednost hi-kvadrata povećava s velikim uzorcima te da čak i trivijalne razlike između modela mogu biti značajne (31). Stoga su korišteni relativni pokazatelji prikladnosti pri čemu je BIC bio niži u mjerno invarijantnom rješenju. Preporučuje se da se BIC preferira nad AIC-om kod velikih uzoraka (32). Vizualnim pregledom su u mjerno neinvarijantnom rješenju također uočene vrlo male razlike u oslobođenim aritmetičkim sredinama čestica za pojedine profile tijekom vremena, stoga je odabrano mjerno invarijantno rješenje.

U trećem koraku analize proučeno je odabrano rješenje i opisani su dobiveni latentni profili. Srednje vrijednosti profila prikazane su u tablici 4 i na slici 1. Procijenjene prevalencije profila u vremenskim točkama prikazane su u tablici 5.

as well (30). The BLRT was statistically significant for all tested solutions, due to which this criterion was not taken into account, as it did not provide additional information (30). The solutions with four and five profiles had the best statistical indicators in all the time points. The solution with five profiles had a better fit according to the VLMR-LRT test in every time point, as well as lower AIC and BIC. However, the four-profile solution had higher entropy and higher posterior probability of classifying individuals into profiles, almost always higher than the ideal value of 0.9 (29). The four-profile solution was also more meaningful, easier to interpret and more parsimonious, and was thus selected.

In the second step of the analysis (27, 28), the four-profile solution was applied across all time points, and its measurement invariance was tested (Table 3).

Although the chi-square difference test was significant, it is known that the chi-square value increases with large samples, and that even trivial differences between models can be significant (31). The relative fit indicators were therefore used, whereby the BIC was lower in the measurement invariant solution. It is recommended that BIC be preferred over AIC in large samples (32). Upon visual inspection, very small differences in the released item means for individual profiles over time were observed in the measurement non-invariant solution, therefore the measurement invariant solution was selected.

In the third step of the analysis, the selected solution was examined and the obtained latent profiles were described. The profile mean values are presented in Table 4 and depicted in Figure 1. The estimated profile prevalences across time points are presented in Table 5.

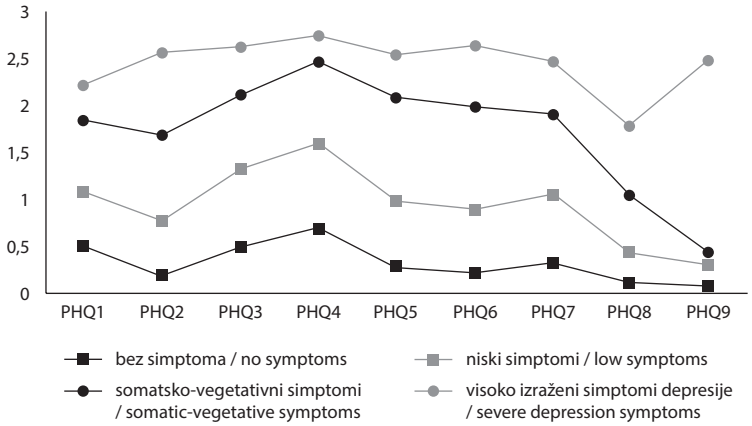
TABLICA 3. Rezultati testiranja longitudinalne mjerne invarijantnosti
TABLE 3. Results of longitudinal measurement invariance testing

Mjerna invarijantnost / Measurement invariance	AIC	BIC	DF	Logaritamska vjerojatnost / Logarithmic likelihood	Razlika hi kvadrata / Chi-square difference	P vrijednost / P-value
Da / Yes	79413.39	79902.21	90	-39616.70		
Ne / No	79384.70	80264.57	162	-39530.35	168.17	<.001

Napomena:Razlika hi kvadrata izračunata je iz transformirane razlike u logaritamskim vjerojatnostima između dva modela.
/ Note: The chi-square difference was computed from the transformed difference in logarithmic likelihoods of the two models.

TABLICA 4. Aritmetičke sredine čestica PHQ-9 za svaki od četiri latentna profila
TABLE 4. Means across the PHQ-9 item for each of the four latent profiles

Čestica PHQ-9 / PHQ-9 item	Prvi profil "Bez simptoma" / Profile 1 "No Symptoms"	Drugi profil "Niski simptomi" / Profile 2 "Low Symptoms"	Treći profil "Somatsko-vegetativni simptomi" / Profile 3 "Somatic-Vegetative Symptoms"	Četvrti profil "Visoko izraženi simptomi depresije" / Profile 4 "Severe Depression Symptoms"
PHQ 1	0.510	1.101	1.855	2.229
PHQ 2	0.182	0.779	1.694	2.585
PHQ 3	0.494	1.330	2.120	2.642
PHQ 4	0.710	1.604	2.487	2.760
PHQ 5	0.273	0.992	2.094	2.549
PHQ 6	0.224	0.908	1.994	2.651
PHQ 7	0.325	1.059	1.919	2.485
PHQ 8	0.115	0.424	1.051	1.787
PHQ 9	0.076	0.316	0.444	2.496



SLIKA 1. Četiri latentna profila depresivnosti adolescenata i aritmetičke sredine tih profila za čestice PHQ-9
FIGURE 1. The four latent profiles of adolescent depression and their means in PHQ-9 items

TABLICA 5. Prevalencije četiriju profila kroz tri točke mjerenja
TABLE 5. Prevalences of the four profiles across three time points

Profil / Profile	Prva točka / Time point 1	Druga točka / Time point 2	Treća točka / Time point 3
Bez simptoma / No Symptoms	39.50%	34.56%	36.85%
Niski simptomi / Low Symptoms	32.35%	38.90%	39.75%
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	15.27%	17.67%	15.72%
„Visoko izraženi simptomi depresije" / Severe Depression Symptoms	12.89%	8.89%	7.68%

Napomena: Prosječna dob sudionika u prvom valu bila je *M*= 15.8 (*SD* = 0.66), u drugom valu *M* = 16.4 (*SD* = 0.66), a u trećem valu *M* = 16.8 (*SD* = 0.67).
/ *Note*: The mean age of the participants in the first wave was *M* = 15.8 (*SD* = 0.66), in the second wave it was *M* = 16.4 (*SD* = 0.66), while in the third wave it was *M* = 16.8 (*SD* = 0.67).

Odabiranje 2 ili 3 na jednoj od prvih osam čestica PHQ-9 upitnika i odabiranje 1, 2 ili 3 na devetoj čestici (suicidalnost) odgovara prisutnosti simptoma depresije prema algoritamskom načinu bodovanja PHQ-9 (33). To znači da je osoba navela da joj je simptom stvarao poteškoće najmanje više od pola dana u posljednja dva tjedna za prvih osam simptoma i barem nekoliko dana za simptom suicidalnosti. Ovo je služilo kao općenita smjernica pri opisu profila, te je profil opisan kao onaj koji ima simptom ako je aritmetička sredina simptoma bila viša od 2.

Adolescenti u najvećem profilu, nazvanom „Bez simptoma" (vidi tablice 4 i 5 te sliku 1), imali su niske vrijednosti na svim simptomima. Drugi najveći profil nazvan je „Niski simptomi", budući da su adolescenti u njemu imali blago povišene, ali i dalje nisko izražene simptome. Među povišenim simptomima isticao se simptom 4: „osjećaj umora ili nedostatka energije". Adolescenti koji su pripadali trećem profilu, nazvanom „Somatsko-vegetativni simptomi", imali su više simptoma iznad vrijednosti 2, a to su bili simptomi 3, 4 i 5 koji se mogu opisati kao Somatsko-vegetativni („poteškoće sa spavanjem ili prekomjerno spavanje", „osjećaj umora ili nedostatka energije", „slab apetit ili prekomjerno jedenje"). Međutim, imali su niske psihomotorne teškoće i vrlo nisku suicidalnost. Konačno, adolescenti u najmanjem profilu, nazvanom „Visoko izraženi simptomi depresije", imali su praktički sve simptome s vrijednostima višim od 2.

Nakon opisa profila ostalo je pitanje kako su adolescenti prelazili između profila tijekom tri vala istraživanja. Latentne vjerojatnosti tranzicija između profila ispitane su u četvrtom koraku analize (tablica 6).

Kao što se vidi iz tablice 6, profili „Bez simptoma" i „Niski simptomi" bili su najstabilniji u vremenskim točkama, a slijede ih profili „Somatsko-vegetativni simptomi" i „Visoko izraženi simptomi depresije". Od t1 do t2 adolescenti su imali 21,2 % vjerojatnosti prelaska iz profila

Selecting 2 or 3 in one of the first eight PHQ-9 items and selecting 1, 2 or 3 in the ninth item (suicidality) corresponds to the presence of depression symptoms according to the algorithmic scoring approach of the PHQ-9 (33). This means that an individual stated that they experienced difficulties due to a symptom for at least more than half of the days in the last two weeks for the first eight symptoms, and at least several days for the suicidality symptom. This served as a general guide in profiles description, and a profile was described as featuring a symptom if the arithmetic mean of a symptom was higher than 2.

Adolescents in the largest profile, entitled "No Symptoms" (see Tables 4 and 5 and Figure 1), presented low values for all symptoms. The second largest profile was named "Low Symptoms", as those adolescents experienced slightly elevated, but still low symptoms. Among the elevated symptoms, symptom 4 was pronounced: "feeling tired or having little energy". Adolescents who were part of the third profile, entitled "Somatic-Vegetative Symptoms", had multiple symptoms above the value of 2, and these were symptoms 3, 4 and 5, which could be described as Somatic-Vegetative ("trouble falling or staying asleep, or sleeping too much", "feeling tired or having little energy", "poor appetite or overeating"). However, their psychomotor difficulties were low, and they had a very low suicidality rate. Finally, adolescents who were part of the smallest profile, entitled "Severe Depression Symptoms", displayed practically all symptoms at a value higher than 2.

After the profiles were described, the question remained on how adolescents transitioned between the profiles in the course of the three study waves. Latent transition probabilities between profiles were examined in the fourth step of the analysis (Table 6).

As can be seen in Table 6, the profiles "No Symptoms" and "Low Symptoms" were the most stable across the time points, followed by the profiles "Somatic-Vegetative Symptoms" and "Severe Depression Symptoms". From p1 to p2, adolescents had a 21.2% probability of switching from

TABLICA 6. Latentne vjerojatnosti prijelaza između profila iz vremenske točke 1 u vremensku točku 2 i iz vremenske točke 2 u vremensku točku 3
TABLE 6. Latent transition probabilities between the profiles from time point 1 to time point 2, and from time point 2 to time point 3

Profil / Profile	Bez simptoma / No Symptoms	Niski simptomi / Low Symptoms	„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	„Visoko izraženi simptomi depresije" / Severe Depression Symptoms
Prijelaz iz točke 1 u točku 2 / Transition from time point 1 to time point 2				
Bez simptoma / No Symptoms (n=666)	.767 (n=511)	.212 (n=141)	.021 (n=14)	.000 (n=0)
Niski simptomi / Low Symptoms (n=547)	.083 (n=45)	.751 (n=411)	.139 (n=76)	.027 (n=15)
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms (n=257)	.054 (n=14)	.215 (n=55)	.628 (n=161)	.103 (n=27)
„Visoko izraženi simptomi depresije" / Severe Depression Symptoms (n=218)	.059 (n=13)	.229 (n=50)	.211 (n=46)	.500 (n=109)
Profil / Profile	Bez simptoma / No Symptoms	Niski simptomi / Low Symptoms	„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	„Visoko izraženi simptomi depresije" / Severe Depression Symptoms
Prijelaz iz točke 2 u točku 3 / Transition from time point 2 to time point 3				
Bez simptoma / No Symptoms (n=421)	.856 (n=360)	.121 (n=51)	.011 (n=5)	.012 (n=5)
Niski simptomi / Low Symptoms (n=473)	.169 (n=80)	.740 (n=350)	.079 (n=37)	.013 (n=6)
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms (n=215)	.024 (n=5)	.321 (n=69)	.581 (n=125)	.073 (n=16)
„Visoko izraženi simptomi depresije" / Severe Depression Symptoms (n=108)	.030 (n=3)	.125 (n=13)	.228 (n=25)	.617 (n=67)

*Napomena:*Brojevi sudionika u zagradama predstavljaju brojeve sudionika za koje je model procijenio da pripadaju određenom profilu i onih koji su prešli iz jednog profila u drugi između vremenskih točaka.Prosječna dob sudionika u prvom valu bila je *M*= 15.8 (*SD* = 0.66), u drugom valu *M* = 16.4 (*SD* = 0.66), a u trećem valu *M* = 16.8 (*SD* = 0.67).
/ *Note:* The numbers of participants in the brackets represent model-estimated numbers of participants belonging to a given profile, and those who transitioned from a profile to another profile between time points. The mean age of the participants in the first wave was *M* = 15.8 (*SD* = 0.66), in the second wave it was *M* = 16.4 (*SD* = 0.66), while in the third wave it was *M* = 16.8 (*SD* = 0.67).

„Bez simptoma" u „Niske simptome". Imali su i 13,9 % vjerojatnosti prelaska iz profila „Niski simptomi" u profil „Somatsko-vegetativni simptomi", što uključuje procijenjenih *n* = 76 pojedinaca. Također, vjerojatnost prelaska iz profila „Somatsko-vegetativni simptomi" u „Visoko izraženi simptomi depresije" iznosila je 10,3 %, odnosno uključivala je procijenjenih 27 sudionika. Uz prelazak prema težim simptomima, dio sudionika prelazio je i u profile s manje izraženim simptomima.Između profila „Somatsko-vegetativni simptomi" i manje ozbiljnog profila „Niski simptomi" postojala je vjerojatnost prijelaza od 21,5 %, što je uključivalo 55 potencijalnih sudionika. Postojala je i vjerojatnost od 21,1 % za prijelaz iz profila „Visoko izraženi simptomi depresije" u profil „Somatsko-vegetativni simptomi" te vjerojatnost od 22,9 % za prijelaz iz tog profila u profil „Niski simptomi".

the "No Symptoms" profile to the "Low Symptoms" profile. They also had a 13.9% probability of switching from the "Low Symptoms" profile to the "Somatic-Vegetative Symptoms" profile, which involved an estimated *n*=76 of individuals. Moreover, the probability of switching from the "Somatic-Vegetative Symptoms" profile to the "Severe Depression Symptoms" profile was 10.3%, i.e. it involved an estimated 27 individuals. Besides switching towards more severe symptoms, some participants also switched to profiles with less pronounced symptoms. There was a 21.5% probability of switching from the "Somatic-Vegetative Symptoms" profile to the less severe "Low Symptoms Profile", which involved 55 potential participants. Furthermore, there was a 21.1% probability of switching from the "Severe Depression Symptoms" profile to the "Somatic-Vegetative Symptoms" profile, and a 22.9% probability of switching from this profile to the "Low Symptoms" profile.

Od mjerenja t2 do t3 adolescenti su imali vjerojatnost od 12,1 % za prijelaz iz profila „Bez simptoma“u profil „Niski simptomi“. Imali su i 7,9 % vjerojatnosti za prijelaz iz profila „Niski simptomi“ u profil „Somatsko-vegetativni simptomi“, a taj je prijelaz uključivao 37 sudionika. Nadalje, postojala je vjerojatnost od 7,3 % za prijelaz iz profila „Somatsko-vegetativni simptomi“ u profil „Visoko izraženi simptomi depresije“. Osim sudionika koji su prešli u profile s izraženijim simptomima, neki su prešli i u profile s nižim razinama rizika. Naime, 16.9% sudionika prešlo je iz profila Niski simptomi u profil Bez simptoma između t2 i t3, a taj prijelaz je uključivao procijenjenih *n* = 80 sudionika. Čak 32.1% sudionika (*n* = 69) prešlo je iz profila „Somatsko-vegetativni simptomi“ u profil Niski simptomi. Dodatno, 22.8% sudionika prešlo je iz profila „Visoko izraženi simptomi depresije“ u profil „Somatsko-vegetativni simptomi“, a 12.5% (*n* = 13) prešlo je iz tog profila u profil „Niski simptomi“.

Nakon provedenih analiza na cijelom uzorku adolescenata, u nastavku su provedene analize odvojeno za djevojke i mladiće. Prvo je provjereno je li dobiveno rješenje s četiri profila optimalno za muške i ženske poduzorke. Testirana su i uspoređena rješenja s tri, četiri i pet profila tijekom tri točke mjerenja, odvojeno za djevojke i mladiće (tablica 7).

Rješenja s pet profila za djevojke i mladiće imala su nešto niže AIC i BIC indikatore od rješenja s četiri profila, ali su rješenja s četiri profila imala bolju entropiju, bila su smislenija i nisu imala problema s konvergencijom. Stoga su za poduzorke djevojaka i mladića potvrđena rješenja s četiri profila. U sljedećem koraku su opisani dobiveni latentni profili odvojeno za djevojke i mladiće. Srednje vrijednosti profila prikazane su u tablici 8 i tablici 9 i na slici 2 i slici 3. Procijenjene prevalencije profila u vremenskim točkama prikazane su u tablici 10 i tablici 11.

Between the p2 and p3 measurements, the adolescents had a 12.1% probability of transitioning from the “No Symptoms” profile to the “Low Symptoms” profile. They had a 7.9% probability of transitioning from the “Low Symptoms” profile to the “Somatic-Vegetative Symptoms” profile, and this transition involved 37 participants. Furthermore, there was a 7.3% probability of transitioning from the “Somatic-Vegetative Symptoms” profile to the “Severe Depression Symptoms” profile. In addition to the participants who switched to profiles with more pronounced symptoms, some also switched to profiles with lower risk levels. Namely, 16.9% of the participants switched from the “Low Symptoms” profile to the “No Symptoms” profile between p2 and p3, which included an estimated 80 participants. As many as 32.1% of the participants (n=69) switched from the “Somatic-Vegetative Symptoms” profile to the “Low Symptoms” profile. Furthermore, 22.8% of the participants switched from the “Severe Depression Symptoms” profile to the “Somatic-Vegetative Symptoms” profile, and 12.5% (*n*=13) switched from that profile to the “Low Symptoms” profile.

After the analyses were conducted on the entire adolescents’ sample, additional analyses were performed separately for girls and boys. First, it was examined whether the previously obtained four-profile solution was optimal for the male and female subsamples. Solutions with three, four, and five profiles were tested and compared across the three measurement points separately for girls and boys (Table 7).

The five-profile solutions for girls and boys yielded somewhat lower AIC and BIC indicators than the four-profile solutions, but the four-profile solutions had better entropy, were more interpretable, and did not have convergence problems. Therefore, the four-profile solutions were confirmed for the subsamples of girls and boys. In the next step, the obtained latent profiles were described separately for girls and boys. The mean values of the profiles are presented in Tables 8 and 9, and Figures 2 and 3. The estimated profile prevalences across time points are shown in Tables 10 and 11.

TABLICA 7. Indikatori pristajanja za modele s različitim brojem profila kod djevojaka i mladića
TABLE 7. Fit indices for models with different numbers of profiles for girls and boys

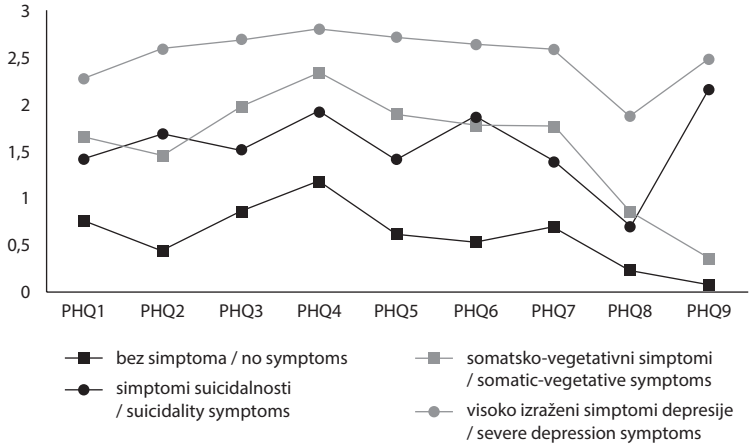
	AIC	BIC	Entropija / Entropy
Djevojke / Girls			
3 profila / 3 profiles	48375.79	48708.14	.800
4 profila / 4 profiles	47605.52	48045.40	.832
5 profila / 5 profiles	46508.85	47075.80	.824
Mladići / Boys			
3 profila / 3 profiles	30870.45	31179.24	.783
4 profila / 4 profiles	29887.51	30296.21	.838
5 profila / 5 profiles	29574.52	30101.28	.824

TABLICA 8. Aritmetičke sredine čestica PHQ-9 za svaki od četiri latentna profila za djevojke
TABLE 8. Arithmetic means of PHQ-9 items for each of the four latent profiles for girls

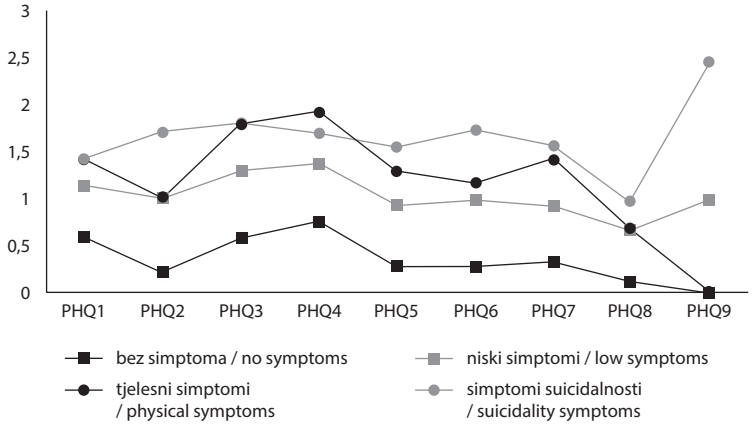
Čestica PHQ-9 / PHQ-9 item	Prvi profil "Bez simptoma" / Profile 1 "No Symptoms"	Drugi profil "Somatsko-vegetativni simptomi" / Profile 2 "Somatic-vegetative symptoms"	Treći profil "Simptomi suicidalnosti" / Profile 3 "Suicidality Symptoms"	Četvrti profil "Visoko izraženi simptomi depresije" / Profile 4 "Severe Depression Symptoms"
PHQ 1	0.777	1.672	1.440	2.292
PHQ 2	0.441	1.473	1.692	2.613
PHQ 3	0.872	1.986	1.541	2.721
PHQ 4	1.189	2.372	1.968	2.841
PHQ 5	0.633	1.920	1.434	2.742
PHQ 6	0.533	1.797	1.906	2.688
PHQ 7	0.696	1.786	1.403	2.613
PHQ 8	0.215	0.871	0.701	1.876
PHQ 9	0.090	0.360	2.210	2.496

TABLICA 9. Aritmetičke sredine čestica PHQ-9 za svaki od četiri latentna profila za mladiće
TABLE 9. Arithmetic means of PHQ-9 items for each of the four latent profiles for boys

Čestica PHQ-9 / PHQ-9 item	Prvi profil "Bez simptoma" / Profile 1 "No Symptoms"	Drugi profil "Niski simptomi" / Profile 2 "Low Symptoms"	Treći profil "Somatsko-vegetativni simptomi" / Profile 3 "Somatic-Vegetative Symptoms"	Četvrti profil "Simptomi suicidalnosti" / Profile 4 "Suicidality Symptoms"
PHQ 1	0.596	1.163	1.445	1.455
PHQ 2	0.227	1.024	1.032	1.720
PHQ 3	0.580	1.298	1.812	1.808
PHQ 4	0.773	1.384	1.954	1.722
PHQ 5	0.291	0.950	1.304	1.556
PHQ 6	0.281	0.999	1.188	1.751
PHQ 7	0.351	0.940	1.452	1.577
PHQ 8	0.136	0.679	0.692	0.955
PHQ 9	0.000	1.000	0.000	2.428



SLIKA 2. Četiri latentna profila depresivnosti kod djevojaka i aritmetičke sredine tih profila za čestice PHQ-9
FIGURE 2. The four latent profiles of depression and their arithmetic means across PHQ-9 items for girls



SLIKA 3. Četiri latentna profila depresivnosti kod mladića i aritmetičke sredine tih profila za čestice PHQ-9
FIGURE 3. The four latent profiles of depression and their arithmetic means across PHQ-9 items for boys

TABLICA 10. Prevalencije četiriju profila kroz tri točke mjerenja za djevojke
TABLE 10. Prevalences of the four profiles across three measurement points for girls

Profil / Profile	Prva točka / Time point 1	Druga točka / Time point 2	Treća točka / Time point 3
Bez simptoma / No Symptoms	50.18%	52.21%	57.26%
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	30.43%	32.96%	29.89%
„Simptomi suicidalnosti" / Suicidality Symptoms	7.64%	6.67%	6.63%
„Visoko izraženi simptomi depresije" / Severe Depression Symptoms	11.73%	8.15%	6.22%

Napomena: Prosječna dob djevojaka u prvom valu bila je *M*= 15.8 (*SD* = 0.66), u drugom valu *M* = 16.3 (*SD* = 0.67), a u trećem valu *M* = 16.8 (*SD* = 0.67).
/ *Note:* The mean age of girls in the first wave was *M* = 15.8 (*SD* = 0.66), in the second wave it was *M* = 16.3 (*SD* = 0.67), while in the third wave it was *M* = 16.8 (*SD* = 0.67).

TABLICA 11. Prevalencije četiriju profila tijekom tri točke mjerenja za mladiće
TABLE 11. Prevalences of the four profiles across three measurement points for boys

Profil / Profile	Prva točka / Time point 1	Druga točka / Time point 2	Treća točka / Time point 3
Bez simptoma / No Symptoms	63.52%	57.13%	57.43%
Niski simptomi / Low Symptoms	13.56%	13.92%	15.02%
„Somatsko-vegetativni simptomi" / Somatic-vegetative Symptoms	15.52%	18.38%	16.57%
„Simptomi suicidalnosti" / Suicidality Symptoms	7.40%	10.58%	10.98%

Napomena: Prosječna dob mladića u prvom valu bila je *M*= 15.9 (*SD* = 0.65), u drugom valu *M* = 16.4 (*SD* = 0.64), a u trećem valu *M* = 16.9 (*SD* = 0.67).
/ *Note:* The mean age of boys in the first wave was *M* = 15.9 (*SD* = 0.65), in the second wave it was *M* = 16.4 (*SD* = 0.64), while in the third wave it was *M* = 16.9 (*SD* = 0.67).

Djevojke su općenito imale izraženije simptome depresije od mladića u ukupnom uzorku. Najveći profil kod djevojaka i dalje je bio „Bez simptoma“, kao i u ukupnom uzorku. Ipak, kod djevojaka su ostala tri profila ukazivala na klinički indikativne poteškoće, Drugi najveći profil kod djevojaka, „Somatsko-vegetativni simptomi“, ukazivao je na povišene simptome 3,4 i 5, kao i u ukupnom uzorku. I kod djevojaka je postojao profil „Visoko izraženi simptomi“ depresije, koji je ukazivao na praktički sve povišene simptome depresije, s vrlo visokim srednjim vrijednostima. Međutim kod njih je otkriven i profil „Simptomi suicidalnosti“, koji je ukazivao na povišen deveti simptom depresije („razmišljali ste kako bi bilo bolje da ste mrtvi ili da se ozlijedite na neki način“) te na povišene rezultate blizu granične vrijednosti od 2 na simptomu 4 („osjećaj umora ili nedostatka energije“) i simptomu 6 („loš osjećaj u svezi sebe samog – ili da niste uspjeli u životu, ili da ste iznevjerili sebe ili svoju obitelj“).

Kod mladića je najveći profil bio „Bez simptoma“ te su taj profil i profil „Niski simptomi“ zajedno obuhvaćali oko 70 % ili više sudionika u sva tri vala. Postojao je i profil „Somatsko-vegetativni simptomi“, koji je za razliku od sličnog profila na ukupnom uzorku i kod djevojaka obuhvaćao rezultate blizu granične vrijednosti od 2 na simptomima 3 i 4 („poteškoće sa spavanjem ili prekomjerno spavanje“ i „osjećaj umora ili nedostatka energije“), ali ne i na simptomu 5 („oslabljeni apetit ili prejedanje“). Uočen je i četvrti profil „Simptomi suicidalnosti“, koji je uključivao povišen deveti simptom depresije te u kojem dio ostalih simptoma depresije također nije bio daleko od vrijednosti 2.

Kao što se vidi iz tablica 12 i 13, najstabilniji profil kod djevojaka i mladića bio je „Bez simptoma“, kod kojeg su uočeni vrlo visoki postotci sudionika, u pravilu iznad 80 %, koji su ostajali u tom profilu u valovima. Kod djevojaka je sljedeći po stabilnosti bio profil „Somatsko-vegetativni simptomi“, a profili „Simpto-

Depression symptoms were generally more pronounced in girls than in boys and in the total sample. The largest profile among girls was still the “No Symptoms” profile, as in the total sample. However, the other three profiles among girls indicated clinically significant difficulties. The second largest profile in girls, the “Somatic-Vegetative Symptoms” profile, showed elevated scores on symptoms 3, 4 and 5, the same as in the total sample. The “Severe Depression Symptoms” profile was present among girls as well, which indicated that practically all depression symptoms were elevated, with very high mean values. However, they also exhibited the “Suicidality Symptoms” profile, characterized by an elevated ninth depression symptom (“thoughts that you would be better off dead, or thoughts of hurting yourself in some way”) and elevated scores close to the cutoff value of 2 on symptom 4 (“feeling tired or having little energy”) and symptom 6 (“feeling bad about yourself – or that you are a failure or have let yourself or your family down”).

Among boys, the most prevalent profile was “No Symptoms”, and together with the “Low Symptoms” profile, it encompassed about 70% or more of the participants across all three waves. The “Somatic-Vegetative Symptoms” profile was also present which, unlike the similar profile in the total sample and among girls, included scores close to the cutoff value of 2 on symptoms 3 and 4 (“trouble falling or staying asleep, or sleeping too much” and “feeling tired or having little energy”), but not on symptom 5 (“poor appetite or overeating”). A fourth profile, “Suicidality Symptoms”, was also identified, which included an elevated ninth depression symptom, and in which some of the other depressive symptoms were also not far from the value of 2.

As evident in Tables 12 and 13, the most stable profile both in girls and in boys was the “No Symptoms” profile, involving very high percentages of the participants, generally above 80%, who remained in that profile across the waves. Among the girls, the next most stable profile was “Somatic-Vegetative Symptoms”, while the “Suicidality Symptoms” and “Severe Depression

TABLICA 12. Latentne vjerojatnosti prijelaza između profila iz vremenske točke 1 u vremensku točku 2 i iz vremenske točke 2 u vremensku točku 3 za djevojke
TABLE 12. Latent transition probabilities between the profiles from time point 1 to time point 2, and from time point 2 to time point 3 for girls

Profil / Profile	Bez simptoma / No Symptoms	„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	„Simptomi suicidalnosti" / Suicidality Symptoms	„Visoko izraženi simptomi depresije" / Severe Depression Symptoms
Prijelaz iz točke 1 u točku 2 / Transition from time point 1 to time point 2				
Bez simptoma / No Symptoms (n=492)	.846 (n=416)	.131 (n=65)	.019 (n=9)	.003 (n=2)
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms (n=298)	.233 (n=69)	.668 (n=199)	0.043 (n=13)	.056 (n=17)
„Simptomi suicidalnosti" / Suicidality Symptoms (n=75)	.215 (n=16)	.303 (n=23)	.435 (n=32)	.103 (n=4)
„Visoko izraženi simptomi depresije" / Severe Depression Symptoms (n=115)	.089 (n=10)	.318 (n=37)	.090 (n=10)	.504 (n=58)
Profil / Profile	Bez simptoma / No Symptoms	„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	„Simptomi suicidalnosti" / Suicidality Symptoms	„Visoko izraženi simptomi depresije" / Severe Depression Symptoms
Prijelaz iz točke 2 u točku 3 / Transition from time point 2 to time point 3				
Bez simptoma / No Symptoms (n=511)	.864 (n=441)	.106 (n=54)	.028 (n=14)	.003 (n=2)
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms (n=323)	.280 (n=90)	.632 (n=205)	.062 (n=20)	.026 (n=8)
„Simptomi suicidalnosti" / Suicidality Symptoms (n=65)	.372 (n=24)	.119 (n=8)	.452 (n=29)	.058 (n=4)
„Visoko izraženi simptomi depresije" / Severe Depression Symptoms (n=80)	.054 (n=4)	.334 (n=27)	.018 (n=1)	.595 (n=48)

Napomena: Brojevi sudionika u zagradama predstavljaju brojeve sudionika za koje je model procijenio da pripadaju određenom profilu i onih koji su prešli iz jednog profila u drugi između vremenskih točaka. Prosječna dob djevojaka u prvom valu bila je *M*= 15.8 (*SD* = 0.66), u drugom valu *M* = 16.3 (*SD* = 0.67), a u trećem valu *M* = 16.8 (*SD* = 0.67). / *Note:* The numbers of participants in brackets represent model-estimated numbers of participants belonging to a given profile, and those who transitioned from a profile to another profile between time points. The mean age of girls in the first wave was *M* = 15.8 (*SD* = 0.66), in the second wave it was *M* = 16.3 (*SD* = 0.67), while in the third wave it was *M* = 16.8 (*SD* = 0.67).

mi suicidalnosti" i „Visoko izraženi simptomi depresije" bili su manje stabilni. Između t1 i t2 može se uočiti da su imale 13,1 % vjerojatnosti prelaska iz profila „Bez simptoma" u ozbiljniji profil „Somatsko-vegetativni simptomi", a taj je prijelaz uključivao procijenjenih 65 sudionica. Imale su i 23,3 % vjerojatnosti prelaska iz profila „Somatsko-vegetativni simptomi" u profil „Bez simptoma", a taj prijelaz uključivao je procijenjenih 69 sudionica. Značajniji prijelazi uključivali su i prijelaz iz profila „Simptomi suicidalnosti" u profil „Somatsko-vegetativni simptomi" (30,3 % vjerojatnosti, n = 23) te također iz profila „Visoko izraženi simptomi depresije" u profil „Somatsko-vegetativni simptomi" (31,8 % vjerojatnosti prelaska, n = 37).

Symptoms" profiles were less stable. Between p1 and p2, girls had a 13.1% probability of transitioning from the "No Symptoms" profile to the more severe "Somatic-Vegetative Symptoms" profile, which encompassed an estimated 65 participants. They also had a 23.3% probability of transitioning from the "Somatic-Vegetative Symptoms" profile to the "No Symptoms" profile, involving an estimated 69 participants. Other notable transitions included moving from the "Suicidality Symptoms" profile to the "Somatic-Vegetative Symptoms" profile (30.3% probability, n = 23), and from the "Severe Depression Symptoms" profile to the "Somatic-Vegetative Symptoms" profile (31.8% probability, n = 37). Similar transitions were observed between p2 and p3 in

TABLICA 13. Latentne vjerojatnosti prijelaza između profila iz vremenske točke 1 u vremensku točku 2 i iz vremenske točke 2 u vremensku točku 3 za mladiće
TABLE 13. Latent transition probabilities between the profiles from time point 1 to time point 2, and from time point 2 to time point 3 for boys

Profil / Profile	Bez simptoma / No Symptoms	Niski simptomi / Low Symptoms	„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	„Simptomi suicidalnosti" / Suicidality Symptoms
Prijelaz iz točke 1 u točku 2 / Transition from time point 1 to time point 2				
Bez simptoma / No Symptoms (n=440)	.793 (n=349)	.094 (n=41)	.070 (n=31)	.043 (n=19)
Niski simptomi / Low Symptoms (n=94)	.326 (n=31)	.304 (n=28)	0.181 (n=17)	.189 (n=18)
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms (n=108)	.081 (n=9)	.165 (n=18)	.669 (n=72)	.086 (n=9)
„Simptomi suicidalnosti" / Suicidality Symptoms (n=51)	.145 (n=7)	.172 (n=9)	.149 (n=8)	.534 (n=27)
Profil / Profile	Bez simptoma / No Symptoms	Niski simptomi / Low Symptoms	„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms	„Simptomi suicidalnosti" / Suicidality Symptoms
Prijelaz iz točke 2 u točku 3 / Transition from time point 2 to time point 3				
Bez simptoma / No Symptoms (n=396)	.852 (n=338)	.096 (n=38)	.028 (n=11)	.023 (n=9)
Niski simptomi / Low Symptoms (n=97)	.242 (n=24)	.281 (n=27)	.300 (n=29)	.177 (n=17)
„Somatsko-vegetativni simptomi" / Somatic-Vegetative Symptoms (n=127)	.238 (n=30)	.165 (n=21)	.557 (n=71)	.040 (n=5)
„Simptomi suicidalnosti" / Suicidality Symptoms (n=73)	.097 (n=7)	.243 (n=18)	.050 (n=4)	.610 (n=44)

Napomena: Brojevi sudionika u zagradama predstavljaju brojeve sudionika za koje je model procijenio da pripadaju određenom profilu i onih koji su prešli iz jednog profila u drugi između vremenskih točaka. Prosječna dob mladića u prvom valu bila je *M*= 15.9 (*SD* = 0.65), u drugom valu *M* = 16.4 (*SD* = 0.64), a u trećem valu *M* = 16.9 (*SD* = 0.67). / *Note:* The numbers of participants in brackets represent model-estimated numbers of participants belonging to a given profile, and those who transitioned from a profile to another profile between time points. The mean age of boys in the first wave was *M* = 15.9 (*SD* = 0.65), in the second wave it was *M* = 16.4 (*SD* = 0.64), while in the third wave it was *M* = 16.9 (*SD* = 0.67).

Slični prijelazi uočeni su i između t2 i t3 kod djevojaka. Dodatno, između t2 i t3 sudionice su imale 37,2 % vjerojatnosti prelaska iz profila „Simptomi suicidalnosti" u profil „Bez simptoma", a taj je prelazak uključivao n=24 procijenjene sudionice.

Kod mladića se može uočiti da je najstabilniji bio već spomenuti profil Bez simptoma, a poslije njega su slijedili profili „Somatsko-vegetativni simptomi" i „Simptomi suicidalnosti", dok je najmanje stabilan bio profil Niski simptomi. Kod tog profila je vjerojatnost prelaska u profil „Simptomi suicidalnosti" bila 18,9 %, što je uključivalo n=18 potencijalnih sudionika. U profil „Simptomi suicidalnosti" su također prelazili sudionici iz preostala dva profila. Između t2 i t3 dodatno se može uočiti da su mladići prelazili iz profila „Somatsko-vegetativni simptomi" u profil „Bez simptoma" (23,8 % vjerojatnosti prelaska, n = 30 sudionika) i u

girls. Additionally, between t2 and t3, girls had a 37.2% probability of moving from the "Suicidality Symptoms" profile to the "No Symptoms" profile, which involved an estimated 24 participants.

Among boys, the most stable profile was again the "No Symptoms" profile, followed by the "Somatic-Vegetative Symptoms" and "Suicidality Symptoms" profiles, while the "Low Symptoms" profile was the least stable. In this profile, the probability of transitioning to the "Suicidality Symptoms" profile was 18.9%, which involved 18 potential participants. Participants also transitioned to the "Suicidality Symptoms" profile from the other two profiles. Between p2 and p3, additional transitions were observed of boys moving from the "Somatic-Vegetative Symptoms" profile to the "No Symptoms" profile (23.8% probability, n = 30 participants) and to the "Low Symptoms" profile (16.5% probability, n = 21 participants). A considerable proportion also transitioned from the "Low Symptoms" profile to the "Somatic-Vegeta-

profil „Niski simptomi“ (16,5 % vjerojatnosti prelaska, n = 21 sudionik). Značajan ih je dio prelazio i iz profila „Niski simptomi“ u profil „Somatsko-vegetativni simptomi“ (30 % vjerojatnosti prelaska, n = 29 sudionika).

RASPRAVA

U ovom je istraživanju ispitivano koji profili simptoma depresije postoje kod adolescenata i kako adolescenti prelaze između profila u različitim vremenskim točkama. Model s četiri profila odabran je jer je najbolje pristajao podatcima i bio najsmisleniji u sve tri vremenske točke te se pokazao mjerno invarijantnim. Ovaj model opisuje četiri profila depresivnih simptoma kod adolescenata: „Bez simptoma“, „Niski simptomi“, „Somatsko-vegetativni simptomi“ i „Visoko izraženi simptomi depresije“. Profil „Visoko izraženi simptomi depresije“ „ukazivao je na najozbiljniju kliničku sliku, jer su gotovo svi simptomi imali prosječne vrijednosti iznad 2, što ukazuje na prisutnost simptoma. Adolescenti iz profila „Somatsko-vegetativni simptomi“ imali su poteškoće s umorom, spavanjem i apetitom, no imali su nisku suicidalnost. Vjerojatnosti tranzicija pokazale su da su neki sudionici prelazili iz manje ozbiljnih u ozbiljnije profile između valova. Posebno izraženi bili su prijelazi iz profila „Niski simptomi“ u profil „Tjelesni simptomi te iz profila „Somatsko-vegetativni simptomi“ u „Visoko izraženi simptomi depresije“. Sudionici su također prelazili iz ozbiljnijih u manje ozbiljne profile, primjerice iz profila „Visoko izraženi simptomi depresije“ u profile „Somatsko-vegetativni simptomi“ ili „Niski simptomi“.

Istraživanje je pružilo važne uvide u strukturu i razvoj depresije kod adolescenata. Postojanje profila „Somatsko-vegetativni simptomi“ potvrdilo je raniji nalaz dobiven na kliničkom uzorku. Loadesova i suradnici (18) identificirali su ovaj profil na većem uzorku adolescenata s depresijom. U njihovom istraživanju adolescentive Symptoms” profile (30% probability, n = 29 participants).

DISCUSSION

This study examined which profiles of depression symptoms exist among adolescents and how adolescents transition between the profiles at different time points. The model with four profiles was selected because it had the best fit with the data, and was the most logical at all three time points. It also proved to be measurement invariant. This model describes the following four profiles of depressive symptoms in adolescents: “No Symptoms”, “Low symptoms”, “Somatic-Vegetative Symptoms” and “Severe Depression Symptoms”. The “Severe Depression Symptoms” profile indicated the most severe clinical picture, as the mean value of almost all symptoms was above 2, thus indicating the presence of symptoms. Adolescents who were in the “Somatic-Vegetative Symptoms” profile had problems with fatigue, sleep and appetite, but had low suicidality scores. Transition probabilities revealed that some participants tended to switch from less serious profiles to more serious profiles between the waves. The most notable were switches from the “Low Symptoms” profile to the “Somatic Vegetative Symptoms” profile, and from the “Somatic-Vegetative Symptoms” profile to the “Severe Depression Symptoms” profile. Participants also tended to switch from more serious to less serious profiles, for example from the “Severe Depression Symptoms” profile to the “Somatic-Vegetative Symptoms” or “Low Symptoms” profiles.

This study provided important insights into the structure and development of depression in adolescents. The existence of the “Somatic-Vegetative Symptoms” profile confirmed a previous finding obtained on a clinical sample. Loades et al. (18) identified this profile on a larger sample of adolescents with depression. In their study, adolescents had problems with sleep, appetite and fatigue, but they also experienced psychomotor difficulties, which were not present in the “So-

ti su imali probleme sa spavanjem, apetitom i umorom, ali i psihomotornim teškoćama, koje nisu bile izražene u profilu „Somatsko-vegetativni simptomi“ dobivenom u ovom istraživanju. Razlika bi se mogla objasniti kliničkom prirodom tog uzorka, za razliku od populacijskog uzorka u ovoj studiji koji je obuhvatio širi raspon adolescenata.

Koristeći uzorak iz opće populacije i mjereći simptome depresije i anksioznosti, van Lang i suradnici (34) identificirali su pet različitih klasa adolescenata, uključujući klase s malom vjerojatnošću postojanja simptoma te klasu s izraženim problemima sa spavanjem i prehranom. S druge strane, Ling i suradnici (35) identificirali su samo klase adolescenata temeljene na težini simptoma depresije, poput niske depresije, subkliničke depresije i vjerojatne kliničke depresije. Međutim, oni su dihotomizirali simptome depresije i koristili upitnik koji mjeri širi raspon simptoma od onih prisutnih u DSM-5. Ovo istraživanje doprinosi dosadašnjim ograničenim spoznajama identificiranjem klinički značajne kategorije adolescenata s povišenim somatsko-vegetativnim simptomima. Njihova kvaliteta života zasigurno je narušena, iako možda nisu u potpunosti depresivni te možda ne bi prešli granične vrijednosti na uobičajeno korištenim instrumentima za dijagnosticiranje depresije. Osim suicidalnosti i psihomotornih simptoma koji su znatno niži u ovoj grupi, njihovi ostali simptomi nisu bili daleko od vrijednosti 2. Za neke adolescente ovo bi mogao biti drugačiji oblik depresije koji se može ili ne mora razviti u punoj mjeri. Nadalje, istraživanje je pokazalo da adolescenti obično prelaze u ovaj profil iz profila „Niski simptomi“ te iz njega mogu prijeći u profil „Visoko izraženi simptomi depresije“ i obrnuto. Buduća istraživanja trebala bi ispitati faktore rizika i zaštitne faktore za ove tranzicije te mogućnosti terapijskih intervencija. Loadesova i suradnici (18) pokazali su da adolescenti s depresijom koji imaju izražene tjelesne simptome imaju lošije

matic-Vegetative Symptoms” profile obtained in this study. The difference may be explained by the clinical nature of that sample, as opposed to the general population sample that was used in this study, which captured a broader range of adolescents.

Using a general population sample and measuring the symptoms of depression and anxiety, van Lang et al. (34) identified five different classes of adolescents, including classes with a low probability of exhibiting symptoms, and a class with pronounced sleeping and eating problems. In contrast, Ling et al. (35) identified only classes of adolescents based on depression symptom severity, such as low depression, subthreshold depression and probable clinical depression. However, they dichotomized depression symptoms and used a questionnaire that measures a broader range of symptoms than the ones present in DSM-5. This study contributes to the current limited body of knowledge by identifying a clinically meaningful category of adolescents with elevated somatic-vegetative symptoms. Their quality of life is surely impaired, although they may not be completely depressed and would perhaps not exceed the threshold values of the commonly used depression screening instruments. Besides suicidality and psychomotor symptoms that are markedly lower in this group, their other symptoms were not far from the mean value of 2. For some adolescents this could be a different form of depression that may or may not become full-blown. This study further revealed that adolescents usually transition to this profile from the “Low Symptoms” profile, and that they could transition from this profile to the “Severe Depression Symptoms” profile and vice-versa. Future studies should examine the risk and protective factors for these transitions, as well as the possibilities of therapeutic interventions. Loades et al. (18) observed that depressed adolescents with pronounced physical symptoms have worse treatment outcomes, and Bohman et al. (36) determined that pronounced “Somatic-Vegetative Symptoms” within depression imply longer duration, greater severity of the disorder, and greater

terapijske ishode, a Bohman i suradnici (36) utvrdili su da izraženi „Somatsko-vegetativni simptomi“ unutar depresije upućuju na dulje trajanje, veću ozbiljnost poremećaja i više komorbiditeta. Stoga bi adolescenti koji prelaze iz profila „Somatsko-vegetativni simptomi“ u profil „Visoko izraženi simptomi depresije“ mogli potencijalno patiti od težeg tijeka depresije.

Dobiveno je i da se veličina profila „Visoko izraženi simptomi depresije“ općenito smanjivala tijekom istraživanja. Prethodna istraživanja pokazuju kako prevalencija depresije i teške depresije naglo raste na prijelazu iz djetinjstva u adolescenciju (37). No, sudionici su već na početku istraživanja bili adolescenti pa je moguće da je razina njihove depresije već dosegnula vršnu vrijednost. Neke longitudinalne studije pokazuju da se veličina depresivne skupine adolescenata smanjuje s godinama (38). U svakom slučaju, prosječna dob od 15,5 godina u kojoj su adolescenti bili na početku istraživanja, je vrijeme kada su oni vjerojatno i najranjiviji za razvoj depresivnih poremećaja (39). U toj dobi oni se suočavaju s nizom razvojnih promjena i izazova. Sudionici su u prvom valu bili u prvim razredima srednje škole, a prelazak u srednju školu je značajan i dugotrajniji stresor, koji uključuje drugačije i veće obrazovne zahtjeve, uklapanje u nove vršnjačke grupe, provođenje sve više vremena s vršnjacima, više sukoba s roditeljima i nove dnevne rutine. Često to uključuje i anksioznost povezanu s iščekivanjem tih promjena te snažnije reakcije na stresore povezane s učinkom nego u djetinjstvu (39). Neka istraživanja također pokazuju da u toj dobi dolazi do snažnijih utjecaja gena na razvoj depresije (40) te da dolazi do snažnije aktivacije amigdale nego kasnije u odrasloj dobi, posebno u situacijama poput vršnjačkog odbacivanja (39). Dodatno, pokazuje se i da kognitivne distorzije i neadaptivni stavovi postaju sve stabilniji i nalik na osobine u toj dobi rane adolescencije (39). Svi ovi faktori mogu objasniti najveći udio adolescenata u najtežem profilu upravo u prvom valu istraživanja. U

comorbidity. Therefore, adolescents transitioning from the “Somatic-Vegetative Symptoms” profile to “Severe Depression Symptoms” profile could potentially suffer from a more severe course of depression.

This study also revealed that the size of the “Severe Depression Symptoms” profile generally decreased over the course of the study. Previous studies have shown that the prevalence of depression and severe depression dramatically increases in the transition period from childhood to adolescence (37). However, the participants were already adolescents at the time the study began, and it is possible that their depression levels had already plateaued. Some longitudinal studies have shown that the size of the depressed group of adolescents decreases over the years (38). In any case, the participants’ average age of 15.5 years at the beginning of the study is a period in which they are likely most vulnerable to the development of depressive disorders (39). At this age, they face a range of developmental changes and challenges. The participants were in the first grade of high school during the first wave, and the transition to high school represents a significant and prolonged stressor, which involves different and greater educational demands, adaptation to new peer groups, spending increasing amounts of time with peers, more frequent conflicts with parents, and new daily routines. This also often includes anxiety related to the anticipation of these changes, and stronger reactions to performance-related stressors compared to childhood (39). Moreover, some studies showed that at this age the genetic influences on the development of depression become stronger (40), and that there is greater amygdala activation than later in adulthood, especially in situations such as peer rejection (39). Furthermore, cognitive distortions and maladaptive attitudes become increasingly stable and trait-like during this early stage of adolescence (39). All these factors may explain why the largest proportion of adolescents was observed in the most severe profile precisely in the first wave of the study. In their review of studies that examined the devel-

pregledu istraživanja koja su ispitivala razvojne putanje simptoma depresije u adolescenciji Ellis i suradnici (41) utvrdili su da istraživanja obično identificiraju skupinu koja već u kasnom djetinjstvu pokazuje izražene simptome depresije, ali se oni smanjuju kako adolescencija napreduje. Istraživanja su također identificirala drugu skupinu koja počinje razvijati ozbiljnije simptome depresije na početku adolescencije, a veličina te skupine se povećava kako adolescencija napreduje. Ta je skupina također imala najizraženije komorbiditete.

Ovo istraživanje uzelo je u obzir heterogenost u načinu na koji se depresivni simptomi grupiraju unutar svake vremenske točke i time prikazalo složenost depresije kod adolescenata. Profil „Visoko izraženi simptomi depresije“ općenito se smanjivao po veličini, ali su sudionici također prelazili u njega i izvan njega u druge profile. Može se pretpostaviti da su oni koji su ostali u ovom profilu tijekom svih mjerenja patili od najtežeg i najviše kroničnog oblika depresije. Istraživanja također pokazuju da osobe koje su ranije bile depresivne i dalje imaju narušenu emocionalnu regulaciju, koristeći više disfunkcionalnih, a manje funkcionalnih strategija u usporedbi s osobama u kontrolnoj skupini koje nikada nisu bile depresivne (42). Osobe koje su prethodno doživjele depresivne epizode također mogu pokazivati višu emocionalnu inerciju u odnosu na osobe koje nikad nisu imale depresiju, što znači da su više „zarobljene“ u negativnom afektu i niskoj razini pozitivnog afekta, čak i kada se kontroliraju brojni drugi čimbenici (43). Stoga, čak i oni sudionici koji su prešli iz profila „Visoko izraženi simptomi depresije“ u profil „Niski simptomi“ vjerojatno nisu potpuno psihički zdravi ili „sigurni“ od daljnjih epizoda depresije koje bi mogle imati razoran učinak na njihove odnose, obrazovanje, posao i zdravlje (6,7,9).

U istraživanju su se pokazale i spolne razlike između dobivenih profila simptoma depresije. Djevojke su imale općenito znatno izraženije simptome depresije od mladića, što se vidjelo

opmental trajectories of depression symptoms in adolescence, Ellis et al. (41) found that studies usually identify a group that exhibited severe depression symptoms as early as in late childhood, but they decreased as adolescence progressed. Studies have also identified another group that started developing more serious depression symptoms at the beginning of adolescence, and the size of this group increased as adolescence progressed. This group also had the most pronounced comorbidities.

Our study took into account the heterogeneity of the manner in which depression symptoms group within each time point, and thus presented the complexity of depression in adolescents. The “Severe Depression Symptoms” profile generally decreased in size, but participants also fluctuated in and out of it to other profiles. It could be assumed that those who stayed in this profile during all measurements suffered from the most severe and chronic form of depression. Studies have also shown that previously depressed individuals still showed impaired emotional regulation, using more dysfunctional and fewer functional strategies when compared to the individuals in the control group who had never been depressed (42). Individuals who have previously experienced depressive episodes may also exhibit higher emotional inertia than those who have never gone through depression, meaning that they are more “trapped” in the negative affect and the low positive affect, even after numerous other factors had been controlled for (43). Therefore, even those participants who transitioned from the “Severe Depression Symptoms” profile to the “Low Symptoms” profile are probably not completely mentally healthy or “safe” from experiencing further depression episodes that could have a crushing effect on their relationships, education, work and health (6, 7, 9).

The study also revealed gender differences in the obtained profiles of depression symptoms. Girls generally had markedly more pronounced depressive symptoms than boys, which was also evident in the much higher percentage of girls exceeding the cutoff values for moderately severe

iu višestruko većem postotku djevojaka koje su prelazile granične vrijednosti za umjereno tešku i tešku depresiju na PHQ-9 upitniku u sva tri vala. Ti nalazi su poznati u literaturi i slični su dobivenima u prethodnim istraživanjima (4), a u ovom istraživanju su dobiveni i na probabilističkom uzorku adolescenata u Hrvatskoj. Profili dobiveni na djevojkama i mladićima pokazuju sličnosti s profilima dobivenim na cijelom uzorku. Pojavljuje se profil „Somatsko-vegetativni simptomi", iako taj profil kod mladića ne sadrži simptom 5 „slab apetit ili prekomjerno jedenje". Veća izraženost tog simptoma kod žena poznata je iz prethodnih istraživanja (13). Romansova i suradnici (44) ukazuju na to da bi ta razlika mogla biti posljedica većeg naglaska koji žene zbog društvenih pritisaka stavljaju na ograničavanje unosa kalorija te zbog emocionalnih problema u depresiji kod njih dolazi do relativno većih promjena u apetitu. Za razliku od nalaza dobivenih na cijelom uzorku, u odvojenim analizama po spolu pojavio se i profil „Simptomi suicidalnosti", koji je bio prisutan i kod djevojaka i kod mladića. Taj profil, prema saznanjima autora, još nije zabilježen u prethodnim istraživanjima. Treba, međutim, napomenuti da su analize latentnih profila simptoma depresije rijetko provođene odvojeno na djevojkama i mladićima, a posebno ne na uzorcima adolescenata koji nisu klinički, a u kojima se može i istaknuti ovaj profil. Općenito, prethodna istraživanja na adolescentima pokazuju da su smrti uzrokovane samoubojstvom češće kod mladića, a djevojke se češće samoozljeđuju (9). U svakom slučaju, postojanje ovog profila simptoma depresivnosti potrebno je ozbiljno shvatiti. U ovom istraživanju je pokazano i da u ovaj profil češće prelaze adolescenti iz profila „Somatsko-vegetativni simptomi" kod djevojaka te iz profila „Niski simptomi" kod mladića. Buduća istraživanja trebala bi replicirati postojanje ovog profila na drugim uzorcima djevojaka i mladića. Konačno, profil „Visoko izraženi simptomi depresije", koji je dobiven na cijelom uzorku, bio je prisutan u uzorku djevojaka, ali ne i u uzorku mladića. Osim već spomenute veće

and severe depression in the PHQ-9 across all three waves. These findings are well documented in the literature and are similar to those reported in previous studies (4), while in this study they were obtained on a probabilistic sample of adolescents in Croatia. The profiles obtained for girls and boys showed similarities to those obtained in the full sample. The "Somatic-Vegetative Symptoms" profile appeared, although among boys it did not include symptom 5, "poor appetite or overeating". Greater expression of this symptom in women has been reported in previous studies (13). Romans et al. (44) suggested that this difference could be a consequence of women putting greater emphasis on limiting caloric intake due to social pressures, and due to emotional issues caused by depression, they therefore experience relatively greater changes in appetite. In contrast to the results obtained from the full sample, in the analyses conducted separately by gender, the "Suicidality Symptoms" profile also emerged, which was present among both girls and boys. To the author's knowledge, this profile has not been reported in previous research. It should, however, be noted that latent profile analyses of depressive symptoms have rarely been conducted separately for girls and boys, particularly not in non-clinical adolescent samples where this profile could be highlighted. In general, previous studies in adolescents have shown that deaths by suicide are more common among boys, while girls more often engage in self-injury (9). In any case, the existence of this depressive symptom profile should be taken seriously. This study also showed that adolescents more often transitioned to this profile from the "Somatic-Vegetative Symptoms" profile among girls, and from the "Low Symptoms" profile among boys. Future studies should replicate the existence of this profile in other samples of girls and boys. Finally, the "Severe Depression Symptoms" profile, which was obtained in the full sample, was present in the girls' sample but not in the boys' sample. In addition to the already mentioned greater severity of depressive symptoms among girls, which this profile configura-

izraženosti simptoma depresivnosti kod djevojaka na koju ova konfiguracija profila ukazuje, vjerojatno je i da profil „Simptomi suicidalnosti“ kod mladića sadrži u sebi i neke mladiće koji imaju visoko izražene gotovo sve simptome depresivnosti. Ipak, vjerojatno ih nije bilo dovoljno da učine samostalni profil.

Istraživanje je imalo važne prednosti, ali i određena ograničenja. Prednosti su bile veliki probabilistički uzorak adolescenata, korištenje instrumenta usklađenog s DSM-5 kriterijima i analize prijelaza latentnih profila za ispitivanje heterogenosti simptoma depresije. Ograničenja uključuju samoprocjenu simptoma depresije, što može povećati procijenjenu prevalenciju simptoma depresije (45). Međutim, čak i ako su veličine profila pod povećanim rizikom bile precijenjene, njihova bi struktura trebala biti manje pogođena samoprocjenom simptoma. Uloženi su napori kako bi se osiguralo da adolescenti pažljivo odgovaraju na pitanja uključivanjem pitanja za provjeru pažnje. Ovi su rezultati dobiveni i na uzorku adolescenata specifične dobi iz Zagreba. Budući da je ovo jedno od rijetkih istraživanja koja longitudinalno ispituju heterogenost depresivnih simptoma u adolescenciji, buduća istraživanja trebala bi replicirati ove nalaze na drugim uzorcima adolescenata u drugim državama te osigurati dulje, višegodišnje praćenje kako bi se pratile promjene iz profila u profil. Prikupljanje podataka bilo bi poželjno započeti već u srednjem ili kasnom djetinjstvu, kada se kod mnogih počinju razvijati simptomi depresije (37). S tim je povezana i mogućnost da je na dobivene rezultate o stabilnosti i prijelazima između profila utjecala duljina intervala između ponovljenih mjerenja. Interval od 6 mjeseci između mjerenja često je korišten u longitudinalnim istraživanjima depresije kod adolescenata (npr., 46), kako bi se pratile razvojne promjene u duljim razdobljima također iz praktičnih razloga. Ipak, moguće je da se te promjene događaju i u kraćim vremenskim razmacima između mjerenja te bi buduća istraživanja mogla koristiti intervale od primjerice tri mjeseca ili kraće

tion indicates, it is also likely that the “Suicidality Symptoms” profile among boys included some boys who had highly elevated scores in relation to nearly all depressive symptoms. Nevertheless, there were probably not enough of them to form a separate profile.

There were notable advantages to this study, but also certain limitations. Its strengths included using a large probabilistic sample of adolescents, using an instrument that closely followed the DSM-5 criteria, and using a latent profile transition analysis to examine the heterogeneity of depression symptoms. The limitations of this study include the self-assessment of depression symptoms, which can inflate the estimates of depression symptom prevalence (45). However, even if the sizes of at-risk profiles were inflated, their structure should be less affected by the self-assessment of the symptoms. Efforts were made to ensure that adolescents answered the questions attentively, by including attention check questions. Furthermore, these results were obtained on a sample of adolescents of a specific age in Zagreb. Since this is one of the very few studies that examined heterogeneity of adolescent depression symptoms longitudinally, future studies should replicate these findings on other samples of adolescents in other countries and offer a longer, multi-year follow-up in order to track profile-to-profile transitions. Data collection should preferably start as early as mid- or late childhood, when depression symptoms start to develop in many individuals (37). This is associated with the possibility that the length of the interval between repeated measurements influenced the obtained results in terms of profile stability and transitions between profiles. A six-month interval between measurements has often been used in longitudinal studies on adolescent depression (e.g. 46) so as to track developmental changes over longer periods, and also for practical reasons. However, it is possible that such changes also occur over shorter time intervals between measurements, and future studies could employ intervals of, for example, three months or less, and compare the obtained

te usporediti tako dobivene rezultate s onima dobivenima na duljim vremenskim intervalima.

Nalazi ovog istraživanja mogli bi se praktično primijeniti u osmišljavanju odgovarajućih intervencija usmjerenih na različite profile adolescenata. Primjerice, adolescenti s profilom „Niski simptomi“ mogli bi imati koristi od preventivnih sadržaja usmjerenih na unaprjeđenje mentalnog zdravlja, dok bi se adolescenti s profilima „Somatsko-vegetativni simptomi“ i „Visoko izraženi simptomi depresije“ vjerojatno trebali uključiti u tretman. Sam tretman mogao bi se dodatno prilagoditi tim dvjema skupinama adolescenata. Slično vrijedi i za profil „Simptomi suicidalnosti“ koji je dobiven u odvojenim analizama po spolu. Nalazi istraživanja ukazuju da se adolescentska depresija ne razlikuje samo po težini među pojedincima, nego i po obrascima simptoma koji mogu varirati tijekom vremena. Ako se provodi probno testiranje depresije kod adolescenata, trebalo bi razmotriti i postojanje profila „Somatsko-vegetativni simptomi“ te također profila „Simptomi suicidalnosti“, posebno kod djevojaka, u kojih je taj profil odvojen od profila „Somatsko-vegetativni simptomi“ i „Visoko izraženi simptomi depresije“. Budući da je pokazano kako je najteži profil „Visoko izraženi simptomi depresije“ bio najzastupljeniji u prvom valu istraživanja, intervencije bi najbolje bilo provoditi kad su adolescenti mlađi, po mogućnosti pri prelasku u srednju školu.

ZAKLJUČAK

Adolescenti se grupiraju u različite profile na temelju svojih depresivnih simptoma te su profili „Somatsko-vegetativni simptomi“ i „Visoko izraženi simptomi depresije“ klinički indikativni. Javlja se i profil „Simptomi suicidalnosti“. Profili su pokazali vremensku stabilnost, no dio adolescenata imao je tendenciju prelaska među njima, a klinički indikativni profili bili su obilježeni češćim prijelazima u njih i izvan njih. Nalazi ovog istraživanja trebaju biti replicirani, no koresults with those from longer measurement intervals.

The findings of this study could be practically applied in designing appropriate interventions that could target the different profiles of adolescents. For example, adolescents with the “Low Symptoms” profile could benefit from preventive content aimed at improving mental health, whereas adolescents with “Somatic-Vegetative Symptoms” and “Severe Depression Symptoms” profiles should probably undergo treatment. Treatment itself could be further tailored to these two adolescent groups. The same applies for the “Suicidality Symptoms” profile as well, which was obtained in separate gender-based analyses. The study findings indicate that adolescent depression does not only differ in severity between individuals, but also in symptom patterns that can vary across time. If depression screening were conducted among adolescents, the existence of the “Somatic-Vegetative Symptoms” profile should also be considered, as well as the “Suicidality Symptoms” profile, particularly among girls where this profile was separate from the “Somatic-Vegetative Symptoms” and “Severe Depression Symptoms” profiles. Since it was shown that the most severe profile, the “Severe Depression Symptoms” profile, was most prevalent in the first wave of the study, interventions would be best implemented when adolescents are younger, preferably at the time of transition into high school.

CONCLUSION

The adolescents were grouped into different profiles according to their depression symptoms, and the “Somatic-Vegetative Symptoms” and “Severe Depression Symptoms” profiles were clinically indicative. The “Suicidality Symptoms” profile was also observed. The profiles showed temporal stability, but some adolescents tended to transition between them, and the clinically indicative profiles were characterized by more frequent transitions in and out of them. The findings of this study should be replicated, but they represent a

rak su prema boljem razumijevanju i ublažavanju ozbiljnog problema adolescentske depresije.

step further towards a better understanding of the serious problem of adolescent depression and how it can be alleviated.

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