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Osjetljivost na potkrepljenje i mentalno zdravlje

/ Reinforcement Sensitivity and Mental Health

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Teorija osjetljivosti na potkrepljenja postulira tri bihevioralna motivacijska sustava u podlozi stabilnih obrazaca ponašanja: bihevioralni inhibicijski sustav (BIS), bihevioralni aktivacijski sustav (BAS) i sustav borbe ili bijega (BBBS). BIS i BBBS kočje ponašanja koja bi mogla biti ugrožavajuća za organizam pa se njihova osjetljivost povezuje sa sklonošću doživljavanju neugodnih emocija. BAS je pak ključan za ponašanja pristupanja okolini s ciljem pribavljanja resursa potrebnih za preživljavanje i reprodukciju, no recentna istraživanja pokazuju da se unutar ovih motivacija treba dodatno razlikovati četiri komponente: postavljanje cilja (BAS_w), planiranje i započinjanje nužnih aktivnosti koje vode cilju (BAS_g), upornost u postizanju cilja (BAS_p) te uroda kad je cilj postignut (BAS_s). Cilj ovog istraživanja bio je provjeriti na koji su način ove različite komponente povezane s mjerama mentalnog zdravlja uključujući različite oblike anksioznosti (socijalna, tjelesna, svakodnevna i anksioznost u novim situacijama) i depresivnost. Provedeno je online istraživanje na 446 odraslih sudionika (272 žene) ($M_{dob} = 34$; $SD = 12$). Rezultati regresijskih analiza pokazuju da komponente teorije osjetljivosti na potkrepljenja značajno doprinose objašnjenju različitih oblika anksioznosti i depresivnosti. Najveći doprinos u svim modelima pokazuje sustav inhibicije ponašanja, koji je dosljedno povezan s višim razinama anksioznosti i depresije, potvrđujući njegovu ključnu ulogu u obradi prijetnje i izbjegavanju negativnih ishoda. Sustav ponašajne aktivacije, osobito BAS_p komponenta, pokazuje zaštitni učinak. Suprotno tome, komponente BAS_w i BAS_s su u nekim slučajevima pozitivno povezane s depresivnošću, što može ukazivati na frustriranu motivaciju. Reaktivni sustav straha pokazuje selektivne učinke pri čemu je važniji za svakodnevnu anksioznost i depresivnost nego za socijalnu anksioznost. Nalazi mogu imati implikacije za psihološke intervencije usmjerene na regulaciju motivacije i emocionalnih reakcija.

/ The Reinforcement Sensitivity Theory posits three behavioral motivation systems that underly stable behavioral patterns: the behavioral inhibition system (BIS), the behavioral approach system (BAS), and the fight-flight-freeze system (FFFS). The BIS and FFFS inhibit behaviors that may pose a threat to the organism, therefore their sensitivity is associated with a greater propensity to experience negative emotions. Conversely, the BAS is central to approach behaviors aimed at acquiring resources essential for survival and reproduction, however recent studies have shown that four components should be further distinguished within these motivations: goal-setting (BAS_w), planning and initiating goal-directed actions (BAS_g), persistence in goal pursuit (BAS_p), and pleasure derived from goal attainment (BAS_s). The aim of this study was to examine the relationships between these components and mental health measures, including multiple forms of anxiety (social, somatic, daily, and anxiety in new situations) and depressive symptoms. An online survey was conducted, involving 446 adult participants (272 women) ($M_{age} = 34$, $SD = 12$). The results of regression analyses indicated that the components of Reinforcement Sensitivity Theory significantly contribute to explaining the variance in different forms of anxiety and depression. The behavioral inhibition system was revealed as the biggest contributor to all models, consistently associated with higher levels of anxiety and depression, thus confirming its pivotal role in threat processing and avoidance of negative outcomes. The behavioral approach system, particularly the BAS_p component, demonstrated a protective effect. In contrast, the BAS_w and BAS_s components were, in some cases, positively associated with depressive symptoms, suggesting the presence of frustrated motivation. The reactive fear system exhibited selective effects, being more relevant for everyday anxiety and depression than for social anxiety. These findings carry potential implications for psychological interventions targeting motivation and emotional response regulation.

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KLJUČNE RIJEČI / KEY WORDS:Bihevioralni inhibicijski sustav / *Bicbehavioral Inhibition System*Bihevioralni aktivacijski sustav / *Behavioral Approach System*Depresivnost / *Depression*Anksioznost / *Anxiety***TO LINK TO THIS ARTICLE:** <https://doi.org/10.24869/spsih.2025.319>**UVOD****Teorija osjetljivosti na potkrepljenja**

Prema Grayu, emocije i motivacija usko su povezane i djeluju urođenim neurobiološkim sustavima koji omogućuju prilagodbu pojedinca na zahtjeve okoline (1-3). Teorija osjetljivosti na potkrepljenja (TOP; engl. *Reinforcement Sensitivity Theory*, RST) predlaže postojanje dvaju temeljnih sustava koji reguliraju ponašanje: bihevioralno inhibicijskog sustava (BIS) i bihevioralno aktivacijskog sustava (BAS) – te dodatno, u revidiranoj verziji teorije (2) i zasebnog sustava borbe/bijega/blokiranja (BBBS; engl. *Fight-Flight-Freeze System*, FFFS).

Bihevioralno aktivacijski sustav se aktivira u prisutnosti nagrade ili odsutnosti kazne te potiče ponašanja usmjerena prema cilju. Neuroanatomski se povezuje s dopaminergičkim putevima koji uključuju nukleus akumbens, ventralno tegmentalno područje i orbitofrontalni korteks (4,5). Ovaj je sustav osjetljiv na uvjetovane pozitivne podražaje stvarajući pozitivnu povratnu petlju koju aktivira prisutnost nagrade. Posljedično, njegova aktivacija rezultira svojevrsnom energizacijom ponašanja, traženjem noviteta i pozitivnim afektom.

Suprotno tome, bihevioralni inhibicijski sustav osjetljiv je na signale kazne, neizvjesnosti ili sukobe između približavanja i izbjegavanja te aktivira anksioznost i povećava pažnju prema

INTRODUCTION**Reinforcement Sensitivity Theory**

According to Gray, emotions and motivation are closely interconnected and operate through innate neurobiological systems that enable individuals to adapt to environmental demands (1-3). The Reinforcement Sensitivity Theory (RST) proposes the existence of two fundamental systems that regulate behavior: the behavioral inhibition system (BIS) and the behavioral approach system (BAS) – and additionally, in the revised version of the theory (2), a separate fight-flight-freeze system (FFFS).

The behavioral approach system is activated in the presence of reward or the absence of punishment, promoting goal-directed behaviors. It is neuroanatomically associated with dopaminergic pathways that include the nucleus accumbens, the ventral tegmental area, and the orbitofrontal cortex (4, 5). This system is sensitive to conditioned positive stimuli, creating a positive feedback loop triggered by the presence of reward. Consequently, its activation results in a sort of energization of behavior, novelty-seeking, and positive affect.

In contrast, the behavioral inhibition system is sensitive to signals of punishment, uncertainty, or approach-avoidance conflict, activating anxiety and increasing attention toward potential threats. Its activation is linked to the septo-hippocampal circuit and serotonergic

potencijalnim prijetnjama. Njegova je aktivacija povezana sa septo-hipokampalnim krugom i serotonergičkom aktivnošću (2,6). Aktivacija BIS-a vodi prema opreznosti, povećanoj procjeni rizika, detekciji uvjetovanih neugodnih podražaja te u širem kontekstu, ruminacijama i pasivnim strategijama suočavanja.

Sustav BBBS posebno reagira na neposredne prijetnje i odgovoran je za reakcije straha i obrambenog ponašanja. Povezan je s aktivacijom limbičkog sustava i moždanog debla, a evolucijski je najstariji sustav, ključan za preživljavanje (7).

Grayova revizija RST-a (2000) ističe da BIS ne reagira samo na kaznu, već ponajprije na konflikt između približavanja i izbjegavanja čime posreduje procese odlučivanja u nesigurnim situacijama (8). Na primjer, društvene situacije koje uključuju potencijalno nagrađujuće, ali i riskantne ishode (npr. javni nastup) tipično aktiviraju BIS. Aktivacija BIS-a dovodi do razmišljanja o prošlosti, brige o budućnosti, eskalacije percepcije opasnosti i izraženijeg pasivnog izbjegavanja. Uloga koju sustav bihevioralne inhibicije ima u razrješavanju konflikata vezanih uz ispunjavanje ciljeva dovodi ga u usku vezu s osobinama neuroticizma i anksioznosti (9-11), što se također manifestira u obliku brige i ruminacija (12). Ujedno, bihevioralna je inhibicija biološki temelj mnogih kognitivnih pristranosti kao što su pristranost pamćenja, negativnih očekivanja i vjerovanja te precjenjivanje prijetnje (13-15).

Aktivacija BAS sustava se pak nalazi u podlozi impulzivnosti, traženja uzbuđenja i ekstrasverzije. Razlog tome je što se BAS aktivira podražajima koji su nam zanimljivi i općenito privlačni (npr. hrana, spolni partneri) (2,8). Unutar ovih približavajućih tendencija identificirano je nekoliko dimenzija. Corr i Krupić (16) su pokazali da se BAS može organizirati u četiri faktora nižeg reda: Htijenje (BAS-Wanting), Traženje (BAS-Seeking), Stjecanje (BAS-Getting) i Ugoda (BAS-Liking). Ove dimenzije

activity (2, 6). Activation of the BIS leads to cautious behavior, enhanced risk assessment, detection of conditioned aversive stimuli, and more broadly, rumination and passive coping strategies.

The fight-flight-freeze system (FFFS) is particularly responsive to immediate threats, and is responsible for fear responses and defensive behavior. It is associated with the activation of the limbic system and the brainstem, and represents the oldest system in terms of evolution, crucial for survival (7).

Gray's revision of the RST (2000) asserts that the BIS does not respond solely to punishment, but primarily to the conflict between approach and avoidance, thus mediating the decision-making processes in uncertain situations (8). For instance, social situations that involve potentially rewarding but risky outcomes (e.g. public speaking) typically activate the BIS. BIS activation leads to retrospection, worry about the future, heightened threat perception, and increased passive avoidance. The role of BIS in resolving goal-related conflicts links it closely to traits such as neuroticism and anxiety (9-11), which is also manifested as worry and rumination (12). Moreover, behavioral inhibition forms the biological basis for many cognitive biases, such as memory bias, negative expectations and beliefs, and threat overestimation (13-15).

BAS activation, on the other hand, underlies impulsivity, sensation-seeking and extroversion. This is due to the fact that the BAS is activated by stimuli that are inherently interesting or generally attractive (e.g. food, sexual partners) (2, 8). Within these approaching tendencies, several dimensions have been identified. Corr and Krupić (16) demonstrated that the BAS can be organized into four lower-order factors: Wanting (BAS_w), Seeking (BAS_s), Getting (BAS_g), and Liking (BAS_l). Different aspects of motivation are distinguished in these dimensions – from striving for achievement and

razlikuju različite aspekte motivacije – od težnje za postignućem i statusom (BAS_w), preko inicijativnosti i sklonosti istraživanju novosti (BAS_s), do ustrajnosti u ostvarivanju cilja (BAS_g) i emocionalne ugone nakon postignuća (BAS_l). Ove su dimenzije različito povezane s BIS-om, pa tako BAS_w korelira negativno, BAS_l pozitivno, dok BAS_s i BAS_g nisu povezani s BIS-om. S druge strane, drugi viši faktor Izbjegavajuća tendencija se sastoji od BIS i BBBS, a povezana je s neuroticizmom, negativnim afektom i osjetljivošću na kazne (17).

Kako se navedeni sustavi aktiviraju privlačnim, odbojnim ili konfliktnim podražajima i tendencijama, određena su se istraživanja usmjerila na njihovu povezanost sa psihopatologijom, konkretnije anksioznim i depresivnim stanjima.

BIS, BAS, anksioznost i depresija

Brojna istraživanja pokazuju da je disbalans između BIS-a i BAS-a rizični faktor za psihopatologiju, osobito za anksiozne i depresivne poremećaje (18-21). Visoka osjetljivost BIS-a konzistentno je povezana s višim razinama anksioznosti (22-25), ali i s depresivnošću, vjerojatno zbog povećane samorefleksije, brige i anticipiranja negativnih ishoda (26). S druge strane, literatura o BAS-u u predviđanju internalizirane psihopatologije je manje dosljedna, no niska aktivacija BAS-a povezuje se s anhedonijom, gubitkom interesa i smanjenom osjetljivošću na nagradu – ključnim obilježjima depresije (27-29). Longitudinalna istraživanja (26,30,31) pokazala su da osobe s nižim BAS-om imaju veću vjerojatnost trajanja depresivnih simptoma tijekom vremena.

Osobe s niskim BAS-om imaju slab odgovor na nagrade i gube motivaciju. Često osjećaju bezvoljnost, tugu i gubitak interesa. S druge strane, viši BAS kod depresivnih pacijenata predviđa oporavak od poremećaja, dok nije bilo veze između BIS-a i oporavka. Istovremeno, longitudinalna studija Johnson i sur. (22)

status (BAS_w), to initiative and novelty-seeking tendencies (BAS_s), persistence in goal attainment (BAS_g), and emotional satisfaction following achievement (BAS_l). These dimensions have different associations with the BIS, therefore BAS_w has a negative correlation and BAS_l has a positive correlation with the BIS, while BAS_s and BAS_g have no correlation with it. Conversely, a higher-order factor, Avoidance Tendency, comprises BIS and FFFS, and is associated with neuroticism, negative affect, and sensitivity to punishment (17).

Given that these systems are activated by appetitive, aversive or conflicting stimuli and tendencies, some studies have focused on their association with psychopathology, specifically with anxiety and depressive disorders.

BIS, BAS, Anxiety and Depression

Numerous studies indicate that an imbalance between the BIS and BAS constitutes a risk factor for psychopathology, particularly for anxiety and depressive disorders (18-21). High BIS sensitivity is consistently associated with elevated levels of anxiety (22-25), as well as depressive symptoms, likely due to increased self-reflection, worry, and anticipation of negative outcomes (26). In contrast, findings regarding the BAS in terms of predicting internalized psychopathology are less consistent. However, low BAS activation is associated with anhedonia, loss of interest, and reduced sensitivity to reward – which are core features of depression (27-29). Longitudinal studies (26, 30, 31) have shown that individuals with lower BAS are more likely to experience persistent depressive symptoms over time.

Individuals with low BAS exhibit diminished responses to reward and lose motivation. They often experience apathy, sadness, and loss of interest. Conversely, higher BAS in depressed patients predicts recovery from the disorder, whereas no association between the BIS and

nije pronašla vezu između BAS-a i dijagnoza depresije gdje su sudionici ispunjavali kriterije za depresivni, anksiozni ili oba poremećaja na temelju dijagnostičkih kriterija DSM-IV. Meta-analizom 204 studije koje se bave TOP-om, depresijom i anksioznošću zaključeno je kako je osjetljivost na kaznu (BIS) visoka i u depresiji i u anksioznosti dok BAS negativno predviđa samo depresiju, a ne anksioznost (32). Kada se radi o povezanosti BIS-a i BAS-a sa specifičnim vrstama anksioznih poremećaja istraživanja su oskudna. Kimbrel, Mitchell i Nelson-Gray su utvrdili da pojedinci sa socijalnom anksioznošću prijavljuju i više razine BIS-a i niže razine BAS-a u usporedbi s pojedincima s malo ili specifičnim socijalnim strahovima (33,34). Ovi nalazi ukazuju da socijalna anksioznost uključuje i višu osjetljivost BIS-a i nižu BAS-a. U jednom se istraživanju pokazalo kako vezu BAS-a i depresivnosti moderira BIS: BAS se pokazao značajnim za predviđanje depresivnih simptoma samo kod pojedinaca s visokom bihevioralnom inhibicijom (35). Ovi nalazi podržavaju ideju da su mehanizmi nagrađivanja i kažnjavanja različito uključeni u različite oblike internaliziranih poremećaja.

Ukratko, istraživanja navode kako je visoki BIS povezan s anksioznim i depresivnim simptomima, dok su za BAS u znanstvenim istraživanjima nalazi nekonzistentni. Mali je broj istraživanja koja su povezivala različite komponente BAS-a s ovim poremećajima, kao i različitim vrstama anksioznosti, osim za socijalnu anksioznost koja je je povezana s višim vrijednostima BIS-a i nižim BAS-a. Važno je napomenuti da ova istraživanja ne razlikuju BAS po njegovim specifičnim komponentama nego ga uzimaju kao jednu varijablu, što bi moglo objasniti ove nekonzistentne nalaze u istraživanjima. Stoga je cilj ovog istraživanja detaljnije ispitati povezanost dimenzija ličnosti s pokazateljima mentalnog zdravlja, uključujući depresivnost i različite oblike anksioznosti (socijalna evaluacija, fizička opasnost,

recovery has been observed. At the same time, a longitudinal study conducted by Johnson et al. (22) found no link between the BAS and depression diagnoses when participants met the criteria for depressive, anxiety, or both disorders based on the DSM-IV diagnostic criteria. A meta-analysis of 204 studies examining the RST, depression, and anxiety showed that sensitivity to punishment (BIS) is elevated both in depression and anxiety, whereas BAS negatively predicts only depression, and not anxiety (32). Research on the association of the BIS and BAS with specific types of anxiety disorders remains scarce. Kimbrel, Mitchell, and Nelson-Gray (2010) found that individuals with social anxiety report higher BIS and lower BAS levels compared to those with minimal or specific social fears (33, 34). These findings suggest that social anxiety involves both heightened BIS sensitivity and reduced BAS sensitivity. One study indicated that the relationship between the BAS and depressive symptoms is moderated by the BIS: BAS was predictive of depressive symptoms only in individuals with high behavioral inhibition (35). These results support the idea that reward and punishment mechanisms are differently involved in distinct forms of internalized disorders.

In summary, studies indicate that high BIS is associated with anxiety and depressive symptoms, whereas BAS-related scientific findings are inconsistent. Few studies have examined the connection between specific BAS components and these disorders or different forms of anxiety, with the exception of social anxiety, which is linked to higher BIS and lower BAS values. It should be noted that these studies treat BAS as a single variable rather than distinguishing its specific components, which may account for these inconsistent findings. Therefore, the aim of the present study was to examine in greater detail the associations between different dimensions of personality and indicators of mental health, including depressive symptoms and various forms of anxiety (social

svakodnevna zabrinutost te anksioznost u novim i nejasnim situacijama).

POSTUPAK

Provedeno je online istraživanje na punoljetnim osobama tijekom mjeseca travnja 2023. godine. Link na online upitnike dijeljen je putem društvenih mreža (*Facebook*) te *WhatsApp* aplikacije. Sudionici su pročitali informirani pristanak iz kojeg su saznali kako se istraživanje provodi u sklopu poslijediplomskog doktorskog studija psihologije Filozofskog fakulteta Sveučilišta u Zagrebu te kako je u potpunosti anonimno, osmišljeno i provodi se u skladu s etičkim načelima struke. Obaviješteni su kako mogu odustati u bilo kojem trenutku te im je kao nagrada pri izlaženju sa stranice prikazan tekst o tehnici opuštanja koju mogu koristiti u svakodnevnom životu. Također, objašnjeno je kome i gdje se mogu obratiti ako osjete da im je potrebna psihološka pomoć, te gdje i kada će moći pročitati rezultate istraživanja.

Ako su označili „Pristajem“ upućeni su na upitnike. U uvodnom dijelu ispunili su upitnik socioekonomskih karakteristika. Nakon toga su ispunjavali upitnike koji se odnose na tendenciju izbjegavajućem i približavajućem ponašanju, različite crte anksioznosti te depresivnost.

MJERNI INSTRUMENTI

Upitnik o socioekonomskim karakteristikama

U ovom dijelu sudionici su pitani za dob, rod, završeno školovanje, bračni status, radni status, veličinu mjesečnih prihoda, veličinu mjesta boravka te boluju li od neke kronične tjelesne bolesti ili psihijatrijskog poremećaja (u obliku da/ne). Na pitanje roda, mjesečnih prihoda te dijagnosticirane bolesti mogli su zaokružiti i

evaluation, physical threat, everyday worry, and anxiety in new and ambiguous situations).

METHOD

The survey was conducted online during April 2023 and involved adult participants. A link to the online questionnaires was shared via social media (*Facebook*) and the *WhatsApp* application. The participants read the informed consent form informing them that the study was being conducted as part of the Postgraduate Doctoral Study of Psychology at the Faculty of Humanities and Social Sciences of the University of Zagreb, and that it was completely anonymous, designed, and conducted in accordance with the ethical principles of the profession. They were informed that they could withdraw from participation at any time. As a reward upon leaving the page, they were presented a text about a relaxation technique applicable in everyday life. Additionally, they were informed about who and where they could turn to if they felt they needed psychological support, as well as where and when they would be able to read the study results.

If they selected 'I agree,' they were directed to the questionnaires. In the introductory part, they completed a questionnaire on socioeconomic characteristics. Next, they completed questionnaires assessing their tendencies toward avoidance and approach behaviors, various anxiety traits, and depressive symptoms.

MEASUREMENT INSTRUMENTS

Questionnaire on Socioeconomic Characteristics

In this part, the participants were asked about their age, gender, completed education, marital status, employment status, size of monthly income, size of place of residence, and whether they suffer from any chronic physical illness

„Ne želim odgovoriti“, a za rod i „Nešto drugo, upišite“.

Upitnik tendencija izbjegavanja i približavanja

Upitnik tendencija izbjegavanja i približavanja preuzet je iz istraživanja Krupić i sur. (36). Upitnik se sastoji od 27 čestica u kojima sudionici procjenjuju koliko se svaka tvrdnja odnosi na njih na ljestvici od 1 do 6 (1 – *uopće se ne odnosi na mene*, 6 – *u potpunosti se odnosi na mene*). Upitnik mjeri šest faktora: anksioznost (BIS), strah (BBBS), želje (BAS_w), traženje (BAS_s), upornost (BAS_g) i uroda (BAS_l). Pouzdanost pojedinih podljestvica na uzorku u istraživanju Krupić i sur. je iznosila $\alpha = 0,856 / \omega = 0,860$ za BIS; $\alpha = 0,871 / \omega = 0,872$ za BBBS; $\alpha = 0,851 / \omega = 0,878$ za BAS_w ; $\alpha = 0,835 / \omega = 0,829$ za BAS_s ; $\alpha = 0,927 / \omega = 0,928$ za BAS_g ; te $\alpha = 0,844 / \omega = 0,841$ za BAS_l . Ukupni se rezultati izražavaju kao prosjeci na svakoj od šest dimenzija. U ovom istraživanju su Cronbachovi alpha koeficijenti pouzdanosti (α) iznosili ,86 za BIS, ,84 za BBBS, ,88 za BAS_w , ,79 za BAS_s , ,87 za BAS_g te ,79 za BAS_l .

Ljestvica depresivnosti, anksioznosti i stresa (*Depression, Anxiety and Stress Scale, DASS-21*)

DASS - 21 je kraća verzija originalnog DASS-42 upitnika (37) koja se sastoji od 21 tvrdnje, a kojom se ispituje razina depresivnosti (DEP), anksioznosti (ANK) i stresa (STR). Sve tri podljestvice opisuju po sedam tvrdnji, a viši rezultat na svakoj podljestvici označava više razne anksioznosti, depresivnosti i stresa.

Zadatak ispitanika je da na ljestvici od 0 (uopće se nije odnosilo na mene) do 3 (gotovo u potpunosti ili većinu vremena se odnosilo na mene) označe koliko često su u proteklih tjedan dana zadnje vrijeme doživjeli stanje opisano u tvrdnji. Ovaj upitnik se često koristi za procje-

or psychiatric disorder (in the form of yes/no answers). For the questions about gender, monthly income and diagnosed illnesses, they could also select 'I prefer not to answer,' and for gender, 'Other, please specify.'

The Approach and Avoidance Tendencies Questionnaire

This questionnaire was adapted from a study conducted by Krupić et al. (36). It consists of 27 items in which the participants rate the extent to which each statement applies to them on a scale from 1 to 6 (1 – *does not apply to me at all*, 6 – *fully applies to me*). The questionnaire measures six factors: anxiety (BIS), fear (FFFS), wanting (BAS_w), seeking (BAS_s), persistence (BAS_g), and liking (BAS_l). The reliability of the subscales in the study sample by Krupić et al. was as follows: $\alpha = 0.856 / \omega = 0.860$ for BIS; $\alpha = 0.871 / \omega = 0.872$ for FFFS; $\alpha = 0.851 / \omega = 0.878$ for BAS_w ; $\alpha = 0.835 / \omega = 0.829$ for BAS_s ; $\alpha = 0.927 / \omega = 0.928$ for BAS_g ; and $\alpha = 0.844 / \omega = 0.841$ for BAS_l . The overall scores were calculated as the means for each of the six dimensions. In this study, the Cronbach's alpha reliability coefficients (α) amounted to .86 for BIS, .84 for FFFS, .88 for BAS_w , .79 for BAS_s , .87 for BAS_g and .79 for BAS_l .

Depression, Anxiety and Stress Scale (DASS-21)

The DASS-21 is a shorter version of the original DASS-42 (37), consisting of 21 items that assess the levels of depression (DEP), anxiety (ANX), and stress (STR). Each of the three subscales contains seven items, and higher scores on each subscale indicate greater levels of anxiety, depression, and stress.

The participants' task was to rate how often they experienced each described state over the past week on a scale from 0 (did not apply to me at all) to 3 (applied to me almost fully or most of the time). This questionnaire is widely

nu depresivnosti te pokazuje dobre metrijske karakteristike. U ovom su istraživanju korištene samo podljestvice anksioznosti i depresivnosti te su Cronbachovi alpha koeficijenti pouzdanosti iznosili ,86 za obje podljestvice.

Endlerove multidimenzionalne ljestvice anksioznosti

Razina anksioznosti mjerena je multidimenzionalnim ljestvicama anksioznosti (*Endler Multidimensional Anxiety Scales*) koje se sastoje od tri dijela: stanja anksioznosti (EMAS-S), crte anksioznosti (EMAS-T) i percepcije anksioznosti (EMAS-P) (20). Za potrebe ovog rada korištene su ljestvice EMAS-T koja mjeri razinu anksioznosti kao crte ličnosti i koja se sastoji od četiri dimenzije: socijalne evaluacije (E-SOC), fizički opasni situacija (E-FIZ), novih i nejasnih situacija (E-NOV) i svakodnevnih situacija (E-DAN). Svaka dimenzija ima po 15 čestica koje ispitanici procjenjuju na 5-stupanjskoj ljestvici Likertova tipa (od 1 – nimalo do 5 – vrlo jako). Unutarnja konzistentnost pojedinih podljestvica u jednom istraživanju iznosila je $\alpha = ,90$ za dimenziju socijalna procjena, $\alpha = ,90$ za dimenziju fizička opasnost, $\alpha = ,87$ za dimenziju nove situacije, $\alpha = ,87$ za dimenziju svakodnevne situacije (38). U ovom istraživanju su koeficijenti pouzdanosti (Cronbachov alpha) iznosili ,67 za E-SOC, ,76 za E-FIZ te ,70 za E-NOV i E-DAN.

Statističke metode

Za opis uzorka koristile su se metode deskriptivne i inferencijalne statistike. Numerički podatci opisani su frekvencijama (postotcima), a dob sudionika aritmetičkom sredinom i standardnom devijacijom.

Regresijskim analizama provjerili smo koliko osjetljivost na potkrepljenje može objasniti određene vrste anksioznosti i depresivnost našim sudionicima.

used for assessing depressive symptoms, and has good psychometric properties. Only the anxiety and depression subscales were used in this study, and Cronbach's alpha reliability coefficients amounted to .86 for both subscales.

The Endler Multidimensional Anxiety Scales (EMAS)

Anxiety levels were measured using the Endler Multidimensional Anxiety Scales, which consist of three components: state anxiety (EMAS-S), trait anxiety (EMAS-T), and anxiety perception (EMAS-P) (20). For the purpose of this study, the EMAS-T scales were used to measure anxiety as a personality trait, consisting of four dimensions: social evaluation (E-SE), physical danger (E-PD), new and ambiguous situations (E-AM), and daily routines (E-DR). Each dimension consists of 15 items rated by the participants on a 5-point Likert scale (from 1 – not at all, to 5 – very strongly). Internal consistency of individual subscales in a prior study amounted to $\alpha = .90$ for social evaluation, $\alpha = .90$ for physical danger, $\alpha = .87$ for new situations, and $\alpha = .87$ for daily routines (38). In this study, Cronbach's alpha reliability coefficients amounted to .67 for E-SE, .76 for E-PD, and .70 for both E-AM and E-DR.

Statistical Methods

Descriptive and inferential statistics were used to characterize the sample. Numerical data were described using frequencies (percentages), while participants' age was reported as mean and standard deviation.

Regression analyses were conducted to examine the extent to which reinforcement sensitivity could account for different forms of anxiety and depressive symptoms among our participants.

Statistical data analyses were performed using SPSS for Windows (version 25, SPSS Inc., Chicago, IL, USA). The significance level (p) was set at $\alpha = .05$.

Za statističku obradu podataka korišten je program SPSS for Windows (inačica 25, SPSS Inc., Chicago, IL, SAD). Razina značajnosti (p) određena je na $\alpha = ,05$.

Prije provedbe regresijske analize provjerene su pretpostavke linearnosti, normalnosti reziduala, homoskedastičnosti, neovisnosti pogrešaka, odsutnosti multikolinearnosti i outliera. Sve pretpostavke bile su zadovoljene.

SUDIONICI

U istraživanju je sudjelovalo 446 osoba, 272 žene i 173 muškarca (jedna se osoba izjasnila kao birodna). Cijelo istraživanje su završile 362 osobe, tj. 201 žena i 160 muškaraca. Uobičajeno se u online istraživanjima očekuje odustajanje sudionika u razini 10-20 %, a i dalje visok broj sudionika omogućuje dobru pouzdanost rezultata. Trećina sudionika je bila mlađa od 25 godina, 18 % ih je bilo u tridesetima, 20 % u četrdesetima te 10 % starijih od 50 godina. Prosječna dob sudionika je 34 godine ($M = 34,11$, $SD = 12,29$). Samaca je bilo 25 %, u braku je 40 % sudionika, a u neformalnoj vezi još 30 % (od kojih 40 % i živi zajedno), dok su ostali razvedeni ili udovci (5 %). Sudionici su bili pretežno visokog obrazovanja (56 %), 32 % ima srednjoškolsko obrazovanje, a 12 % završen stupanj doktora znanosti. Najveći udio osoba je u radnom odnosu (66 %) ili studira (28 %), dok je manji udio nezaposlenih i umirovljenika (6 %). Veliki postotak osoba nema dijagnosticiranu kroničnu tjelesnu (80 %) niti psihijatrijsku bolest (92 %).

REZULTATI I RASPRAVA

Rezultati pet pojedinačnih regresijskih analiza prikazani su u tablici 1. U regresijskim analizama prediktori su isti, tj. oni se sastoje od šest komponenata izbjegavanja i približavanja

Before conducting the regression analysis, the assumptions of linearity, residual normality, homoscedasticity, independence of errors, absence of multicollinearity, and outliers were verified. All assumptions were met.

PARTICIPANTS

A total of 446 individuals participated in the study, of whom 272 were women and 173 were men (one participant identified as non-binary). The entire study was completed by 362 participants, i.e. 201 women and 160 men. The expected participant dropout rates in online studies usually amount to 10-20 %, while a high number of remaining participants ensures good reliability of the results. One-third of the participants were under 25 years of age, 18% were in their thirties, 20% were in their forties, and 10% were over 50 years old. The mean age of the participants was 34 years ($M = 34.11$, $SD = 12.29$). In terms of marital status, 25% of the participants were single, 40% were married, and 30% were in informal relationships (of which 40% cohabitated), while the remaining 5% were divorced or widowed. Most participants had higher education (56%), 32% had completed secondary education, and 12% held a doctoral degree. The majority were employed (66%) or attending university (28%), with a smaller proportion being unemployed or retired (6%). A high percentage of participants reported having no diagnosed chronic physical illnesses (80%) or psychiatric disorders (92%).

RESULTS AND DISCUSSION

The results of five separate regression analyses are presented in Table 1. The predictors in the regression analyses are the same, i.e. they consist of six components of avoidance and approach (BIS, FFFS, BAS_w – wanting, BAS_s – seeking, BAS_g – getting, BAS_l – liking). There

TABLICA 1. Prikaz rezultata (beta) pojedinačnih regresijskih analiza gdje su prediktori u svim analizama šest komponenata izbjegavanja i približavanja, a kriteriji u pojedinačnim su redom četiri dimenzije anksioznosti kao crte ličnosti (E-SOC: socijalna, E-FIZ: od fizičke ugroze, E-NOV: od novih situacija te E-DAN: svakodnevna) i depresivnost (DEPR).

TABLE 1. Overview of the (beta coefficients) results of individual regression analyses where the predictors in all analyses are the six components of avoidance and approach, and the criteria in the individual analyses are, respectively, the four dimensions of trait anxiety (E-SE: social, E-PD: from physical danger, E-AM: from new situations, and E-DR: daily routines) and depression (DEP).

Prediktori / Predictors	Kriterij / Criterion				
	E-SOC / E-SE R ² = ,488***	E-FIZ / E-PD R ² = ,204***	E-NOV / E-AM R ² = ,400***	E-DAN / E-DR R ² = ,103***	DEPR / DEP R ² = ,344***
BIS	,675***	,398***	,465***	,020	,157***
BBBS / FFFS	-,004	,034	,105**	,168**	,236***
BAS _w	-,003	,084	,002	-,024	,128***
BAS _s	-,067	-,098	-,186***	-,015	,095***
BAS _g	-,016	,084	-,016	-,025	-,254***
BAS _i	-,088**	,066	-,156***	-,233***	-,279***

*** p<,001, **p<,05

(BIS, BBBS, BAS_w – želje, BAS_s – traženje, BAS_g – upornost, BAS_i – ugoda). Kriterij je jedan u svakoj od pet analiza: to su redom četiri dimenzije anksioznosti kao crte ličnosti (E-SOC: socijalna, E-FIZ: od fizičke ugroze, E-NOV: od novih situacija te E-DAN: svakodnevna) te depresivnost.

Rezultati provedenih regresijskih analiza pokazuju da komponente Teorije osjetljivosti na potkrepljenja (TOP) značajno predviđaju varijacije u socijalnoj anksioznosti, anksioznosti u novim situacijama, svakodnevnoj anksioznosti i depresivnosti. Dobiveni nalazi uglavnom su u skladu s prethodnim znanstvenim radovima pri čemu se uočavaju i određene specifičnosti.

Socijalna anksioznost

Komponente TOP objašnjavaju najviše, gotovo polovicu varijance socijalne anksioznosti (48,8 %) što je relativno visoka vrijednost u psihološkim istraživanjima i ukazuje na dobar model.

BIS je najvažniji i jedini snažno pozitivan prediktor socijalne anksioznosti što znači da su osobe koje su sklonije izbjegavanju negativnih ishoda, tj. imaju veću osjetljivost na kaznu, opreznije i zabrinutije te su također socijalno

is one criterion in each of the five analyses: these are, respectively, the four dimensions of trait anxiety (E-SE: social, E-PD: from physical danger, E-AM: from new situations, and E-DR: daily routines) and depression.

The results of the conducted regression analyses indicate that the components of the Reinforcement Sensitivity Theory (RST) significantly predict variations in social anxiety, anxiety in new situations, daily anxiety, and depressive symptoms. Overall, the obtained findings are largely consistent with previous studies, whereby some specific nuances were also observed.

Social Anxiety

The RST components explained the largest portion, almost half of the variance in social anxiety (48.8%), which is a relatively high value in psychological research, and indicates a well-fitting model.

The BIS emerged as the most important and only strong positive predictor of social anxiety, which suggests that individuals who are prone to avoid negative outcomes, i.e. are more sensitive to punishment, are more cautious, worry-prone and socially anxious. This finding is consistent with the theory, as BIS is traditionally associated with anxiety and inhibition in social situations.

anksioznije. Ovaj je nalaz u skladu s teorijom, jer se BIS tradicionalno povezuje s anksioznošću i inhibicijom u socijalnim situacijama.

BAS₁ (komponenta koja označava doživljavanje ugođe nakon ostvarenja cilja) ima značajan negativan doprinos. Osobe koje manje uživaju u socijalizaciji (nizak BAS₁) imaju višu socijalnu anksioznost što bi moglo dodatno poticati izbjegavanje socijalnih situacija. Ovaj je nalaz djelomično u skladu i s nalazima Kimbrel i suradnika iz 2012. godine, koji su pokazali da visok BIS i nizak BAS djeluju preko kognitivnih pristranosti u predviđanju socijalne anksioznosti (13). Sličan je nalaz dobio i 2016. godine Kimbrel sa suradnicima kod ratnih veterana kod kojih je socijalna anksioznost pozitivno povezana s BIS-om i BBBS-om te negativno s BAS osjetljivošću (39).

Ostale komponente BAS-a (želje, traženje, upornost) te BBBS-a (strah) nisu statistički značajni prediktori i ne doprinose značajno predviđanju socijalne anksioznosti kada se uzme u obzir utjecaj BIS-a i BAS₁-a. Iako BBBS mjeri *primarni strah* (reakcije borbe ili bijega), očito ne igra ključnu ulogu u kontekstu socijalne anksioznosti, koja je kod naših sudionika više povezana s inhibicijom nego s automatskim odgovorima straha.

Ovi rezultati pokazuju važnost neuropsiholoških mehanizama motivacije u razumijevanju socijalne anksioznosti i mogu imati praktične implikacije za psihološke intervencije, npr., u terapijski rad uključiti različite načine povećavanja ugođe u socijalnim interakcijama koja bi mogla smanjiti razinu socijalne anksioznosti.

Anksioznost u novim situacijama

Naš model objašnjava 40,0 % varijance anksioznosti u novim situacijama sa snažnim pozitivnim BIS prediktorom, slabijim BBBS prediktorom, te negativnim prediktorima traženja novih situacija, kao i doživljavanju ugođe u novim

The BAS₁ (the component reflecting the experience of pleasure after achieving a goal) showed a significant negative contribution. Individuals who derive less pleasure from social interactions (low BAS₁) exhibited higher social anxiety, potentially reinforcing avoidance of social situations. This finding partially aligns with the findings obtained by Kimbrel et al. in 2012, which showed that high BIS and low BAS act through cognitive biases in predicting social anxiety (13). Similar results were also reported by Kimbrel et al. in 2016 among war veterans, where social anxiety was positively associated with the BIS and FFFS, and negatively associated with BAS sensitivity (39).

Other BAS components (wanting, seeking, getting) and FFFS (fear) were not statistically significant predictors and did not substantially contribute to social anxiety when considering the influence of BIS and BAS₁. Although the FFFS measures *the primary fear* (fight-or-flight reactions), it apparently does not play a key role in the context of social anxiety, which seems more related to behavioral inhibition than to automatic fear responses in our sample.

These findings underscore the importance of neuropsychological motivational mechanisms in understanding social anxiety, and may have practical implications for psychological interventions, e.g. by including into therapeutic work various strategies aimed at increasing pleasure in social interactions, which could reduce social anxiety.

Anxiety in New Situations

Our model explained 40.0% of the variance in anxiety in new situations, with the BIS acting as a strong positive predictor, FFFS as a weaker predictor, and novelty-seeking and experiencing pleasure in new situations as negative predictors. Individuals who are sensitive to punishment and perceive novelty as threatening, experience heightened anxiety. This finding aligns with the RST, where the BIS supports

situacijama. Osobe koje su osjetljive na kaznu i percipiraju novost kao prijetnju doživljavaju pojačanu anksioznost. Ovaj nalaz je u skladu s TOP teorijom gdje BIS podupire zabrinutost i neodlučnost u nepoznatim ili dvosmislenim kontekstima, kao i da osobe koje su reaktivnije na izravne prijetnje pokazuju veću anksioznost u novim situacijama. Suprotno, osobe koje traže novost i uživaju u nagradama, pokazuju nižu anksioznost, što ukazuje da pozitivna motivacija štiti od anksioznosti u novim situacijama. Ovi su rezultati u skladu s TOP modelom i prethodnim ranije spomenutim istraživanjima (8,13).

Anksioznost od fizički opasnih situacija

Model objašnjava 20,4 % varijance anksioznosti od fizički opasnih situacija pri čemu je jedini značajan pozitivan prediktor BIS. Ovaj rezultat ukazuje na to da osobe s povećanom osjetljivošću na kaznu i izbjegavanjem negativnih ishoda pokazuju više anksioznosti od tjelesne povrede. Kako tjelesna povreda uglavnom označava bolno iskustvo, osobe koje su osjetljivije na kaznu izbjegavat će mogućnost bolnog doživljaja. Istraživanja uglavnom podupiru ovaj nalaz. Rezultati istraživanja Sánchez-Rodríguez i suradnika 2021. godine podržavaju ideju da je aktivacija BIS-a važnija od aktivacije BAS-a u objašnjavanju različitih ishoda povezanih s boli (40), kao i da je uloga BIS-a kod kronične boli dominantna u općem funkcioniranju veterana (41).

Svakodnevna anksioznost

Model objašnjava 10,3 % varijance u svakodnevnoj anksioznosti što je statistički značajno, ali se radi o relativno slabom modelu u usporedbi s prethodnima. Značajan pozitivan prediktor svakodnevne anksioznosti je BBBS što ukazuje na to da su osobe koje su osjetljivije na prijetnje i opasnosti (borba – bijeg - blokada

worry and indecision in unfamiliar or ambiguous contexts, and the individuals who are more reactive to direct threats exhibit higher anxiety in new situations. Conversely, individuals who seek novelty and enjoy rewards display lower anxiety, suggesting that positive motivation protects against anxiety in new contexts. These results are consistent with the RST model and the aforementioned studies (8, 13).

Anxiety in Physically Dangerous Situations

The model explained 20.4% of the variance in anxiety in physically dangerous situations, with the BIS emerging as the only significant positive predictor. This result indicates that individuals with heightened sensitivity to punishment and tendency to avoid negative outcomes experience higher levels of anxiety due to potential physical injury. Since physical injury usually represents a painful experience, those with higher sensitivity to punishment tend to avoid situations that could potentially be painful. Previous studies generally support this finding. The results of a study conducted by Sánchez-Rodríguez et al. in 2021, supported the idea that BIS activation is more important than BAS activation in explaining the various outcomes related to pain (40), as well as that the role of BIS in chronic pain is dominant in the overall functioning of veterans (41).

Daily Anxiety

The model explained 10.3% of the variance in daily anxiety, which is statistically significant, but represents a relatively weak model compared to the previous ones. The FFFS emerged as a significant positive predictor of daily anxiety, indicating that individuals who are more sensitive to threats and danger (fight–flight–freeze responses) tend to experience higher daily anxiety. Emotional satisfaction after engagement in activities (BAS) was shown to be a significant negative predictor of daily anxiety, meaning that individ-

reakcije) sklonije doživljavanju više svakodnevne anksioznosti. Značajan negativni prediktor svakodnevne anksioznosti je doživljavanje ugone nakon aktivnosti (BAS), što znači da će osobe koje inače doživljavaju više zadovoljstva nakon aktivnosti biti manje svakodnevno anksiozne.

Za razliku od socijalne anksioznosti, gdje dominira BIS (zabrinutost, anticipacija), ovdje reaktivni strah ima veću ulogu moguće i kroz urođeni neurobiološki sustav. Također, svakodnevnicu je nemoguće izbjeći za razliku od socijalnih, novih ili fizički opasnih situacija, pa vjerojatno BIS stoga nema ključnu ulogu. Model objašnjava manji udio varijance (10,3 %) što znači da su za svakodnevnu anksioznost vjerojatno važni i drugi čimbenici (npr. životne okolnosti, stresori, emocionalna regulacija).

Depresija

Model objašnjava 34,4 % varijance u depresivnosti što je statistički značajno i teorijski relevantno. To pokazuje da emocionalno motivacijski sustavi objašnjavaju više od trećine razlika u depresivnosti. Sve komponente TOP-a su povezane s depresijom: BIS je pozitivno i značajno povezan s depresivnošću, tj. osobe s povećanom osjetljivošću na kaznu i izbjegavanjem negativnih ishoda pokazuju više depresivnih simptoma. Ovaj nalaz je očekivan i u skladu je s TOP teorijom, jer je BIS povezan s neugodnim emocijama i pasivnošću. BBBS je također pozitivno i značajno povezan s depresivnošću što znači da osobe koje imaju jači reaktivni emocionalni odgovor na percipirane prijetnje su i depresivnije.

Ovi nalazi su u skladu s meta-analitičkim nalazima, gdje je depresivnost bila pozitivno povezana s BIS i BBBS komponentama, što odražava povećanu osjetljivost na prijetnje i negativne ishode (32). Istovremeno komponente BAS sustava „upornost” i „ugoda” pokazale su se kao snažni negativni prediktori depresije što je u

uals who generally derive more satisfaction from activities will experience lower daily anxiety.

Unlike social anxiety, which is dominated by the BIS (worry and anticipation), in daily anxiety reactive fear plays a larger role, possibly through an innate neurobiological system. Furthermore, unlike social, new or physically dangerous situations, everyday life cannot be avoided, which is probably why the BIS does not play a central role in this aspect. The model explains a smaller proportion of variance (10.3 %), which also suggests that other factors (e.g. life circumstances, stressors, or emotion regulation) likely contribute to daily anxiety.

Depression

The model explained 34.4% of the variance in depressive symptoms, which is both statistically significant and theoretically relevant. This indicates that emotional-motivational systems account for more than one-third of the differences in depressive symptoms. All RST components were related to depression: the BIS was positively and significantly associated with depressive symptoms, meaning that individuals with heightened sensitivity to punishment and tendencies to avoid negative outcomes exhibit more depressive symptoms. This finding was expected and consistent with the RST theory, since the BIS is associated with unpleasant emotions and passivity. The FFFS was also positively and significantly related to depression, suggesting that individuals with stronger reactive emotional responses to perceived threats are more prone to depressive symptoms.

These findings align with meta-analytic evidence showing that depression is positively associated with BIS and FFFS components, reflecting increased sensitivity to threats and negative outcomes (32). Conversely, the BAS components “persistence” and “pleasure” emerged as strong negative predictors of depression, which is consistent with the characterization of

skladu s obilježjem depresije kao poremećaja smanjene reaktivnosti na nagradu i anhedonije (42, 43).

Zanimljiv je nalaz da su komponente BAS „željje” i „traženje” pozitivno povezane s depresivnošću što se može interpretirati kao frustrirana motivacija – osobe koje snažno žele ili traže nagrade, ali ih ne uspijevaju ostvariti, mogu doživljavati povećano razočaranje i osjećaj neuspjeha, što posljedično jača simptome depresije. Ovaj nalaz nije uobičajen u literaturi, no kompatibilan je s teorijama koje ukazuju na nesklad između želja i mogućnosti kao mehanizma depresije (44).

Uzmu li se svi ovi nalazi u obzir, rezultati provedenih analiza pokazuju da komponente teorije osjetljivosti na potkrepljenja značajno doprinose objašnjenju različitih oblika anksioznosti i depresivnosti. Najveći doprinos u svim modelima pokazuje sustav inhibicije ponašanja (BIS), koji je dosljedno povezan s višim razinama anksioznosti i depresije, potvrđujući njegovu ključnu ulogu u obradi prijetnje i izbjegavanju negativnih ishoda. Sustav ponašajne aktivacije (BAS), osobito komponenta doživljavanja ugone nakon ostvarenja cilja (BAS_l), pokazuje zaštitni učinak – više razine ugone povezane su s nižom socijalnom i svakodnevnom anksioznošću te manjom depresivnošću. Suprotno tome komponente BAS_w i BAS_s, koje označavaju potragu za nagradom, u nekim su slučajevima pozitivno povezane s depresivnošću, što može ukazivati na frustriranu motivaciju. Reaktivni sustav straha (BBBS) pokazuje selektivne učinke pri čemu je važniji za svakodnevnu anksioznost i depresivnost nego za socijalnu anksioznost. Ukupno gledano, TOP komponente objašnjavaju značajan dio varijance socijalne anksioznosti i depresivnosti, dok su manje učinkovite u predviđanju svakodnevne anksioznosti. Dobiveni nalazi potvrđuju da su individualne razlike u osjetljivosti na nagrade i kazne temeljni mehanizmi emocionalnog funkcioniranja. Ovi

depression as a disorder that involves reduced reward responsiveness and anhedonia (42, 43).

Interestingly, the BAS components “wanting” and “seeking” were positively associated with depressive symptoms. This may be interpreted as frustrated motivation – individuals who strongly desire or seek rewards, but fail to achieve them, may experience greater disappointment and sense of failure, which in turn exacerbates depressive symptoms. While this finding is less common in the literature, it aligns with theories suggesting that a mismatch between desires and attainable outcomes can contribute to depression (44).

Taking into account all of the obtained findings, the results of conducted analyses demonstrate that RST components significantly contribute to explaining various forms of anxiety and depression. The behavioral inhibition system (BIS) was shown to have the largest contribution across all models, being consistently associated with higher levels of anxiety and depression, thus confirming its central role in threat processing and avoidance of negative outcomes. The behavioral approach system (BAS), particularly the component reflecting pleasure after goal attainment (BAS_l), exhibited a protective effect – higher levels of pleasure were associated with lower social and daily anxiety, and reduced depression. In contrast, the BAS_w and BAS_s components, which represent the pursuit of rewards, were in some cases positively related to depressive symptoms, potentially reflecting frustrated motivation. The reactive fear system (FFFS) exhibited selective effects, being more relevant for daily anxiety and depression than for social anxiety. Overall, RST components explain a substantial portion of variance in social anxiety and depression, while they are less effective in predicting daily anxiety. The obtained findings confirm the position that individual differences in sensitivity to reward and punishment are fundamental mechanisms of emotional functioning. These results have practical implications as well – enhancing

rezultati imaju i praktične implikacije – povećanje pozitivne motivacije i užitka u socijalnim interakcijama moglo bi smanjiti anksioznost i depresivnost. Ukupno, nalazi potvrđuju teorijsku valjanost TOP modela i ukazuju na važnost integriranja motivacijskih sustava u razumijevanju i tretmanu emocionalnih poremećaja.

OGRANIČENJA I PRAKTIČNE SMJERNICE

Iako se radi o relativno velikom uzorku naši su sudionici većinom visoko obrazovani i zaposleni, a gotovo trećinu sudionika čine studenti. Radi se i o pretežno zdravoj populaciji. S obzirom na ove specifičnosti pitanje je koliko bi se rezultati mogli generalizirati na opću populaciju, ali i koliko su primjenjivi kod pojedinaca s dijagnozama iz depresivnog i anksioznog spektra. Osim navedenog, upitno je jesu li sudionici bili iskreni u svojim odgovorima, što se ne može provjeriti s obzirom da se radi o online istraživanju.

Praktične implikacije uključile bi moguće ispitivanje osjetljivosti na potkrepljenja u kliničkoj populaciji te sukladno tome određivanje prikladnijih tretmana s obzirom na vrstu tegoba. Na primjer, poticanje upornosti (ne odustajanja) te nalaženje ugone u postignutom cilju bilo bi od koristi u svim tretmanima anksioznosti i depresivnosti. Osim u tretmanima, ovo istraživanje daje i dobru smjernicu za daljnja znanstvena istraživanja mentalnog zdravlja.

ZAKLJUČAK

Bihevioralni inhibicijski sustav (BIS) pokazao se kao snažan prediktor viših razina specifičnih oblika anksioznosti, osobito socijalne i anksioznosti u novim situacijama, te depresivnosti, što potvrđuje njegovu ključnu ulogu

positive motivation and the experience of pleasure in social interactions could reduce anxiety and depressive symptoms. In total, the findings confirm the theoretical validity of the RST model and indicate the importance of integrating motivational systems in the understanding and treatment of emotional disorders.

LIMITATIONS AND PRACTICAL IMPLICATIONS

Although the study involved a relatively large sample, most of our participants were highly educated and employed, and nearly one-third of them were students. They were predominantly healthy individuals. Given these specificities, it is questionable to what extent the findings could be generalized to the general population, as well as how much could be applicable to individuals with diagnoses across the depressive and anxiety spectrum. In addition to the above, it is questionable whether the participants were honest in their responses, which cannot be verified since it was an online survey.

Practical implications would involve possible assessments of reinforcement sensitivity in clinical populations, and accordingly, the determination of more appropriate treatments taking into account the specific type of difficulty. For example, fostering persistence (not giving up) and finding pleasure in achieved goals would be beneficial in all treatments targeting anxiety and depression. Beyond clinical treatments, this study provides useful guidance for future scientific studies addressing mental health.

CONCLUSION

The behavioral inhibition system (BIS) emerged as a strong predictor of higher levels of specific forms of anxiety, particularly social anxiety and anxiety in new situations, as well as depressive symptoms, thus confirming its central role in

u procesima izbjegavanja prijetnji i negativnih ishoda. Međutim, svakodnevna anksioznost bolje je objašnjena komponentama sustava osjetljivosti na prijetnju (BBBS), koje odražavaju reaktivni strah i doživljaj neposredne ugroženosti. Aktivacijski sustav ponašanja (BAS) pokazuje da slabije doživljavanje ugone nakon postignuća cilja predviđa više razine anksioznosti i depresivnosti, dok osobe koje više uživaju u postignućima te koje se lakše motiviraju na djelovanje i upornije ostvaruju ciljeve pokazuju niže razine tih simptoma. Drugim riječima, veća sposobnost doživljavanja pozitivnih emocija i nagrada djeluje zaštitno na mentalno zdravlje. Ovi nalazi ukazuju na složenu međuigru između sustava inhibicije, aktivacije i straha te njihovih uloga u oblikovanju emocionalnih reakcija i psihološke dobrobiti. U praktičnom smislu rezultati ukazuju da bi psihološke intervencije usmjerene na jačanje pozitivne motivacije, povećanje doživljaja ugone i smanjenje preosjetljivosti na kaznu mogle biti korisne u prevenciji i tretmanu anksioznih i depresivnih stanja. Ovi nalazi osim toga otvaraju prostor za daljnja istraživanja neuropsiholoških mehanizama motivacije i njihovih implikacija za razumijevanje individualnih razlika u emocionalnom funkcioniranju.

the processes of avoiding threats and negative outcomes. Daily anxiety, however, was better explained by the reactive fear system (FFFS) components which reflect reactive fear and immediate threat sensitivity. The behavioral approach system (BAS) revealed that lower perception of pleasure following goal attainment predicts higher anxiety and depression levels, whereas individuals who experience more enjoyment from achievements, who are more easily motivated to act and are more persistent in achieving their goals, tend to report lower levels of these symptoms. In other words, greater capacity for experiencing positive emotions and rewards appears protective for mental health. These findings highlight the complex interplay between the inhibition, approach and fear systems, and their roles in shaping emotional responses and psychological well-being. Practically, the results suggest that psychological interventions aimed at enhancing positive motivation, increasing the experience of pleasure, and reducing hypersensitivity to punishment may be effective in preventing and treating anxiety and depressive conditions. Moreover, these findings provide avenues for further research addressing the neuropsychological mechanisms of motivation and their implications for understanding the individual differences in emotional functioning.

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Kolika je cijena usamljenosti kod studenata? Odnos usamljenosti, psihičkog i općeg zdravlja te akademske uspješnosti

/ What Is the Cost of Loneliness Among University Students? The Relationship Between Loneliness, Mental and General Health, and Academic Achievement

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Cilj ovog istraživanja bio je ispitati razinu usamljenosti studenata Sveučilišta u Zagrebu i odnos usamljenosti s različitim sociodemografskim obilježjima te psihičkim i općim zdravljem, kao i sa subjektivnom procjenom akademske uspješnosti, uključujući medijacijsku ulogu usamljenosti. Na prigodnom uzorku studenata ($N=879$; dob=18-35) primijenjeni su UCLA-3, CORE-10, DASS-21, SAAS i SRH te prikupljeni sociodemografski podatci. Provedene su deskriptivne analize, testiranje razlika, korelacijske analize i hijerarhijska regresija; medijacija je testirana nad odnosom SAAS i CORE-10. 76,9 % studenata iskazalo je visoku razinu usamljenosti. Usamljenost je značajno povezana s višim anksiozno-depresivnim simptomima i stresom, lošijom samoprocjenom zdravlja i nižom akademskom uspješnosti. U hijerarhijskoj regresijskoj analizi, nakon kontrole varijabli roda, godine studija i SES-a, i usamljenost ($\beta=.423$, $p<.001$) i niža akademska uspješnost ($\beta=-.318$, $p<.001$) značajno su predviđali lošije psihičko zdravlje. Utvrđena je djelomična medijacija usamljenosti u odnosu između akademske uspješnosti i psihičkog zdravlja (indirektni efekt $a \times b = -.103$, $p<.001$; omjer medijacije ≈ 23 %). Ovim istraživanjem pokazano je da je usamljenost prevalentna i snažno povezana sa psihičkim zdravljem studenata te djelomično posreduje negativan učinak lošije akademske uspješnosti na psihološki distres. Potrebne su višerazinske intervencije (univerzalna, selektivna i indikativna prevencija) usmjerene na socijalnu povezanost, ranu identifikaciju i ciljanu podršku najrizičnijim skupinama.

/ The aim of this study was to examine the levels of loneliness among the students of the University of Zagreb, as well as the relationship between loneliness and various sociodemographic characteristics, mental and general health, and subjective academic achievement, including the mediating role of loneliness. A convenience sample of university students ($N = 879$; age = 18–35) completed the UCLA-3, CORE-10, DASS-21, SAAS and SRH, and provided sociodemographic information. Descriptive analyses, group difference testing, correlation analyses, and hierarchical regression were conducted; mediation was tested for the relationship between SAAS and CORE-10. High levels of loneliness were reported by 76.9% of the students. Loneliness was significantly associated with higher levels of anxiety and depressive symptoms and stress, poorer self-rated health, and lower academic achievement. In the hierarchical regression analysis, after controlling for gender, year of study, and socioeconomic status variables, both loneliness ($\beta = .423$, $p < .001$) and lower academic achievement ($\beta = -.318$, $p < .001$) proved to be significant predictors of poorer mental health. Partial mediation of loneliness was found in the relationship between academic achievement and mental health (indirect effect $a \times b = -.103$, $p < .001$; mediation proportion $\approx 23\%$). The findings of this study indicate that loneliness is highly prevalent among university students and strongly associated with their mental health, partially mediating the negative effect of poorer academic achievement on psychological distress. Multilevel interventions (universal, selective, and indicated prevention) aimed at social connectedness, early identification, and targeted support for the most at-risk groups are warranted.

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KLJUČNE RIJEČI / KEY WORDS:Usamljenost / *Loneliness*Studenti / *Students*Psihičko zdravlje / *Mental Health*Akademska uspješnost / *Academic Achievement*Medijacija / *Mediation***TO LINK TO THIS ARTICLE:** <https://doi.org/10.24869/spsih.2025.337>**UVOD**

Briga o psihičkom zdravlju u ranoj odrasloj dobi ima iznimnu važnost za javno zdravstvo, budući da se u tom razdoblju života bilježi nagli porast javljanja psihičkih poremećaja (1). Naime, prema istraživanjima otprilike polovica svih psihičkih poremećaja javlja se prvi put već od sredine adolescencije, a čak tri četvrtine do sredine dvadesetih godina života (2). Studentska populacija osobito je ranjiva zbog životnih promjena, preseljenja, izgradnje novih društvenih mreža i visokih akademskih zahtjeva (3). Podatci ukazuju da između 12 % i 46 % studenata pati zbog nekog psihičkog poremećaja (4-8). Tijekom posljednjih dvadeset godina broj studenata s problemima psihičkog zdravlja povećao se 2 do 5 puta prije pandemije (9), te se dodatno povećao tijekom i nakon pandemije COVID-19 (10). Unatoč dostupnosti efikasnih tretmana, istraživanja pokazuju da samo jedan od pet studenata dobiva minimalno adekvatan tretman (4), a prosječno vrijeme netretiranja psihičkih problema i poremećaja kreće se od 4 do 23 godine (11). S obzirom na to da su problemi s psihičkim zdravljem povezani s lošijim akademskim uspjehom (12,13), prestankom studiranja (14,15) i lošijim funkcioniranjem kasnije u životu (16,17) ne čudi da sve veći broj svjetskih sveučilišta razvija preventivne i intervencijske aktivnosti za unaprjeđenje psihičkog zdravlja studenata, a na popisu takvih aktivnosti jest i rad na smanjenju usamljenosti (18).

INTRODUCTION

Care for mental health in early adulthood is of particular importance for public health, as this period of life is marked by a sharp increase in the onset of mental disorders (1). In fact, studies indicate that approximately half of all mental disorders first appear by mid-adolescence, and as many as three-quarters by the mid-twenties (2). University students are a particularly vulnerable population due to major life transitions, relocation, establishment of new social networks, and high academic demands (3). Available data suggest that between 12% and 46% of students experience a mental disorder (4–8). Over the past two decades, the number of students reporting mental health problems increased two- to five-fold prior to the COVID-19 pandemic (9), and further increased during and after the pandemic (10). Despite the availability of effective treatments, studies have shown that only one in five students will receive minimally adequate treatment (4), while the average duration of untreated mental health problems and disorders ranges from 4 to 23 years (11). Given that mental health problems are associated with poorer academic achievement (12, 13), higher dropout rates (14, 15), and poorer functioning later in life (16, 17), it is not surprising that an increasing number of universities worldwide are developing preventive and intervention-based initiatives aimed at improving student mental health, which also includes efforts to reduce loneliness (18).

Usamljenost se definira kao subjektivno, negativno emocionalno iskustvo koje proizlazi iz percepcije da osoba ima manje društvenih kontakata nego što želi i/ili da ti odnosi ne pružaju očekivanu razinu intimnosti i podrške (19,20). Usamljenost ne mora odgovarati objektivnoj društvenoj izolaciji – moguće je imati malo društvenih kontakata, a ne osjećati se usamljeno, kao i imati bogat društveni život, ali i dalje doživljavati usamljenost (21). Kognitivni model objašnjava usamljenost kao nesklad između željene i stvarne razine društvene aktivnosti pri čemu je veći nesklad povezan s višom razinom usamljenosti (22). Radi se o složenom, višedimenzionalnom fenomenu koji može biti privremen, povremen ili kroničan, a najčešće se dijeli na socijalnu usamljenost (nedostatak osjećaja pripadnosti) i emocionalnu usamljenost (nedostatak bliskih, intimnih odnosa) (23). Važno je razlikovati i željenu samoću, koja može biti obnavljajuća, od neželjene usamljenosti koja se povezuje s emocionalnom patnjom, izolacijom i negativnim zdravstvenim ishodima (24).

Prevalencija usamljenosti varira među zemljama i populacijama, no istraživanja pokazuju da su mladi i stariji odrasli najrizičnije skupine (25). U Španjolskoj 22 % mladih od 16 do 24 godina izvještava o osjećaju neželjene usamljenosti (26), dok u UK-u 6,3 % osoba mladih od 30 godina prijavljuje učestalu usamljenost (27). U Njemačkoj je 32,4 % studenata navelo umjerenu, a 3,2 % ozbiljnu usamljenost (28). U Ujedinjenom Kraljevstvu je 2018. godine 9,8 % mladih u dobi od 16 do 24 godine izvještavalo da se često osjeća usamljeno (29), dok je više od 15 % studenata navelo da svakodnevno doživljava usamljenost. Povećan rizik pritom je utvrđen među studentima pripadnicima etničkih manjina, osobama s invaliditetom, međunarodnim studentima i onima koji žive kod kuće (30). Studenti su posebno ranjivi tijekom prve akademske godine kada se suočavaju s povećanim akademskim pritiscima, izazovima preseljenja i potrebom

Loneliness is defined as a subjective, negative emotional experience arising from the perception that one has fewer social contacts than desired, and/or that these relationships do not provide the expected level of intimacy and support (19, 20). Loneliness does not necessarily correspond to objective social isolation – individuals may have few social contacts without feeling lonely, or conversely, may maintain an active social life while still experiencing loneliness (21). The cognitive model conceptualizes loneliness as a discrepancy between desired and actual levels of social interaction, with greater discrepancies associated with higher levels of loneliness (22). Loneliness is a complex, multidimensional phenomenon that may be transient, episodic or chronic, and is most commonly distinguished into social loneliness (lack of a sense of belonging) and emotional loneliness (lack of close, intimate relationships) (23). It is also important to distinguish desired solitude, which can be restorative, from unwanted loneliness which is associated with emotional distress, isolation, and adverse health outcomes (24).

The prevalence of loneliness varies across countries and populations, however, studies consistently indicate that the young and older adults represent the most at-risk groups (25). In Spain, 22% of young people between 16 and 24 years of age reported experiencing unwanted loneliness (26), while in the United Kingdom 6.3% of individuals under the age of 30 reported frequent loneliness (27). In Germany, 32.4% of students reported moderate loneliness and 3.2% reported severe loneliness (28). In 2018, a total of 9.8% of young people aged 16-24 in the United Kingdom reported often feeling lonely (29), while more than 15% of students reported experiencing loneliness on a daily basis. Increased risk was also identified among students belonging to ethnic minorities, individuals with disabilities, international students, and those living at home (30). Students are particularly vulnerable during their first academic year, when they face increased academic

za uspostavljanjem novih društvenih mreža (3).

Iako se adolescenti smatraju najmanje usamljenima među svim dobnim skupinama, tijekom studija većina studenata bilježi najviše stope usamljenosti (28,31,32). Usamljenost je najizraženija kod bruća i studenata poslijediplomskih studija, ali na različite načine (33). Ovo stajalište podržavaju studije koje potvrđuju dva jasna vrhunca pojave usamljenosti – kod mlađih i starijih studenata (34,35). Njihova su istraživanja također pokazala da mlađi studenti češće osjećaju usamljenost od starijih, a taj obrazac postupno opada s dobi.

Istraživanja ukazuju na povezanost usamljenosti s tjelesnim i psihičkim zdravljem. Povezana je s depresijom, anksioznošću, stresom, fobijama, opsesivno-kompulzivnim poremećajem, problemima sa spavanjem, nižim životnim zadovoljstvom, suicidalnom ideacijom, kognitivnim deficitima i oštećenjem funkcionalnosti mozga (25,36-39). Kronična usamljenost može mijenjati obrasce socijalnog ponašanja i smanjivati vjerojatnost budućih društvenih interakcija (40). Utvrđena je i povezanost socioekonomskog statusa (SES) s usamljenošću. Mladi iz obitelji nižeg SES-a izvještavaju o višim razinama usamljenosti od onih iz obitelji višeg SES-a (41,42). Na fiziološkoj razini usamljenost je povezana s povišenim razinama kortizola, upalnim procesima, oslabljenim imunološkim sustavom, lošim životnim navikama te povećanim rizikom od kardiovaskularnih bolesti i smrtnosti (43,44). Usamljenost kod studenata također je povezana s maladaptivnim stilovima suočavanja, nižim akademskim postignućem i smanjenom motivacijom (45). Istraživanja o povezanosti usamljenosti s negativnim posljedicama za zdravlje, ali i akademsko funkcioniranje, ne daju jasan uvid u uzročno posljedične mehanizme. Prema dosada dostupnim podacima jedina provedena longitudinalna studija utvrdila je da viša razina usamljenosti predviđa pogoršanje psihičkog

pressures, relocation-related challenges, and the need to establish new social networks (3).

Although adolescents are generally considered the least lonely age group, most university students report some of the highest levels of loneliness during their studies (28, 31, 32). Loneliness is most pronounced among first-year and postgraduate students, albeit in different ways (33). This view is supported by studies identifying two distinct peaks in loneliness – among younger and older students (34, 35). These studies also indicated that younger students experience loneliness more frequently than older students, with loneliness gradually decreasing with age.

Studies have shown evidence of a connection between loneliness and both physical and mental health. Loneliness has been linked to depression, anxiety, stress, phobias, obsessive-compulsive disorder, sleep disturbances, lower life satisfaction, suicidal ideation, cognitive deficits, and impaired brain functioning (25, 36–39). Chronic loneliness may alter patterns of social behavior and reduce the likelihood of future social interactions (40). It has also been observed that socioeconomic status (SES) is associated with loneliness. Young people from lower SES backgrounds reported higher levels of loneliness than those from higher SES backgrounds (41, 42). At the physiological level, loneliness has been associated with elevated cortisol levels, inflammatory processes, weakened immune functioning, unhealthy lifestyle behaviors, and increased risk of cardiovascular disease and mortality (43, 44). Among students, loneliness has also been linked to maladaptive coping styles, poorer academic achievement, and reduced motivation (45). Studies addressing the association of loneliness with adverse health consequences and poorer academic outcomes do not provide a clear insight into the underlying causal mechanisms. According to currently available data, the only longitudinal study conducted to date found that higher levels of loneliness predicted subsequent deterioration in mental health, whereas earlier mental health

zdravlja, dok ranije narušeno psihičko zdravlje ne predviđa naknadno povećanje usamljenosti. Iako teorijski modeli često polaze od pretpostavke da usamljenost prethodi nepovoljnim zdravstvenim ishodima, valja uzeti u obzir i mogućnost obrnutog procesa, prema kojem osobe s narušenim zdravstvenim stanjem mogu dodatno reducirati društvene kontakte, što rezultira povećanom usamljenosti. Ovakav obrazac upućuje na potencijalno dvosmjerno i dinamičko međudjelovanje navedenih varijabli. Kada je riječ o akademskom uspjehu, i dalje ostaje nejasno u kojoj mjeri studenti svjesno ili nesvjesno reduciraju društvene interakcije. Iako su dosadašnje empirijske studije polazile su od pretpostavke da usamljenost djeluje kao rizični čimbenik koji može doprinijeti slabijem akademskom funkcioniranju, valja uzeti u obzir različite dvosmjerne i dinamične odnose među navedenim konstruktima. Model u ovom radu ispituje upravo drugačiji odnos varijabli polazeći od preventivne perspektive da su akademski zahtjevi i neuspjeh jasno prepoznatljivi, situacijski stresori unutar studentskog konteksta, dok se usamljenost u tom okviru može promatrati kao psihosocijalni proces osjetljiv na promjene u okolini. Ovaj pristup omogućuje istraživanje mehanizma kojim akademski stres ima indirektan efekt na mentalno zdravlje putem socijalne izolacije što je u skladu s prethodnim teorijskim razmatranjima o usamljenosti kao posredniku između vanjskih izazova i dobrobiti studenata. Zbog snažne povezanosti usamljenosti, psihičkog zdravlja, općeg zdravlja i akademske uspješnosti nužno je razumjeti mehanizme koji ih povezuju te razviti učinkovite intervencije za prevenciju i smanjenje usamljenosti među studentima.

CILJ

Cilj ovog rada bio je istražiti razinu percipirane usamljenosti među studentima zagrebačkog sveučilišta s obzirom na različita socio-

problems did not predict later increases in loneliness. Although theoretical models often start with the assumption that loneliness precedes adverse health outcomes, the possibility of reverse processes must also be considered, whereby individuals with compromised health may further reduce social interactions, resulting in increased loneliness. Such findings suggest potentially bidirectional and dynamic interaction among these variables. With regard to academic achievement, it also remains unclear to what extent students consciously or unconsciously reduce social interactions. Although previous empirical studies have typically assumed that loneliness functions as a risk factor potentially contributing to poorer academic functioning, it is important to consider alternative bidirectional and dynamic relationships among these constructs. The model in the present study examined a different relationship between variables, grounded in a preventive framework that conceptualizes academic demands and failure as clearly identifiable situational stressors within the student context, while loneliness can be viewed in this framework as a psychosocial process sensitive to environmental changes. This approach enables the examination of the mechanism through which academic stress may exert an indirect effect on mental health via social isolation, which is consistent with previous theoretical considerations of loneliness as a mediator between external challenges and student well-being. Given the strong connection between loneliness, mental health, general health, and academic achievement, it is essential to understand the mechanisms linking these domains, and to develop effective interventions aimed at preventing and reducing loneliness among university students.

AIM

The aim of this study was to examine the levels of perceived loneliness among the students at the University of Zagreb with regard to various

demografska obilježja te istražiti povezanost usamljenosti s psihičkim zdravljem i općim zdravljem te akademskom uspješnošću. Nadalje ovim istraživanjem se nastoji istražiti relativni doprinos usamljenosti na psihičko zdravlje u odnosu na ulogu usamljenosti kao medijatora između akademske uspješnosti i psihičkog zdravlja. Pretpostavka je da kod usamljenijih studenata akademska neuspješnost ima snažniji efekt na lošije psihičko zdravlje.

METODE

Sudionici

Za potrebe ovog istraživanja prikupljeni su podatci na prigodnom uzorku od 879 studenata Sveučilišta u Zagrebu. Dob sudionika kretala se u rasponu od 18 do 35 godina, s prosječnom dobi od 21,9 godine ($SD = 2,57$). Većinu sudionika činile su studentice (76,9 %), dok je udio studenata iznosio 20,7 %. Dodatno, 2,4 % studenata izjasnilo se u nebinarnim rodnim terminima. Najveći broj sudionika bili su studenti prve godine i treće godine preddiplomskog studija (22,9 % i 22,2 %), dok je najmanje bilo apsolvenata i 6. godine Medicinskog fakulteta (9 %). Uzorak je bio zastupljen studentima iz svih područja: biotehničko 10 %, društveno 25 %, humanističko 18 %, interdisciplinarno 3,5 %, prirodno 4,7 %, tehničko 14 %, umjetničko 12 % i zdravstveno 13,5 %. Većina sudionika procijenila je svoje socioekonomsko stanje osrednjim (77 %), 3,3 % sudionika vrlo niskim i niskim, dok je 8,4 % sudionika procijenilo visokim i vrlo visokim. Većina sudionika (50,3 %) se doselila u Zagreb na studij. S obitelji živi 47,7 % studenata, 31,6 % živi s cimerom/icom, dok ih 13,8 % živi samo. a 6,9 % živi s partnerom/icom. Većina sudionika bila je isključivo i pretežno heteroseksualne orijentacije (62,9 %), dok je ostalih s neheteroseksualnom orijen-

sociodemographic characteristics, and to investigate the association between loneliness and mental health, general health, and academic achievement. Furthermore, this study aimed to examine the relative contribution of loneliness to mental health in comparison to the role of loneliness as a mediator in the relationship between academic achievement and mental health. It was hypothesized that among lonelier students, poorer academic achievement would have a stronger negative effect on mental health.

METHODS

Participants

For the purposes of this study, data were collected from a convenience sample of 879 students at the University of Zagreb. The age range of the participants was between 18 and 35 years, with a mean age of 21.9 ($SD = 2.57$). The majority of the participants were female students (76.9%), while male students accounted for 20.7% of the sample. An additional 2.4% of the students identified as non-binary. The largest number of participants were first-year and third-year undergraduate students (22.9% and 22.2%, respectively), while final-year students and sixth-year medical students were least represented (9%). The sample included students from all study fields: biotechnical sciences (10%), social sciences (25%), humanities (18%), interdisciplinary studies (3.5%), natural sciences (4.7%), technical sciences (14%), arts (12%), and health sciences (13.5%). Most participants rated their socioeconomic status as average (77%), while 3.3% rated it as very low or low, and 8.4% rated it as high or very high. Most of the participants (50.3%) had relocated to Zagreb for their studies. In terms of living arrangements, 47.7% lived with their families, 31.6% lived with roommates, 13.8% lived alone, and 6.9% lived with a partner. The majority identified as exclusively or predominantly heterosexual (62.9%), while

tacijom bilo 37,1 %. U vrijeme ispunjavanja ankete većina sudionika (55,2 %) nije bila u vezi, dok ih je nešto manje od polovine 44,8 % bilo u vezi.

Mjerni instrumenti

Prikupljeni su sociodemografski podatci koji obuhvaćaju pitanja o rodu (muškarac, žena, *queer*/rodno fluidni, nebinarni, transrodni, ne želim se izjasniti i preferiram opisati, a za obradu su kategorije odgovora grupirane u muškarac, žena te svi drugi osim onih koji se ne žele izjasniti da su drugog rodnog identiteta), dobi, seksualnoj orijentaciji (6 stupnjeva od isključivo heteroseksualna do isključivo homoseksualna i dodatni odgovor aseksualna, a u daljnjim analizama prva dva odgovora su tretirana kao heteroseksualna orijentacija, a svi ostali kao neheteroseksualne orijentacije), područja studiranja (biotehničko, društveno, humanističko, interdisciplinarno, prirodno, tehničko, umjetničko, zdravstveno), fakultet i godini studiranja, je li se osoba doselila u Zagreb na studij (da ili ne), s kim živi (sam/a, s obitelji, s cimerom/ima, s partnerom/icom), status o vezi (1 – nisam u vezi, 2 – u vezi, ali živimo odvojeno; 3 – u vezi, braku, izvanbračnoj zajednici, životnom partnerstvu i živimo zajedno) i socioekonomskom statusu procijenjenom u odnosu na druge (od 1 vrlo nisko do 7 vrlo visoko).

Percipirana usamljenost mjerena je Ljestvicom usamljenosti (engl. *UCLA 3 Item Loneliness Scale*) (46). Zadatak sudionika je da na tri čestice odgovori koliko često se osjećaju usamljeno, koliko im nedostaje društvo i koliko često se osjećaju isključeno. Ukupni rezultat formira se kao zbroj odgovora na svaku česticu i kreće se od 3 do 9. Veći rezultat znači veći doživljaj usamljenosti, a granični rezultati od 6 na više označava visoku razinu usamljenosti. Ovo je često korištena ljestvica u epidemiološkim istraživanjima i istraživanjima psihičkog zdravlja te ima zadovoljavajuće metrijske karakteristike uz

37.1% identified as non-heterosexual. At the time of data collection, the majority (55.2%) of the participants were not involved in a romantic relationship, whereas somewhat less than a half (44.8%) reported being in a relationship.

Measurement Instruments

The sociodemographic data collected included items on gender (male, female, *queer*/gender-fluid, non-binary, transgender, prefer not to say, and prefer to self-describe; while for analytical purposes, responses were grouped into male, female, and other gender identities, excluding those who chose not to disclose), age, sexual orientation (rated on a six-point scale from exclusively heterosexual to exclusively homosexual, with an additional asexual option; and for subsequent analyses, the first two categories were classified as heterosexual orientation and all others as non-heterosexual orientation), field of study (biotechnical, social sciences, humanities, interdisciplinary, natural sciences, technical sciences, arts, health sciences), faculty and year of study, relocation to Zagreb for study purposes (yes/no), living arrangements (alone, with family, with roommates, with a partner), relationship status (1 – not in a relationship; 2 – in a relationship, but living separately; 3 – in a relationship/marriage/cohabitation/life partnership and living together), and perceived socioeconomic status relative to others (rated from 1 as very low to 7 as very high).

Perceived loneliness was measured using the UCLA 3-Item Loneliness Scale (46). The participants were asked to provide answers on three items, indicating how often they felt lonely, how much they lacked companionship, and how often they felt excluded. The total score was calculated as the sum of responses to each item, yielding a range from 3 to 9. Higher scores indicated greater perceived loneliness, with borderline scores of 6 or higher indicating a high level of loneliness. This scale is widely

unutarnju pouzdanost. Cronbachov α u ovom istraživanju iznosi ,80.

Kao mjera akademske uspješnosti korištena je Ljestvica subjektivne akademske uspješnosti (engl. *SAAS Subjective Academic Achievement Scale*). SAAS je kratka ljestvica od pet čestica osmišljena za procjenu studentske percepcije vlastite akademske uspješnosti (47). Ljestvica se koristi u obrazovnim istraživanjima kako bi se dobio cjelovitiji uvid u akademsku uspješnost, osobito u kontekstu subjektivnih kriterija uspjeha. Studenti na ljestvici od 1 uopće se ne slažem do 5 u potpunosti se slažem procjenjuju: (1) *Zadovoljan/a sam svojim ocjenama na studiju.*; (2) *Uspješan/a sam u učenju za svoj studij.*; (3) *Moje ocjene odgovaraju trudu koji ulažem.*; (4) *Napredujem dovoljno brzo u svom studiju.* i (5) *Moji kolege/ice na studiju uče uspješnije od mene.* Ukupan rezultat računa se kao zbroj bodova (raspon približno 5–25), gdje viša vrijednost označava veći doživljaj akademske uspješnosti. Ova ljestvica pokazuje zadovoljavajuću pouzdanost (Cronbachov alfa koeficijenti $\alpha = ,84$).

Kao mjera koja obuhvaća ključne aspekte psihičkog zdravlja i dobrobiti, a mjeri opću razinu psihičke uznemirenosti korišten je ukupni rezultat na CORE-10. CORE-10 je skraćena verzija CORE-OM (*Clinical Outcomes in Routine Evaluation – Outcome Measure*) i ove su dvije verzije u visokoj korelaciji koja iznosi ,94 u kliničkom uzorku te ,92 u nekliničkom uzorku (48). U istraživanju je korištena hrvatska verzija CORE-10 koja se sastoji od 10 tvrdnji od čega su dvije pozitivno formulirane (npr. *Znao/la sam da se mogu osloniti na nekoga ako mi zatreba* i *Mogao/la sam se nositi s poteškoćama*), a osam ih je negativnog karaktera (npr. *Osjećao/la sam se napeto, tjeskobno ili nervozno*). Sudionici su zamoljeni da procijene i odgovore na 10 tvrdnji o tome kako su se osjećali u proteklih tjedan dana. Odgovori su ponuđeni na ljestvici od 5 stupnjeva, pri čemu 0 označava nikada, 1 vrlo rijetko, 2 ponekad, 3 često, dok 4 označava gotovo uvijek. U ovom istraživanju se uku-

used in epidemiological and mental health research, and demonstrates satisfactory metric characteristics, with internal reliability. In this study, Cronbach's alpha amounted to .80.

Academic achievement was assessed using the Subjective Academic Achievement Scale (SAAS) (47). The SAAS is a brief five-item scale designed to assess students' perceptions of their own academic achievement (47). It is commonly used in educational studies in order to obtain a more comprehensive overview of academic achievement, particularly in terms of subjective success criteria. The students rated their agreement on a five-point scale, ranging from 1 – strongly disagree to 5 – completely agree, addressing the following statements: (1) *I am satisfied with my grades*; (2) *I am successful in studying for my study program*; (3) *My grades reflect the effort I put into my studies*; (4) *I am progressing fast enough in my studies*; and (5) *My peers perform better academically than I do*. The total score was calculated as the sum of item scores (approximate range 5–25), with higher scores indicating higher perceived academic achievement. This scale showed good internal reliability (Cronbach's alpha coefficient amounted to .84).

The CORE-10 total score was used as a measure that encompasses the key aspects of mental health and well-being, measuring the total level of psychological distress. The CORE-10 is a shortened version of the CORE-OM (Clinical Outcomes in Routine Evaluation – Outcome Measure), with the two versions showing a high correlation in clinical ($r = .94$) and non-clinical samples ($r = .92$) (48). The Croatian version of the CORE-10, consisting of 10 items, was used in this study, wherein two items were positively worded (e.g. *I knew I could rely on someone if I needed to* and *I was able to cope with difficulties*), and eight were negatively worded (e.g. *I felt tense, anxious, or nervous*). The participants were asked to rate and respond to 10 items addressing how they had felt over the past week. The responses were provided on a five-point scale, rating as fol-

pni CORE-10 rezultat računao kao zbroj svih odgovora pri čemu je mogući raspon bodova od 0 do 40. Veći rezultat na CORE-u ukazuje na višu psihološku uznemirenost, a u daljnjoj analizi koristit ćemo ju kao narušeno psihičkog zdravlje. CORE-10 pokazuje dobru pouzdanost, s Cronbachovim alfa koeficijentom na ovom uzorku od ,87.

Kao dodatna mjera psihičkog zdravlja korištena je Skraćena ljestvica depresivnosti, anksioznosti i stresa (engl. *DASS-21 Depression, Anxiety and Stress Scale – Short Form*). Riječ je o ljestvici samoprocjene namijenjenoj mjerenju prisutnosti neugodnih emocionalnih stanja u proteklih tjedan dana (49). Ljestvica je nastala skraćivanjem originalnog upitnika DASS-42 na 21 česticu. Sastoji se od tri podljestvice (depresivnost, anksioznost i stres), a svaka od njih ima po sedam čestica. Za svaku česticu sudionici procjenjuju svoje slaganje na ljestvici od 0 (uopće se nije odnosilo na mene) do 3 (gotovo u potpunosti ili većinu vremena se odnosilo na mene). Primjer čestice za podljestvicu depresivnosti jest „Osjetio/la sam kao da se nemam čemu radovati“, za podljestvicu anksioznosti „Bio/la sam uplašen/a bez opravdanog razloga“ te za podljestvicu stresa „Bilo mi je teško opustiti se“. Nakon udvostručavanja rezultata na svim česticama (radi lakše usporedbe s DASS-42) rezultat se za svaku podljestvicu dobiva zbrajanjem odgovora na 7 čestica te se proteže u rasponu od 0 do 42 pri čemu veći rezultat znači veću izraženost konstrukta, a u daljnjoj analizi rezultata bit će korištena s terminom narušenog psihičkog zdravlja. Također su definirane granične vrijednosti izraženosti simptoma na pojedinoj podljestvici (od normalne do ekstremno ozbiljne izraženosti). Cronbachovi α koeficijenti pouzdanosti iznose ,89 za depresivnost; ,85 za anksioznost; ,90 za stres.

Procjena zdravstvenog stanja ispitana je Ljestvicom subjektivnog zdravstvenog stanja (engl. *SRH, Self-rated Health Scale*) ocijenjena je jednim pitanjem *Svoje zdravstveno stanje pro-*

lows: 0 – never, 1 – very rarely, 2 – sometimes, 3 – often, 4 – almost always. The total CORE-10 score in this study was calculated as the sum of all responses, yielding a possible score range from 0 to 40. Higher CORE scores indicated greater psychological distress, and in subsequent analyses, this variable was treated as an indicator of impaired mental health. The CORE-10 showed good reliability, and Cronbach's alpha coefficient in this sample amounted to .87.

As an additional measure of mental health, we used the Depression, Anxiety and Stress Scale – Short Form (DASS-21). This a self-report instrument designed to assess negative emotional states experienced during the past week (49). The DASS-21 was formed by shortening the original DASS-42 questionnaire to a total of 21 items. It consists of three subscales (depression, anxiety, and stress), each comprising seven items. Participants rated the extent to which they agreed with each item, from 0 (did not apply to me at all) to 3 (applied to me almost completely or most of the time). Example items included the following: *I felt like I had nothing to look forward to* for the depression subscale, *I felt scared without any good reason* for the anxiety subscale, and *I found it difficult to relax* for the stress subscale. After doubling all of the item scores (to facilitate comparability with the DASS-42), the scores for each item were obtained by summing the responses to the 7 items, ranging from 0 to 42, with higher scores indicating greater symptom severity, and in subsequent analyses these scores were treated as indicators of impaired mental health. Furthermore, the threshold values for symptom severity were calculated on each subscale (from normal to extremely severe). Cronbach's alpha reliability coefficients amounted to .89 for depression, .85 for anxiety, and .90 for stress.

Self-rated health was assessed using the Self-Rated Health Scale (SRH), measured by a single item, *"I would rate my health as"*, ranging from 1 (*very poor*) to 5 (*very good*) (50). This simple and widely used measure is used in epidemiological

cijenio/la bih od 1 (izrazito loše) do 5 (izrazito dobro)' (50). Ova jednostavna i uobičajena mjera koristi se u epidemiološkoj i psihološkoj praksi te se pokazala snažnim prediktorom mortaliteta, morbiditeta i korištenja zdravstvenih usluga. U analizi je varijabla tretirana kao ordinalna (1-5) pri čemu viši rezultat signalizira bolji subjektivni osjećaj vlastitog zdravlja.

Uz ovu mjeru sudionici su o svom zdravlju izvijestili i dvama pitanja o prisutnosti ili odsutnosti psihičkih bolesti ili problema te fizičkih bolesti (1) *Patite li od neke psihičke bolesti ili emocionalnih problema (npr. anksioznost, depresija, ADHD)?* te (2) *Patite li od neke fizičke bolesti (npr. visok krvni tlak, dijabetes, rak...)*. Na oba pitanja sudionici su mogli dati odgovor da (0) ili ne (1).

Postupak

Podatci potrebni za ovo korelacijsko istraživanje prikupljeni su putem online platforme *SurveyMonkey* tijekom veljače, ožujka i travnja 2025. godine, u razdoblju koje je obuhvaćalo završetak ispitnih rokova i početak ljetnog semestra. Za prikupljanje sudionika korištena je metoda snježne grude pri čemu je poveznica na upitnik dijeljena u grupnim razgovorima studenata različitih područja i godina studija. Dodatno, upitnik je prosljeđen e-mail adresama prodekana svih fakulteta Sveučilišta u Zagrebu koji su ga distribuirali svojim studentima. U svrhu širenja dosega poziv na sudjelovanje objavljen je i putem studentskih udruga te na društvenim mrežama (*Facebook* i *Instagram*). Ukupno je ispitivanju upitnika pristupilo 1250 sudionika od čega je 879 (70 %) studenata dovršilo ispunjavanje upitnika.

U informiranom pristanku bilo je jasno naznačeno da se traže studenti Sveučilišta u Zagrebu, da je sudjelovanje anonimno i dobrovoljno, te da će se rezultati obrađivati isključivo na grupnoj razini. Sudionicima je objašnjeno da mogu u bilo kojem trenutku prekinuti

and psychological practice, and has proved to be a strong predictor of mortality, morbidity, and healthcare utilization. In the analysis, this variable was treated as ordinal (1–5), with higher scores indicating better perceived health.

In addition to this measure, the participants reported on their health status by responding to two items assessing the presence or absence of mental health conditions and physical illnesses: (1) *Do you suffer from any mental illness or emotional problems (e.g. anxiety, depression, ADHD)?* and (2) *Do you suffer from any physical illness (e.g. high blood pressure, diabetes, cancer...)?*. Both items could be answered by selecting yes (0) or no (1).

Procedure

Data for this correlational study were collected via the online platform *SurveyMonkey* during February, March and April of 2025, in a period encompassing the end of examination sessions and the beginning of the summer semester. Participants were recruited using the snowball sampling method, whereby the survey link was shared within group chats of students from different fields and years of study. In addition, the questionnaire was distributed via email to the vice-deans of all faculties at the University of Zagreb, who subsequently forwarded it to their students. In order to further increase the reach, invitations to participate were also published through student associations and on social media platforms (*Facebook* and *Instagram*). A total of 1250 individuals accessed the questionnaire, of whom 879 students (70%) completed it in full.

The informed consent form clearly stated that participation was limited to students of the University of Zagreb, that participation was anonymous and voluntary, and that data would be analyzed exclusively at group level. The participants were informed that they could withdraw from participation at any point without any consequences. The study was approved by

ispunjavanje bez posljedica. Istraživanje je odobrilo Etičko povjerenstvo Filozofskog fakulteta Sveučilišta u Zagrebu (broj odobrenja: EPOP_2024_25_15_HR), što je bilo navedeno u pozivnici i u obrascu pristanka.

Sve primijenjene ljestvice sadržavale su jasne upute za ispunjavanje, a procijenjeno vrijeme ispunjavanja bilo je između 15 i 20 minuta. Svi sudionici su ispunjavali upitnik istim redoslijedom pri čemu je svaka ljestvica bila prikazana na zasebnoj stranici kako bi se smanjio efekt zamora i povećala usredotočenost. Na dnu svake stranice, kao i na završetku upitnika, nalazio se kontakt Savjetovaništa za studente u slučaju da je sudionik tijekom ispunjavanja osjetio nelagodnu ili potrebu za psihološkom podrškom.

REZULTATI

Rezultati istraživanja obrađivani su u statističkom programu Jamovi, verzija 2.6.26.

Postotak studenata koji su se izjasnili o tome da pate od neke psihičke bolesti ili emocionalnih problema je 31,5 % dok ih je 36 % izvijestilo o tome da pate od neke tjelesne bolesti. Testiranje normaliteta distribucija Shapiro–Wilkovim testom pokazalo je da sve distribucije varijabli značajno odstupaju od

the Ethics Committee of the Faculty of Humanities and Social Sciences, University of Zagreb (approval number: EPOP_2024_25_15_HR), which was explicitly stated in both the invitation to participate and the consent form.

All of the applied scales provided clear instructions, and the estimated completion time ranged from 15 to 20 minutes. All the participants completed the questionnaire in the same order, with each scale presented on a separate page so as to reduce fatigue effects and enhance focus. At the bottom of each page, as well as at the end of the questionnaire, contact information for the Student Counseling Centre was provided in case any of the participants experienced distress or felt the need for psychological support while completing the questionnaire.

RESULTS

The study results were analyzed using the statistical software program Jamovi, version 2.6.26.

The percentage of students who reported suffering from a mental illness or emotional problems was 31.5%, while 36% reported having a physical illness. Testing the normality of distributions using the Shapiro–Wilk test indicated that all variable distributions significantly

TABLICA 1. Deskriptivna analiza i rezultati testiranja normalnosti distribucija kontinuiranih varijabli (N = 879)
TABLE 1. Descriptive analysis and results of testing the normality of distributions of continuous variables (N = 879)

				Asimetričnost / Skewness		Spljoštenost / Kurtosis		
	M	SD	Min-Max	A	SE	S	SE	W
UCLA	6,22	1,44	3-9	,11	,08	,09	,17	,91**
DASS21D	13,84	10,66	0-42	,82	,08	-,25	,17	,92**
DASS21A	11,65	9,62	0-42	,88	,08	,17	,17	,92**
DASS21S	18,19	10,76	0-42	,35	,08	-,77	,17	,97**
CORE-10	13,63	7,67	0-40	,44	,08	-,31	,17	,98**
SAAS	16,84	5,07	5-25	-,37	,08	-,68	,17	,97**
SRH	3,61	,84	1-5	-,38	,08	-,23	,17	,87**

Legenda: A – indeks asimetričnosti distribucije, S – indeks spljoštenosti distribucije, SE – standardna pogreška, W – Shapiro-Wilkov test normalnosti distribucija; UCLA – usamljenost, DASS21D – depresivnost, DASS21A – anksioznost, DASS21S – stres, CORE-10 – narušeno psihičko zdravlje, SAAS – akademska uspješnost, SRH – samoprocjena zdravlja ** $p < ,01$

/ Legend: A – distribution skewness index, S – distribution kurtosis index, SE – standard error, W – Shapiro–Wilk test of distribution normality; UCLA – loneliness, DASS-21D – depression, DASS-21A – anxiety, DASS-21S – stress, CORE-10 – impaired mental health, SAAS – academic achievement, SRH – self-rated health; ** - $p < .01$

normalne. S obzirom da je Shapiro–Wilkov test izrazito osjetljiv na veliku veličinu uzorka ($n > 50$), preporučeno je oslanjanje na indekse asimetričnosti i spljoštenosti radi provjere oblika distribucija (51). Indeksi asimetričnosti i spljoštenosti bili su unutar granica ± 1 za sve varijable, što označava umjerene devijacije koje se smatraju prihvatljivima (52,53). Ljestvica usamljenosti, procjene akademske uspješnosti te zdravstvenog stanja su negativno asimetrične, što ukazuje na više prosječne razine usamljenosti, procijenjene bolje akademske uspješnosti te bolje zdravstveno stanje. Očekivano, ljestvice narušenog psihičkog zdravlja (DASS-21 i CORE-10) distribuiraju se pozitivno asimetrično s prosječnim nižim vrijednostima sugerirajući da najveći broj sudionika ima nešto malo do umjereno izražene psihičke smetnje, a manji broj izražene psihičke tegobe. Rezultati na ljestvici usamljenosti pokazuju da prema sugeriranom graničnom rezultatu koji ukazuje na izraženu razinu usamljenosti svega 23,1 % sudionika osjeća manju do umjerenu razinu usamljenosti, dok 76,9 % studenata iskazuje značajno izraženu razinu usamljenosti.

Kako bi se odgovorilo na prvi istraživački problem i procijenila razina usamljenosti s obzirom na sociodemografske karakteristike provedene su statističke analize razlika te prikazane njihove značajnosti između pojedinih skupina sudionika.

Rezultati pokazuju da se razine usamljenosti studenata ovisno o tome s kim žive razlikuju no uz mali efekt ($\eta^2 = 0,012$). *Post hoc* analize upućuju na to da studenti koji žive s partnerom/icom iskazuju najniže razine usamljenosti ($M = 5,74$; $SD = 1,37$), značajno niže u odnosu na studente koji žive sami ($M = 6,43$; $SD = 1,41$) ili s cimerima ($M = 6,28$; $SD = 1,38$), dok između ostalih skupina nisu utvrđene statistički značajne razlike. Status veze također se pokazao statistički značajnim čimbenikom usamljenosti pri čemu studenti koji nisu

deviated from normality. Given that the Shapiro–Wilk test is highly sensitive to large sample sizes ($n > 50$), reliance on indices of skewness and kurtosis is recommended for the purpose of assessing the distribution shape (51). The skewness and kurtosis indices were within the ± 1 range for all variables, indicating moderate deviations that are considered acceptable (52, 53). The scales of loneliness, subjective academic achievement, and self-rated health were negatively skewed, indicating above-average levels of loneliness, higher perceived academic achievement, and better perceived health. As expected, measures of impaired mental health (DASS-21 and CORE-10) showed positive skewness with lower mean values, suggesting that the majority of the participants experienced mild to moderate psychological symptoms, while a smaller proportion reported pronounced psychological difficulties. The results on the loneliness scale indicate that, according to the suggested cut-off score for elevated loneliness, only 23.1% of the participants reported low to moderate loneliness levels, whereas 76.9% of the students reported a markedly high level of loneliness.

In order to address the first research question and assess levels of loneliness in relation to sociodemographic characteristics, statistical analyses of differences were conducted, and the significance of these differences between individual participant groups is presented.

The results show that students' loneliness levels differ depending on whom they live with, although the effect is small ($\eta^2 = 0.012$). *Post hoc* analyses indicate that students living with a partner reported the lowest levels of loneliness ($M = 5.74$; $SD = 1.37$), significantly lower than those of students living alone ($M = 6.43$; $SD = 1.41$) or with roommates ($M = 6.28$; $SD = 1.38$), while no statistically significant differences were found between the other groups. The relationship status also proved to be a statistically significant factor for loneliness, with

TABLICA 2. Prikaz izraženosti usamljenosti obzirom na sociodemografske karakteristike (N=879)**TABLE 2.** Overview of the severity of loneliness in relation to sociodemographic characteristics (N = 879)

		UCLA-3					
		<i>n</i>	%	<i>M</i>	<i>SD</i>	<i>F</i> ili <i>t</i> (<i>df</i>)	
Rod / Gender	muškarac / man	181	20,7	6,09	1,49	F (2,876)=1,244 <i>p</i> >,05; $\eta^2 = ,003$	
	žena / woman	657	76,9	6,24	1,43		
	neki drugi rodni identitet / other gender identity	20	2,4	6,55	1,50		
Seksualna orijentacija / Sexual orientation	heteroseksualna / heterosexual	689	62,9	6,13	1,41	t(875)=-3,628 <i>p</i> <,001; <i>d</i> = ,25	
	neheteroseksualna / non-heterosexual	187	37,1	6,55	1,51		
S kime žive / Living	sam/a / alone	121	13,8	6,43	1,41	F(3,875)=3,544 <i>p</i> <,05; $\eta^2 = ,012$	
	s obitelji / with family	419	47,7	6,17	1,48		
	s cimerom/icom / with roommate	278	31,6	6,28	1,38		
	s partnerom/icom / with partner	61	6,9	5,74	1,37		
Status veze / Relationship status	u vezi / in a relationship	394	44,8	6,02	1,46	t(874)=3,596 <i>p</i> <,001; <i>d</i> = ,24	
	nije u vezi / not in a relationship	485	55,2	6,37	1,41		
Preseljenje u Zg na studij / Moving to Zagreb to study	da / yes	442	22,9	6,30	1,39	t(877)=1,874 <i>p</i> <,01; <i>d</i> = ,13	
	ne / no	437	17,2	6,12	1,48		
Područje studija / Field of study	biotehničko / biotechnical	89	22,2	6,66	1,39	F(7,871)= 1.852 <i>p</i> >,05; $\eta^2 = ,015$	
	društveno / social	217	16,4	6,05	1,48		
	humanističko / humanities	158	12,4	6,26	1,43		
	interdisciplinarno / interdisciplinary	31	9,0	6,16	1,34		
	prirodno / natural sciences	41	0,3	6,37	1,71		
	tehničko / technical/engineering	120	3,0	6,10	1,46		
	umjetničko / art	104	11,7	6,21	1,31		
	zdravstveno / health sciences	119	39,7	6,18	1,39		
Prisutnost psihičke bolesti / Presence of mental illness	da / yes	277	36,9	6,65	1,50	t (877)= 6,23 <i>p</i> <,001; <i>d</i> = ,42	
	ne / no	602	7,7	6,01	1,37		
Prisutnost fizičke bolesti / Presence of physical illness	da / yes	316	0,7	6,37	1,47	t(877)=2,53 <i>p</i> <,01; <i>d</i> =,17	
	ne / no	536	50,3	6,12	1,42		

Legenda: aritmetičke sredine (*M*) i standardne devijacije (*SD*) rezultata na ljestvici usamljenosti UCLA-3; *t* – *t*-test; *F* – *F* vrednosti; *df* – stupnjevi slobode; *p* – razina statističke značajnosti, η^2 – eta veličina efekta iskazana eta na kvadrat, *d* – veličina efekta iskazana Chohenovim *d* / Legend: arithmetic means (*M*) and standard deviations (*SD*) of the results on the UCLA-3 Loneliness Scale; *t* – *t*-test; *F* – *F* values; *df* – degrees of freedom; *p* – statistical significance level; η^2 – eta effect size expressed as eta squared; *d* – effect size expressed as Cohen's *d*.

u vezi iskazuju nešto više razine (mali efekt $d = ,24$) usamljenosti u odnosu na one koji su u vezi, uz mali efekt ($d = ,24$). Slično tome, neheteroseksualni studenti iskazuju nešto više razine usamljenosti ($d = ,25$) od heteroseksualnih studenata. Iako je razlika vezana uz preseljenje u Zagreb radi studija statistički značajna, dobiven je vrlo mali efekt ($d = ,13$), što upućuje na ograničenu praktičnu važnost tog nalaza. Razlike u razinama usamljenosti s

students who are not in a relationship reporting slightly higher levels (small effect, $d = 0.24$) of loneliness compared to those who are in a relationship (small effect, $d = 0.24$). Similarly, non-heterosexual students reported slightly higher levels of loneliness ($d = 0.25$) compared to heterosexual students. Although the difference related to moving to Zagreb for studies is statistically significant, the obtained effect was very small ($d = 0.13$), indicating limited prac-

obzirom na rod i područje studija nisu bile statistički značajne. Najizraženiji nalaz odnosi se na prisutnost psihičkih bolesti ili problema pri čemu studenti koji ih navode iskazuju znatno više razine usamljenosti, uz srednju veličinu efekta ($d = 0,42$). Studenti s tjelesnim bolestima također iskazuju više razine usamljenosti, no uz mali efekt ($d = 0,17$). Ovi rezultati upućuju na važnu povezanost usamljenosti s mentalnim, a u manjoj mjeri i tjelesnim zdravljem studenata.

Tablica 3 prikazuje korelacijsku matricu ispitivanih varijabli. Usamljenost se pokazala značajno povezanom s mjerom akademske uspješnosti te pokazateljima psihičkog zdravlja te općeg zdravlja. Rezultati pokazuju da su studenti koji doživljavaju veću razinu usamljenosti lošijeg psihičkog zdravlja na svim mjerama psihičkog zdravlja, lošijeg generalnog zdravlja te da ostvaruju slabiju akademsku uspješnost. Najveće korelacije (srednje velike povezanosti) nalaze se između usamljenosti i mjera psihičkog zdravlja (posebno depresivnosti i općeg psihičkog zdravlja).

U svrhu ispitivanja relativnog doprinosa usamljenosti na narušeno psihičko zdravlje (CORE-10) provedena je hijerarhijska regresijska analiza u dva koraka. U prvom koraku u

tical significance of the result. Differences in loneliness levels in terms of gender and field of study were not statistically significant. The most pronounced finding referred to the presence of mental illness or problems, wherein students reporting such issues exhibited substantially higher levels of loneliness, with a medium effect size ($d = 0.42$). Students with physical illnesses also reported higher levels of loneliness, but with a small effect ($d = 0.17$). These results point to an important association between loneliness and students' mental health, and to a lesser extent, their physical health.

Table 3 presents the correlation matrix of the examined variables. A significant association was found between loneliness and academic achievement, as well as indicators of mental and general health. The results indicate that students who experience higher levels of loneliness have poorer mental health across all mental health measures, poorer general health, and lower academic achievement. The strongest correlations (moderate associations) were observed between loneliness and measures of mental health (particularly depression and general mental health).

In order to examine the relative contribution of loneliness to impaired mental health (CORE-10), a two-step hierarchical regression analysis

TABLICA 3. Korelacijska matrica mjerenih varijabli (N=879)
TABLE 3. The correlation matrix of measured variables (N = 879)

	1	2	3	4	5	6	7	8	9
1. SES	-								
2. god. studija / year of study	-,03	-							
3. UCLA	-,15*	-,08*	-						
4. SAAS	-,24**	,17**	-,26**	-					
5. DASS21-D	-,16**	-,05	,48**	-,43**	-				
6. DASS21-A	-,14**	-,14**	,35**	-,40**	,63**	-			
7. DASS21-S	,13**	-,06	,39**	-,38**	,73**	,77**	-		
8. CORE-10	-,20**	-,07*	,51**	-,44**	,84**	,72**	,78**	-	
9. SRH	,23**	,02	-,22**	-,33**	-,41**	-,41**	-,40**	-,45**	-

Legenda: SES – socioekonomski status; UCLA – usamljenost; SAAS – akademska uspješnost; DASS21D – depresivnost; DASS21A – anksioznost; DASS21S – stres; CORE-10 – narušeno psihičko zdravlje; SRH – samoprocjena zdravlja * $p < 0,05$; ** $p < 0,01$
/ Legend: SES – socioeconomic status; UCLA – loneliness; SAAS – academic achievement; DASS21D – depression; DASS21A – anxiety; DASS21S – stress; CORE-10 – impaired mental health; SRH – self-rated health; * $p < 0.05$; ** $p < 0.01$

model su uključene sociodemografske varijable: rod (muški i ženski), godina studija te percipirani socioekonomski status. Ovaj inicijalni model bio je statistički značajan, $F(3,875) = 14,93, p < ,001$, te je objasnio 4,9 % varijance kriterijske varijable. Od uključenih prediktora značajan doprinos imala je varijabla percipiranog socioekonomskog statusa ($\beta = -,198, p < ,001$) pri čemu niži percipirani status predviđa više teškoća sa psihičkim zdravljem. Rod se pokazao statistički značajno prediktivnim ($\beta = ,086, p < ,01$) pri čemu su žene imale narušenije psihičko zdravlje, dok se godine studija nisu pokazale prediktivnima za psihičko zdravlje ($\beta = -,037, p > ,05$). U drugom koraku u model su dodatno uključene varijable akademske uspješnosti u obliku samoprocjene akademske uspješnosti te usamljenost. Ovim korakom statistički značajno se povećao postotak objašnjene varijance psihičkog zdravlja $\Delta R^2 = ,326, \Delta F(2,873) = 227,49, p < ,001$ pri čemu je ukupno objašnjeno 37,5 % varijance ($R^2 = ,375$). Obje varijable imaju svoj značajan relativan doprinos u objašnjenju psihičkog zdravlja. Studenti koji su lošije akademske uspješnosti imaju lošije psihičko zdravlje ($\beta = -,318, p < ,001$) dok viša razina usamljenosti

was conducted. In the first step, the following sociodemographic variables were included in the model: gender (male and female), year of study, and perceived socioeconomic status. This initial model was statistically significant, $F(3,875) = 14.93, p < .001$, and explained 4.9% of the criterion variable variance. Among the included predictors, perceived socioeconomic status had a significant contribution ($\beta = -0.198, p < .001$), with lower perceived status predicting greater difficulties in terms of mental health. Gender was also a statistically significant predictor ($\beta = 0.086, p < .01$), with women reporting poorer mental health, whereas the year of study was not a significant predictor of mental health ($\beta = -0.037, p > .05$). In the second step, variables representing academic achievement (in the form of self-rated academic achievement) and loneliness were additionally included. This step resulted in a statistically significant increase in the explained variance of mental health, $\Delta R^2 = 0.326, \Delta F(2.873) = 227.49, p < .001$, with a total of 37.5% of the variance explained ($R^2 = 0.375$). Both variables made significant relative contributions to explaining mental health. The students with lower academic achievement had poorer mental health ($\beta = -0.318, p < .001$),

TABLICA 4. Rezultati hijerarhijske regresijske analize za kriterijsku varijablu narušeno psihičko zdravlje (CORE-10).
TABLE 4. Results of the hierarchical regression analysis for the criterion variable of impaired mental health (CORE-10).

	β	β
	1.	2.
Korak / Step		
Rod / Gender	,086**	,044
God. studija / Year of study	-,037	,013
SES	-,198**	-,059*
Korak / Step		
Akademska uspješnost / Academic achievement		-,318**
Usamljenost / Loneliness		,423**
R	,22	,61
R²	,045	,37
F(df;p)	14,93 (3,875; ,00)	104,59 (5,873; ,00)

Legenda: rod (1-M, 2-Ž); SES – socioekonomski status; R – koeficijent multiple korelacije; R² – udio objašnjene varijance kriterijske varijable; F(df; p) – test značajnosti regresijskog modela, β – standardizirani regresijski koeficijent, * $p < ,05$; ** $p < ,01$.
 / Legend: gender (1-M, 2-F); SES – socioeconomic status; R – multiple correlation coefficient; R² – proportion of explained criterion variable variance; F(df; p) – significance test of the regression model; β – standardized regression coefficient; * $p < .05$; ** $p < .01$.

predviđa lošije psihičkog zdravlje ($\beta = ,423, p < ,001$).

Kako bismo dodatno istražili ulogu usamljenosti u kontekstu psihičkog zdravlja i akademske uspješnosti, pretpostavili smo da bi usamljenost mogla imati posredničku ulogu između akademske uspješnosti i psihičkog zdravlja. Izračunali smo medijacijski efekt usamljenosti te nam rezultati prikazani na slici 1. pokazuju djelomičnu medijaciju. Dobiven je indirektni efekt ($a \times b$) koji iznosi $-,103$ ($p < ,001$) što sugerira da se studenti lošije akademske uspješnosti osamljuju (put „a“), a da veća usamljenosti doprinosi pogoršanju psihičkog zdravlja (put „b“). Ovaj put pokazuje da određeni dio ukupnog odnosa između akademske uspješnosti i psihičkog zdravlja može biti objašnjena putem veće usamljenosti. Ukupni efekt ($c + a \times b$) iznosi $-,447$ ($p < ,001$) što ukazuje da sveukupno, lošija akademska uspješnost značajno predviđa lošiji rezultat na mjeri psihičkog zdravlja. Omjer medijacije iznosi 23,1 % što znači da je približno četvrtina odnosa između akademske uspješnosti i psihičkog zdravlja objašnjena upravo posredno putem usamljenosti.

RASPRAVA

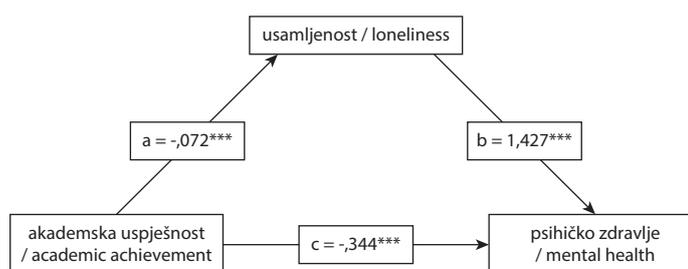
Nalazi ovog istraživanja upućuju na visoku razinu percipirane usamljenosti među studentima Sveučilišta u Zagrebu te na srednje jaku povezanost usamljenosti s mjerama psihičkog i općeg zdravlja te subjektivnom procjenom aka-

while higher levels of loneliness predicted poorer mental health ($\beta = 0.423, p < .001$).

In order to further investigate the role of loneliness in the context of mental health and academic achievement, we hypothesized that loneliness might mediate the relationship between academic achievement and mental health. We calculated the mediation effect of loneliness, and the results, presented in Figure 1, indicate partial mediation. An indirect effect ($a \times b$) was achieved, amounting to -0.103 ($p < .001$), suggesting that students with lower academic achievement experience higher loneliness (path “a”), with higher loneliness contributing to poorer mental health (path “b”). This pathway indicates that a portion of the total relationship between academic achievement and mental health can be explained through increased loneliness. The total effect ($c + a \times b$) amounted to -0.447 ($p < .001$), indicating that overall, lower academic achievement significantly predicts poorer scores on the mental health measure. The mediation ratio was 23.1%, meaning that approximately one-quarter of the relationship between academic achievement and mental health is explained indirectly through loneliness.

DISCUSSION

The findings of this study indicate a high level of perceived loneliness among the students of the University of Zagreb, and a moderate-to-strong association between loneliness and measures of mental and general health, as well as self-re-



SLIKA 1. Medijacija 1: akademska uspješnost - usamljenost - psihičko zdravlje
FIGURE 1. Mediation 1: Academic achievement – Loneliness – Mental health

demske uspješnosti. Pokazano je da više razine usamljenosti prate lošije psihičko zdravlje, slabiji osjećaj općeg zdravlja i doživljaj slabije akademske uspješnosti. Ovi su nalazi u skladu s brojnim istraživanjima koja potvrđuju da je studentska populacija izrazito ranjiva na doživljaj usamljenosti, posebice u razdobljima prilagodbe na akademske zahtjeve i nove socijalne okolnosti (3,28). Istraživanja provedena u nizu zemalja bilježe različite prevalencije usamljenosti u studentskoj populaciji, a jedna od viših zabilježena je u SAD-u i doseže razinu od gotovo 65 % (54). Naši rezultati, prema kojima više od tri četvrtine studenata doživljava visoku usamljenost, ukazuju na još izraženiji problem u hrvatskom kontekstu te potvrđuju da je usamljenost važan prediktor psihičkog zdravlja u studentskoj populaciji, kao i značajan javnozdravstveni izazov. Nadalje, ovi se nalazi uklapaju u zaključke Svjetske zdravstvene organizacije koja je usamljenost proglasila globalnim prioritetom javnog zdravlja, s procjenom da 1 od 6 osoba u svijetu doživljava značajnu društvenu izoliranost pri čemu su mladi među najpogođenijima (24). Kada govorimo o razlikama u razinama usamljenosti s obzirom na status veze, vrstu stanovanja, socioekonomski status i seksualnu orijentaciju, naši rezultati potvrđuju ranije dobivene nalaze o ranjivosti specifičnih podskupina studentske populacije. Studenti koji žive sami i studenti koji nisu u vezi u pravilu pokazuju veću usamljenost (34). Isto tako, studenti nižeg socioekonomskog statusa i neheteroseksualne orijentacije također iskazuju povišenu usamljenost (55,56). Ono što je važno naglasiti jest da se u hijerarhijskom regresijskom modelu u ovom istraživanju usamljenost pokazala kao snažan prediktor psihičkog distresa, iznad samih sociodemografskih varijabli, što je u skladu s rezultatima meta-analize koja je potvrdila da usamljenost značajno doprinosi razvoju depresivnosti, anksioznosti i stresa (59). Osim toga, longitudinalna istraživanja potvrđuju da viša usamljenost tijekom vremena predviđa

ported academic achievement. Higher levels of loneliness were associated with poorer mental health, lower perceived general health, and lower perceived academic achievement. These findings are consistent with numerous studies confirming that the student population is particularly vulnerable to experiences of loneliness, especially during periods of adjustment to academic demands and new social environments (3, 28). Studies conducted in various countries reported different prevalence rates of loneliness among students, with one of the highest rates observed in the USA, reaching nearly 65% (54). According to our results, more than three-quarters of students experience high levels of loneliness, indicating an even more pronounced problem in the Croatian context, and confirming that loneliness is an important predictor of mental health in the student population, as well as a significant public health challenge. Furthermore, these findings align with the conclusions of the World Health Organization, which has identified loneliness as a global public health priority, estimating that one in six people worldwide experiences significant social isolation, with young people being among the most affected (24). In terms of the differences in loneliness levels based on the relationship status, type of housing, socioeconomic status, and sexual orientation, our results confirmed the previous findings regarding the vulnerability of specific subgroups of students. Students living alone and those who are not in a relationship generally reported higher loneliness levels (34). Similarly, students with lower socioeconomic status and those of non-heterosexual orientation also reported elevated loneliness levels (55,56). Importantly, in the hierarchical regression model of this study, loneliness emerged as a strong predictor of psychological distress, beyond the sociodemographic variables, and this is consistent with the meta-analytic findings which confirmed that loneliness significantly contributes to the development of depression, anxiety, and stress (59). In addition, longitudinal studies

pogoršanje psihičkog zdravlja (33). Nadalje, u ovom je istraživanju promatrana i mediatorska uloga usamljenosti u odnosu između akademske uspješnosti i psihičkog zdravlja. Dobivena djelomična medijacija ukazuje da se dio negativnog učinka lošije percipirane akademske uspješnosti na psihičko zdravlje može objasniti povećanim osjećajem usamljenosti. Drugim riječima, studenti koji se suočavaju s akademskim teškoćama češće razvijaju osjećaj nepovezanosti i isključenosti, što dodatno pogoršava njihovo psihičko stanje. Ovakvi su rezultati u skladu s istraživanjima koja pokazuju da manjak akademske uspješnosti i osjećaja pripadnosti doprinosi negativnim obrascima mišljenja, sniženom samopoštovanju i porastu emocionalne patnje među studentima (47). Navedeno dodatno potvrđuje važnost promatranja akademske uspješnosti ne samo kognitivnom i izvedbenom dimenzijom, već i njegovom socioemocionalnom komponentom, koja može imati ključnu ulogu u zaštiti psihičkog zdravlja studenata.

S obzirom na visoku prevalenciju usamljenosti među hrvatskim studentima i njezinu značajnu povezanost s psihičkim zdravljem, nalazi ovog istraživanja imaju važne praktične implikacije za visokoobrazovni sustav. Naši rezultati naglašavaju potrebu za djelovanjem na više razina prevencije i institucionalne podrške. Na razini univerzalne prevencije, moguće je razvijati razne programe na sveučilištima koji su usmjereni na jačanje socijalne povezanosti i osjećaja pripadnosti, poput sustava mentorstva/tutorstva za bruoše, manjih skupina za učenje, studentskih klubova te kampanja koje destigmatiziraju traženje psihološke pomoći i podižu svijest o problematici usamljenosti (57). Selektivna prevencija uključivala bi rano prepoznavanje putem redovnog i brzog ispitivanja razina usamljenosti kratkim instrumentima (primjerice UCLA-3 ljestvica) u studentskim savjetovaništima te upućivanje studenata na psihološku podršku kada se prepoznaju ri-

have confirmed that higher loneliness predicts worsening mental health over time (33). Moreover, this study also examined the mediating role of loneliness in the relationship between academic achievement and mental health. The observed partial mediation indicates that part of the negative effect of lower perceived academic achievement on mental health can be explained by increased feelings of loneliness. In other words, students facing academic difficulties are more likely to develop feelings of disconnection and social exclusion, which further worsens their mental state. These findings are consistent with research results showing that low academic achievement and reduced sense of belonging contribute to negative thought patterns, lower self-esteem, and increased emotional distress among students (47). Such observations further highlight the importance of considering academic achievement not only in terms of cognitive and achievement dimensions, but also in terms of its socioemotional component, which can play a key role in protecting the mental health of students.

Given the high prevalence of loneliness among Croatian students and its significant association with mental health, the findings of this study have important practical implications for the higher education system. Our results emphasize the need for multi-level prevention and institutional support. At the level of universal prevention, universities could develop various programs aimed at strengthening social connectedness and a sense of belonging, such as mentoring/tutoring systems for first-year students, small study groups, student clubs, and campaigns that destigmatize seeking psychological help and raise awareness about the issue of loneliness (57). Selective prevention would involve early identification through regular and rapid assessment of loneliness levels using brief instruments (e.g. the UCLA-3 scale) in student counseling centers, and referral to psychological support for students identified as at risk. At the indicated preven-

zični obrasci. Na razini indikativne prevencije, bilo bi potrebno osigurati ciljane psihološke intervencije za najrizičnije skupine (neheteroseksualne studente, studente nižeg socioekonomskog statusa i one koji žive sami), uz jačanje dostupnosti grupa podrške i zajedničkih aktivnosti koje potiču socijalnu uključenost (18). Ovakve inicijative mogle bi doprinijeti stvaranju poticajnijeg akademskog okruženja u kojem se osjećaj pripadnosti prepoznaje kao važna komponenta psihičkog zdravlja i uspješnosti u studiju.

Neka od metodoloških ograničenja kao i smjerovi budućih istraživanja odnose se ponajprije na prigodan uzorak i korelacijsko istraživanje, što onemogućuje donošenje uzročnih zaključaka. Nadalje, metode samoprocjene također mogu dovesti do određenih razina pristranosti u procjenama, a rodna neravnoteža uzorka (76,9 % studentica) dodatno ograničava generalizaciju nalaza. Buduća istraživanja trebala bi uključiti longitudinalne pristupe kako bi se još jasnije razjasnio smjer odnosa između usamljenosti, psihičkog zdravlja i akademske uspješnosti te uvesti i neke objektivnije pokazatelje jačine socijalne mreže, poput broja i kvalitete interpersonalnih kontakata.

ZAKLJUČAK

Rezultati ovog istraživanja pokazuju da je usamljenost izrazito raširena i konzistentno povezana s lošijim psihičkim zdravljem, slabijim općim zdravljem i nižom procjenom akademske uspješnosti. Nakon kontrole sociodemografskih varijabli, usamljenost ostaje robustan prediktor psihološkog distresa, a djelomična medijacija pokazuje da dio negativnog učinka lošeg akademskog funkcioniranja na psihičko zdravlje djeluje putem povišene razine usamljenosti. Ovi nalazi nadopunjuju nalaze međunarodnih studija i podupiru aktualne preporuke stručnjaka koji socijalnu povezanost postavljaju kao prioritet. Potrebno je sustavno jačati inicijative

tion level, targeted psychological interventions should be provided for the highest-risk groups (non-heterosexual students, students of lower socioeconomic status, and those living alone), along with increasing the availability of support groups and shared activities that promote social inclusion (18). Such initiatives could contribute to creating a more supportive academic environment, where a sense of belonging is recognized as an important component of both mental health and academic success.

Some methodological limitations and directions for future studies primarily relate to the convenience sample and correlational design, which preclude causal conclusions. Furthermore, self-report measures may introduce certain amounts of bias in assessments, while the gender imbalance in the sample (76.9% female) further limits the generalizability of the results. Future studies should include longitudinal designs so as to further clarify the directionality of the relationships between loneliness, mental health and academic achievement, as well as incorporate some more objective indicators of social network strength, such as the number and quality of interpersonal contacts.

CONCLUSION

The results of this study indicate that loneliness is highly prevalent and consistently associated with poorer mental health, lower general health, and lower perceived academic achievement. After controlling for sociodemographic variables, loneliness remained a robust predictor of psychological distress, and partial mediation showed that part of the negative effect that poor academic functioning has on mental health operates through increased loneliness. These findings complement those obtained in international studies, and support current expert recommendations prioritizing social connectedness. It is necessary to systematically strengthen university-based initiatives

na bazi sveučilišta koje potiču osjećaje pripadnosti i podrške (mentorski i tutorski programi, grupe za učenje, studentske zajednice), uvoditi brzu detekciju usamljenosti u studentskim savjetovalištim (npr. putem UCLA-3) i razvijati ciljne intervencije za najrizičnije skupine (neheteroseksualne studente, studente nižeg SES-a, one koji žive sami). Sveučilišni sustavi koji prate i bave se pitanjem usamljenosti mogu očekivati bolje psihičko zdravlje i veću akademsku uspješnost studenata.

that foster the sense of belonging and support (mentoring and tutoring programs, study groups, student communities), implement rapid detection of loneliness in student counseling centers (e.g. via the UCLA-3), and develop targeted interventions for the most at-risk groups (non-heterosexual students, students of lower SES, and those living alone). University systems that monitor and address the issue of loneliness can expect improvements in the mental health and academic achievements of their students.

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Učinci terorističkog napada na školsku klimu

/ *The Effects of a School Terrorist Attack on School Climate*

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Cilj ovog istraživanja bio je ispitati i usporediti školsku klimu u strukovnim srednjim školama grada Zagreba sa strukovnim srednjim školama u ostalim dijelovima Hrvatske tijekom provedbe sigurnosnih mjera. U istraživanje su bili uključeni učenici šest srednjih škola diljem Hrvatske, smještenih u gradovima Zagreb, Rijeka, Zadar, Varaždin i Opatija. Ukupno je sudjelovalo 642 učenika od kojih 171 učenica i 471 učenik. Za mjerenje školske klime korišten je Hrvatski upitnik školske klime za učenike (1). Za analizu podataka korišten je t-test za nezavisne uzorke. Rezultati su pokazali da su učenici u prosjeku iskazivali umjereno pozitivnu školsku klimu ($M=51,4$, $SD=12,23$). Utvrđena je statistički značajna razlika u školskoj klimi između škola u Zagrebu i onih izvan Zagreba ($t=3,013$, $df=137,974$, $p=.003$). Škole u Zagrebu imale su negativniju školsku klimu ($M=47,93$, $SD=12,88$) u usporedbi s ostalim školama ($M=52,06$, $SD=12$). Iako rezultati upućuju na negativniju školsku klimu u strukovnim školama u Zagrebu, važno je uključiti veći broj škola i dodatno istražiti moguće uzroke ovakvih nalaza.

/ The aim of this study was to examine and compare the school climate in vocational high schools in the City of Zagreb and vocational high schools in the rest of Croatia during the implementation of security measures. The study involved students from six high schools across Croatia, located in the cities of Zagreb, Rijeka, Zadar, Varaždin, and Opatija. A total of 642 students participated in the study, of which 171 were female and 471 were male students. The Croatian School Climate Questionnaire for Students (1) was used as a measure of school climate. An independent samples t-test was used in order to analyze the data. The results indicated that, on average, the students observed a moderately positive school climate ($M=51.4$, $SD=12.23$). A statistically significant difference in school climate was found between the schools in Zagreb and those outside of Zagreb ($t=3.013$, $df=137.974$, $p=.003$). A more negative school climate was present in the schools in Zagreb ($M=47.93$, $SD=12.88$) compared to the other schools ($M=52.06$, $SD=12$). Although the results indicate a more negative school climate in vocational schools in Zagreb, a larger number of schools should be involved and the possible causes for these findings should be further investigated.

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Školska klima

Sustav obrazovanja važan je za svako moderno civilizirano društvo. Kako bi ispunio svoju svrhu, sustav obrazovanja mora zadovoljiti niz kriterija. Iako je važno mnogo čimbenika, ovaj će se članak ponajprije usmjeriti na školsko okruženje. Da bi učenici napredovali, školsko okruženje mora poticati učenje i podržavati ostvarenje punog potencijala svakog učenika (2). Jedna od temeljnih komponenti školskog okruženja, kojim se ovaj rad detaljnije bavi, jest školska klima. Pojam „školska klima” može djelovati jasno sam po sebi, bez potrebe dodatnog definiranja. Tome ne doprinosi ni činjenica da ne postoji univerzalno prihvaćena definicija tog pojma (3).

Neki znanstvenici definiraju školsku klimu kao skup zajedničkih uvjerenja, vrijednosti i stavova koji utječu na interakcije između učenika i odraslih uspostavljajući granice prihvatljivog ponašanja i školska pravila (4). Drugi školsku klimu opisuju apstraktnije definirajući je kao „srce i dušu škole” (5). Upravo je zato važno naglasiti stvaranje poticajne školske klime. Nacionalno vijeće SAD- a za školsku klimu (6) navodi:

„Postojana i pozitivna školska klima promiče razvoj mladih i učenje, što je ključno za vođenje produktivnog, smislenog i ispunjenog života u demokratskom društvu. Takva klima temelji se na normama, vrijednostima i očekivanjima koji osiguravaju da se pojedinci osjećaju društveno, emocionalno i fizički sigurno. Ona potiče angažman i poštovanje, a učenici, obitelji i odgojno-obrazovni djelatnici zajedno surađuju na stvaranju, održavanju i doprinosu zajedničkoj viziji škole. Nastavnici svojim primjerom njeguju stav koji ističe vrijednost i radost učenja. Svaki pojedinac ima ulogu u funkcioniranju škole i očuvanju fizičkog okruženja.”

Školska klima ima velik utjecaj na mentalno i fizičko zdravlje učenika (7). Osim toga može

School Climate

The education system is important for every modern, civilized society. In order to fulfil its intended purpose, the education system must meet a variety of criteria. While numerous factors are important, this article will primarily address the school environment. For students to thrive, the school environment must foster learning, and support the achievement of each student's full potential (2). One of the key components of this environment, which we will explore in detail, is school climate. The term “school climate” may seem self-explanatory, needing no further explanations. This issue is further promoted by the fact that there is no universally agreed-upon definition of the term (3).

Some scholars define school climate as a set of shared beliefs, values and attitudes that influence the interactions between students and adults, establishing the boundaries of acceptable behavior and school norms (4). Others offer a more abstract characterization, describing school climate as “the heart and soul of the school” (5). That is why it is important to put emphasis on creating an encouraging school climate. The US National School Climate Council (6) stated the following:

“A sustainable, positive school climate is one that fosters youth development and learning necessary for a productive, contributing and satisfying life in a democratic society. Such a climate includes norms, values, and expectations that support people feeling socially, emotionally and physically safe. It fosters engagement and respect, and students, families and educators work together to develop and contribute to a shared school vision. Educators model and nurture an attitude that emphasizes the benefits and satisfaction that can be gained from learning. Members of the school community contribute to the operations of the school and the care of its physical environment.”

utjecati i na emocionalno stanje učenika. U srednjim školama s pozitivnom školskom klimom zabilježeno je manje samoprijavljenih psihijatrijskih poteškoća među učenicima (8,9). Pozitivna školska klima povezana je sa smanjenim izostancima učenika (10) i nižim stopama pedagoških mjera suspenzije učenika u srednjim školama (11). Osim toga pozitivna školska klima može djelovati kao zaštitni čimbenik protiv zlorabe psihoaktivnih tvari, kao i protiv psihičkih teškoća, jer je povezana s manjom učestalosti tih problema. Pozitivna školska klima povezana je i s nižom stopom konzumacije droga (8,12).

Uz sve prethodno navedeno, pozitivna školska klima povezana je s motivacijom za učenje (13), a djeluje i kao zaštitni čimbenik od negativnog utjecaja socioekonomskog okruženja u kojem su učenici odrastali na njihov školski uspjeh (14). Povezana je s nižom razinom agresije i nasilja u školi (15,16) te s manjim brojem slučajeva uznemiravanja (17). Osim toga, pozitivna školska klima povezuje se i s pozitivnim životnim razvojem mladih (18). Pozitivna školska klima može ublažiti negativne učinke izloženosti nasilju u zajednici unatoč nepovoljnim socijalnim okolnostima (19). Također, pozitivna školska klima pozitivno predviđa socijalne i psihološke prilagodbe učenika (20). Nadalje, važno je spomenuti da školska klima obuhvaća različite aspekte. Wang i Degol (4) ističu višedimenzionalnost školske klime koja proizlazi iz istraživačke literature. Prema njima, školsku klimu moguće je definirati sa četiri sastavnice: akademska, komponenta zajednice, sigurnost i institucionalno okruženje. Ove četiri dimenzije obuhvaćaju gotovo sve aspekte školskog okruženja koji su ključni za kognitivni, ponašajni i psihološki razvoj učenika. Akademska klima odnosi se na ukupnu kvalitetu akademskog okruženja uključujući elemente poput kurikula, nastave, osposobljavanja učitelja i stručnog usavršavanja (7).

School climate has a great impact on the mental and physical health of students (7). Additionally, it can affect the students' emotional states. There are fewer self-reports of psychiatric difficulties among high school students in schools with a positive school climate (8, 9). Positive school climate is associated with fewer student absences (10) and lower rates of student suspension in high schools (11). Furthermore, a positive school climate can act as a protective factor against substance abuse and mental health issues, as it is associated with a lower frequency of these problems. Positive school climate is linked to lower levels of drug use (8, 12).

In addition to the above, a positive school climate is associated with motivation to learn (13), and also serves as a protective factor, preventing the socioeconomic environment which the students grew up in from having a negative impact on their academic success (14). It is associated with lower levels of aggression and violence in schools (15, 16), as well as with fewer cases of harassment (17). Moreover, a positive school climate is linked to positive life development among young people (18). It can mitigate the negative effects of exposure to community violence, despite unfavorable social circumstances (19). A positive school climate also positively predicts the students' social and psychological adjustment (20). Furthermore, it is important to mention that school climate includes different aspects. Wang and Degol (4) emphasized the multidimensionality of school climate that emerges from the research literature. According to them, the school climate can be defined using the following four components: academic climate, community, safety, and institutional environment. These four dimensions encompass nearly all features of the school environment that impact the students' cognitive, behavioral, and psychological development. The academic climate refers to the overall quality of the academic environment, including the elements such as curricula, instruction, teacher training, and professional development (7).

Dimenzija nazvana „zajednica” odnosi se na međuljudske odnose unutar škole. Institucionalno okruženje odnosi se na organizacijske i strukturne aspekte škole (21). Preciznije, to uključuje primjerenost školskog prostora, održavanje i infrastrukturu zgrade te dostupnost i raspodjelu obrazovnih resursa (4). Na kraju, sigurnost označava razinu fizičke i emocionalne sigurnosti koju škola pruža, zajedno s postojanjem pravedne, dosljedne i učinkovite disciplinske prakse. Osiguranje školske sigurnosti ključno je za poticanje učenja i zdravog razvoja (22). Upravo je to aspekt školske klime na kojem će se najviše staviti naglasak u ovom članku.

Školska sigurnost

Percepcija školske sigurnosti važan je čimbenik koji treba uključiti u rasprave o školskoj klimi, a s njom je i neodvojivo povezana (23-26). Prvo, može služiti kao pokazatelj relativne razine sigurnosti u školskom okruženju (27). Još važnije, novija istraživanja pokazala su da percepcija sigurnosti među učenicima ima veći utjecaj na njihovu dobrobit i uspjeh nego stvaran broj prijavljenih incidenata u njihovoj školi (28,29). Kada učenici svoju školu doživljavaju kao nesigurno mjesto, postoji tendencija pogoršanja njihovog akademskog uspjeha (28). Takva percepcija također negativno utječe na samopouzdanje učenika, njihovu motivaciju, angažiranost, redovitost pohađanja nastave i ocjene (30-32).

Bosworth i suradnici (33) identificirali su tri kategorije obilježja koja doprinose sigurnom školskom okruženju. Te kategorije su: organizacija i školska disciplina; školsko osoblje i odnosi te fizičke karakteristike i sigurnosne mjere. Školsko osoblje povećava osjećaj sigurnosti poticanjem osjećaja brige i zajedništva što za pojedince znači da se osjećaju primijećeno i podržano. Na primjer, učenici navode da se osjećaju sigurnije kada su učitelji češće u nji-

The dimension entitled “community” refers to the interpersonal relationships within the school. The institutional environment pertains to the organizational and structural features of the school environment (21). More precisely, it refers to the adequacy of the school setting, the maintenance and infrastructure of the building, and the accessibility and allocation of educational resources (4). Lastly, safety indicates the degree of physical and emotional security provided by the school, along with the presence of fair, consistent, and effective disciplinary practices. Ensuring school safety is vital for fostering both learning and healthy development (20). Precisely this aspect of school climate will be the main focus of this article.

School Safety

The perception of school safety is an important factor that needs to be included in discussions about school climate, and is inherently connected to it (23-26). First, it can serve as a measure of the relative safety in the school environment (27). More importantly, recent studies have shown that students’ perceptions of safety have a greater influence on their well-being and performance than the actual number of reported incidents at their school (28, 29). When students perceive their school as unsafe, their academic performance tends to decline (28). Such perception also negatively affects the students’ confidence, motivation, commitment, attendance, and grades (30-32).

Bosworth et al. (33) identified three categories of characteristics that contribute to a safe school environment. These categories are the following: organization and school discipline; school staffing and relationships; and physical characteristics and safety features. School staffing enhances the perception of safety by fostering a sense of care and community, where individuals feel seen and supported. For example, students report feeling safer when teachers are frequently near-

hovoj blizini. Organizacija i školska disciplina odnose se na obilježja koja stvaraju uredno i strukturirano okruženje. Učenici koji percipiraju sustav discipline kao jasan i dosljedan obično se osjećaju sigurnije. Naposljetku, fizičke karakteristike i sigurnosne mjere odnose se na konkretne sigurnosne elemente unutar i oko škole, kao što su sigurnosne kamere, detektori metala i zaštitari.

Može se tvrditi da je poboljšanje fizičkih karakteristika i sigurnosnih mjera najlakša od triju kategorija putem koje se može utjecati na percepciju sigurnosti i školske klime. Stoga ne iznenađuje da je pristup u kojem se jačaju sigurnosne mjere u školama sve češće preferiran u školama u Sjedinjenim Američkim Državama (34). Svrha fizičkih sigurnosnih mjera je dvostruka: primarno one služe kao sredstvo zaštite od nasilja, a osim toga su namijenjene odvratanju potencijalnih počinitelja. Osim njihove izravne preventivne funkcije, ove mjere također imaju za cilj povećati osjećaj učenika da su zaštićeni (35). Ako se učenici osjećaju zaštićeno i vjeruju da je njihova sigurnost školi prioritet, veća je vjerojatnost da će se osjećati sigurno u školskom okruženju. Stoga je cilj provedbe takvih mjera pomoć u povećanju percepcije sigurnosti kod učenika.

Ipak, prisutnost mjera poput sigurnosnih kamera, detektora metala, ograda i sličnih obilježja može učenicima signalizirati i to da nisu sigurni u školi. Te mjere mogu sugerirati postojanje neposredne prijetnje zbog koje je potrebna takva vrsta zaštite (36). Nadalje, učenici te mjere mogu protumačiti kao zaštitu od učenika, a ne za zaštitu njih samih. Drugim riječima, mogu steći dojam da ih školsko osoblje doživljava kao potencijalne počinitelje (37). Učenici često sigurnosne mjere poput nadzornih kamere doživljavaju kao narušavanje privatnosti i izraz nepovjerenja (38). Istraživanja su pokazala da te mjere ili nemaju nikakav učinak ili čak mogu imati negativan utjecaj na razinu školskog nasilja i osjećaj viktimizacije kod

by. Organization and school discipline refer to the features that create an orderly and structured environment. Students who perceive a clear and consistent system of discipline tend to feel safer. Lastly, physical characteristics and safety features refer to tangible security measures located within and around the school, such as security cameras, metal detectors, and security guards.

One could argue that improving the physical characteristics and safety features is the easiest of the three categories to influence the perceptions of safety and school climate. It is, therefore, no surprise that the approach of strengthening school security measures has become increasingly favored in schools in the United States (34). The purpose of physical security measures is twofold: they primarily serve as a means of protection against violence, and are also intended to deter potential perpetrators. Beyond their direct preventive function, these measures are also meant to enhance the students' sense of being protected (35). If students feel protected and believe that their safety is a priority for the school, they are more likely to feel safe within the school environment. The aim of implementing such measures is, therefore, to help increase the students' perception of safety.

However, the presence of measures such as security cameras, metal detectors, fences, and similar features can also signal to students that they are not safe at school. These measures may imply the existence of an immediate threat that makes such protections necessary (36). Furthermore, students might interpret these measures as protection from students, rather than for their benefit. In other words, they may get the impression that school staff view students as potential perpetrators (37). Students often perceive security measures such as surveillance cameras as an invasion of privacy and a sign of distrust (38). Studies have shown that these measures either have no effect or may even have a negative impact on school violence rates and students' feelings of victimization (39-41). With regard to the

učenika (39-41). Što se tiče percepcije sigurnosti, istraživanja pokazuju da učinci takvih mjera na osjećaj sigurnosti među učenicima mogu varirati i ovisiti o različitim čimbenicima (42,43). Također, sigurnosne mjere ne djeluju jednako na sve skupine učenika. Djevojčice te etničke manjine u nekim sredinama mogu se osjećaju nelagodnije i nesigurnije u školama s intenzivnim nadzorom. Univerzalni pristupi sigurnosti mogu imati nejednake psihološke učinke (44). Jedna od sastavnica školske klime je i strah od nasilja, koji može postojati čak i u odsutnosti neposredne opasnosti te ima tendenciju porasta nakon izloženosti nasilnim događajima (45). Stoga sigurnosne mjere mogu, zapravo, povećati strah i osjećaj nesigurnosti (42). To je osobito važno u kontekstu ovog članka.

Istraživanje ovoga rada potaknuto je napadom koji se dogodio u prosincu 2024. godine u Osnovnoj školi Prečko u Zagrebu. Dana 20. prosinca 2024. godine, 19-godišnji mladić ušao je u Osnovnu školu Prečko naoružan nožem i ozlijedio sedam osoba. Napad je započeo kada je napadač napao učenika koji se slučajno zatekao u hodniku. Zatim je ušao u nasumičnu učionicu gdje je ubio sedmogodišnjeg učenika i ranio još četvero drugih. Osim toga, 62-godišnja učiteljica pokušala je zaštititi svoje učenike, ali je i sama pritom ozlijeđena. Napadač je učiteljicu izbio čak 31 put nanijevši joj ozljede opasne za život. U međuvremenu su se učenici sakrili ispod svojih klupa. Nakon što je napadač napustio prostoriju, učenici su počeli bježati i skrivati se gdje god su mogli. Kasnije su pronađeni na različitim mjestima unutar škole, vidno traumatizirani.

Taj je događaj duboko potresao lokalnu zajednicu i izazvao zabrinutost za sigurnost u školama na nacionalnoj razini. Kao odgovor na teroristički napad u Prečkom Ministarstvo znanosti, obrazovanja i mladih Republike Hrvatske donijelo je krajem prosinca 2024. i početkom siječnja 2025. godine niz sigurnosnih smjernica

perception of safety, studies indicate that the effects of such measures on students' sense of safety may vary and depend on different factors (42, 43). Security measures also do not have the same effect on all student groups. In some environments, girls and ethnic minorities may feel more uncomfortable and less safe in schools with intensive surveillance. Universal approaches to security can have unequal psychological effects (44). One component of school climate is the fear of violence, which can exist even in the absence of immediate danger, and tends to increase after being exposed to violent events (45). For this reason, security measures may, in fact, increase fear and a sense of a lack of safety (42). This is especially important in the context of this article.

Research for this paper was prompted by an attack that occurred in December 2024 at Prečko Elementary School in Zagreb. On December 20, 2024, a 19-year-old male entered Prečko Elementary School armed with a knife, and injured seven people. The attack began when he targeted a student whom he had encountered in a corridor. He then entered a random classroom, where he killed a 7-year-old student and injured four others. Additionally, a 62-year-old teacher attempted to shield her students, but was also injured in the process. The attacker stabbed the teacher 31 times, inflicting life-threatening injuries. Meanwhile, the students hid under their tables. After the attacker left the room, the students began to escape and hide wherever they could. They were later found in various parts of the school, visibly traumatized.

The incident deeply shook the local community and sparked national concern over school safety. In response to the terrorist attack in Prečko, the Ministry of Science, Education and Youth of the Republic of Croatia adopted a series of security guidelines and documents in late December 2024 and early January 2025, including the Protocol on Entry and Exit Control in School Institutions, which stipulates the mandatory locking of school doors during working hours,

i dokumenata uključujući Protokol o kontroli ulaska i izlaska u školskim ustanovama, kojim se propisuje obvezno zaključavanje školskih vrata tijekom radnog vremena, kontrolirani ulazak posjetitelja te dežurstvo osoblja na ulazima (46,47). Međutim, navede mjere su se počele primjenjivati i ranije. U školama koje su sudjelovale u ovom istraživanju navedene mjere su se primjenjivala tijekom provedbe istraživanja. Posljedično, učenici u svim hrvatskim školama izloženi su učincima tih mjera. S obzirom na sve prethodno navedeno važno je ispitati kakvo je trenutno stanje školske klime u hrvatskim školama.

Važno je ne zanemariti ni učinak samog napada na školsku klimu. Razumno je pretpostaviti da je percepcija sigurnosti među učenicima Osnovne škole Prečko u Zagrebu bila značajno narušena. Međutim, i kod učenika drugih škola u okolnom području moguća je slična reakcija. Istraživanja su pokazala da strah izazvan terorističkim napadima u školama može porasti ne samo među učenicima škola koje su izravno pogođene već i u obližnjim školama (47). Stoga je opravdano očekivati da negativni učinci spomenutog terorističkog napada na školsku klimu na području Zagreba mogu nadilaziti učinke sigurnosnih mjera uvedenih u svim hrvatskim školama. Cilj ovog istraživanja bio je ispitati i usporediti školsku klimu u strukovnim srednjim školama na području grada Zagreba s onom u strukovnim srednjim školama u ostalim područjima Republike Hrvatske tijekom provedbe navedenih sigurnosnih mjera.

METODA I REZULTATI

Sudionici

U istraživanju su sudjelovali učenici iz pet srednjih strukovnih škola u Republici Hrvatskoj. Škole su se nalazile u gradovima Zagrebu, Rijeci, Zadru, Varaždinu i Opatiji. Ukupno je

controlled entry of visitors, and staff being on duty at the entrances (46, 47). However, the implementation of these measures began even earlier. In the schools participating in this study, these measures were being implemented during the course of the study. Consequently, students in all Croatian schools are now exposed to the effects of these measures. Given all of the above-mentioned, it is important to examine the current state of school climate in Croatian schools.

It is also important not to overlook the effect of the attack itself on the school climate. It is reasonable to assume that the perception of safety among the students at Prečko Elementary School in Zagreb was significantly affected. However, students at other schools in the surrounding area may also have been similarly impacted. Studies have shown that fear triggered by terrorist attacks in schools can increase not only among students in the schools directly affected, but also in the schools in their vicinity (47). It is, therefore, justifiable to expect that the negative effects of the aforementioned terrorist attack on school climate in the Zagreb area may go beyond the impact of the security measures introduced in all Croatian schools. The aim of this study was to examine and compare the school climates in vocational high schools in the City of Zagreb with those in vocational high schools in the rest of the Republic of Croatia during the implementation of these security measures.

METHOD AND RESULTS

Participants

The study involved students from five vocational high schools in the Republic of Croatia. The schools were located in the cities of Zagreb, Rijeka, Zadar, Varaždin, and Opatija. A total of 642 students participated, of which 171 were female students and 471 were male students. The participants included students from the first to the fourth grade of high school.

sudjelovalo 642 učenika od kojih 171 učenica i 471 učenik. Sudionici su bili učenici od prvog do četvrtog razreda srednje škole.

Postupak

Prikupljanje podataka provedeno je putem online upitnika izrađenog pomoću Google Obrasci alata. Za mjerenje školske klime korišten je Hrvatski upitnik o školskoj klimi za učenike (1). Upitnik je sadržavao standardizirane tvrdnje kojima se mjerila percepcija učenika o školskoj klimi uključujući njihov osjećaj sigurnosti te odnose s vršnjacima i nastavnicima. Upitnik sadrži ukupno 15 tvrdnji. Odgovori se bilježe na Likertovoj ljestvici koja označuje stupanj slaganja s tvrdnjom od 1 do 5, pri čemu 1 znači "potpuno se slažem", a 5 "uopće se ne slažem". Ukupan rezultat formira se kao zbroj odgovora na svim česticama te se kreće u rasponu od 15 do 75. Viši rezultat ukazuje na to da učenici percipiraju pozitivniju školsku klimu. Pouzdanost izražena Cronbach alfa koeficijentom iznosi 0,90 što je zadovoljavajuća mjera pouzdanosti (1). Poveznica na upitnik poslana je elektroničkim putem preko školskih kanala, poput e-pošte ili školskih komunikacijskih platformi, uz pomoć školskog osoblja i nastavnika.

Sudjelovanje u istraživanju bilo je dobrovoljno i anonimno. Poštivane su sve smjernice Etičkog kodeksa za istraživanje s djecom. Istraživanje nije ni na koji način štetilo djetetu. Dana je uputa o mogućnosti obraćanja eksperimentatorima ako sudionici pri ispunjavanju osjete bilo kakvu nelagodu. Sudionici su bili informirani o svrsi istraživanja, povjerljivosti njihovih odgovora te o njihovom pravu da u bilo kojem trenutku odustanu bez ikakvih posljedica. Sudionicima je dano uputstvo da samostalno ispune upitnik, bez rasprave s vršnjacima, i da na sva pitanja odgovore iskreno, temeljem vlastitog iskustva. Istraživanje nije uključivalo bilo kakvu eksperimentalnu manipulaciju osim prirodno prisutnih razlika u školskom okruženju.

Procedure

Data collection was conducted using an online questionnaire created using the Google Forms tool. The Croatian School Climate Questionnaire for Students (1) was used to measure the school climate. The questionnaire included standardized items measuring the students' perception of school climate, including their sense of safety and their relationships with peers and teachers. The questionnaire contained 15 statements. The responses were marked on a 5-point Likert scale, indicating the degree of agreement with each statement, whereby 1 meant "I completely agree", and 5 meant "I completely disagree". The total result was formed as the sum of responses to all items, and ranged between 15 and 75. A higher score indicated that the students perceived a more positive school climate. The reliability expressed by the Cronbach alpha coefficient amounted to 0.90, which is a satisfactory measure of reliability (1). The link to the questionnaire was distributed electronically through school channels, such as email or school messaging platforms, with the assistance of school staff and teachers.

Participation was voluntary and anonymous. All guidelines of the ethical standards for research involving children were followed throughout the study. The study course did not cause harm to any child in any way. The participants were instructed to contact the researchers if they experienced any discomfort while completing the tasks. The participants were informed about the purpose of the study, the confidentiality of their responses, and their right to withdraw at any time without consequence. The participants were instructed to complete the questionnaire individually, without discussion with peers, and to answer all questions honestly, based on their personal experiences. The study did not involve any experimental manipulation beyond the naturally occurring differences in school environments. The variables were, therefore, observed rather than manipulated, and the assignment to "experimental conditions" (Zagreb vs. other cities) was based on location rather than randomization.

Stoga su varijable opažane, a ne manipulirane, a raspodjela u „eksperimentalne uvjete” (Zagreb naspram drugih gradova) temeljila se na lokaciji, a ne na nasumičnom odabiru.

REZULTATI

U sljedećem dijelu prikazani su deskriptivni podatci o školskoj klimi s obzirom na lokaciju škole. Budući da su pretpostavke za parametrijsku analizu bile zadovoljene, aritmetička sredina (M) korištena je kao mjera središnje tendencije, a standardna devijacija (SD) kao mjera raspršenosti. Rezultati su prikazani kao bodovi na upitniku o školskoj klimi (tablica 1).

U ovom su istraživanju učenici, u prosjeku, iskazali umjereno pozitivnu školsku klimu u svojim školama (M=51,4, SD=12,23). Kako bi se utvrdilo postoji li razlika u školskoj klimi s obzirom na lokaciju škole, provedena je t-test analiza za nezavisne uzorke. Utvrđena je statistički značajna razlika u školskoj klimi između škola u gradu Zagrebu i škola izvan Zagreba (t=3,013, df=137,974, p=.003). Škole u Zagrebu imale su negativniju školsku klimu (M=47,93, SD=12,88) u usporedbi s ostalim školama (M=52,06, SD=12).

Slika 1 grafički prikazuje prosječne školske klime prema lokaciji škole.

RASPRAVA

Cilj ovog istraživanja bio je procijeniti i usporediti školsku klimu u strukovnim srednjim školama smještenima u gradu Zagrebu s oni-

RESULTS

The following section presents descriptive data on school climate taking into consideration the school location. Since the assumptions for parametric analysis were met, the arithmetic mean (M) was used as the measure of central tendency, and standard deviation (SD) was used as the measure of dispersion. The results are presented as scores on the school climate questionnaire (Table 1).

The students in this study, on average, expressed experiencing a moderately positive school climate in their schools (M=51.4, SD=12.23). In order to determine whether there were differences in school climate based on school location, an independent samples t-test was conducted. A statistically significant difference was found in school climate between schools in the City of Zagreb and those outside of Zagreb (t=3.013, df=137.974, p=.003). The schools in Zagreb had a more negative school climate (M=47.93, SD=12.88) compared to the other schools (M=52.06, SD=12).

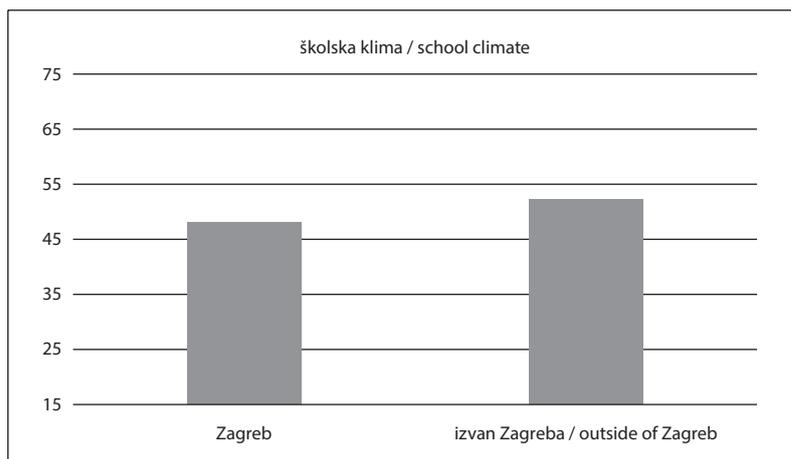
Figure 1 presents a graphical representation of the average school climate based on school location.

DISCUSSION

The aim of this study was to assess and compare the school climate in vocational high schools located in the City of Zagreb and those in other regions of Croatia. On average, the students reported moderately positive school climate in their schools. However, a statistically signifi-

TABLICA 1. Deskriptivni podatci školske klime prema lokaciji škole izraženi kao bodovi na upitniku o školskoj klimi
TABLE 1. Descriptive data on school climate based on school location, expressed as scores on the school climate questionnaire

lokacija škole / School location	školska klima / School climate	
	M	SD
Zagreb	47,93	12,88
izvan Zagreba / Outside of Zagreb	52,06	12



SLIKA 1. Prosječna školska klima prema lokaciji škole izražena bodovima na upitniku o školskoj klimi
FIGURE 1. Average school climate based on school location, expressed as scores on the school climate questionnaire

ma u drugim dijelovima Hrvatske. U prosjeku, učenici su izvijestili o umjereno pozitivnoj školskoj klimi u svojim školama. Ipak, utvrđena je statistički značajna razlika između školske klime škola u Zagrebu i onih izvan tog područja. Točnije, škole u Zagrebu imale su negativniju školsku klimu u usporedbi sa školama u drugim regijama. Ovakvim rezultatima može pridonijeti više različitih čimbenika. Uzrok te razlike nije bilo moguće točno utvrditi na temelju ovog istraživanja.

Zabrinutost zbog mogućih terorističkih napada u školi povezana je s povišenom anksioznošću, depresijom i paničnim napadima. Taj efekt je prisutan i kada nema stvarnih napada (49). Međutim, u slučaju stvarnog terorističkog napada percepcija sigurnosti među učenicima značajno pada i samo djelomično se vraća na prijašnje razine tijekom nekoliko mjeseci (50). Nakon terorističkog napada koji se dogodio u SAD-u u osnovnoj školi u Uvaldeu učenici, roditelji i nastavnici su pokazivali dugotrajne simptome anksioznosti, nesanice i posttraumatskog stresa (51). Prema tome, efekt napada u Osnovnoj školi Prečko na školsku klimu osjetio bi se i dalje tijekom provedbe ovog istraživanja. Nadalje, rezultati su u skladu s prethodnim istraživanjima koja pokazuju kako se školska klima može značajno razlikovati među različitim obrazovnim sredinama (52). Ipak, ono što

significant difference was found between the school climate in schools in Zagreb and those outside the area. More precisely, the schools in Zagreb had a more negative school climate compared to schools in other regions. There could be multiple factors contributing to these results. The exact cause of the difference could not be accurately determined based on this study alone.

Worry about potential terrorist attacks at schools is associated with increased anxiety, depression, and panic attacks. This effect is present even in the absence of real attacks (49). However, in the event of an actual terrorist attack, the students' perception of safety decreases significantly, and it only partially returns to previous levels over the course of several months (50). After the terrorist attack that took place in the United States at the elementary school in Uvalde, the students, parents and teachers exhibited long-lasting symptoms of anxiety, insomnia, and post-traumatic stress (51). Therefore, the impact of the attack at Prečko Elementary School on the school climate would still be felt during the implementation of this study. Furthermore, the results are consistent with previous studies, which suggest that the school climate can vary significantly across different educational environments (52). However, a particularly noteworthy aspect of these findings is the direction of the difference and the fact that schools in one specific re-

je važno naglasiti u ovim nalazima jest smjer te razlike i činjenica da se škole u jednoj specifičnoj regiji—Zagrebu—značajno razlikuju od škola u ostalim dijelovima Hrvatske. Jedno od mogućih objašnjenja, uzimajući u obzir jedinstvene karakteristike zagrebačkog područja u odnosu na druge gradove, jest broj stanovnika i sve što sa sobom nosi život u gradu te veličine. Zagreb je najveći grad u Hrvatskoj, a razlika u broju stanovnika između Zagreba i ostalih gradova čimbenik je kojeg je bitno uzeti u obzir. Neka istraživanja pokazuju da je školska klima pozitivnija u manjim školama i manjim mjestima u usporedbi s većim gradovima (53), ali ti rezultati variraju (48). Stoga treba istražiti i alternativna objašnjenja zašto je školska klima bila lošija upravo u zagrebačkom području. Najznačajnija razlika između zagrebačkog područja i drugih područja Hrvatske u vrijeme provođenja ovog istraživanja jest događaj terorističkog napada u Zagrebu.

Događaji, poput terorističkog napada u Osnovnoj školi Prečko u Zagrebu, mogu imati dugotrajan utjecaj na školsku klimu, ne samo u pogođenoj školi, već i u okolnim školama (47). Prvo, učenici u školama na zagrebačkom području bili su izloženi informacijama o napadu. Detalji napada postali su javno dostupni čime je čitavo hrvatsko stanovništvo, uključujući sve učenike, bilo izloženo informacijama o tom događaju. To je vjerojatno imalo značajno utjecalo na osjećaj sigurnosti među učenicima. Medijsko izvještavanje o zločinima može uvelike oblikovati percepciju opasnosti u javnosti suptilno povećavajući strah osobito u slučajevima rijetkih, strašnih i šokantnih zločina (54), posebno u adolescentskoj populaciji (55). Gerbner i Gross (56) su istaknuli snažan utjecaj koji televizija ima na to kako ljudi percipiraju svijet i njegove opasnosti. Medijsko prikazivanje zločina povećava percipiranu vjerojatnost suočavanja s nasiljem (56).

Istraživanja utjecaja televizijskog izvještavanja o zločinima pokazala su pozitivnu pove-

gion—Zagreb—differ significantly from those in the other parts of Croatia. One possible explanation, considering the unique characteristics of the Zagreb area compared to other cities, is its population size and all the factors that are associated with living in a city of that size. Zagreb is the largest city in Croatia, and the difference in population size between Zagreb and other cities is an important factor to consider. Some studies have found that school climate tends to be more positive in smaller schools and towns compared to larger cities (53), however, these findings vary (48). Alternative explanations should, therefore, be explored to discover why the school climate was worse specifically in the Zagreb area. The biggest observable difference between the Zagreb area and the rest of Croatia at the time of this study, was the occurrence of the terrorist attack that took place in Zagreb.

Events such as the terrorist attack at Prečko Elementary School in Zagreb can have a long-lasting effect on the school climate, not only in the affected school, but also in the schools nearby (47). First, students attending the schools in the Zagreb area were exposed to information about the attack. The details of the attack were made public, which exposed the entire Croatian population, including all students, to information about the incident. This likely had a significant impact on the students' perception of safety. Media coverage of crimes can greatly influence the public perception of danger, subtly increasing fear especially in cases of rare, horrific and sensational crimes (54), which is especially prominent in the adolescent population (55). Gerbner and Gross (56) highlighted the strong influence of television on the manner in which people perceive the world and its dangers. The portrayal of crimes in the media increases the perceived likelihood of encountering violence (56).

Studies on the effect of television coverage of crimes have shown a positive association between fear and viewers who share similarities with the victims. The more similar the viewers

zanost između straha i gledatelja koji dijele sličnosti sa žrtvama. Što su se gledatelji više poistovjećivali sa žrtvama, to su doživljavali veće razine straha (57). Ovo je važno uzeti u obzir jer su se učenici u zagrebačkom području vjerojatno najviše poistovjećivali s učenicima škole u kojoj se napad dogodio. Moguće je da je percepcija sigurnosti, a posljedično i školska klima među učenicima na zagrebačkom području, bila značajno negativno pogođena prethodno spomenutim terorističkim napadom. Ipak, kao potencijalno ograničenje ovog istraživanja važno je naglasiti da se napad dogodio u osnovnoj školi, a istraživanje je provedeno nad učenicima srednjih škola. Međutim, Kaminski i sur. (47) utvrdili su da takvi teroristički napadi povećavaju strah ne samo među učenicima u izravno pogođenim školama, već i u geografski bliskim školama. Nadalje, istraživanja su pokazala da je taj strah bio direktno povezan s geografskom blizinom zločina. Što su ispitanici živjeli bliže mjestu zločina, to su prijavljivali veće razine straha (58,59).

Kao odgovor na teroristički napad u Prečkom, u školama diljem Hrvatske uveden je niz fizičkih sigurnosnih mjera poput zaključavanja vrata te dežuranja na ulazu (45,46). Istraživanja su pokazala da sigurnosne mjere sprječavanja poput sigurnosnih kamera, zaštitara te zaključavanje vrata ne doprinosi smanjenju nasilja u školama niti osjećaju sigurnosti (60). Iako te mjere mogu utjecati na osjećaj sigurnosti i školsku klimu (42), primijenjene su jednako na razini cijele države. Uzevši u obzir primjenu mjere na području cijele Hrvatske, razlike u školskoj klimi između škola na zagrebačkom području i ostalim područjima Hrvatske vjerojatno se mogu pripisati alternativnom uzroku, potencijalno navedenom terorističkom napadu. Ipak, s obzirom na značajnu ulogu koju školska klima ima na dobrobit učenika i njihov akademski uspjeh (61), od velikog je značenja da odgovorni za donošenje odluka u

were to the victims, the higher were the levels of fear they experienced (57). This is important to consider, as students in the Zagreb area may have felt they had the most in common with the students at the school where the attack occurred. It is possible that the perception of safety, and consequently the school climate among students in the Zagreb area, were significantly negatively affected by the aforementioned terrorist attack. However, as a potential limitation of this study, it is important to emphasize that the incident occurred in an elementary school, while our study was conducted among high school students. Nevertheless, Kaminski et al. (47) observed that such terrorist attacks increase fear not only among students in schools that are directly affected, but also in schools that are geographically nearby. Furthermore, studies have shown that this fear was directly associated with geographical proximity to the crime. The closer the subjects lived to the crime site, the more fear they reported (58, 59).

In response to the terrorist attack in Prečko, a series of physical security measures were introduced in schools across Croatia, such as locking the doors and monitoring the entrances (45, 46). Studies have shown that preventive security measures such as surveillance cameras, the presence of security guards, and locking the doors do not contribute to reducing violence in schools or to the sense of safety (60). Although these measures can impact the sense of safety and the school climate (42), they were applied uniformly across the country. Considering that the measures were applied across the entire territory of Croatia, the differences in school climate between schools in the Zagreb area and the rest of the country can likely be attributed to an alternative cause, potentially the aforementioned terrorist attack. Nevertheless, given the significant role that the school climate plays in the students' well-being and their academic success (61), it is of great importance that those who are responsible for decision-making in the field of education

obrazovanju i članovi školske uprave prepoznaju važnost intervencija s ciljem poboljšanja školske klime. Provedba ciljanih intervencija za poboljšanje školske klime u zagrebačkim školama mogla bi unaprijediti iskustvo obrazovanja te postignuća učenika.

ZAKLJUČAK

Statistički značajna razlika u školskoj klimi pronađena je između škola grada Zagreba i onih izvan Zagreba. Škole u Zagrebu pokazale su negativniju školsku klimu u usporedbi sa školama drugih područja. Školska klima u Zagrebu je negativnija, ali se ne može sa sigurnošću utvrditi je li to posljedica napada koji se dogodio u prosincu 2024. u Osnovnoj školi Prečko. Iako rezultati upućuju na negativniju školsku klimu u zagrebačkim strukovnim školama, potrebno je provesti daljnja istraživanja, uključujući veći broj škola, kako bi se istražili mogući uzroci ovih nalaza.

and the members of school administrations recognize the importance of interventions aimed at improving the school climate. Implementing targeted interventions to improve school climate in schools in Zagreb could enhance the students' educational experiences and achievements.

CONCLUSION

A statistically significant difference was found in terms of school climate between the schools in the City of Zagreb and those outside of Zagreb. The schools in Zagreb exhibited a more negative school climate compared to the schools in other regions. The school climate in Zagreb is more negative, however, whether this is due to the attack that occurred in December 2024 at Prečko Elementary School, could not be definitively determined. Although the results suggest a more negative school climate in vocational schools in Zagreb, further studies that would include a larger number of schools should be implemented in order to explore the potential causes for these findings.

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Kognitivno-bihevioralna terapija temeljena na zaključivanju za opsesivno-kompulzivni poremećaj kod djece i adolescenata

/ Inference-Based Cognitive-Behavioral Therapy for Obsessive-Compulsive Disorder in Children and Adolescents

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Kognitivno-bihevioralna terapija temeljena na zaključivanju (engl. *Inference-Based Cognitive-Behavioral Therapy*, I-CBT) (I-KBT) nudi konceptualno različit pristup opsesivno-kompulzivnom poremećaju (OKP) od tradicionalnog KBT modela, naglašavajući *inferencijalnu zbuđenost* - tendenciju tretiranja zamišljenih mogućnosti kao ekvivalentnih stvarnosti - i kako kompulzije pojačavaju tu pogrešnu percepciju. Isticanjem razlike između imaginacije i stvarnosti, I-KBT cilja kognitivne procese koji održavaju opsesivno razmišljanje. Iako studije na odraslima pokazuju pozitivne ishode, primjena kod djece i adolescenata je za sada u početcima. Ovaj članak donosi pregled teorijskih postavki I-KBT-a, razmatra ključne razvojne čimbenike i ilustrira kliničku primjenu prikazom slučaja 13-godišnje djevojčice s prisilnim mislima povezanim s opasnošću i kompulzivnim ritualima. Razvojni aspekti poput pojačanog kapaciteta za imaginaciju, razvoja metakognicije i prilagodbi u obitelji kod pedijatrijskog OKP ispituju se kao čimbenici koji doprinose održavanju simptoma i potencijalne točke terapijskog djelovanja. Integrirajući dokaze iz istraživanja I-KBT-a kod odraslih s dokazanim pedijatrijskim OKP intervencijama rasprava identificira mogućnosti za inovacije i prilagodbu. Unatoč nedostatku kontroliranih pedijatrijskih ispitivanja, preliminarna klinička opažanja sugeriraju da I-KBT može poslužiti kao razvojno osjetljiva alternativa ili dodatak KBT tehnici izlaganja za djecu. Buduća istraživanja trebala bi procijeniti izvedivost, mehanizme promjene i ulogu uključenosti roditelja. Sveukupno, I-KBT predstavlja obećavajuću intervenciju u razvoju koja može proširiti mogućnosti liječenja za djecu i adolescente s OKP-om.

/ Inference-Based Cognitive-Behavioral Therapy (I-CBT) offers a distinct approach to obsessive-compulsive disorder (OCD) that is conceptually different than the traditional CBT model, emphasizing inferential confusion – the tendency to treat imagined possibilities as equivalent to reality – and how compulsions reinforce this misperception. By highlighting the difference between imagination and reality, I-CBT targets the cognitive processes that maintain obsessive thinking. Although studies on adults have shown promising outcomes, its application in children and adolescents remains limited. This article reviews the theoretical foundations of I-CBT, considers the key developmental factors, and illustrates its clinical application through a case report of a 13-year-old girl with danger-related intrusive thoughts and compulsive rituals. Developmental aspects such as heightened imaginative capacity, evolving metacognition, and family accommodation in cases of pediatric OCD are examined as contributors to symptom maintenance and potential therapeutic leverage points. By integrating the evidence obtained from adult-based I-CBT studies with established pediatric OCD interventions, the discussion identifies the opportunities for innovation and adaptation. Despite the lack of controlled pediatric trials, preliminary clinical observations suggest that I-CBT may serve as a developmentally sensitive alternative or complement to exposure-based CBT for children. Future studies should evaluate the feasibility, mechanisms of change, and the role of parental involvement. Overall, I-CBT represents a promising emerging intervention capable of expanding the treatment options for children and adolescents with OCD.

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Opsesivno-kompulzivni poremećaj (OKP) je kronični i iscrpljujući poremećaj koji se često manifestira u djetinjstvu, a karakteriziraju ga prisilne misli i ponavljajuća ponašanja koja značajno utječu na funkcioniranje djeteta. Kognitivno-bihevioralna terapija (KBT) se smatra prvom linijom psihološkog liječenja za dječji OKP i pokazala je snažnu učinkovitost u smanjenju simptoma (1-3). Standardni KBT protokoli naglašavaju identifikaciju i restrukturiranje maladaptivnih kognicija, izlaganje zastrašujućim podražajima i primjenu adaptivnih strategija suočavanja. Brojna randomizirana kontrolirana ispitivanja potvrdila su učinkovitost KBT-a u smanjenju simptoma i poboljšanju funkcioniranja kod dječjeg OKP-a (4,5). Ipak, klinička opažanja i empirijski podatci podjednako sugeriraju da značajna podskupina djece s OKP-om ne postiže punu remisiju nakon standardnog KBT-a (1,2). U liječenju dječjeg OKP-a, na primjer, izostanak odgovora i djelomični odgovor ostaju česti, što naglašava potrebu za usavršavanjem i proširenjem postojećih terapijskih pristupa (5).

Kognitivno-bihevioralna terapija temeljena na zaključivanju (engl. *Inference-Based Cognitive-Behavioral Therapy*, I-CBT) (I-KBT) je takvo poboljšanje. Izvorno razvijena za odrasle s OKP-om otpornim na liječenje, I-KBT pomiče terapijski fokus sa sadržaja prisilnih misli na

INTRODUCTION

Obsessive-compulsive disorder (OCD) is a chronic and debilitating disorder that often manifests in childhood, characterized by intrusive thoughts and repetitive behaviors that significantly impact the affected child's functioning. Cognitive-behavioral therapy (CBT) is widely regarded as the first-line psychological treatment for pediatric OCD, and has demonstrated robust efficacy in symptom reduction (1-3). Standard CBT protocols emphasize the identification and restructuring of maladaptive cognitions, exposure to feared stimuli, and the application of adaptive coping strategies. Numerous randomized controlled trials have confirmed the efficacy of CBT in reducing the symptoms and improving functioning in pediatric OCD (4, 5). Nevertheless, clinical observations and empirical data both suggest that a significant subset of children with OCD do not achieve full remission following standard CBT treatment (1, 2). In the treatment of pediatric OCD, for example, nonresponse and partial response remain common, underscoring the need for refinement and expansion of the existing therapeutic approaches (5).

Inference-Based Cognitive-Behavioral Therapy (I-CBT) represents one such refinement. Originally developed for adults with treatment-resistant OCD, I-CBT shifts the therapeutic focus from the content of intrusive thoughts to the

processe zaključivanja koji ih uzrokuju (6,7). Ovaj pristup naglašava razliku između zaključivanja na stvarnosti, koje se temelji na senzornim dokazima i zajedničkoj stvarnosti, i zaključivanja temeljenog na mogućnostima, u kojem pojedinac tretira zamišljene mogućnosti kao da su vjerojatne ili stvarne. Fokusirajući se na procese zaključivanja koji su u osnovi sumnje I-KBT nudi novi put za terapijsku promjenu, posebno u slučajevima u kojima je tradicionalna KBT bila samo djelomično učinkovita.

Iako su razvoj i empirijska validacija I-KBT-a ponajprije provedeni na odrasloj populaciji, ovaj pristup nosi značajan potencijal za mlade pacijente. Djeca zbog svoje razvojne faze često pokazuju pojačan kapacitet za imaginaciju, fluidnu granicu između fantazije i stvarnosti te ograničenu metakognitivnu svjesnost. Ove razvojne karakteristike, iako u mnogim aspektima adaptivne, mogu djecu učiniti posebno osjetljivima na različite inferencijalne pogreške i razvoj OKP-a. Rani dokazi upućuju na to da I-KBT može ponuditi usporedivu učinkovitost s tradicionalnom KBT-om, a istovremeno potencijalno poboljšati podnošljivost i prihvatljivost liječenja u pedijatrijskoj populaciji (7,8).

Važno je da I-KBT ne odbacuje imaginaciju kod djece kao maladaptivnu. Umjesto toga, na kapacitet za imaginaciju se gleda kao prirodnu ljudsku snagu, a istovremeno pomaže djeci da nauče procijeniti kada je zaključivanje temeljeno na mogućnostima zavaravajuće. Ova razlika može biti posebno relevantna u razvojnim kontekstima, jer mnoga djeca s OKP-om ili anksioznim poremećajima izvještavaju da im se njihovi nametljivi strahovi čine „stvarni“ unatoč tome što ih prepoznaju kao malo vjerojatne. Vodeći djecu da ponovno utemelje svoje zaključivanje u dokazima temeljenim na stvarnosti, I-KBT ih može osnažiti da se odupru kompulzivnim ritualima i smanje oslanjanje na izbjegavajuća ponašanja.

Cilj ovog prikaza je doprinijeti ovom novom području prikazom konceptualnih temelja

reasoning processes that give rise to them (6, 7). This approach emphasizes the difference between reality-based reasoning, which is grounded in sensory evidence and shared reality, and possibility-based reasoning, in which the individual treats imagined possibilities as if they were probable or real. By focusing on the inferential processes that underlie doubt, I-CBT offers a novel route for therapeutic change, particularly in cases where traditional CBT has been only partially effective.

Although the development and empirical validation of I-CBT have primarily been undertaken in adult populations, this approach holds significant potential for younger patients. Children, by virtue of their developmental stage, often display heightened imaginative capacity, a fluid boundary between fantasy and reality, and limited metacognitive awareness. These developmental characteristics, while adaptive in many respects, may also render children particularly vulnerable to various inferential errors and the development of OCD. Early evidence suggests that I-CBT efficacy may be comparable to traditional CBT, all the while potentially improving treatment tolerability and acceptability in pediatric populations (7, 8).

Importantly, I-CBT does not dismiss children's imagination as maladaptive. Instead, it validates imaginative capacity as a natural human strength, and at the same time helps children learn to evaluate when possibility-based reasoning could be misleading. This difference may be particularly relevant in developmental contexts, as many children with OCD or anxiety disorders report that their intrusive fears seem "real" despite recognizing them as unlikely. By guiding children to re-anchor their reasoning in reality-based evidence, I-CBT can empower them to resist compulsive rituals and reduce reliance on avoidance behaviors.

The present article aims to contribute to this emerging field by outlining the conceptual foundations of I-CBT and exploring its clini-

I-KBT-a i njegove kliničke primjene u populaciji djece i adolescenata. Prvo, razmatramo teorijske postavke pristupa temeljenog na zaključivanju s naglaskom na njegovu jedinstvenu konceptualizaciju pogrešaka u zaključivanju kod OKP-a. Drugo, prikazujemo razvojne specifičnosti koje utječu na prilagodbu I-KBT-a za djecu uključujući ulogu imaginacije, metakognicije i uključenosti roditelja. Treće, predstavljamo kliničku primjenu i ilustrativni prikaz slučaja kako bismo prikazali terapijski proces. Konačno, raspravljamo o budućim smjernicama, uključujući prioritete u istraživanjima, metodološke izazove i potencijal I-KBT-a da se primjenjuje kao transdijagnostička intervencija u mentalnom zdravlju djece. Time želimo kliničarima, istraživačima i edukatorima pružiti okvir za razumijevanje i primjenu I-KBT-a u dječjoj populaciji. Povezivanjem teorije usmjerene na odrasle i prakse usmjerene na dijete, ovaj članak nastoji unaprijediti područje prema učinkovitijim, razvojno specifičnim intervencijama za djecu s OKP-om i srodnim poremećajima.

TEORIJSKE OSNOVE PRISTUPA TEMELJENOG NA ZAKLJUČIVANJU

Tradicionalni KBT modeli OKP-a naglašavaju disfunkcionalna uvjerenja – poput preuveličane odgovornosti, precjenjivanja prijetnje ili netolerancije neizvjesnosti – kao ishodišta za poremećaj (9). I-KBT, nasuprot tome, smješta opsesivno-kompulzivne fenomene na razinu procesa rasuđivanja, a ne sadržaja uvjerenja. Prema O'Connoru i Aardemi (10), prisilne misli postaju klinički relevantne opsesije ne zbog svog semantičkog sadržaja, već zbog neispravnog inferencijalnog lanca koji hipotetsku mogućnost pretvara u percipiranu vjerojatnost. Ovaj proces, nazvan inferencijalna zbunjenost (engl. *inferential confusion*), događa se kada pojedinci ne vjeruju dokazima baziranim na senzornim podražajima i umjesto toga se oslanjaju

cal applications in child and adolescent populations. First, we review the theoretical underpinnings of the inference-based approach, with a focus on its unique conceptualization of reasoning errors in OCD. Second, we examine the developmental specificities that affect the adaptation of I-CBT for children, including the role of imagination, metacognition, and parental involvement. Third, we present clinical applications and an illustrative case report to highlight the therapeutic process. Finally, we discuss future directions, including research priorities, methodological challenges, and the potential for I-CBT to serve as a transdiagnostic intervention in pediatric mental health. In doing so, we aim to provide clinicians, researchers, and educators with a framework for understanding and applying I-CBT in the pediatric population. By bridging the gap between adult-focused theory and child-focused practice, the aim of this article is to advance the field toward more effective, developmentally sensitive interventions for children struggling with OCD and related disorders.

THEORETICAL FOUNDATIONS OF THE INFERENCE-BASED APPROACH

Traditional CBT models of OCD emphasize dysfunctional beliefs – such as inflated responsibility, overestimation of threat, or intolerance of uncertainty – as central to the disorder (9). I-CBT, by contrast, situates obsessive-compulsive phenomena at the level of reasoning processes rather than belief content. According to O'Connor and Aardema (10), intrusive thoughts become clinically relevant obsessions not because of their semantic content, but because of the faulty inferential chain that transforms a hypothetical possibility into a perceived probability. This process, termed *inferential confusion*, occurs when individuals

na zamišljene mogućnosti na temelju kojih donose zaključke o stvarnosti (11).

Prema ovom gledištu, opsesije nisu prisilne misli koje izazivaju nelagodu, već obmanjujuće naracije konstruirane pogrešnim zaključivanjem. Klinička implikacija je duboka: umjesto da pacijente usmjerava u osporavanje vjerojatnosti događaja kojih se boje ili habituaciju na nelagodu izlaganjem, I-KBT radi na promjeni samog procesa zaključivanja. Pacijenti uče razlikovati zaključivanje utemeljeno na izravnim dokazima od zaključivanja potaknutog hipotetskom imaginacijom. Terapijski stav stoga naglašava odustajanje od opsesivne naracije na temelju toga da ona od početka nikada nije bila relevantna (11).

Terapijski proces započinje identificiranjem „točke sumnje“, trenutka kada osoba odbacuje senzorne informacije i ulazi u narativ OKP-a. Pacijent i terapeut zajednički mapiraju ovaj narativ – kako imaginarni scenarij (npr. šteta, kontaminacija, katastrofa) dobiva na vjerodostojnosti unatoč kontradiktornim dokazima – pojašnjavajući slijed koraka u pogrešnom zaključivanju koji proizvode opsesivnu sumnju (12). Ovo mapiranje pomaže pacijentima da prepoznaju da opsesije ne potječu od stvarnih znakova prijetnje u okolini, već od vlastitih narativa koje sami generiraju.

Primarna komponenta I-KBT-a je jačanje rasuđivanja temeljenog na stvarnosti. Pacijenti uče razlikovati ono što je poznato putem osjetila i kontekstualnih informacija od onoga što je samo zamišljeno. Strukturirane vježbe vode ih da procijene uvjerljivost svojih misli koristeći provjerljive dokaze, a ne hipotetske mogućnosti (10). Istraživanja pokazuju da povećano oslanjanje na senzorne informacije smanjuje opsesivnu sumnju i slabi percipiranu vrijednost kompulzija (11).

Budući da imaginacija ima središnju ulogu u opsesijama, I-KBT uči pacijente da tretiraju prisilne misli i slike kao izmišljene „priče OKP-a“,

distrust sensory evidence and instead rely on imagined possibilities to draw conclusions about reality (11).

In this view, obsessions are not intrusive cognitions that trigger distress, but rather misleading narratives constructed through erroneous reasoning. The clinical implication is profound: rather than engaging patients in disputing the likelihood of feared events or habituating to distress through exposure, I-CBT works to dismantle the inferential process itself. Patients learn to differentiate between reasoning grounded in direct evidence and reasoning fueled by hypothetical imagination. The therapeutic stance, therefore, emphasizes disengagement from the obsessive narrative on the grounds that it was never relevant to begin with (11).

The therapeutic process begins by identifying the “point of doubt,” the moment when the person abandons sensory-based information and enters the OCD narrative. The patient and the therapist collaboratively map this narrative – how an imagined scenario (e.g. harm, contamination, catastrophe) gains credibility despite contradictory evidence – by clarifying the sequence of erroneous inferential steps that produce obsessive doubt (12). This mapping helps patients recognize that obsessions originate not from real threat cues in the environment, but from internally generated narratives.

The primary component of I-CBT is strengthening reality-based reasoning. Patients learn to distinguish what is known through the senses and contextual information from what is merely imagined. Structured exercises guide them to evaluate the plausibility of their thoughts using verifiable evidence rather than hypothetical possibilities (10). Research shows that increasing reliance on sensory information reduces obsessive doubt and weakens the perceived value of compulsions (11).

a ne kao upozorenja. Tehnike poput označavanja narativa OKP-a, decentriranja od slika i uspoređivanja imaginarnih događaja sa znakovima iz stvarnog svijeta pomažu pacijentima da smanje uvjerljivu moć ovih unutarnjih scenarija (12). Terapija također ispravlja pristranosti u rasuđivanju koje su uobičajene kod OKP-a, uključujući nepovjerenje u osjetila i inverzno zaključivanje – zaključivanje o opasnosti iz zamišljenih posljedica umjesto iz trenutne stvarnosti (13).

Kako pacijenti usvajaju zdravije stilove razmišljanja, kompulzije se prirodno smanjuju. Za razliku od KBT-a temeljenog na izlaganju, I-KBT ne zahtijeva izravno suočavanje sa zastrašujućim podražajima; promjena ponašanja proizlazi iz korigiranog razmišljanja, a ne kao posljedica habituacije. To čini I-KBT posebno prikladnim za osobe koje imaju teškoća s primjenom tehnike izlaganja, uključujući često djecu i adolescente (14). U kasnijim seansama strategije sprječavanja recidiva pomažu pacijentima da prepoznaju rane znakove inferencijalne zbunjenosti i proaktivno primjenjuju razmišljanje temeljeno na stvarnosti.

Sveukupno, I-KBT pruža razvojno fleksibilnu i kognitivno usmjerenu alternativu tradicionalnim KBT pristupima. Izravnim rješavanjem pogrešaka u rasuđivanju koje generiraju opsesije I-KBT omogućuje pojedincima – i odraslima i djeci – da se oslobode sumnje, ponovno utemelje svoje razmišljanje u stvarnosti i smanje kompulzivno ponašanje.

Edukacija iz kognitivno-bihevioralne terapije temeljena na zaključivanju (I-KBT) pruža se putem specijaliziranih radionica, certificiranih programa i supervizirane kliničke prakse koju su razvili začetnici modela i pridružene institucije (15). Formalna edukacija obično uključuje teorijsku osnovu o inferencijalnoj konfuziji i procesima zaključivanja kod OKP-a, razvoj praktičnih vještina korištenjem strukturiranih modula i superviziju temeljenu na slučajevima kako bi se osigurala sukladnost modelu.

Since imagination plays a central role in obsessions, I-CBT teaches patients to treat intrusive thoughts and images as fictional “OCD stories” rather than warnings. Techniques such as labeling the OCD narrative, decentering from imagery, and comparing imagined events with real-world cues help patients reduce the persuasive power of these internal scenarios (12). Therapy also corrects the reasoning biases common in OCD, including distrust of the senses and inverse inference – inferring danger from imagined consequences rather than from the current reality (13).

As patients adopt healthier reasoning styles, compulsions naturally diminish. Unlike exposure-based CBT, I-CBT does not require direct confrontation with feared stimuli; behavioral change emerges from corrected reasoning rather than habituation. This makes I-CBT particularly suitable for individuals who struggle with exposure tasks, including many children and adolescents (14). In later sessions, relapse-prevention strategies help patients recognize early signs of inferential confusion and apply reality-based reasoning proactively.

Overall, I-CBT provides a developmentally flexible and cognitively focused alternative to traditional CBT approaches. By directly addressing the reasoning errors that generate obsessions, I-CBT enables individuals – both adults and children – to disengage from doubt, re-anchor their thinking in reality, and reduce compulsive behavior.

Training in Inference-Based Cognitive-Behavioral Therapy (I-CBT) is provided through specialized workshops, certification programs, and supervised clinical practice developed by the originators of the model and affiliated institutions (15). Formal training usually includes the theoretical basis of inferential confusion and reasoning processes in OCD, practical skill development using structured modules, and case-based supervision so as to ensure conformity with the model.

RAZVOJNE SPECIFIČNOSTI KOD PRIMJENE I-KBT

Iako je I-KBT u prvom redu razvijen i testiran kod odraslih osoba s opsesivno-kompulzivnim poremećajem (OKP), njegove teorijske pretpostavke i principi liječenja vrlo su relevantni za mlađe dobne skupine. Djeca su zbog svoje razvojne faze posebno sklona imaginarnom zaključivanju, teškoćama u razlikovanju mogućnosti od vjerojatnosti i izazovima u kritičkom vrednovanju valjanosti svojih zaključaka (16). Ove karakteristike stvaraju plodan kontekst za pojavu i održavanje opsesivno-kompulzivnih simptoma, kao i za anksiozne poremećaje koji su karakterizirani pretjeranim procjenama prijetnji. Prikazom razvojnih specifičnosti relevantnih za primjenu I-KBT-a unutar razvojnog okvira ovaj članak nastoji razmotriti i prednosti i izazove prilagođavanja intervencija temeljenih na zaključivanju za djecu.

Konceptualni temelji I-KBT-a usko su usklađeni sa suvremenim razvojnim i kognitivnim modelima dječje anksioznosti i OKP-a. Istraživanja u dječjoj psihologiji ističu da se djeca često više oslanjaju na heurističko zaključivanje, a manje na sustavno zaključivanje utemeljeno na dokazima u usporedbi s odraslima. Osim toga, deficiti u metakognitivnom praćenju – sposobnost promišljanja i procjene vlastitih misli – često se uočavaju kod dječje anksioznosti i OKP-a (17). Ove razvojne tendencije mogu pojačati inferencijalnu zbunjenost koja je ključna za opsesivnu sumnju. Izravnim terapijskim djelovanjem na procesa zaključivanja I-KBT nudi razvojno primjerenu intervenciju koja se bavi ključnim kognitivnim ranjivostima koje doprinose održavanju simptoma.

Klinički, prilagođavanje I-KBT-a djeci zahtijeva promišljeno razmatranje i razvojnih i kontekstualnih čimbenika. Terapijski proces mora biti pristupačan, zanimljiv i prilagođen kognitivnim i emocionalnim sposobnostima djeteta. To uključuje korištenje metafora, priča i vizualnih

DEVELOPMENTAL SPECIFICITIES IN I-CBT APPLICATION

Although I-CBT has been primarily developed and tested in adults with obsessive-compulsive disorder (OCD), its theoretical assumptions and treatment principles are highly relevant for younger age groups as well. Children, by virtue of their developmental stage, are especially prone to imaginative reasoning, difficulties in distinguishing possibility from probability, and challenges in critically evaluating the validity of their inferences (16). These characteristics create a fertile context for the emergence and maintenance of obsessive-compulsive symptoms, as well as for anxiety-related disorders that are characterized by exaggerated threat appraisals. By presenting the developmental specificities relevant to the application of I-CBT within a developmental framework, this article seeks to illuminate both the advantages and the challenges of adapting inference-based interventions for youth.

The conceptual foundations of I-CBT align closely with contemporary developmental and cognitive models of childhood anxiety and OCD. Studies in the field of child psychology highlight that children often rely more on heuristic reasoning and less on systematic evidence-based reasoning when compared to adults. Additionally, deficits in metacognitive monitoring – the ability to reflect on and evaluate one's own thoughts – are commonly observed in childhood anxiety and OCD (17). These developmental tendencies may amplify the inferential confusion central to obsessive doubt. By directly targeting the reasoning processes, I-CBT offers a developmentally congruent intervention that addresses the root cognitive vulnerabilities which contribute to symptom persistence.

Clinically speaking, adapting I-CBT for children requires thoughtful consideration of both developmental and contextual factors. The therapeutic process must be accessible, engaging, and tailored to the child's cognitive and emo-

pomagala za ilustraciju apstraktnih koncepata poput inferencijalne zbunjenosti i zaključivanja temeljenog na mogućnostima. Na primjer, terapeuti mogu koristiti metafore „detektivskog rada“ ili „kutije s dokazima“ kako bi pomogli djeci da vježbaju razlikovanje između dokaza temeljenih na stvarnosti i imaginarnih scenarija. Štoviše, roditelji imaju ključnu ulogu u podržavanju generalizacije vještina i smanjenju prilagodbi na djetetovo kompulzivno ponašanje u obitelji (18). Uključenost roditelja ne samo da jača intervenciju, već pruža i priliku za rješavanje procesa razmišljanja u obitelji i odgovora na neizvjesnost.

Na primjer, za 11-godišnjeg dječaka koji odbija dodirivati kvake u školi zbog straha od zaraze smrtonosnom bolešću s gledišta tradicionalne kognitivno-bihevioralne terapije (KBT), liječenje može uključivati izlaganje dodirivanju kvaka u kombinaciji s prevencijom odgovora odnosno izvršavanja kompulzija, dok s gledišta I-KBT-a, intervencija započinje ispitivanjem inferencijalnog „skoka“ koji ju transformirao neutralnu kvaku u objekt opasan za život. Vođenim ispitivanjem terapeut pomaže djetetu da prepozna da strah nije bio utemeljen na izravnim dokazima (npr. „Što si zapravo vidio ili osjetio kada si pogledao kvaku?“) već na zamišljenoj mogućnosti („Zamislilo sam nevidljive klice koje bi me mogle ubiti“). Eksternalizacijom inferencijalnog lanca terapeut osnažuje dijete da misao označi kao nebitnu mogućnost, a ne kao vjerojatnu stvarnost. S vremenom dijete uči ponovno utemeljiti rasuđivanje na dokazima sadašnjeg trenutka smanjujući značenje opsesivnih sumnji i smanjujući prisilu za izvođenjem rituala.

Unatoč potencijalu I-KBT kod djece, empirijska evaluacija I-KBT-a kod djece još je u začetku. Preliminarne studije na odraslim populacijama pokazuju da I-KBT dovodi do značajnog i produljenog smanjenja simptoma OKP-a, čak i među osobama koje nisu reagirale na KBT temeljenoj na izlaganju (10,11). Prenošenje

tional capacities. This involves the use of metaphors, stories, and visual aids to illustrate abstract concepts such as inferential confusion and possibility-based reasoning. For example, therapists may employ metaphors of “detective work” or “evidence boxes” in order to help children practice distinguishing between reality-based clues and imagined scenarios. Moreover, parents play a crucial role in supporting skill generalization and reducing accommodation to the child’s compulsive behaviors (18). Parental involvement not only strengthens the intervention, but also provides an opportunity to address the family’s own reasoning processes and responses to uncertainty.

For example, if we consider an 11-year-old boy who refuses to touch doorknobs at school due to fears of contracting a fatal illness, from a traditional CBT standpoint, treatment might involve exposure to touching doorknobs combined with response prevention, i.e. refraining from performing the compulsion, but from an I-CBT standpoint the intervention begins by examining the inferential “leap” that transformed a neutral doorknob into a life-threatening object. Through guided questioning, the therapist helps the child recognize that the fear was not grounded in direct evidence (e.g. “What did you actually see or sense when you looked at the doorknob?”), but instead in an imagined possibility (“I imagined invisible germs that could kill me”). By externalizing the inferential chain, the therapist empowers the child to label the thought as an irrelevant possibility rather than a probable reality. Over time, the child learns to re-anchor their reasoning in present-moment evidence, reducing the significance of obsessive doubts and diminishing the compulsion to perform rituals.

Despite its potential in the treatment of children, the empirical evaluation of I-CBT with children is still in its infancy. Preliminary studies in adult populations have shown that I-CBT produces significant and sustained reductions in

ovih rezultata na populaciju djece zahtijeva sustavnu prilagodbu, pilot testiranja i rigorozna klinička ispitivanja. Iako je standardni KBT s izlaganjem i prevencijom odgovora opsežno istraživano za pedijatrijski OKP (2-5,19), trenutno postoje ograničena empirijska istraživanja koja ispituju model temeljen na zaključivanju u mlađim populacijama (7,8). Ključna pitanja ostaju u vezi s optimalnom dobi za početak primjene I-KBT-a, stupnjem potrebnog sudjelovanja roditelja i mehanizmima kojima djeca internaliziraju vještine zaključivanja - posebno s obzirom na kontinuirano sazrijevanje metakognitivnih i apstraktnih sposobnosti zaključivanja kod djece (20). Rješavanje ovih pitanja bit će ključno za utvrđivanje I-KBT-a kao intervencije utemeljene na dokazima u mentalnom zdravlju djece i adolescenata te za generalizaciju njegove koristi potvrđene kod odraslih na pedijatrijske prezentacije OKP-a.

Kao i kod odraslih, klinička primjena I-KBT-a kod djece proteže se izvan OKP-a. Iako je OKP do danas bio primarni fokus istraživanja temeljenih na zaključivanju, pogreške u zaključivanju temeljene na mogućnostima također su vidljive kod generaliziranog anksioznog poremećaja, zdravstvene anksioznosti i specifičnih fobija. Identificiranjem pogrešaka u zaključivanju koje leže u osnovi ovih obrazaca razmišljanja terapeuti mogu proširiti principe I-KBT-a na niz pedijatrijskih prezentacija anksioznosti ističući potencijalnu transdijagnostičku korisnost modela.

PRIKAZ BOLESNICE

Prikazujemo slučaj 13-godišnje djevojčice negativne obiteljske anamneze za psihijatrijske poremećaje. Tijek trudnoće, porod i rani psihomotorni razvoj su bili uredni, bez odstupanja. Prije početka poremećaja bila je odlična učenica, živjela je u stabilnom obiteljskom okruženju s oba roditelja i mladom sestrom. Aktivno se bavila atletikom i imala uredne odnose s

OCD symptoms, even among individuals who did not respond to exposure-based CBT (10, 11). Translating these findings to pediatric populations requires systematic adaptation, pilot testing and rigorous clinical trials. Although the standard CBT with exposure and response prevention is well-researched for use with pediatric OCD (2-5, 19), there is currently limited empirical work examining the inference-based model in younger populations (7, 8). The remaining key issues address the optimal age for introducing I-CBT, the degree of parental involvement required, and the mechanisms by which children internalize inferential reasoning skills – especially given the ongoing maturation of metacognitive and abstract reasoning capacities in children (20). Addressing these issues will be critical in establishing I-CBT as an evidence-based intervention in treating the mental health of children and adolescents, and in determining whether its benefits observed in adults can be generalized to pediatric OCD presentations.

As in adults, the clinical applications of I-CBT in children extend beyond OCD. Although OCD has been the primary focus of inference-based research to date, possibility-based reasoning errors are also evident in generalized anxiety disorder, health anxiety, and specific phobias. By identifying the inferential errors underlying these thought patterns, therapists can extend I-CBT principles across a range of pediatric anxiety presentations, highlighting the model's potential transdiagnostic utility.

CASE REPORT

The present case involves a 13-year-old girl with no family history of psychiatric disorders. Her prenatal course, birth, and early developmental milestones were all regular, unremarkable. Prior to the onset of the disorder, she was an excellent student, living in a stable family environment with both parents and a younger sister. She actively participated in athletics and demonstrat-

vršnjacima i socijalizaciju. Prije pojave simptoma OKP-a nije imala problema s mentalnim zdravljem.

Djevojčica je upućena u polikliniku za dječju i adolescentnu psihijatriju s opsesivno-kompulzivnim simptomima koji su se progresivno pogoršavali tijekom posljednjih nekoliko mjeseci. Psihologijska procjena prije tretmana upućivala je da je riječ o djevojčici iznadprosječne opće intelektualne efikasnosti, na socio-emocionalnom planu (BYI-II) adekvatno izražena slika o sebi, nisu dobivena se odstupanja na drugim kliničkim ljestvicama, ljestvica strahova i anksioznosti za djecu i adolescente (SKAD-62) upućivala je na iznadprosječnu pojavnost teškoća vezanih uz opsesivno-kompulzivnu simptomatologiju.

Njezine primarne prisilne misli bile su usredotočene na opasnost i katastrofalne ishode, posebno na strah da će se nešto strašno dogoditi članovima njezine obitelji, uključujući njihovu iznenadnu smrt, osim ako ona ne učini određene rituale. Njezine kompulzije uključivale su naizmjenično hodanje na prstima i petama određeni broj puta prije ulaska u određene prostorije, ponavljanje fraze „sve će biti u redu“ točan broj puta prije spavanja, ispijanje određene količine vode prije spavanja.

Pojava simptoma mogla bi se povezati s pandemijom COVID-19 kada je čula da je stariji poznanik obitelji umro od virusa. Nakon tog događaja, pacijentica je počela zamišljati živopisne scenarije u kojima bi članovi njezine obitelji mogli iznenada umrijeti.

S vremenom su prisilne misli postajale sve češće i uznemirujuće, a rituali, u početku ograničeni na večer, proširili su se na njezine dnevne rutine. Simptomi su uzrokovali značajne teškoće funkcioniranja: odlazak na spavanje se odglašao za 60-90 minuta zbog dugotrajnih kompulzija, što ju je dovodilo do toga da zaspi kasno nakon ponoći. Kao rezultat toga imala je teškoća s buđenjem ujutro, što je u kombinaciji s

ed normal peer relationships and socialization. Prior to the onset of OCD symptoms, she had no history of mental health problems.

The girl was referred to the child and adolescent psychiatry clinic with obsessive-compulsive symptoms that had progressively worsened over the past several months. The psychological assessment before treatment indicated that the girl had above-average general intellectual ability, an adequately expressed self-image at the socio-emotional level (BYI-II), and had no deviations observed on other clinical scales, while the Fear and Anxiety Scale for Children and Adolescents (SKAD-62) indicated an above-average occurrence of difficulties related to obsessive-compulsive symptomatology.

Her primary intrusive thoughts centered on danger and catastrophic outcomes, particularly the fear that something terrible would happen to her family members, including their sudden death, unless she performed specific rituals. Her compulsions included walking alternately on tiptoes and heels a set number of times before entering certain rooms, repeating the phrase “everything will be ok” a precise number of times before going to sleep, drinking a fixed quantity of water before bedtime.

The onset of symptoms could be traced back to the COVID-19 pandemic, when she overheard that an elderly acquaintance of the family had died from the virus. Following this event, the patient began to imagine vivid scenarios in which her own family members could die suddenly.

Over time, these intrusive thoughts became more frequent and distressing, and the rituals, initially limited to the evening, extended into her daily routines. The symptoms caused significant functional impairment: bedtime was routinely delayed by 60–90 minutes due to prolonged compulsions, leading her to fall asleep well after midnight. As a result, she had difficulty waking up in the morning, which, combined with extensive rituals, contributed

opsežnim ritualima pridonijelo čestom kašnjenju u školu. Imala je i teškoća sa započinjanjem domaće zadaće jer je smatrala da treba dovršiti umirujuće rituale prije učenja, što je dodatno smanjilo njezinu školsku učinkovitost. Obiteljske aktivnosti bile su više puta prekidane, a i pacijentica i njezini roditelji opisivali su sveprisutnu atmosferu napetosti i iscrpljenosti. Iako je prepoznala da su ishodi njezinih strahova malo vjerojatni, osjećala se primoranom dovršiti svaki ritual „za svaki slučaj“, bojeći se da bi svako odstupanje moglo ugroziti njezinu obitelj.

Procjena je provedena na početku i nakon liječenja, a težina simptoma praćena je tijekom intervencije pomoću Yale-Brownove opsesivno-kompulzivne ljestvice za djecu (CY-BOCS). Napredak tretmana praćen je i bilježenjem dnevne učestalosti kompulzivnih ponavljanja i količine vremena provedenog u izvođenju rituala, što je pružilo klinički značajne pokazatelje funkcionalnih promjena. Njezin rezultat na Yale-Brownovoj opsesivno-kompulzivnoj ljestvici – verzija za djecu (CY-BOCS) prije početka liječenja bio je 20, što ukazuje na umjerene do teške simptome OKP-a.

Terapijski proces odvijao se tijekom 18 sesija I-KBT-a, prilagođenih pedijatrijskoj populaciji. Nakon završetka aktivne faze tretmana kontrolne seanse nastavljene su dva puta na mjesec tijekom tri mjeseca, a zatim jednom na mjesec tijekom jedne godine kako bi se pratila stabilnost psihičkog stanja i pojačali rezultati liječenja.

I-KBT se sastoji od 12 strukturiranih modula koji su prilagođeni djeci i adolescentima, a istovremeno odražavaju temeljni model na zaključivanju te koriste razvojno primjeren jezik, materijale i kliničke ciljeve.

1. Opsesivna sumnja – Djeca uče kako OKP stvara sumnje „što ako“ koje se čine stvarnima čak i kada nema stvarnih dokaza, te kako te sumnje pokreću ciklus OKP-a.

to frequent lateness for school. She also struggled to begin writing her homework because she felt she needed to complete the reassuring rituals before studying, thus further reducing her academic productivity. Family activities were repeatedly interrupted, and both the patient and her parents described a pervasive atmosphere of tension and exhaustion. Although she recognized that her feared outcomes were unlikely, she felt compelled to complete each ritual “just in case”, fearing that any deviation might endanger her family.

The assessment was conducted at baseline and post-treatment, with symptom severity monitored throughout the intervention using the Children’s Yale-Brown Obsessive-Compulsive Scale (CY-BOCS). Treatment progress was also tracked by recording the daily frequency of compulsive repetitions and the amount of time spent performing rituals, providing clinically meaningful indicators of functional change. Her Yale-Brown Obsessive-Compulsive Scale, Child Version (CY-BOCS) score before starting treatment was 20, indicating moderate-to-severe OCD symptoms.

The therapeutic process unfolded over the course of 18 sessions of I-CBT, adapted for pediatric population. Upon completion of the active treatment phase, follow-up sessions were continued twice monthly for three months and subsequently once monthly for one year, in order to monitor the mental status stability and reinforce treatment gains.

Inference-Based Cognitive-Behavioral Therapy (I-CBT) consists of 12 structured modules, which are adapted for children and adolescents all the while preserving the core inference-based model and using developmentally appropriate language and clinical goals.

1. Obsessional Doubt – Children learn how OCD creates “what if” doubts that feel real even when there is no real evidence, and how these doubts start the OCD cycle.

2. Logika iza OKP-a – Ovaj modul pokazuje kako OKP koristi pogrešno zaključivanje kako bi prešao s male ideje na veliki strah, pomažući mladima da uoče „logiku OKP-a“ nasuprot logici stvarnog života.
 3. Opsesivna priča – Dijete otkriva kako OKP gradi strašnu priču u svom umu i uči odvojiti zamišljenu priču od onoga što se zapravo događa u stvarnosti.
 4. Tema ranjivog ja – Mladi ljudi istražuju vrstu osobe za koju OKP kaže da jesu (npr. „Opasan/na sam“, „Neodgovoran/na sam“) i uče da je ovo priča o OKP-u, a ne njihovo pravo ja.
 5. OKP je 100 % imaginaran – Ovaj modul pomaže djeci da shvate da opsesije dolaze iz mašte, a ne iz stvarne opasnosti, iako se čine vrlo uvjerljivima.
 6. Sumnja i mogućnost – Djeca uče razliku između „moguće je“ i „vjerojatno je“ te zašto OKP tretira male mogućnosti kao da su sigurne.
 7. Mjehurić OKP-a – Dijete uči kako ih OKP zarobljava u mjehuriću straha i pravila te kako povratak u stvarnost slabi OKP.
 8. Osjećaj stvarnosti – Mladi ljudi vježbaju vjerovanje svojim osjetilima i stvarnim dokazima umjesto zamišljenim pričama, učeći odlučivati na temelju onoga što mogu vidjeti, čuti i dodirnuti.
 9. Druga priča – Zajedno s terapeutom, dijete gradi novu, realističnu priču koja odgovara stvarnim dokazima i podržava samouvjerenje, svakodnevne izbore.
 10. Trikovi OKP-a – Ovaj modul uči djecu da prepoznaju podmukle trikove koje OKP koristi (hitnost, krivnja, pravila „za svaki slučaj“) kako bi mogli reagirati na miran i samouvjeren način.
 11. Pravo ja – Djeca jačaju svoj osjećaj tko su zapravo izvan OKP-a, usredotočujući se na svoje vrijednosti, snage i ono što im je važno.
2. The Logic Behind OCD – This module shows how OCD uses faulty reasoning to jump from a small idea to a big fear, helping young people spot the “OCD logic” versus real-life logic.
 3. The Obsessional Story – The child discovers how OCD constructs a scary story in their mind, and learns to separate the imagined story from what is actually happening in reality.
 4. The Vulnerable Self Theme – Young people explore the kind of person that OCD says they are (e.g. “I am dangerous,” “I am irresponsible”), and learn that this is an OCD story, not their real self.
 5. OCD Is 100% Imaginary – This module helps children understand that obsessions come from imagination and not from real danger, even though they feel very convincing.
 6. Doubt and Possibility – Children learn the difference between “it is possible” and “it is probable,” and the reasons why OCD treats tiny possibilities as if they were certain.
 7. The OCD Bubble – The child learns how OCD traps them inside a bubble of fear and rules, and how stepping back into reality weakens OCD.
 8. Reality Sensing – Young people practice trusting their senses and real evidence instead of imagined stories, learning to decide based on what they can see, hear, and touch.
 9. The Alternative Story – Together with the therapist, the child builds a new, realistic story that fits the real evidence and supports confident, everyday choices.
 10. Tricks of the OCD – This module teaches children to recognize the sneaky tricks OCD uses (urgency, guilt, “just in case” rules), so they can respond in a calm, confident manner.
 11. The Real Self – Children strengthen their sense of who they really are beyond OCD,

12. Znati i činiti: Kretati se dalje i sprječavati recidiv – Dijete uči kako koristiti ove vještine u svakodnevnom životu, nositi se s neuspjesima i spriječiti OKP da ponovno preuzme kontrolu.

I-KBT u ovom slučaju uključivao je svih 12 modula, a svaki se modul isporučivao tijekom jedne do dvije sesije, ovisno o pacijentovoj razini razumijevanja i sposobnosti primjene koncepata u svakodnevnom životu. Intervenciju je proveo prvi autor, koji je educiran za kognitivno-bihevioralnu terapiju temeljenu na zaključivanju, a fleksibilan tempo omogućio je prilagodbu tretmana razvojnim potrebama i stilu učenja djeteta. Između sesija djevojčica je poticana da vježba naučene koncepte koristeći razvojno prikladne strategije poput priča, metafora, crteža i konkretnih primjera iz stvarnog života. Ove su aktivnosti korištene kako bi se učvrstile vještine inferencijalnog zaključivanja i olakšala njihova primjena u svakodnevnim situacijama. Roditelji su upućeni da aktivno podržavaju provedbu terapijskih strategija između sesija pojačavanjem zaključivanja temeljenog na stvarnosti i smanjenjem akomodacije ponašanja povezanih s opsesivno-kompulzivnim poremećajem. Pridržavanje tretmana I-KBT protokolu osigurana je korištenjem strukturiranog kontrolnog popisa modula koji je terapeut ispunjavao nakon svake sesije, dokumentirajući pokrivenost ključnih koncepata i tehnika. Bilješke sa sesija redovito su se pregledavale kako bi se potvrdilo pridržavanje slijeda i teorijskih principa intervencije, a povratne informacije roditelja o primjeni strategija i zadataka kod kuće korištene su za potvrdu provedbe između sesija.

Psihoedukacija i eksternalizacija OKP-a

Pacijentica i njezini roditelji upoznati su s KBT modelom temeljenim na zaključivanju. OKP je eksternaliziran kao „varalica koji stvara pri-

focusing on their values, strengths, and what matters to them.

12. Knowing and Doing: Moving on and Preventing Relapse – The child learns how to use these skills in daily life, handle setbacks, and keep OCD from taking over again.

In this case, I-CBT included all 12 modules, with each module delivered over one to two sessions depending on the patient's level of understanding and ability to apply the concepts in daily life. The intervention was conducted by the first author, who is trained in inference-based cognitive-behavioral therapy, and the flexible pacing allowed the treatment to be tailored to the child's developmental needs and learning style. Between sessions, the patient was encouraged to practice the learned concepts using developmentally appropriate strategies such as stories, metaphors, drawings, and concrete real-life examples. These activities were used to help consolidate inferential reasoning skills and facilitate their application in everyday situations. The parents were instructed to actively support the implementation of therapeutic strategies between sessions by reinforcing reality-based reasoning and reducing accommodation of OCD-related behaviors. Treatment fidelity to the I-CBT protocol was ensured through the use of a structured module checklist completed by the therapist after each session, documenting the coverage of core concepts and techniques. Session notes were reviewed regularly in order to confirm adherence to the sequence and theoretical principles of the intervention, and parental feedback regarding strategy and task application at home was used to corroborate implementation between the sessions.

Psychoeducation and Externalization of OCD

The patient and her parents were introduced to the inference-based CBT model. OCD was externalized as a “trickster story-maker” that

će“ i predstavlja scenarije „što ako“ koji nisu povezani sa stvarnošću. Naučila je da njezinu nelagodu nije uzrokovala stvarna opasnost, već „iskrivljena priča“ koju je stvorila njezina imaginacija (10).

Mapiranje narativa OKP-a

Zajedno s terapeutom, pacijentica je rekonstruirala „priču“ OKP-a: zamišljenu smrt člana obitelji i uvjetno uvjerenje da njezini rituali mogu to spriječiti. Ova je priča suprotstavljena stvarnim dokazima i svakodnevnim vještinama rasuđivanja ističući nedosljednosti (11).

Razvoj zdravih zaključaka

Koristeći vježbe vođenog rasuđivanja pacijentica je vježbala razlikovanje između mogućeg i vjerojatnog. Na primjer, potaknuta je da razmisli: „Što zapravo znam o sigurnosti svoje obitelji upravo sada?“ Generirala je alternativne zaključke na temelju vidljive stvarnosti (npr. „Moji roditelji su zdravi i ne događa se ništa neobično“).

Tehnike vizualizacije i mašte

S obzirom na snagu njezinih nametljivih slika, terapija se usredotočila i na pomoć u upravljanju imaginacijom. Naučila je tretirati nametljive slike kao izmišljene „filmove“, a ne kao predviđanja stvarnih ishoda (12). Kreativne tehnike poput označavanja „glasa“ OKP-a kao „lažljivog redatelja“ pomogle su joj da odvoji nametljive scenarije od stvarnosti.

Uključenost roditelja

Roditelji su bili educirani kako smanjiti prilagodbu. Prilagodba u obitelji je uobičajena kod pedijatrijskog OKP-a i pokazalo se da održava simptome (18). Umjesto da čekaju da učini njezine rituale podržali su je u primjeni novih strategija zaključivanja prije spavanja. Obitelj

presents “what if” scenarios disconnected from reality. She learned that her distress was not caused by real danger, but by a misleading narrative created by her imagination (10).

Mapping the Narrative of OCD

Together with the therapist, the patient reconstructed the OCD “storyline”: the imagined death of a family member and the conditional belief that her rituals could prevent it. This narrative was contrasted with real-life evidence and everyday reasoning skills, highlighting inconsistencies (11).

Development of Healthy Inferences

Using guided reasoning exercises, the patient practiced distinguishing between the possible and probable. For example, she was encouraged to consider: “What do I actually know about my family’s safety right now?”. She generated alternative inferences based on observable reality (e.g. “My parents are healthy, and nothing unusual is happening”).

Imagery and Imagination Techniques

Given the strength of her intrusive images, the therapy also focused on helping her manage her imagination. She learned to treat intrusive images as fictional “movies” rather than predictions of real-life events (12). Creative techniques such as labeling the OCD “voice” as “the liar director” helped her separate intrusive scenarios from the reality.

Parental Involvement

The parents were coached to reduce accommodation. Family accommodation is common in cases of pediatric OCD, and has been shown to maintain the symptoms (18). Instead of waiting

je uvela postupne promjene poput postavljanja vremenskog ograničenja za večernje rituale istovremeno podržavajući je njezinim nastojanjima za generiranje zdravih zaključaka.

Konsolidacija i sprječavanje recidiva

Prije kraja liječenja naglasak je stavljen na održavanje postignutog. Pacijentica je stvorila „plan provjere stvarnosti“, popis pitanja koja si je mogla postaviti kada se pojavi sumnja i podsjetnik na svoju mogućnost da odluči ne slijediti priču OKP-a. Roditelji su dobili upute kako reagirati na neuspjehe poticanjem zaključivanja temeljenog na stvarnosti umjesto razuvjeravanja.

Nakon četiri mjeseca I-KBT-a pacijentica je pokazala značajno poboljšanje. Njezin CY-BOCS rezultat nakon provedenih 18 seansi se smanjio na 10, što ukazuje na blagu razinu simptoma. Rituali prije spavanja smanjeni su na manje od 10 minuta, a izjavila je da je u stanju odbaciti prisilne misli bez odgovaranja na njih ritualima. Izrazila je povećano samopouzdanje u razlikovanju zamišljenih strahova od stvarnih dokaza. Roditelji su primijetili mirniju obiteljsku atmosferu i smanjeni stres oko kompulzija. Završila je sedmi razred s odličnim ocjenama i nastavila trenirati atletiku.

RASPRAVA

Ovaj slučaj ilustrira kako kognitivno-bihevioralni model temeljen na zaključivanju nudi razvojno prilagođen okvir za razumijevanje i liječenje pedijatrijskog OKP-a karakteriziranog prisilnim mislima usmjerenim na opasnost i prisilnim radnjama vezanima uz pravila. Obrazac simptoma kod pacijentice – nametljivi strahovi od opasnosti koja bi mogla zadesiti članove obitelji, popraćeni vrlo specifičnim mentalnim i bihevioralnim ritualima – podudara se s konceptualizacijom I-KBT-a da opsesije nastaju

for her rituals, they supported her in applying new reasoning strategies at bedtime. The family implemented gradual changes, such as setting a time limit for evening rituals while reinforcing her efforts to generate healthy inferences.

Consolidation and Relapse Prevention

Toward the end of treatment, emphasis was placed on maintaining what had been achieved. The patient created a “reality-check plan,” a list of questions she could ask herself when doubt arose, and a reminder of her ability to choose not to follow the OCD story. The parents were instructed on how to respond to setbacks by reinforcing inference-based reasoning rather than persuading her otherwise.

After four months of I-CBT, the patient showed significant improvement. Her CY-BOCS score decreased to 10 after 18 sessions, indicating a mild level of symptoms. Bedtime rituals were reduced to less than 10 minutes, and she reported being able to dismiss intrusive thoughts without acting on them through rituals. She expressed increased confidence in distinguishing between imagined fears and actual evidence. The parents observed a calmer family atmosphere and reduced stress about compulsions. She completed the seventh grade with excellent grades and continued training athletics.

DISCUSSION

This case illustrates how the inference-based cognitive-behavioral model offers a developmentally sensitive framework for understanding and treating pediatric OCD characterized by danger-oriented intrusive thoughts and rule-bound compulsions. The patient’s symptom pattern – intrusive fears of harm befalling family members, accompanied by highly specific mental and behavioral rituals – aligns with the I-CBT conceptualization that obsessions

iz inferencijalne zbunjenosti, procesa u kojem zamišljene mogućnosti nadjačavaju senzorne informacije i navode pojedinca da tretira hipotetske prijetnje kao da su stvarne (10,11). U ovom slučaju razmišljanjem pacijentice dominirala je pogreška „ako to mogu zamisliti, moglo bi se dogoditi“. Živahna slika umirućih članova obitelji stvorila je uvjerljiv, ali neutemeljen narativ. Ova inferencijalna zbunjenost poticala je sumnju i motivirala kompulzije (npr. hodanje na prstima određeni broj puta, ponavljanje umirujućih fraza i pijenje točnih količina vode) usmjerenih na sprječavanje zamišljenog scenarija (11).

Razvojna razmatranja bila su ključna za formuliranje slučaja. U dobi od 13 godina imaginacija je posebno snažna, a oslanjanje pacijentice na konkretne rituale odražavalo je razvojnu ranjivost na miješanje mogućnosti s vjerojatnošću (21). Početak tijekom pandemije COVID-19, potaknut saznanjem o smrti starijeg poznanika, u skladu je s istraživanjima koja pokazuju da su djeca posebno ranjiva na katastrofično zaključivanje kada su izložena dvosmislenim ili prijetećim informacijama tijekom razvojnih razdoblja obilježenih pojačanom emocionalnom reaktivnošću i ograničenom metakognitivnom zrelošću (20).

Teškoće u svakodnevnom funkcioniranju u ovom slučaju – produljene rutine odlaska na spavanje, teškoće kod učenja i ponavljajuća kašnjenja u školu – naglašava kliničku važnost rješavanja inferencijalnog zaključivanja u ranoj fazi liječenja. Tradicionalna kognitivno-bihevioralna terapija temeljena na izlaganju ostaje vrlo učinkovita za pedijatrijski OKP (3-5,19), no neka djeca imaju teškoća s tolerancijom izlaganja ili održavaju rigidne sigurnosne obrasce unatoč primjeni tehnike izlaganja. I-KBT nudi alternativnu početnu točku usmjeravajući se na proces zaključivanja koji generira opsesije umjesto da se ponajprije fokusira na habituaciju. Za ovu pacijenticu pomicanje terapijskog naglaska prema ispiti-

arise from inferential confusion, a process in which imagined possibilities override the sensory information and lead the individual to treat hypothetical threats as if they were real (10, 11). In this case, the patient's reasoning was dominated by the "if I can imagine it, it could happen" fallacy. The vivid image of family members dying created a compelling, yet unfounded narrative. This inferential confusion fueled doubt and motivated compulsions (e.g. walking on tiptoes a certain number of times, repeating reassuring phrases, and drinking exact amounts of water) aimed at preventing the imagined scenario (11).

Developmental considerations were central to case formulation. At the age of 13, imagination is particularly powerful, and the patient's reliance on concrete rituals reflected a developmental vulnerability to confusing possibility with probability (21). The onset during the COVID-19 pandemic, triggered by learning about the death of an older acquaintance, is consistent with studies showing that children are particularly vulnerable to catastrophic reasoning when exposed to ambiguous or threatening information during developmental periods marked by heightened emotional reactivity and limited metacognitive maturity (20).

The daily functional impairment documented in this case – prolonged bedtime routines, academic difficulties, and recurrent lateness for school – highlights the clinical relevance of addressing inferential reasoning early in the treatment. Traditional exposure-based CBT remains highly effective for pediatric OCD (3-5,19), however some children struggle with exposure tolerance or maintain rigid safety behaviors despite exposure exercises. I-CBT offers an alternative entry point by targeting the reasoning process that generates obsessions, rather than focusing primarily on habituation. For this patient, shifting the therapeutic emphasis toward examining the "imagined scenario" that dominated her decision-making

vanju „zamišljenog scenarija“ koji je dominirao njezinim donošenjem odluka pomoglo je smanjiti osjećaj potrebe izvršavanja rituala i smanjiti tjeskobu oko potencijalne opasnosti. Ovaj pristup može biti posebno prikladan za djecu koja mogu razumijeti imaginativno zaključivanje, ali možda još nemaju u potpunosti razvijeno apstraktno mišljenje. Strukturirani vizualni alati, narativne tehnike i roditeljska podrška mogu premostiti te razvojne nezrelosti (17,20). Štoviše, slučaj naglašava važnost uključivanja skrbnika u pomaganje djeci u testiranju stvarnosti, jačanju senzornog rasuđivanja i prekidanju obiteljske prilagodbe – čimbenicima za koje se zna da utječu na ishode liječenja pedijatrijskog OKP-a (18). Iako kontrolirana ispitivanja I-KBT-a za djecu još nisu provedena, preliminarni nalazi kod odraslih pokazuju značajno smanjenje simptoma i snažnu trajnost poboljšanja (7,11) što sugerira da su potrebna daljnja istraživanja pedijatrijske primjene.

Potencijalni izazovi u provedbi I-KBT-a s djecom u prvom se redu odnose na razvojne čimbenike, posebno na dobne razlike u apstraktnom zaključivanju, metakognitivnom kapacitetu i sposobnosti promišljanja o unutarnjim kognitivnim procesima. Mlađa djeca, naročito predškolske dobi, mogu imati teškoća s razlikovanjem zamišljenih mogućnosti od stvarnosti na refleksivan način, što može ograničiti njihovu sposobnost da se u potpunosti uključe u inferencijalne koncepte koji su ključni za I-KBT. Određivanje minimalnog kognitivnog kapaciteta za učinkovitu primjenu – umjesto stroge kronološke dobi – stoga bi pružilo vrijedne smjernice kliničarima.

Daljnja istraživanja koja ispituju kako se vještine inferencijalnog zaključivanja pojavljuju i razvijaju tijekom djetinjstva i kako se mogu terapijski razvijati ponudila bi dodatni uvid u izvedivost i optimalno vrijeme za primjenu ovog pristupa. Buduće studije trebale bi ispitati razvojne moderatore, obiteljske

helped reduce the need for ritual completion and decrease the anxiety around the potential harm. This approach may be particularly suitable for children who can understand imaginative reasoning, but may not yet possess fully developed abstract thinking. Structured visual tools, narrative techniques, and parental scaffolding can bridge these developmental immaturities (17, 20). Moreover, this case underscores the importance of involving caregivers in helping the children reality-test, reinforce sensory-based reasoning, and interrupt family accommodation – factors known to influence treatment outcomes in pediatric OCD (18). Although controlled trials of I-CBT for children have not yet been conducted, preliminary findings among adults have demonstrated significant symptom reductions and strong durability of improvements (7, 11), suggesting that further research into pediatric applications is warranted.

Potential challenges in implementing I-CBT with children primarily relate to developmental factors, particularly age differences when it comes to abstract reasoning, metacognitive capacity, and the ability to reflect on internal cognitive processes. Younger children, especially preschoolers, may have difficulty distinguishing imagined possibilities from the reality in a reflective manner, which may limit their ability to fully engage with the inferential concepts that are central to I-CBT. Determining a minimum cognitive capacity for effective implementation – rather than a strict chronological age – would therefore provide valuable guidance to clinicians.

Further studies examining how inferential reasoning skills emerge and develop throughout childhood, and how they can be therapeutically developed, would offer additional insight into the feasibility and optimal timing of implementing this approach. Future studies should examine developmental moderators, family processes, and mechanisms of change

procesu i mehanizme promjene kako bi se razjasnilo za koga i pod kojim uvjetima I-KBT pruža dodanu vrijednost kod djece. Štoviše, buduća istraživanja trebala bi biti usmjerena i na razvoj alata za procjenu u pedijatrijskoj populaciji. Mjere inferencijalne zbunjenosti i pogrešaka u rasuđivanju moraju se validirati za mlađe populacije. Postojeći instrumenti poput Upitnika inferencijalne zbunjenosti (22) zahtijevaju prilagodbu kako bi bili razvojno primjereni. Buduća istraživanja trebala bi biti usmjerena i na ispitivanje dugoročne učinkovitosti I-KBT-a kod djece i adolescenata s OKP-om uključujući trajnost učinka tretmana i stope recidiva tijekom duljih razdoblja praćenja. Longitudinalne studije koje uključuju sesije praćenja nakon liječenja, dopunske intervencije ili roditeljski vođeno poticanje vještina inferencijalnog zaključivanja mogu pojasniti kako se terapijski učinci mogu održavati tijekom vremena. Takvi nalazi ojačali bi bazu dokaza za I-KBT i informirali o njegovoj integraciji u rutinsku pedijatrijsku skrb za mentalno zdravlje. Konačno, istraživanja bi trebala istražiti potencijal I-KBT-a kao transdijagnostičke intervencije i kod pedijatrijskih anksioznih poremećaja te procijeniti poboljšava li tretman usmjeren na proces rasuđivanja ishode izvan OKP-a.

ZAKLJUČAK

Ovaj članak prikazuje I-KBT kao potencijalan i konceptualno inovativan pristup procjeni i liječenju opsesivno-kompulzivnog poremećaja kod djece i adolescenata. Prikazom teorijskih osnova, razvojnih specifičnosti i kliničke primjene ističemo jedinstvenu vrijednost tretmana usmjerenog na proces inferencijalnog zaključivanja – umjesto isključivo habituacije na zastrašujuće stimuluse tijekom bihevioralne tehnike izlaganja – kao puta do smanjenja simptoma. Predstavljeni slučaj pokazuje kako se I-KBT može izvedbom prilagoditi za rane

in order to clarify for whom and under what conditions I-CBT provides added value in children. Moreover, future studies should address the development of assessment tools in the pediatric population. Measures of inferential confusion and reasoning errors must be validated for younger populations. The existing instruments such as the Inferential Confusion Questionnaire (22) may require adaptation in order to be developmentally appropriate. Future studies should also examine the long-term effectiveness of I-CBT in children and adolescents with OCD, including the durability of treatment effects and relapse rates over longer follow-up periods. Longitudinal studies that include post-treatment follow-up sessions, supplemental interventions, or parent-led facilitation of inferential reasoning skills may clarify how therapeutic effects could be maintained over time. Such findings would strengthen the evidence base for I-CBT and would provide information on its integration into routine pediatric mental health care. Finally, studies should explore the potential of I-CBT as a transdiagnostic intervention for pediatric anxiety disorders as well, and also assess whether targeting the reasoning processes improves outcomes beyond OCD.

CONCLUSION

This article presents I-CBT as a promising and conceptually innovative approach to the assessment and treatment of obsessive-compulsive disorder in children and adolescents. By outlining its theoretical foundations, developmental considerations, and clinical applications, we emphasized the unique value of treatments targeting the inferential reasoning process – rather than solely fear habituation as part of behavioral exposure techniques – as a pathway to symptom reduction. The presented case demonstrates how I-CBT can be feasibly adapted for early adolescents, and effectively

adolescente i učinkovito rješava opsesivnu sumnju potaknutu zamišljenim katastrofama, obrazac koji se često opaža kod pedijatrijskog OKP-a, ali nije uvijek adekvatno obuhvaćen tradicionalnim KBT.

Važno je napomenuti da razvojna perspektiva prikazana u ovom radu naglašava potrebu prilagođavanja I-KBT-a kognitivnom, emocionalnom i socijalnom kontekstu djece, uključujući njihov povećani kapacitet za imaginaciju, razvoj metakognitivnih vještina i oslanjanje na skrbnike za emocionalnu i bihevioralnu regulaciju. Ti čimbenici oblikuju ne samo prezentaciju simptoma već i mehanizme putem kojih će vjerojatno doći do terapijske promjene. Uključenost roditelja, razvoj vještina rasuđivanja i pažljivo praćenje kako djeca tumače mogućnost, vjerojatnost i odgovornost za štetu mogu biti posebno ključni za uspješnu primjenu modela temeljenog na zaključivanju.

Iako preliminarni nalazi kod odraslih podržavaju kliničku učinkovitost I-KBT-a, nužno su potrebna sustavna istraživanja u pedijatrijskoj populaciji. Buduća istraživanja trebala bi ispitati razvojnu prikladnost liječenja, mehanizme promjene i komparativnu ili dodatnu vrijednost uz utvrđene intervencije temeljene na izlaganju. Jednako su važna istraživanja obiteljske prilagodbe, kulturnih razmatranja i kontekstualnih stresora – poput onih doživljenih tijekom pandemije COVID-19 – koji mogu stupiti u interakciju s ranjivostima inferencijalnog rasuđivanja.

Integriranjem teorije, razvojnih specifičnosti i kliničkih opažanja, ovaj članak nastoji potaknuti daljnja empirijska istraživanja i kliničke inovacije. Sveobuhvatnija baza dokaza razjasnit će potencijal I-KBT-a da služi kao transdijagnostička i razvojno responzivna intervencija, te u konačnici proširiti repertoar učinkovitih tretmana dostupnih djeci i adolescentima s opsesivno-kompulzivnim i srodnim poremećajima.

addresses obsessional doubt driven by imagined catastrophes, a pattern that is frequently observed in pediatric OCD, but not always adequately captured by traditional CBT frameworks.

Importantly, the developmental perspective presented in this paper underscores the need to tailor I-CBT to the cognitive, emotional, and social context of children, including their heightened imaginative capacity, evolving metacognitive skills, and reliance on caregivers for emotional and behavioral regulation. These factors shape not only symptom presentation, but also the mechanisms through which therapeutic change is likely to occur. Parental involvement, development of reasoning skills, and careful attention to how children interpret possibility, probability and responsibility for harm may be especially crucial for a successful application of the inference-based model.

Although preliminary findings in adults support the clinical efficacy of I-CBT, systematic research in the pediatric population is certainly needed. Future studies should examine the developmental appropriateness of the treatment, its mechanisms of change, and its comparative or adjunctive value alongside established exposure-based interventions. Equally important are investigations into family accommodation, cultural considerations, and contextual stressors – such as those experienced during the COVID-19 pandemic – which may interact with inferential reasoning vulnerabilities.

By integrating theory, developmental specificities and clinical observations, this article aims to stimulate further empirical inquiry and clinical innovation. A more comprehensive evidence base will clarify the potential of I-CBT to serve as a transdiagnostic and developmentally responsive intervention, ultimately expanding the repertoire of effective treatments available to children and adolescents struggling with obsessive–compulsive and related disorders.

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In memoriam

/ Obituary

Sjećanje na Vlastu Rudan

/ Memory of Vlasta Rudan

Prof. dr. sc. / Prof., PhD

(11. ožujka 1948. – 17. kolovoza 2025.)

/ (11 March 1948 – 17 August 2025)



Vlasta Rudan rođena je u Zagrebu 1948. godine. Njezina majka bila je psihijatar na KBC-u Zagreb (prof. dr. sc. Duška Blažević), suprug Pavao Rudan je akademik (član HAZU-a) i redoviti profesor antropologije, a sin dr. sc. Duško Rudan psihijatar je na Klinici za psihijatriju i psihološku medicinu KBC-a Zagreb i asistent na Medicinskom fakultetu. Medicinski interesi prof. Vlaste Rudan bili su psihodinamska psihijatrija, dječja i adolescentna psihijatrija, psihoterapija i psihoanaliza djece i odraslih.

Vlasta Rudan diplomirala je 1971. na Medicinskom fakultetu Sveučilišta u Zagrebu. Godine 1976. završila je Poslijediplomski studij „Psihoterapija” na Medicinskom fakultetu Sveučilišta u Zagrebu, a 1976. položila je specijalistički ispit iz psihijatrije. Od 1978. zaposlena je na Odjelu, zatim Poliklinici za dječju i adolescentnu psihijatriju i psihoterapiju Klinike za psihološku medicinu KBC-a Zagreb. Godine 1981. obranila je magistarski rad, a 1995. obranila je doktorat medicinskih znanosti na Medicinskom fakultetu Sveučilišta u Zagrebu. Godine 1982. postala je edukator iz dinamički orijentirane obiteljske, bračne i partnerske terapije. Akademске godine 1983./1984. bora-

Vlasta Rudan was born in Zagreb in 1948. Her mother (Prof. Duška Blažević, MD, PhD) was a psychiatrist at the University Hospital Centre Zagreb, her husband Pavao Rudan is an academician (member of the Croatian Academy of Sciences and Arts) and Full Professor of Anthropology, while her son, Duško Rudan, PhD, is a psychiatrist at the Department of Psychiatry and Psychological Medicine of the University Hospital Centre Zagreb and Teaching Assistant at the School of Medicine. Prof. Vlasta Rudan’s medical interests included psychodynamic psychiatry, child and adolescent psychiatry, psychotherapy, and psychoanalysis of children and adults.

Vlasta Rudan graduated from the University of Zagreb School of Medicine in 1971. In 1976, she completed the Postgraduate Program of Psychotherapy at the same institution, and that same year she passed the specialist examination in psychiatry. From 1978 onward, she was employed first at the Hospital Ward, and afterwards at the Polyclinic for Child and Adolescent Psychiatry and Psychotherapy of the Department of Psychological Medicine at the University Hospital Centre Zagreb. In 1981, she defended her master’s thesis, and in 1995 she defended her PhD in medical sciences at the University of Zagreb School of Medicine. In 1982, she became an educator in dynamically oriented family, marital, and couples’ therapies.

vila je u Psychoanalytic Institute – Baltimore, Washington, D. C., USA. Godine 1988. postala je supervizor iz analitičke psihoterapije, a iste je godine bio i njezin studijski boravak u Washington, D. C., USA radi organizacije liječenja adolescenata s psihičkim smetnjama u hospitalnim uvjetima. Godine 1997. postaje naslovni docent na Katedri za psihijatriju i psihološku medicinu za predmet Psihološka medicina za potrebe dodiplomske i poslijediplomske nastave na Medicinskom fakultetu Sveučilišta u Zagrebu. Godine 1998. završava užu specijalizaciju iz dječje i adolescentne psihijatrije, a 2001. postaje docent u kumulativnom radnom odnosu. Od 2001. postaje direktni član Međunarodnog psihoanalitičkog udruženja (IPA), a od 2003. psihoanalitičar za djecu i adolescente IPA-e. Godine 2003. postaje izvanredni profesor u kumulativnom odnosu na Katedri za psihijatriju i psihološku medicinu Medicinskog fakulteta Sveučilišta u Zagrebu. Godine 2009. postaje redoviti profesor u kumulativnom odnosu na Katedri za psihijatriju i psihološku medicinu Medicinskog fakulteta Sveučilišta u Zagrebu. Od 2008. voditelj je Dnevne bolnice za adolescente Klinike za psihološku medicinu KBC-a Zagreb, a od 2011. voditelj Specijalističkog zavoda za psihoterapiju Klinike za psihološku medicinu KBC-a Zagreb. Održavala je predavanja, seminare i vježbe u dodiplomskoj nastavi na Medicinskom fakultetu Sveučilišta u Zagrebu za predmete Psihološka medicina i Dječja i adolescentna psihijatrija u okviru predmeta Psihijatrija Katedre za psihijatriju i psihološku medicinu. Bila je voditelj nastave Psihološka medicina i dječja i adolescentna psihijatrija na dodiplomskom studiju Medicinskog fakulteta na engleskom jeziku. Sudjelovala je u specijalističkom poslijediplomskom studiju na Medicinskom fakultetu Sveučilišta u Zagrebu na studiju Psihoterapija, bila je voditeljica specijalističkog poslijediplomskog studija Dječja i adolescentna psihijatrija u kojem je razvijala kolegije Adolescentna psihijatrija i Opća psi-

During the 1983/1984 academic year, she undertook advanced training at the Psychoanalytic Institute in Baltimore, Washington, D.C., USA. In 1988, she became a supervisor in analytic psychotherapy, and in the same year she completed a study visit in Washington, D.C., USA, focused on the organization of hospital-based treatment for adolescents with mental disorders. In 1997, she was appointed Adjunct Assistant Professor at the Department of Psychiatry and Psychological Medicine for the course Psychological Medicine, contributing to both undergraduate and postgraduate teaching at the University of Zagreb School of Medicine. In 1998, she completed subspecialty training in child and adolescent psychiatry, while in 2001 she was appointed Assistant Professor in a joint appointment. As of 2001, she became a direct member of the International Psychoanalytical Association (IPA), and as of 2003, an IPA-certified psychoanalyst for children and adolescents. In 2003, she was promoted to Associate Professor in a joint appointment at the Department of Psychiatry and Psychological Medicine of the University of Zagreb School of Medicine, and in 2009 to Full Professor in a joint appointment at the same Department. As of 2008, she served as Head of the Day Hospital for Adolescents at the Department of Psychological Medicine, University Hospital Centre Zagreb, and as of 2011 as Head of the Specialist Institute for Psychotherapy of the same Department. She delivered lectures, seminars, and practical classes in undergraduate medical education at the University of Zagreb School of Medicine, as part of the courses Psychological Medicine and Child and Adolescent Psychiatry within the subject of Psychiatry at the Department of Psychiatry and Psychological Medicine. She was the Head of Teaching for Psychological Medicine and Child and Adolescent Psychiatry in the English-language undergraduate study program at the School of Medicine. She also participated in specialist postgraduate education at the University of Zagreb School of Medicine, within the postgraduate study program of Psychotherapy, and served as Head of the specialist postgraduate study program Child and Adolescent Psychiatry, where she developed the courses Adolescent Psychiatry and General Psychopathology. She additionally contributed to postgraduate teaching in

hopatologija. Sudjelovala je u poslijediplomskoj nastavi u poslijediplomskom studiju Školska medicina i poslijediplomskom studiju Obiteljska medicina. Sudjelovala je u nastavi na Edukacijsko-rehabilitacijskom fakultetu Sveučilišta u Zagrebu, gdje je vodila kolegij Psihoterapija.

Od 1986. do 1992. tajnica je Hrvatskog društva za psihoterapiju HLZ-a. Od 1992. do 1998. dopredsjednica Hrvatskog društva za psihoterapiju. Od 1995. do 2003. predsjednica je Hrvatskog društva za dojenačku, dječju i adolescentnu psihijatriju, član Europskog i Međunarodnog društva za dječju i adolescentnu psihijatriju i pridružene struke. Od 2001. do 2004. predsjednica Hrvatske psihoanalitičke grupe, od 2004. predsjednica Zagrebačkog psihoanalitičkog foruma, od 2005. edukator i supervizor iz suportivne psihoterapije u Psihijatrijskoj bolnici za djecu i mladež (Kukuljevićeva). Od 2000. do 2008. predsjednica je Hrvatske psihoanalitičke studijske grupe Internacionalnog udruženja psihoanalitičara (IPA) i Europske psihoanalitičke federacije (EPF). Godine 2011. imenovana za predsjednicu Hrvatskog društva za psihoanalitičku psihoterapiju. Osim navedenog bila je član i predsjednik stručnih i organizacijskih odbora brojnih znanstvenih skupova te član više radnih skupina Ministarstva zdravstva Republike Hrvatske.

Od 1988. aktivno sudjeluje u znanstvenim projektima: Adolescencija – istraživanje razvojnih, dijagnostičkih i preventivnih aspekata, Antropološka istraživanja populacijske strukture Hrvatske, The study and care of refugee families – A pilot study of anthropological and psychodynamic aspects, UNESCO, Antropološka istraživanja populacijske strukture Hrvatske – tema: Populacijska struktura Hrvatske – Sociokulturni pristup. Od 2000. voditelj je znanstvenog projekta Prevencija mentalnog zdravlja djece i adolescenata u Republici Hrvatskoj – Roditeljsko uočavanje emocionalnih teškoća

the School Medicine and Family Medicine study programs. She taught at the Faculty of Education and Rehabilitation Sciences of the University of Zagreb, where she led the course on Psychotherapy.

From 1986 to 1992, she served as Secretary of the Croatian Association for Psychotherapy within the Croatian Medical Association. From 1992 to 1998, she was Vice President of the Croatian Association for Psychotherapy. From 1995 to 2003, she served as President of the Croatian Society for Infant, Child and Adolescent Psychiatry, and was a member of the European and International Associations for Child and Adolescent Psychiatry and Allied Professions. From 2001 to 2004, she served as President of the Croatian Psychoanalytic Group, from 2004 she was President of the Zagreb Psychoanalytic Forum, and from 2005 she acted as an educator and supervisor in supportive psychotherapy at the Psychiatric Hospital for Children and Adolescents (*Kukuljevićeva*). From 2000 to 2008, she was President of the Croatian Psychoanalytic Study Group within the International Psychoanalytical Association (IPA) and the European Psychoanalytical Federation (EPF). In 2011, she was appointed President of the Croatian Association for Psychoanalytic Psychotherapy. In addition, she served as a member and chair of professional and organizational committees of numerous scientific conferences, and as a member of several working groups formed by the Ministry of Health of the Republic of Croatia.

As of 1988, she actively participated in scientific research projects: Adolescence – a Study of Developmental, Diagnostic, and Preventive Aspects; Anthropological Research on the Population Structure of Croatia; The Study and Care of Refugee Families – A Pilot Study of Anthropological and Psychodynamic Aspects (UNESCO); Anthropological Research on the Population Structure of Croatia – topic: Population Structure of Croatia – A Sociocultural Approach. As of 2000, she served as principal investigator for the scientific projects Prevention of Mental Health Problems in Children and Adolescents in the Republic of Croatia – Parental Recognition of Emotional Difficulties in Children – A Contribution to Early Diagnosis; Emotional and Behavioral Problems of Children

u djeteta – doprinos ranoj dijagnozi, Emocionalni i ponašajni problemi djece i adolescenata u Republici Hrvatskoj i Prediktivna vrijednost procjene emocionalnih i ponašajnih problema u mladima.

Sudjelovala je u prijedlogu nove specijalizacije iz dječje i adolescentne psihijatrije pri Ministarstvu zdravstva RH, zajedno s prof. Vesnom Vidović. Godine 1995. odlukom Skupštine Zbora dodijeljena joj je Povelja Hrvatskog liječničkog zbora za doprinos medicinskoj znanosti i struci te za razvoj zdravstvene zaštite u Republici Hrvatskoj.

Bila je aktivna na psihijatrijskim kongresima i kongresima dječje i adolescentne psihijatrije (kongres Europske unije pedopsihijatarata, međunarodni kongresi dječje i adolescentne psihijatrije, međunarodni kongresi psihoanalitičara, Konferencija Europske psihoanalitičke federacije; nekoliko hrvatskih kongresa psihijatarata i Hrvatski kongres dječje i adolescentne psihijatrije, gdje je bila i organizator kongresa).

Prof. Vlasta Rudan bila je poznata kao vrstan kliničar, uz to znanstvenik i organizator brojnih skupova te edukator nizu kolega iz područja psihoterapije, psihijatrije te dječje i adolescentne psihijatrije. Bila je suorganizator istočnoeuropske ljetne škole za dječju i adolescentnu psihoanalizu, suorganizator seminara dječje i adolescentne psihijatrije Dani Maje Beck Dvoržak; jedan od petero predlagača i pokretača postupka za odobrenje hrvatske studijske grupe za psihoanalizu od Međunarodnog psihoanalitičkog udruženja (IPA).

Organizirala je niz stručnih skupova i tečajeva Medicinskog fakulteta, urednik je niza knjiga koje je objavila Medicinska naklada, a koje su bile vezane uz tematske skupove („Psihodinamika ljubavi i mržnje”, urednici D. Marčinko, M. Jakovljević i V. Rudan; 2019.; „Nelagoda u kulturi 21. stoljeća – psihodinamska rasprava”, urednici: D. Marčinko i V. Rudan; 2018.; „Histe-

and Adolescents in the Republic of Croatia; and The Predictive Value of the Assessment of Emotional and Behavioral Problems in Youth.

In cooperation with Prof. Vesna Vidović, she participated in submitting a proposal for a new specialization in child and adolescent psychiatry to the Ministry of Health of the Republic of Croatia. By decision of the Assembly of the Croatian Medical Association, in 1995 she was awarded the Charter of the Croatian Medical Association for her contribution to medical science and the profession, and for the development of health care in the Republic of Croatia.

She was actively involved in psychiatric congresses and congresses on child and adolescent psychiatry (the Congress of the European Union of Child and Adolescent Psychiatrists, international congresses of child and adolescent psychiatry, international congresses of psychoanalysts, and conferences of the European Psychoanalytic Federation; several Croatian congresses of psychiatrists and the Croatian Congress of Child and Adolescent Psychiatry, where she also was an organizer).

Prof. Vlasta Rudan was widely recognized as an outstanding clinician, scientist, organizer of numerous professional meetings, and educator of many colleagues in the fields of psychotherapy, psychiatry, and child and adolescent psychiatry. She was a co-organizer of the Eastern European Summer School for Child and Adolescent Psychoanalysis, co-organizer of seminars in child and adolescent psychiatry “Days of Maja Beck Dvoržak”, and one of five proponents and initiators of the procedure for obtaining the approval of the International Psychoanalytical Association (IPA) for the Croatian Psychoanalytic Study Group.

She organized a series of professional meetings and courses for the School of Medicine and served as editor of a series of books published by *Medicinska naklada*, all in reference to thematic conferences (“Psychodynamics of Love and Hate”, editors D. Marčinko, M. Jakovljević and V. Rudan; 2019; “Discomfort in 21st Century Culture – A Psychodynamic Discussion”, editors D. Marčinko and V. Rudan; 2018; “Hysteria”, editors D. Marčinko and V. Rudan; 2017; “Psychoanalyt-

rija”, urednici: D. Marčinko i V. Rudan; 2017.; „Psihoanalitički modeli komunikacije u vremenu brzih promjena”, urednici: D. Marčinko i V. Rudan; 2016.; „Poremećaji ličnosti: stvarni ljudi, stvarni problemi”, urednici: D. Marčinko, M. Jakovljević i V. Rudan; 2015.; „Žalovanje”, urednici V. Rudan i D. Marčinko; 2014.; „Od nasilja do dijaloga”, urednici V. Rudan i D. Marčinko; 2014.; „Narcistični poremećaj ličnosti i njegova dijagnostička opravdanost – doprinos međunarodnoj raspravi”, urednici D. Marčinko i V. Rudan; 2013.).

Bila je član niza stručnih društava: Hrvatska akademija medicinskih znanosti, HLZ, HD za psihoanalitičku psihoterapiju, HD dojenačke, dječje i adolescentne psihijatrije, IPA (Međunarodno psihoanalitičko udruženje), IACAPAP (Međunarodno udruženje dječje i adolescentne psihijatrije), ESCAP (Europsko udruženje dječje i adolescentne psihijatrije), HD za personologiju, poremećaje ličnosti i poremećaje hranjenja. Od 2015. bila je aktivna unutar Centra za unaprjeđenje mentalnog zdravlja, vezanog uz Medicinski fakultet u Zagrebu te je nesebično davala podršku studentima fakulteta.

13. studenog 2025. organizirali smo tečaj Medicinskog fakulteta „Dobri odnosi” (uz popratnu knjigu), s međunarodnim sudjelovanjem, a koji smo posvetili sjećanju na našu prof. Vlastu Rudan.

Krasila ju je mudrost srca i nesebični angažman u pomaganju drugim ljudima. Hvala joj na svemu dobrom što nam je dala i što je nemjerljivo!

Darko Marčinko

ic Models of Communication in a Time of Rapid Change”, editors D. Marčinko and V. Rudan; 2016; “Personality Disorders: Real People, Real Problems”, editors D. Marčinko, M. Jakovljević and V. Rudan; 2015; “Mourning”, editors V. Rudan and D. Marčinko; 2014; “From Violence to Dialogue”, editors V. Rudan and D. Marčinko; 2014; “Narcissistic Personality Disorder and Its Diagnostic Justification – A Contribution to the International Debate”, editors D. Marčinko and V. Rudan; 2013).

She was a member of numerous professional associations: the Croatian Academy of Medical Sciences, the Croatian Medical Association, the Croatian Association for Psychoanalytic Psychotherapy, the Croatian Society for Infant, Child and Adolescent Psychiatry, the International Psychoanalytical Association (IPA), the International Association for Child and Adolescent Psychiatry and Allied Professions (IACAPAP), the European Society for Child and Adolescent Psychiatry (ESCAP), and the Croatian Society for Personology, Personality Disorders and Eating Disorders. As of 2015, she was actively involved with the Centre for Mental Health Improvement, affiliated with the School of Medicine in Zagreb, where she selflessly provided support to the students.

On 13 November 2025, we organized a course at the School of Medicine, entitled “Good Relationships” (with an accompanying book), which involved international participation, and which we dedicated to the memory of our Prof. Vlasta Rudan.

She was distinguished by wisdom of the heart and her selfless commitment to helping others. We are deeply thankful for all of her immeasurable contributions!

Darko Marčinko

Vlastu smo izgubili na bolan način iznenada.

Ostala nam je tuga za dragom i bliskom osobom. Mnoge nas je zadužila. Bitno je utjecala na razvoj dječje i adolescentne psihijatrije, psihoanalize i psihoanalitičke psihoterapije u našoj sredini.

Najbolje što je imala – empatiju, znanje i umijeće – dala je svojim mladim pacijentima pomažući im prebroditi burna razdoblja njihovih života.

Kada se pogleda samo njezina biografija i impresivan popis vrijednih znanstvenih i stručnih radova, ostajemo zadivljeni širinom znanja, njezinom silnom radnom energijom i predanošću svojem pozivu. Vlasta je bila poznata po tome što kad se bavila svojim pacijentima kao da nije postojalo radno vrijeme. Ostajala bi na klinici nakon što su sve smjene završile. Bavila se najsloženijim i najtežim pitanjima koje srećemo u dječjoj i adolescentnoj psihijatriji, pitanjima odrastanja, krize identiteta, promjene raspoloženja i gradnje strukture ličnosti u adolescenciji.

U svakodnevnom životu Vlasta je bila ugodna sugovornica u mnogim temama. Imala je široko obrazovanje i interese, dobro je poznavala književnost. Zanimala su je različita društvena pitanja. Bila je temperamentna u nastupu i izlaganju svojih stavova, jasna, razumljiva i zanimljiva.

Voljeli su je pacijenti, divili su joj se edukanti, poštovali su je suradnici.

Kao i svatko od nas u svakodnevnom životu znala je biti emotivna. Znala se razveseliti i naljutiti. Imala je jak osjećaj dužnosti i odgovornosti i stroge etičke kriterije. Kad bi se naljutila, nekad i opravdano, to bi izgledalo opasno, ali neraspoloženje nije dugo trajalo. Voljela se i našaliti pa je uz nju bilo vedrih trenutaka.

U pogledu njezina znanstvenog i stručnog doprinosa, koji ima odjek i izvan naše sredine, željela bih posebno istaknuti jednu naoko

The loss of Vlasta was sudden and painful.

We are left with grief for a colleague who was dear and close to us. Many of us are indebted to her. Her contribution to the development of child and adolescent psychiatry, psychoanalysis, and psychoanalytic psychotherapy in our community was immense.

She devoted her best – empathy, knowledge, and skill – to her young patients, helping them weather the turbulent periods of their lives.

Viewing her biography and the impressive list of valuable scientific and professional publications alone, we are left in awe of the breadth of her knowledge, immense capacity for work, and devotion to her vocation. It was well known that when Vlasta was with her patients, it seemed as if working hours did not exist. She would stay at the clinic long after all shifts had ended. She dealt with the most complex and demanding issues that we encounter in our work in child and adolescent psychiatry, the issues of growing up, experiencing identity crises, mood changes, and building a personality structure during adolescence.

In everyday life, Vlasta was an engaging conversationalist on numerous topics. She had a broad education and diverse interests, and was well-versed in literature. She took an active interest in various social issues. She was temperamental in her approach, and clear, comprehensible and engaging in the presentation of her views.

She was loved by her patients, admired by her trainees, and respected by her colleagues.

Like any of us, she would be emotional in everyday life. She would rejoice and at times get angry. She had a strong sense of duty and responsibility, and upheld strict ethical standards. When she was angry, sometimes justifiably so, it could appear strict, but such bad moods would not last long. She also enjoyed humor, and we spent many joyful moments with her.

In terms of her scientific and professional contributions, which resonate beyond our community, I would like to highlight one seemingly small matter. It is her work on the specialization program

malu stvar. Riječ je o radu na programu specijalizacije iz dječje i adolescentne psihijatrije koji je prethodio stvaranju novih stručnjaka na tom području. Time je omogućila stvaranje Klinike za dječju i adolescentnu psihijatriju u Kliničkom bolničkom centru Zagreb, koji se sada može svrstati među vodeće medicinske ustanove u svijetu.

Vlaste se najradije sjećam s različitih seminara i kongresa, okružene mladim ljudima, vedre, nasmiješene, opuštene, kako živahno razgovara. Voljela je oko sebe okupljati mlade motivirajući i hrabreći ih u izboru našeg poziva.

Mnogima je bila mentorica i suradnica svesrdno im pomažući u napredovanju i veseleći se njihovim uspjesima.

Vlastu ćemo pamtili po njezinoj nadarenosti, nepresušnom znanju i sposobnosti da ga iskoristi u svrhu napretka struke. Krasila ju je humanost i odanost pozivu. Bila je uzor, možda nedostižan, ali nam kao nezaboravan primjer ostaje u sjećanjima.

Vesna Vidović

in child and adolescent psychiatry, which preceded the formation of new specialists in this field. In this way, she enabled the establishment of the Department of Child and Adolescent Psychiatry at the University Hospital Centre Zagreb, which can now be ranked among the world's leading medical institutions.

My fondest memories of Vlasta are from various seminars and congresses where she was surrounded by young people, cheerful, smiling and relaxed, engaged in lively conversation. She loved to gather young people around her, motivating and encouraging them to choose our profession.

She was a mentor and collaborator to many individuals, providing wholehearted support for their professional advancement and rejoicing in their successes.

We will remember Vlasta for her talent, her inexhaustible knowledge, and ability to use it for the advancement of the profession. She was distinguished by her humanity and devotion to her calling. She was a role model, perhaps an unattainable one, but will remain unforgettable in our memories.

Vesna Vidović

Kongresi u 2026. godini

/ Congresses in 2026

20th International Conference of Gerontology and Geriatric Psychiatry

Dubai, 26 – 27. siječnja 2026.

<https://waset.org/gerontology-and-geriatric-psychiatry-conference-in-january-2026-in-dubai>

American Psychoanalytic Association National Meeting

San Francisco, 27. siječnja – 1. veljače 2026.

<https://apsa.org/meetings-events/>

43rd Global Psychiatry and Mental Health Conference

Pariz, 16. veljače 2026.

<https://psychiatriccongress.insightconferences.com/>

12th International Conference on Depression, Anxiety and Stress Management

London, 23 – 24. veljače 2026.

<https://stressmanagement.psychiatrycongress.com/>

Mayo Clinic Psychiatry Clinical Updates plus Psychiatry in Medical Settings

Waimea, 2 – 6. ožujka 2026.

<https://ce.mayo.edu/psychiatry-and-psychology/content/psychiatry-clinical-updates-2026-plus-psychiatry-medical-settings>

Cognitive Neuroscience Society Annual Meeting

Vancouver, 7 – 10. ožujka 2026.

<https://www.cogneurosociety.org/annual-meeting/>

11th International Conference on Neuroscience and Cognitive Brain Information

>Valencia, 8 – 12. ožujka 2026.

<https://www.iaia.org/conferences2026/CfPBRAININFO26.html>

19. tjedan psihologije u Hrvatskoj

9 – 15. ožujka 2026.

<https://www.psihologija.hr/kalendar/19-tjedan-psihologije>

ECNP Workshop on Applied Neuroscience

Nica, 12 – 15. ožujka 2026.

<https://www.ecnp.eu/early-career-scientists/workshop>

34th European Congress of Psychiatry

Prag, 5 – 8. travnja 2026.

<https://epa-congress.org/>

International Neuroscience Winter Conference

Sölden, 11 – 15. travnja 2026.

<https://www.swc.ucl.ac.uk/winterneuroscienceconference/>

32nd International Symposium on Controversies in Psychiatry

Barcelona, 16 – 17. travnja 2026.

<https://www.controversiasbarcelona.org/>

40th International Conference on Mental Health and Psychiatry

Amsterdam, 27 – 28. travnja 2026.

<https://psychiatriccongress.europeannualconferences.com/>

Society for Sex Therapy and Research Annual Meeting – Sexuality in Connection

Vancouver, 7 – 9. svibnja 2026.

<https://sstarnet.glueup.com/event/2026-sstar-annual-meeting-sexuality-in-connection-a-systemic-perspective-162242/>

17th World Congress of the International Neuromodulation Society

Lisabon, 9 – 14. svibnja 2026.

<https://ins-congress.com/>

2nd World Congress on Psychology & Behavioral Sciences

London, 15 – 17. svibnja 2026.

<https://www.wpbcconf.org/>

Annual Meeting of the American Psychiatric Association

San Francisco, 16 – 20. svibnja 2026.

<https://www.psychiatry.org/psychiatrists/meetings/annual-meeting>

17th Conference on Cognitive Science

Dubrovnik, 21 – 24. svibnja 2026.

<https://ducog.cecog.eu/>

65th International Neuropsychiatric Congress

Pula, 21 – 24. svibnja 2026.

<https://www.pula-cong.com/>

20th International Conference on Psychology

Atena, 25 – 29. svibnja 2026.

<https://www.atiner.gr/psychology>

Royal College of Psychiatrists International Congress

Liverpool, 15 – 18. lipnja 2026.

<https://www.rcpsych.ac.uk/events/congress>

11th World Confederation of Cognitive and Behavioural Therapies Congress

San Francisco, 25 – 28. lipnja 2026.

<https://wccbt2026.org/>

12th Congress of the European Academy of Neurology

Ženeva, 27 – 30. lipnja 2026.

<https://www.ean.org/congress2026>

27th World Congress of International Association for Child and Adolescent Psychiatry and Allied Professions

Hamburg, 1 – 4. srpnja 2026.

<https://www.iacapap-congress.com/>

31st International Conference on Applied Psychology

Firenca, 21 – 25. srpnja 2026.

<https://www.icap2026.org/>

37th World Congress Collegium Internationale Neuro-Psychopharmacologicum

Glasgow, 26 – 29. lipnja 2026.

<https://cinp2026.org/>

Federation of European Neuroscience Societies Forum

Barcelona, 6 – 10. srpnja 2026.

<https://fensforum.org/>

EPATH's Summer School

Gent, 8 – 10. srpnja 2026.

<https://epath.eu/2026-summer-school/>

Alzheimer's Association International Conference

London, 12 – 15. srpnja 2026.

<https://aaic.alz.org/>

40th Annual Conference of the European Health Psychology Society

Pafos, 1 – 4. rujna 2026.

<https://2026.ehps.net/>

56th EABCT Congress

Bruxelles, 16 – 19. rujna 2026.

<https://eabctcongress.org/>

3rd International Conference on Mental Health & Psychiatry

Madrid, 17 – 18. rujna 2026.

<https://globalscion.com/mentalhealth/>

46th International Conference of the Stress, Trauma, Anxiety, and Resilience Society

Zagreb, 22 – 24. rujna 2026.

<https://star-society.org/next-star-conferences/>

ISTSS 42nd Annual Meeting

San Antonio, 23 – 26. rujna 2026.

<https://istss.org/annual-meeting-hub/>

9. hrvatski psihijatrijski kongres i 21. hrvatski psihijatrijski dani

Brela, 7 – 10. listopada 2026.

<https://psihijatrija.hr/>

39th ECNP Congress

Muenchen, 10 – 13. listopada 2026.

<https://www.ecnp.eu/congress2026/>

26th World Congress of Psychiatry

Stockholm, 23 – 26. listopada 2026.

<https://wcp-congress.com/>

Annual Meeting of American Academy of Child and Adolescent Psychiatry

Atlanta, 26 – 31. listopada 2026.

https://www.aacap.org/aacap/CME_and_Meetings/Future_Annual_Meetings

33. godišnja konferencija hrvatskih psihologa

Vodice, 4 – 7. studenoga 2026.

Neuroscience 2026

Washington, D.C., 14 – 18. studenoga 2026.

<https://www.sfn.org/meetings/neuroscience-2026>

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Upute autorima

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Tijekom cijelog redakcijskog postupka, *Socijalna psihijatrija* slijedi sve smjernice Odbora za etiku objavljivanja (*Committee of publication ethics* - COPE), detaljnije na: https://publicationethics.org/files/Code%20of%20Conduct_2.pdf, kao i preporuke ponašanja, izvještavanja, uređivanja i objavljivanja znanstvenih radova u časopisima medicinske tematike koje je objavio Međunarodni odbor urednika medicinskih časopisa (*International Committee of Medical Journal Editors* - ICMJE), detaljnije na: <http://www.icmje.org/journals-following-the-icmje-recommendations/>.

Urednici časopisa *Socijalna psihijatrija* također su obvezni osigurati integritet i promicati inovativne izvore podataka temeljenih na dokazima, kako bi održali kvalitetu i osigurali utjecaj objavljenih radova u časopisu, a sukladno načelima iznesenim u Sarajevskoj deklaraciji o integritetu i vidljivosti (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5209927/>).

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Radovi koji su pisani prema Uputama za autore, šalju se na recenziju. Časopis *Socijalna psihijatrija* recenzentima savjetuje da se pridržavaju uputa u Uputama za recenzente koje su dostupne na mrežnim stranicama Časopisa.

Instructions to authors

Aim & Scope

Socijalna psihijatrija is a peer-reviewed journal intended for publication of manuscripts from the fields of social psychiatry, clinical psychiatry and psychology, biopsychology, psychotherapy, forensic psychiatry, war psychiatry, alcoholism and other addictions, mental health protection among persons with intellectual and developing disabilities, epidemiology, deontology and psychiatric service organisations.

All manuscripts must be written in the Croatian and English language.

All manuscripts undergo the same review process if they follow the scope of the Journal and fulfil the conditions according to the Author guidelines.

The Editorial board will not take the responsibility for the viewpoint of the Author's manuscript - it remains the exclusive responsibility of an Author.

Socijalna psihijatrija publishes the following types of articles: editorials, original scientific papers, professional papers, review's, case reports, reports on drugs and methods of treatment, short announcements, annotations, news, book review's, letters to the editor, and other papers in the field of social psychiatry.

Exceptionally, the Editorial board can accept other kinds of paper (social psychiatry event paper, social psychiatry history-related paper, etc.).

During the whole peer-reviewed process, the *Socijalna psihijatrija* journal follows the Committee of publication ethics (COPE) guidelines (https://publicationethics.org/files/Code%20of%20Conduct_2.pdf) as well as the "Recommendations for the conduct, reporting editing, and publication of scholarly work in medical journals" set by the International Committee of Medical Journal Editors (ICMJE - <http://www.icmje.org/journals-following-the-icmje-recommendations/>).

Editors at the *Socijalna psihijatrija* journal pay close attention to the integrity and visibility of scholarly publications as stated in Sarajevo Declaration (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5209927/>).

Editorial board

Each received manuscript is evaluated by the Editor-in-Chief. The manuscripts that do not meet the main criteria listed in the Author guidelines are returned to the Author. Manuscripts that are qualified are processed further.

Peer-review

Manuscripts that meet the scope of the Journal and are prepared according to the Author guidelines are sent to peer-review.

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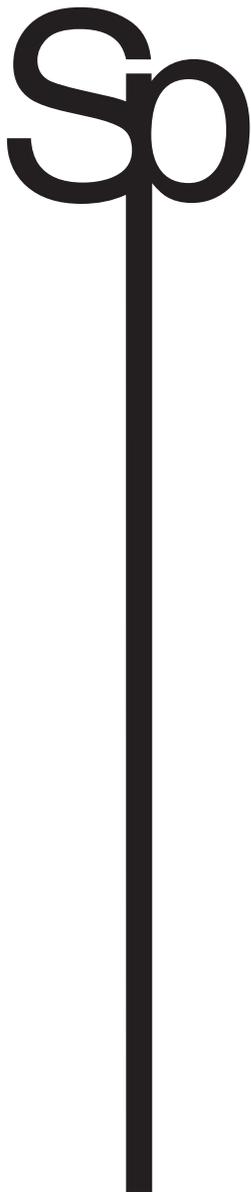
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