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Determinante zadovoljstva životom starijih osoba: što je najvažnije za zadovoljstvo životom u starijoj dobi?

/ Determinants of Life Satisfaction in Older People: What Is Crucial for Life Satisfaction in Older Age?

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Zadovoljstvo životom jedan je od ključnih indikatora kvalitete života te pokazatelj uspješnosti suočavanja s različitim životnim izazovima i gubitcima u procesu starenja. Stoga je u kontekstu kontinuiranog porasta dužine života i udjela starijih osoba u populaciji od sve većeg značenja otkrivanje ključnih determinanti njihovog zadovoljstva životom, posebno onih koje su podložne intervencijama. Cilj ovoga istraživanja bio je ispitati koliki je doprinos različitih skupina potencijalnih prediktora (sociodemografski, zdravstveni, funkcionalni, psihološki i socijalni) objašnjenju individualnih razlika u zadovoljstvu životom starijih osoba. Istraživanje je provedeno na prigodnom izvaninstitucionalnom uzorku od 790 starijih osoba u dobi od 65 do 98 godina ($M = 73,97$ godina, $SD = 6,58$) iz različitih krajeva Hrvatske, od čega 460 žena (58,23 %). Upitnici koji su uključivali instrumente za ispitivanje ključnih konstrukata primjenjivani su individualno. Rezultati regresijskih analiza pokazali su da su među ispitanim potencijalnim prediktorima značajan doprinos objašnjenju zadovoljstva životom imali percipirani financijski status, funkcionalna sposobnost, mentalno zdravlje, optimizam, otpornost i socijalna podrška. Pritom su se najboljim prediktorima zadovoljstva životom ispitanih starijih osoba pokazali mentalno zdravlje i percipirani financijski status. Javne politike, javnozdravstveni programi i psihosocijalne intervencije trebali bi se usmjeriti na ove i druge čimbenike koji olakšavaju prilagodbu starijim osobama te doprinose njihovom zadovoljstvu životom.

/ Life satisfaction is one of the key indicators of quality of life and an indicator of successful coping with various life challenges and losses in the ageing process. Therefore, in the context of the continuous increase in life expectancy and the proportion of older people in the population, it is becoming increasingly important to discover the key determinants of their life satisfaction, especially those which are subject to interventions. The aim of this study was to examine to what extent different groups of potential predictors (sociodemographic, health, functional, psychological, and social) contribute to the explanation of individual differences in life satisfaction among older people. The study was conducted on a convenience community dwelling sample of 790 older people aged between 65 and 98 years ($M = 73.97$ years, $SD = 6.58$) from different geographical regions in the Republic of Croatia, 460 of them being women (58.23%). The questionnaires which included instruments for examining key constructs were applied individually. The results of regression analyses showed that, among the examined potential predictors, perceived financial status, functional ability, mental health, optimism, resilience, and social support significantly contributed to the explanation of life satisfaction. In that context, mental health and perceived financial status proved to be the best predictors of life satisfaction among elderly respondents. Public policies, public health programmes and psychosocial interventions should focus on these and other factors that facilitate the adjustment of older people and contribute to their life satisfaction.

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UVOD

Stanovništvo zemalja diljem svijeta ubrzano stari, odnosno udio starijih osoba u populaciji kontinuirano raste. Ovaj demografski trend već više desetljeća prati i Hrvatska u kojoj je, prema zadnjem Popisu stanovništva iz 2021., udio osoba starih 65 i više godina u ukupnom stanovništvu porastao na čak 22,45 % (1). Stoga kvaliteta i zadovoljstvo životom u starijoj dobi postaju iznimno važne teme, ne samo za starije osobe i njihove obitelji, nego su te teme i u središtu interesa javnih politika. Nekoliko međuvladinih organizacija kao što su Svjetska zdravstvena organizacija ili Ujedinjeni narodi sve više potiču zemlje da uz uobičajene ekonomske indikatore koriste i pokazatelje dobrobiti (npr. zadovoljstvo životom) stanovništva kada donose važne političke odluke (2).

Jedna od komponenti kvalitete života i dobrobiti u širem smislu je zadovoljstvo životom. Ono se obično definira kao pojedinačna opća procjena vlastitog života utemeljena na činiteljima koje pojedinac smatra ključnima ili kao kognitivna ili evaluativna komponenta subjektivne dobrobiti (3,4). Pod utjecajem je genetskih, društveno-strukturnih faktora, kao i promjenjivih životnih okolnosti (5,6). Zadovoljstvo životom je jedan od pokazatelja uspješne psihološke prilagodbe u starijoj dobi, kada se osoba suočava s brojnim promjenama i gubitcima u području zdravlja, tjelesnog i kognitivnog

INTRODUCTION

The world population is rapidly ageing, that is, the proportion of older people in the population is continuously increasing. This demographic trend has also been present in Croatia for decades, where, according to the latest 2021 census, the proportion of people aged 65 and older in the total population has increased to as much as 22.45% (1). Therefore, the quality of life and life satisfaction in older age have become extremely important topics not only for older people and their families, but they have also become an area of interest for public policies. Several inter-governmental organisations, such as the World Health Organisation or the United Nations, have been increasingly encouraging countries to consider the indicators of population well-being (e.g. life satisfaction) when making important political decisions, in addition to the usual economic indicators (2).

One of the components of quality of life and well-being in a broader sense is life satisfaction. It is usually defined as an individual's general assessment of their own life based on the factors that they consider to be the key factors, or as the cognitive or evaluative component of subjective well-being (3, 4). It is influenced by genetic, sociostructural factors, as well as changeable life circumstances (5, 6). Life satisfaction is one of the indicators of successful psychological adjustment in older age, when a person is confronted by numerous changes and losses regarding their

funkcioniranja te uključenosti u socijalne i produktivne aktivnosti (7,8). Stoga je u kontekstu starenja stanovništva od sve većeg značenja otkrivanje ključnih determinanti zadovoljstva životom, posebno onih koje su podložne intervencijama, s ciljem očuvanja ili unaprjeđenja zadovoljstva životom u starijoj dobi.

Jedan od najčešće ispitivanih korelata zadovoljstva životom starijih osoba je njihov objektivni ili subjektivni zdravstveni status. Rastući je broj istraživanja koja potvrđuju povezanost većeg zadovoljstva životom s boljim zdravljem, odnosno s manjim rizikom pojave kroničnih bolesti ili s njihovim manjim brojem (2, 9-13) te sa smanjenom stopom smrtnosti (2,14). Ovaj odnos može biti dvosmjernan, odnosno bolje zdravlje doprinosi većem zadovoljstvu životom, ali i veće zadovoljstvo životom poboljšava zdravstvene ishode. Taj se utjecaj na povoljnije zdravstvene ishode zadovoljstva životom ostvaruje na više načina: (a) putem povoljnog djelovanja na druge psihološke i socijalne resurse koji štite od štetnog utjecaja stresa, (b) posrednim putem, preko djelovanja na povoljna zdravstvena ponašanja (npr. češću tjelesnu aktivnost ili zdravu prehranu) i (c) izravnim putem, preko bioloških mehanizama (npr. nižih razina upalnih biljega) (2). Uz objektivni zdravstveni status, i subjektivna samoprocjena zdravlja usko je povezana sa zadovoljstvom životom i u izvaninstitucionalnim uzorcima starijih osoba, kao i u onih koje žive u domovima za starije osobe (2, 7, 13, 15-19). Pritom se pokazuje da su starije osobe koje povoljnije procjenjuju vlastito zdravlje zadovoljnije životom. Subjektivni zdravstveni status ili subjektivna samoprocjena zdravlja odnosi se na pojedinčevu percepciju vlastitog općeg zdravstvenog stanja te je jako dobar prediktor morbiditeta i mortaliteta starijih osoba (20). Nadalje, bolje mentalno zdravlje, primjerice, niže razine depresivnih simptoma, povezano je s većim zadovoljstvom životom starijih osoba (2,11,16).

Funkcionalna sposobnost pojedinca odnosno sposobnost samostalnog izvođenja svakodnevnog

health, their physical and cognitive functioning, and their inclusion in social and productive activities (7, 8). Therefore, in the context of population ageing, it is of increasing importance to identify the key determinants of life satisfaction, especially those which are subject to interventions, with the aim of preserving or improving life satisfaction in older age.

One of the most frequently examined correlates of life satisfaction in older people is their objective or subjective health status. There is a growing number of studies confirming the correlation between greater life satisfaction and better health, i.e. a decreased risk of chronic diseases or their lower number (2, 9-13), as well as reduced mortality rates (2, 14). This correlation can be two-way, meaning that better health contributes to greater life satisfaction, but also greater life satisfaction improves health outcomes. This impact of life satisfaction on more favourable health outcomes is achieved in multiple ways: (a) through the favourable impact on other psychological and social resources which protect from harmful effects of stress, (b) indirectly, through influencing favourable health behaviours (e.g. more frequent physical activity or healthy nutrition), and (c) directly, through biological mechanisms (e.g. lower levels of inflammatory markers) (2). In addition to the objective health status, subjective self-rated health is also closely associated with life satisfaction in non-institutional samples of older people, as well as those living in nursing homes (2, 7, 13, 15-19). It has thereby been proved that older people who assess their own health more favourably are more satisfied with their lives. Subjective health status or subjective self-rated health refers to an individual's perception of their general health status and is a very good predictor of morbidity and mortality in older people (20). Furthermore, better mental health, e.g. lower levels of depressive symptoms, is associated with greater life satisfaction among older people (2, 11, 16).

An individual's functional ability, i.e. the ability of independent performance of daily activities, such as maintaining personal hygiene or doing house-

nih aktivnosti, kao što je održavanje osobne higijene ili obavljanje kućanskih poslova, u uskoj je vezi sa zdravstvenim stanjem pojedinca. Očuvana funkcionalna sposobnost omogućuje starijim osobama da rade (ne samo u formalnoj radnoj ulozi), družu se, obavljaju svakodnevne aktivnosti i svoje društvene uloge, što sve utječe na njihovu dobrobit. Narušeno zdravlje može ugroziti funkcionalnu sposobnost a ograničenja u samostalnom obavljanju svakodnevnih aktivnosti i ovisnost o pomoći drugih snažno negativno utječu na zadovoljstvo životom (11,13,16,17).

Uz zdravstveni i funkcionalni status brojni su psihosocijalni resursi pojedinca koji mogu utjecati na njegovo zadovoljstvo životom. I taj odnos može biti dvosmjernan, odnosno bolji psihosocijalni resursi mogu doprinijeti većem zadovoljstvu životom, ali i zadovoljstvo životom može ojačati neke indikatore psihosocijalne dobrobiti. Primjerice, u prospektivnoj studiji na nacionalno reprezentativnom uzorku odraslih osoba starijih od 50 godina u SAD-u, Kim i sur. (2) su utvrdili da su pojedinci koji su bili najzadovoljniji životom četiri godine kasnije imali povoljnije rezultate na gotovo svim ispitanim psihosocijalnim indikatorima kao što su veći pozitivni afekt, izraženiji optimizam i doživljaj životne svrhe, te manje izražene depresivne simptome, manji doživljaj usamljenosti i niži negativni afekt. Među psihološkim resursima koji mogu olakšati uspješno nošenje s promjenama u procesu starenja, sve se više istražuju optimizam i otpornost. Optimizam se općenito odnosi na pozitivna očekivanja budućih ishoda te je rastući broj empirijskih nalaza koji ukazuju na njegovu povezanost s boljim tjelesnim i mentalnim zdravljem, većim zadovoljstvom životom i dobrobiti u različitim dobnim skupinama, uključujući i starije osobe (21,22). Otpornost se odnosi na sposobnost učinkovitog svladavanja stresnih događaja i situacija uz zadržavanje normalnog psihološkog i tjelesnog funkcioniranja, odnosno mogućnost osobe da izdrži i da se lako i brzo oporavi od teških situa-

hold chores, is closely linked with their health status. Preserved functional ability enables older people to work (not only in the formal work role), socialise, perform daily activities and fulfil their social roles, all of which affects their well-being. Impaired health can jeopardise functional ability, while limitations in independent performance of daily activities and dependence on the help from others have a strong negative impact on life satisfaction (11, 13, 16, 17).

In addition to the health and functional status, there are numerous psychosocial resources in an individual which can influence their life satisfaction. That correlation can also be two-way, i.e. better psychosocial resources can contribute to greater life satisfaction, but life satisfaction can also strengthen some indicators of psychosocial well-being. For instance, in their prospective study on a national representative sample of adults over the age of 50 in the USA, Kim et al. (2) found that the individuals who were most satisfied with their lives, four years later had more favourable results in almost all the examined psychosocial indicators such as greater positive affect, higher optimism and perception of life purpose, as well as fewer depressive symptoms, lower perception of loneliness and lower negative affect. Among the psychological resources that can facilitate successful coping with changes in the ageing process, optimism and resilience have been increasingly investigated. Optimism generally refers to positive expectations of future outcomes, and there is a growing number of empirical findings showing its connection with better physical and mental health, higher life satisfaction and well-being, in different age groups, including older people (21, 22). Resilience refers to the ability of successful coping with stressful events and situations while maintaining normal psychological and physical functioning, i.e. an individual's ability to endure and to easily and quickly recover from difficult situations, such as accidents or diseases (23). More resilient people are more efficient in using available resources, they are better at coping with stress, they accept inevitable changes in the ageing process more easily and are more skilful in maintaining inclusion in the

cija, kao što su nesreće ili bolesti (23). Otpornije osobe učinkovitije koriste dostupne resurse, bolje se nose sa stresom, lakše prihvaćaju neizbježne promjene u procesu starenja i vještije su u održavanju uključenosti u one aktivnosti koje su im važne, što sve pozitivno doprinosi njihovom zadovoljstvu životom. Dosadašnja istraživanja potvrđuju doprinos otpornosti mentalnom i tjelesnom zdravlju te kvaliteti i zadovoljstvu životom u starijoj dobi (24,25).

Uz psihološke resurse, i oni socijalni koji su s njima usko povezani također imaju važnu ulogu u kontekstu dobrobiti starijih osoba. Brojna ranija istraživanja pokazala su važnost socijalne podrške, socijalne participacije ili uključenosti u različite društvene i produktivne aktivnosti (npr. čuvanje unučadi, druženje s prijateljima, volontiranje, vrtlarenje, religijske aktivnosti, aktivna participacija u udruženjima umirovljenika) za zadovoljstvo i kvalitetu života starijih osoba i njihovo uspješno i aktivno starenje (7, 13, 15, 26-29). Primjerice, socijalna podrška spominje se kao jedan od najznačajnijih prediktora zadovoljstva životom u starijoj dobi (30) jer štiti od negativnih utjecaja stresa te nepovoljnih emocionalnih stanja, kao što je depresivnost u starijih osoba (31,32). Uz to, bogatija socijalna mreža i sudjelovanje u aktivnostima u slobodno vrijeme povezani su s boljom prilagodbom na starenje i dužim životom (33).

U pogledu sociodemografskih odrednica zadovoljstva životom, rezultati ranijih istraživanja uglavnom upućuju na nepostojanje spolnih razlika u razinama zadovoljstva životom u starijih osoba (34) premda se korelati zadovoljstva životom mogu razlikovati između starijih muškaraca i žena (30). Nadalje, istraživanja jednoglasno potvrđuju povezanost višeg socioekonomskog statusa, uključujući bolje obrazovanje i bolji materijalni status, s većim zadovoljstvom životom (15, 16, 35- 37). U pogledu bračnog statusa i načina života, istraživanja pokazuju da su udovištvo i samački život povezani s nižim zadovoljstvom životom u starijoj dobi (15,29,38).

activities they find important, which all contributes positively to their life satisfaction. Previous research confirms the contribution of resilience to mental and physical health, as well as to the quality of life and life satisfaction in older age (24, 25).

In addition to psychological resources, the social resources which are closely associated with them also have an important role in the context of well-being among older people. Numerous previous studies have shown the importance of social support, social participation or inclusion in various social and productive activities (e.g. looking after grandchildren, socialising with friends, volunteering, gardening, religious activities, active participation in retiree associations) for the life satisfaction and quality of life in older people, as well as for their successful and active ageing (7, 13, 15, 26, 27-29). For example, social support is mentioned as one of the most important predictors of life satisfaction in older age (30) because it protects from the negative effects of stress and unfavourable emotional states such as depression among older people (31,32). In addition, a richer social network and participation in leisure activities are associated with better adaptation to ageing and a longer life (33).

With regard to the sociodemographic determinants of life satisfaction, the results of previous research mostly indicate a non-existence of gender differences in terms of life satisfaction levels in older people (34), although the correlates of life satisfaction can vary among older men and women (30). Furthermore, research unanimously confirms that there is a correlation between higher socioeconomic status, including better education and better financial status, and greater life satisfaction (15, 16, 35-37). With regard to marital status and lifestyle, research shows that widowhood and single life are associated with lower life satisfaction in older age (15, 29, 38). Furthermore, older people who live alone and who are socially excluded are at a higher risk of developing mental health problems, e.g. they have a higher incidence of depressive symptoms (39).

Probably one of the most interesting findings in the field of research on age-related changes in life

Također, starije osobe koje žive same i koje su socijalno isključene u većem su riziku pojave problema mentalnog zdravlja, primjerice, imaju veću pojavnost depresivnih simptoma (39).

Vjerojatno jedan od najzanimljivijih nalaza u području istraživanja dobnih promjena u zadovoljstvu životom jest taj da nepovoljne promjene i gubitci u procesu starenja, od narušenog zdravstvenog i funkcionalnog statusa do gubitka bliskih osoba, nužno ne ugrožavaju zadovoljstvo životom starijih osoba koje u većine ostaje očuvano. Ova je pojava u literaturi poznata kao paradoks dobi i dobrobiti (40). Međutim, čini se da je ona tipičnija za bogate i razvijenije zemlje (41). Despot Lučanin (40) navodi da kao teorijski okvir za objašnjenje rezultata istraživanja zadovoljstva životom u starijoj dobi najbolje mogu poslužiti model selektivne optimizacije s kompenzacijom ili tzv. SOC model (42) i teorija socioemocionalne selektivnosti (43). Prema prvom modelu, uspješno starenje i očuvano zadovoljstvo životom u starijoj dobi moguće je zahvaljujući održavanju povoljnog balansa između razvojnih dobitaka i gubitaka, odnosno zahvaljujući odabiru manjeg broja ostvarivih i smislenih ciljeva, optimizaciji energije uložene u pojedine aktivnosti te kompenzaciji ograničenja i gubitaka u starijoj dobi (44). Prema teoriji socioemocionalne selektivnosti, socijalna mreža se tijekom odrasle dobi sužava zbog ograničene vremenske perspektive, ali raste kvaliteta užeg kruga emocionalno ispunjavajućih i vrlo bliskih socijalnih odnosa. To veće ulaganje u odnose s vrlo bliskim osobama doprinosi zadovoljstvu i dobrobiti starijih osoba (30).

Na kraju, u kontekstu istraživanja determinanti zadovoljstva životom u starijoj dobi, treba naglasiti da takvih istraživanja još uvijek manjka jer se većina istraživanja zadovoljstva životom provodi u mlađim dobnim skupinama. Također, još uvijek se ne zna dovoljno o relativnom doprinosu čimbenika iz različitih skupina (npr. zdravstveni, funkcionalni, psihosocijalni) zadovoljstvu životom starijih osoba.

satisfaction is that unfavourable changes and losses in the ageing process, from impaired health and functional status to the loss of close persons, do not necessarily jeopardise life satisfaction among older people, and in most cases it remains preserved. In literature, this phenomenon is known as the age and well-being paradox (40). However, it seems to be more typical for wealthy and more developed countries (41). Despot Lučanin (40) argues that the model of selective optimisation with compensation, or the so-called SOC model, (42) and the socioemotional selectivity theory (43) can serve as the theoretical framework for explaining the results obtained in the research on life satisfaction in older age. According to the first model, successful ageing and preserved life satisfaction in older age can be achieved by maintaining a favourable balance between developmental gains and losses, i.e. due to a selection of a smaller number of reachable and meaningful goals, optimisation of the energy invested in individual activities and compensation of limitations and losses in older age (44). According to the socioemotional selectivity theory, the social network shrinks in adult age due to a limited time perspective, but the quality of the close circle of emotionally fulfilling and very close social relationships increases. This greater investment in relationships with very close persons contributes to the satisfaction and well-being of the elderly (30).

Finally, within the context of research focusing on the determinants of life satisfaction in older age, it should be pointed out that there are still few studies on this subject since most studies on life satisfaction are conducted among younger age groups. Moreover, enough is not yet known about the relative contributions of factors from different groups (e.g. health, functional, psychosocial) to life satisfaction in older people.

THE AIM OF THE STUDY

The aim of this study was to examine to what extent the potential predictors from different groups contribute to the explanation of individu-

CILJ ISTRAŽIVANJA

Cilj ovoga istraživanja bio je dobiti odgovor na pitanje koliki je doprinos potencijalnih prediktora iz različitih skupina objašnjenju individualnih razlika u zadovoljstvu životom starijih osoba. Ispitane su sljedeće skupine potencijalnih prediktora: a) sociodemografski (spol, dob, stupanj obrazovanja, financijsko stanje, način života - samački život ili suživot s drugom osobom/osobama), b) zdravstveni (broj kroničnih bolesti, mentalno zdravlje i subjektivna procjena zdravlja), c) funkcionalni (funkcionalna sposobnost), d) psihološki (optimizam i otpornost) i e) socijalni (socijalna podrška i uključenost u socijalne i produktivne aktivnosti u zajednici).

Pretpostavljeno je da će sve skupine zahvaćenih potencijalnih prediktora (sociodemografski, zdravstveni, funkcionalni, psihološki i socijalni) pridonijeti objašnjenju individualnih razlika u zadovoljstvu životom starijih osoba. Točnije, očekivano je da će viši stupanj obrazovanja, bolja financijska situacija, nesamački život, zatim manji broj kroničnih bolesti, bolje mentalno zdravlje, povoljnija subjektivna procjena zdravlja te bolji funkcionalni status biti pozitivni prediktori zadovoljstva životom starijih osoba. Nadalje, pretpostavljeno je da će izraženiji optimizam, otpornost, socijalna podrška te veća socijalna uključenost pozitivno pridonijeti zadovoljstvu životom u starijoj dobi. S obzirom na ranije nesuglasne i nedostatne nalaze o relativnom doprinosu pojedinih skupina prediktora, nisu formirane eksplicitne hipoteze u pogledu usporedbe jačine prediktivnog doprinosa pojedinačnih potencijalnih prediktora.

METODA

Sudionici

U istraživanju je sudjelovao prigodni izvaninstitucionalni uzorak od 790 starijih osoba koje su većinski živjele u vlastitom domu, od čega 460 žena (58,23 %). Prosječna dob sudionika

al differences in life satisfaction among older people. The following groups of potential predictors were examined: a) sociodemographic (gender, age, education level, financial status, way of life – single life or living with another person/other persons), b) health (number of chronic diseases, mental health and subjective self-rated health), c) functional (functional ability), d) psychological (optimism and resilience) and e) social (social support and inclusion in social and productive activities in the community).

It was assumed that all these groups of examined potential predictors (sociodemographic, health, functional, psychological and social) would contribute to the explanation of individual differences in life satisfaction among older people. More precisely, it was expected that a higher level of education, better financial situation, non-single life, a lower number of chronic diseases, better mental health, more favourable subjective self-rated health and better functional status would be positive predictors of life satisfaction among the elderly. Furthermore, it was assumed that higher optimism, resilience, social support and greater social inclusion would positively contribute to life satisfaction in older age. In view of the earlier inconsistent and insufficient findings relating to the relative contribution of individual groups of predictors, no explicit hypotheses were formed regarding the comparison of extent of the predictive contributions of individual potential predictors.

METHOD

Participants

The study was conducted on a convenience community-dwelling sample of 790 older people mainly living in their own homes, 460 of them being women (58.23%). The average age of participants was 73.97 years ($SD = 6.58$; age range: 65 - 98 years). Most were married (64%) or widowed (29%). Most of the participants lived only with their spouses (44.5%) or alone (22.5%), whereas

iznosila je 73,97 godina ($SD = 6,58$; dobnji raspon: 65-98 godina). Većina sudionika živjela je u bračnoj zajednici (64 %) ili su bili udovci/udovice (29 %). Većina sudionika je živjela samo s bračnim partnerom (44,5 %) ili sami (22,5 %), dok je u proširenoj obitelji s bračnim partnerom i djecom živjelo 19,6 % sudionika, a samo s djecom živjelo ih je 11,8 %. Većina sudionika završila je srednju školu (44,8 %), dok ih je 28,5 % završilo nekoliko razreda ili osmogodišnju osnovnu školu. Završenu višu ili visoku školu imalo je 26,7 % sudionika. U gradu je živjelo 64 % sudionika, u manjem mjestu/općini 18,5 %, dok je na selu živjelo 17,5 % uzorka. Velika većina ispitanih osoba imala je djecu (96 %).

Instrumenti

U uvodnom dijelu upitnika zahvaćene su sociodemografske varijable: spol, dob, stupanj obrazovanja (nezavršena osnovna škola, završena osnovna škola, srednja škola, viša ili visoka škola), bračno stanje, s kim žive, gdje žive (grad, manje mjesto/općina, selo), žive li u vlastitom domu, broj djece te procjena financijskog stanja/materijalne situacije (na ljestvici od 1- vrlo loše, do 5 - izvrsno).

Zadovoljstvo životom ispitano je *Ljestvicom zadovoljstva životom (Satisfaction with Life Scale-SWLS)* (3). Ljestvica pomoću pet čestica ispituje opću evaluaciju vlastitog života. Sudionici pomoću ljestvice od 1 (*uopće se ne slažem*) do 7 (*u potpunosti se slažem*) izražavaju svoje slaganje sa svakom tvrdnjom. Ukupan rezultat je prosjek procjena na svim tvrdnjama. Cronbach alfa koeficijent pouzdanosti je u ispitanom uzorku iznosio 0,87.

Kronične bolesti ispitane su na način da su sudionici na popisu od 10 kroničnih bolesti (artritis, povišeni krvni tlak, bolesti srca i krvnih žila, rak, dijabetes itd.), koje su najzastupljenije u starijoj populaciji (45), označavali one bolesti od kojih boluju. Također je bilo omogućeno navođenje dodatnih bolesti.

19.6% of the participants lived in extended families with their spouses and children, and 11.8% of them lived only with their children. The majority of the participants had completed high school (44.8%), while 28.5% of them had completed several grades or eight-year elementary school, and 26.7% of participants had a college or university degree. A total of 64% of participants lived in a city, 18.5% lived in a smaller town/municipality, whereas 17.5% of the sampled participants lived in rural areas. The vast majority of the respondents had children (96%).

Instruments

The introductory part of the questionnaire included sociodemographic variables: gender, age, education level (incomplete elementary school, elementary school, high school, college or university), marital status, who they live with, where they live (city, smaller town/municipality, rural areas), whether they live in their own homes, the number of children and self-assessment of their financial status/material situation (from 1 – very bad, to 5 – excellent).

Life satisfaction was assessed using the *Satisfaction with Life Scale - SWLS* (3). This 5-item scale measures the general assessment of one's own life. Using the scale ranging from 1 (*completely disagree*) to 7 (*completely agree*), the participants express their agreement with each statement. The total result represents the average of assessments on all statements. Cronbach's alpha reliability coefficient in the examined sample amounted to 0.87.

Chronic diseases were assessed in such manner that on the list of ten chronic diseases (arthritis, hypertension, cardiovascular diseases, cancer, diabetes etc.) which are most common in older population (45), the participants marked the diseases which they were suffering from. It was also possible to list additional diseases.

Subjective health was assessed using the following question: "How would you rate your present health?", with a proposed 5-point answer scale (from 1- very bad to 5 - excellent).

Subjektivno zdravlje ispitano je pomoću pitanja: “Kako biste ocijenili svoje sadašnje zdravlje?” 5-stupanjskom ljestvicom za odgovore (od 1 - vrlo loše do 5 - odlično).

Funkcionalna sposobnost ispitana je pomoću *Ljestvice dnevnih aktivnosti* (46). Ljestvica uključuje 14 aktivnosti svakodnevnog života i samozbrinjavanja (npr. korištenje stepenica, pranje i kupanje) za koje su sudionici označavali stupanj samostalnosti u njihovom izvođenju pomoću ljestvice od 1 (*ne mogu uopće*) do 4 (*mogu bez poteškoća*). Ukupan rezultat je zbroj procjena na svih 14 čestica pri čemu viši rezultat označava bolju funkcionalnu sposobnost. Cronbach alfa koeficijent ljestvice je u ispitanom uzorku iznosio 0,92.

Mentalno zdravlje ispitano je pomoću podljestvice mentalnog zdravlja iz Upitnika zdravstvenog statusa SF-36 (47, 48). Upitnikom se pomoću 36 čestica procjenjuje 8 domena zdravlja, uključujući emocionalnu dobrobit ili mentalno zdravlje. Podljestvica mentalnog zdravlja uključuje 5 čestica i uglavnom zahvaća procjenu anksioznosti, depresivnosti i stresa. Ukupni rezultat se izražava kao vrijednost od 0 do 100 gdje viši rezultat označava bolje mentalno zdravlje. Cronbach alfa koeficijent podljestvice mentalnog zdravlja u ovom je istraživanju iznosio 0,85.

Optimizam je kao opća sklonost očekivanju pozitivnih ishoda ispitana ljestvicom optimizma *Life Orientation Test revised - LOT-R* (49) koja sadrži šest tvrdnji. Slaganje sa svakom tvrdnjom procjenjuje se pomoću 5-stupanjske ljestvice (od 1 - *uopće se ne slažem* do 5 - *potpuno se slažem*). Ukupan rezultat je prosjek procjena na svim česticama, uz prethodno obrnuto bodovanje tri čestice negativnog smjera. Pouzdanost ljestvice izražena pomoću Cronbach alfa koeficijenta u ovom je uzorku iznosila 0,76.

Otpornost je ispitana adaptiranom hrvatskom verzijom (50) *Kratke ljestvice otpornosti (Brief Resilience Scale)* (51). Ljestvica od 6 tvrdnji ispituje sposobnost uspješnog nošenja i oporavka od različitih stresnih situacija i nedaća. Slaganje s tvrdnjama izražava se pomoću ljestvice

Functional ability was assessed using the *Daily Activities Scale* (46). The scale comprises 14 daily and self-care activities (e.g. using the stairs, washing and bathing) for the performance of which the participants marked their level of independence ranging from 1 (*cannot do it at all*) to 4 (*can do it without difficulties*). The total result is the sum of assessments on all 14 items, whereby a higher score indicates better functional ability. Cronbach's alpha coefficient of the scale in the examined sample amounted to 0.92.

Mental health was assessed using the mental health subscale (MH) from the Medical Outcomes Study Questionnaire Short Form 36 Health Survey (SF-36) (47, 48). The questionnaire utilises 36 items to assesses eight domains of health, including emotional well-being or mental health. The mental health subscale comprises five items and mainly assesses anxiety, depression and stress. The total result is expressed as the score ranging from 0 to 100, whereby a higher score indicates better mental health. Cronbach's alpha coefficient of the Mental Health Subscale amounted to 0.85 in this study.

Optimism as a general tendency to expect positive outcomes was assessed using the *Life Orientation Test revised - LOT-R* (49), consisting of six statements. Agreement with each statement is assessed using a 5-point scale (from 1 - *completely disagree* to 5 - *completely agree*). The total result is the average of assessments on all items, with previous reverse scoring of the three negatively formulated items. The reliability of the scale expressed with Cronbach's alpha coefficient in this sample amounted to 0.76.

Resilience was assessed using the adapted Croatian version (50) of the *Brief Resilience Scale* (51). The scale consisting of six statements measures the ability to successfully cope with and recover from various stressful situations and adversities. Agreement with the statements is expressed using a 5-point scale (from 1 - *completely disagree* to 5 - *completely agree*). The total result is calculated as the average of assessments on all items, with previous reverse scoring of the three negatively

od pet stupnjeva (od 1 - *uopće se ne slažem* do 5 - *potpuno se slažem*). Ukupan rezultat se izračunava kao prosjek procjena na svim česticama, uz prethodno obrnuto bodovanje tri čestice negativnog smjera. Cronbach alfa koeficijent ljestvice dobiven u ovom uzorku iznosio je 0,75.

Socijalna podrška ispitana je prilagođenom verzijom *Ljestvice socijalne podrške* autorice Despot Lučanin (46) koja uključuje tri tvrdnje koje ispituju tri vrste podrške: druženje, emocionalnu i instrumentalnu podršku. Te su tri vrste podrške ispitane u odnosu na dva izvora: (a) članove obitelji te (b) prijatelje i susjede. Sudionici su procjenjivali dostupnost ispitanih oblika socijalne podrške iz dvaju izvora na ljestvici od tri stupnja (1 - *nemam nikoga*, 2 - *imam, povremeno*, 3 - *imam, gotovo uvijek*). Pritom se može izračunati ukupan rezultat za socijalnu podršku od članova obitelji, te za podršku od prijatelja i susjeda, kao i ukupan rezultat na ljestvici kao zbroj prosječnih procjena za ova dva izvora podrške. Za potrebe ovoga istraživanja izračunat je ukupan rezultat na ljestvici kao pokazatelj ukupne percipirane socijalne podrške. Pouzdanost ljestvice izražena Cronbach alfa koeficijentom iznosila je 0,68.

Uključenost u socijalne i produktivne aktivnosti ispitana je pomoću popisa od 9 različitih kategorija socijalnih i produktivnih aktivnosti (npr. pomaganje prijateljima ili članovima obitelji, odlaženje na kulturne aktivnosti (kino, kazalište, koncerti, izložbe, muzeji), vjerske aktivnosti (odlazak na mise, vjerske proslave i sl.), volontiranje). Popis je osmišljen za potrebe ovoga istraživanja. Sudionici su trebali označiti kategorije aktivnosti u kojima su sudjelovali u zadnjih šest mjeseci. Ukupan rezultat je izražen kao broj kategorija aktivnosti u kojima su sudionici sudjelovali u zadnjih šest mjeseci.

Postupak

Istraživanje je provedeno u sklopu institucionalnog projekta Sveučilišta u Zadru *Uspješno starenje: razvoj i validacija integriranog višedi-*

formulated items. Cronbach's alpha coefficient of the scale obtained in this sample amounted to 0.75.

Social support was assessed using the adapted version of the *Social Support Scale* by author Despot Lučanin (46) which comprises three items measuring three types of support: socialising, emotional and instrumental support. These three types of support were assessed in relation to two sources: (a) family members, and (b) friends and neighbours. Participants assessed the availability of the examined types of social support from the two sources on a 3-point scale (1 - *do not have any-one*, 2 - *have, occasionally*, 3 - *have, almost always*). It is thereby possible to calculate the total result both for social support from family members and for social support from friends and neighbours, as well as the total result on the scale as the sum of average assessments for these two sources of support. For the purposes of this study, the total result on the scale was calculated as an indicator of the total perceived social support. The reliability of the scale expressed through Cronbach's alpha coefficient amounted to 0.68.

Inclusion in social and productive activities was assessed using a list that included nine different categories of social and productive activities (e.g. helping friends or family members, attending cultural activities (cinema, theatre, concerts, exhibitions, museums), religious activities (attending masses, religious celebrations etc.), volunteering). The list was designed for the purposes of this study. The participants were asked to mark the categories of the activities in which they had participated in the last six months. The total result is expressed as the number of categories of activities in which participants had participated in the last six months.

Procedure

The study was conducted as part of the institutional project entitled *Successful Ageing: Development and Validation of an Integrated Multidimensional Model* (IP.01.2021.21), supported by the

menzionalnog modela (IP.01.2021.21). Upitnike koji su uključivali gore opisane mjerne instrumente primjenjivali su individualnim intervjuom u domovima sudionika ili na drugom dogovorenom mjestu članovi istraživačkog tima, studenati psihologije Sveučilišta u Zadru i Filozofskog fakulteta Sveučilišta u Zagrebu te troje vanjskih anketara - magistara psihologije. U istraživanju su sudjelovale starije osobe iz različitih krajeva Hrvatske ali većinski iz dalmatinskih županija i Grada Zagreba. Uzorak se širio metodom snježne grude. Provedbu istraživanja odobrilo je Etičko povjerenstvo Sveučilišta u Zadru. Istraživanje je provedeno u razdoblju od studenog 2021. do veljače 2022. godine.

REZULTATI

Osnovni deskriptivni podatci i povezanosti ispitanih varijabli prikazani su u tablici 1.

Kolmogorov-Smirnovljev test normalnosti distribucije pokazao je da distribucije rezultata na svim ljestvicama značajno odstupaju od normalne. Međutim, indeksi asimetričnosti i spljoštenosti nemaju ekstremne vrijednosti što dopušta korištenje parametrijske statistike (52). Iz tablice 1 je nadalje vidljivo da su rezultati na mjerama zadovoljstva životom, funkcionalne sposobnosti, mentalnog zdravlja, subjektivne procjene zdravlja, optimizma i socijalne podrške pomaknuti prema višim vrijednostima. Rezultati na ljestvici otpornosti kreću se oko teorijskog prosjeka. Financijsko stanje većina procjenjuje prosječnim. Broj bolesti se kreće u rasponu od 0 do 8, a većina je osoba izvjestila da boluje od jedne ili dvije kronične bolesti. Svi ovi podatci pokazuju da je riječ o uzorku starijih osoba koje su relativno dobro zdravlja te dobrih psiholoških i socijalnih resursa. Jedino je uključenost u produktivne i socijalne aktivnosti bila niža te su sudionici izvještavali o uključenosti u dvije do tri kategorije aktivnosti u prosjeku, od ponuđenih 9. Na-

University of Zadar, Croatia. The questionnaires including the aforementioned measuring instruments were administered to the participants during individual interviews in their own homes or at other locations of their choice by the members of the research team, psychology students of the University of Zadar and the Faculty of Humanities and Social Sciences of the University of Zagreb, as well as three external interviewers with masters in psychology. Older people from different geographical regions in the Republic of Croatia, but mainly from Dalmatian counties and the City of Zagreb, participated in the study. Participants were recruited using the snowball sampling method. The study was approved by the Ethics Committee of the University of Zadar. The study was conducted in the period from November 2021 to February 2022.

RESULTS

Basic descriptive data and correlations of the assessed variables are shown in Table 1.

The Kolmogorov-Smirnov distribution normality test showed that the distributions of results on all scales deviated significantly from normal. However, the skewness and kurtosis indexes did not reach extreme values, allowing the use of parametric statistics (52). Table 1 further shows that the results concerning the measures of life satisfaction, functional ability, mental health, subjective self-rated health, optimism and social support have shifted towards higher values. The results on the resilience scale are within the theoretical average. Financial status was assessed as average by the majority of the participants. The number of diseases ranges from zero to eight, and most participants reported having one or two chronic diseases. All of these data indicate that this is a sample of older people who are relatively healthy and have good psychological and social resources. The only variable with a lower score was the inclusion in productive and social activities, and on average, participants reported on being included in two to three categories of activities

TABLICA 1. Osnovni deskriptivni podaci i povezanosti ispitanih varijabli (N=790)
TABLE 1. Basic descriptive data and correlations of the examined variables (N=790)

VARIJABLE / VARIABLES	Dob / Age	FIN	ZŽ / LS	B / D	FS / FA	MZ / MH	SZ / SH	OP	OTP / R	SP / SS	USPA / ISPA
Dob / Age	1,00										
Financije (FIN) / Finances (FIN)	0,03	1,00									
Zadovoljstvo životom (ZŽ) / Life satisfaction (LS)	-0,02	0,39**	1,00								
Broj bolesti (B) / Number of diseases (D)	0,19**	-0,18**	-0,24**	1,00							
Funkcionalna sposobnost (FS) / Functional ability (FA)	-0,39**	0,15**	0,28**	-0,34**	1,00						
Mentalno zdravlje (MZ) / Mental health (MH)	-0,06	0,27**	0,55**	-0,24**	0,29**	1,00					
Subjektivno zdravlje (SZ) / Subjective health (SH)	-0,17**	0,31**	0,38**	-0,47**	0,43**	0,44**	1,00				
Optimizam (OP) / Optimism (OP)	-0,09*	0,19**	0,43**	-0,16**	0,24**	0,47**	0,32**	1,00			
Otpornost (OTP) / Resilience (R)	-0,08*	0,18**	0,39**	-0,25**	0,22**	0,47**	0,33**	0,42**	1,00		
Socijalna podrška (SP) / Social support (SS)	-0,08*	0,04	0,22**	-0,08*	0,08*	0,15**	0,08*	0,22**	0,15**	1,00	
Uključenost u socijalne i produktivne aktivnosti (USPA) / Inclusion in social and productive activities (ISPA)	-0,27**	0,11**	0,19**	-0,15**	0,34**	0,23**	0,29**	0,15**	0,18**	0,12**	1,00
M (aritmetička sredina) / M (arithmetic mean)	73,97	3,21	4,89	1,85 (Mod=1)	51,70	66,20	3,24	3,53	3,07	4,81	2,62
SD (standardna devijacija) / SD (standard deviation)	6,58	0,68	1,23	1,34	6,36	16,02	0,78	0,72	0,71	0,75	1,81
Dobiveni raspon / Range	65-98	1-5	1-7	0-8	17-56	4-100	1-5	1-5	1-5	2-6	0-9
Asimetričnost (SKW) / Skewness (SKW)		0,16	-0,47	0,93	-2,16	-0,39	0,14	-0,49	-0,17	-0,23	0,91
Spljoštenost (KTS) / Kurtosis (KTS)		1,33	-0,19	1,22	5,29	0,08	0,583	0,52	-0,01	-0,38	1,09
Kolmogorov-Smirnovljev test (K-S d) / Kolmogorov-Smirnov test (K-S d)		0,35**	0,09**	0,20**	0,25**	0,08**	0,31**	0,07**	0,07**	0,09**	0,17**

*p < 0,05, **p < 0,01

dalje, povezanosti zadovoljstva životom i svih njegovih potencijalnih zdravstvenih, funkcionalnih, psiholoških i socijalnih prediktora bile su značajne i pozitivne, izuzev očekivane značajne negativne povezanosti zadovoljstva životom i broja bolesti. Korelacije između po-

out of the nine that were offered. Furthermore, the correlations between life satisfaction and all its potential health, functional, psychological and social predictors were significant and positive, with the exception of the expected significant negative correlation between life satisfaction and

jedinih potencijalnih prediktora zadovoljstva životom (iz skupina zdravstvenih, funkcionalnih, psiholoških i socijalnih varijabli) također su bile značajne i pozitivne, osim korelacija broja bolesti s ostalim varijablama, koje su bile značajne i negativne.

Kako bi se odgovorilo na glavni problem ovoga istraživanja, a to je ispitati koliki je doprinos potencijalnih prediktora iz različitih skupina zadovoljstvu životom starijih osoba, najprije je provedena standardna multipla regresijska analiza u kojoj su svi potencijalni prediktori (sociodemografske karakteristike, zdravstvene varijable, funkcionalna sposobnost, psihološki i socijalni resursi) zajedno uvedeni u regresijsku analizu. Rezultati ove analize, prikazani u tablici 2, pokazali su da među svim uvedenim prediktorima dob, financije, funkcionalna sposob-

the number of diseases. The correlations between individual potential predictors of life satisfaction (from the groups of health, functional, psychological and social variables) were also significant and positive, except for the correlations between the number of diseases and other variables, which were significant and negative.

In order to address the main issue of this study, which was to examine the extent of the contribution of potential predictors from different groups to life satisfaction in older people, a standard multiple regression analysis was first conducted wherein all the potential predictors (sociodemographic characteristics, health variables, functional ability, psychological and social resources) were introduced in the regression analysis together. The results of this analysis, presented in Table 2, showed that among all the introduced

TABLICA 2. Rezultati standardne multiple regresijske analize sa zadovoljstvom životom kao kriterijem i sociodemografskim karakteristikama, značajkama zdravstvenog i funkcionalnog statusa te psihološkim i socijalnim resursima kao prediktorima (N=790)

TABLE 2. The results of standard multiple regression analysis with life satisfaction as a criterion and sociodemographic characteristics, characteristics of health and functional status, and psychological and social resources as predictors (N=790)

PREDIKTORI / PREDICTORS	ZADOVOLJSTVO ŽIVOTOM / LIFE SATISFACTION
	β
Spol (1-muškarci, 2-žene) / Gender (1 - men, 2 - women)	0,01
Dob / Age	0,07*
Obrazovanje (nezavršena OŠ, završena OŠ, SŠ, VSŠ) / Education (incomplete elementary school, elementary school, high school, college)	-0,04
Način života (1-žive sami, 2- žive s nekim) / Way of life (1- living alone, 2-living with someone)	0,05
Financije / Finances	0,23***
Broj bolesti / Number of diseases	-0,03
Funkcionalna sposobnost / Functional ability	0,09**
Mentalno zdravlje / Mental health	0,31**
Subjektivno zdravlje / Subjective health	0,02
Optimizam / Optimism	0,14***
Otpornost / Resilience	0,08*
Socijalna podrška / Social support	0,11***
Socijalna uključenost / Social inclusion	0,02
R ²	0,437***
Korigirani R ² / Adjusted R ²	0,428***
F (13,775)	46,390***

*p < 0,05, **p < 0,01, ***p < 0,001

nost, mentalno zdravlje, optimizam, otpornost i socijalna podrška značajno doprinose objašnjenju zadovoljstva životom ispitanih starijih osoba. Pri tome viša dob, bolje procijenjeno financijsko stanje, bolja funkcionalna sposobnost, bolje mentalno zdravlje, izraženiji optimizam i otpornost te veća socijalna podrška doprinose većem zadovoljstvu životom. Kada je riječ o utvrđenom doprinosu više dobi većem zadovoljstvu životom, vjerojatno je riječ o supresorskom efektu s obzirom na to da je korelacija dobi i zadovoljstva životom bila negativna i neznčajna (vidi u tablici 1). Sve su varijable uvedene u regresijsku analizu zajedno objasnile značajnih 43 % varijance zadovoljstva životom. Najveći zasebni doprinos zadovoljstvu životom imali su mentalno zdravlje i financije.

U nastavku se pokušalo ispitati koliki je zasebni doprinos pojedinih skupina prediktora zadovoljstvu životom. U tu svrhu provedena je hijerarhijska regresijska analiza u kojoj su sociodemografske značajke uvedene u prvom koraku, varijable zdravstvenog i funkcionalnog statusa u drugom, a psihološki i socijalni resursi u trećem koraku analize (tablica 3). Među uvedenim sociodemografskim varijablama jedino su financije pokazale značajan doprinos objašnjenju zadovoljstva životom u prvom koraku analize. Sociodemografske varijable zajedno su objasnile značajnih 16 % varijance kriterijske varijable. Uz kontrolu doprinosa sociodemografskih značajki, varijable zdravstvenog i funkcionalnog statusa su u drugom koraku objasnile dodatnih značajnih 23 % varijance zadovoljstva životom. Pritom su značajan pozitivan doprinos ostvarili mentalno zdravlje i funkcionalna sposobnost. Nakon kontrole doprinosa varijabli uvedenih u prethodna dva koraka, psihosocijalni resursi uvedeni u trećem koraku hijerarhijske regresijske analize objasnili su dodatnih skromnih ali statistički značajnih 4 % varijance zadovoljstva životom. Pritom su sve uvedene varijable osim uključenosti u produktivne i socijalne aktivnosti

prediktora, age, finances, functional ability, mental health, optimism, resilience and social support significantly contribute to the explanation of life satisfaction among the older people who were interviewed. In that context, higher age, better assessed financial status, better functional ability, better mental health, higher optimism and resilience, as well as higher social support contribute to greater life satisfaction. The specified contribution of higher age to greater life satisfaction can be regarded as a suppressor effect, given that the correlation between age and life satisfaction was negative and non-significant (see Table 1). All the variables introduced in the regression analysis together explained the significant 43% variance in life satisfaction. Mental health and finances had the greatest individual contributions to life satisfaction.

An attempt was further made to examine the specific contributions of each group of predictors to life satisfaction. For that purpose, a hierarchical regression analysis was conducted in which sociodemographic characteristics were introduced in the first step, health and functional status variables were introduced in the second, and psychological and social resources were introduced in the third step (Table 3). Among the introduced sociodemographic variables, only finances showed a significant contribution to the explanation of life satisfaction in the first step of the analysis. The sociodemographic variables together explained the significant 16% variance in the criterion variable. After controlling the contribution of sociodemographic characteristics, health and functional status variables explained the additional significant 23% variance in life satisfaction in the second step. At the same time, mental health and functional ability had a significant positive contribution. After controlling the contribution of the variables introduced in the previous two steps, the psychosocial resources introduced in the third step of the hierarchical regression analysis explained the additional modest, but statistically significant, 4% variance in life satisfaction. All the introduced variables, except for inclusion in productive and social activities, thereby had a

TABLICA 3. Rezultati hijerarhijske regresijske analize sa zadovoljstvom životom kao kriterijem i sociodemografskim karakteristikama, značajkama zdravstvenog i funkcionalnog statusa te psihološkim i socijalnim resursima kao prediktorima (N=790)
TABLE 3. The results of hierarchical regression analysis with life satisfaction as a criterion and sociodemographic characteristics, characteristics of health and functional status, and psychological and social resources as predictors (N=790)

Prediktori / Predictors	ZADOVOLJSTVO ŽIVOTOM / LIFE SATISFACTION	
	β	(β)
1. korak / 1 st step		
<i>Sociodemografske varijable / Sociodemographic variables</i>		
Spol (1-muškarci, 2-žene) / Gender (1 - men, 2 - women)	-0,02	(0,01)
Dob / Age	-0,02	(0,08*)
Obrazovanje (nezavršena OŠ, završena OŠ, SŠ, VSŠ) / Education (incomplete elementary school, elementary school, high school, college)	0,03	(-0,04)
Način života (1-žive sami, 2- žive s nekim) / Way of life (1 - living alone, 2 - living with someone)	0,06	(0,06)
Financije / Finances	0,39***	(0,23***)
R ²	0,166***	
Korigirani R ² / Adjusted R ²	0,161***	
2. korak / 2 nd step		
<i>Zdravstveni i funkcionalni prediktori / Health and functional predictors</i>		
Broj bolesti / Number of diseases	-0,04	(-0,03)
Funkcionalna sposobnost / Functional ability	0,12***	(0,09**)
Mentalno zdravlje / Mental health	0,42***	(0,31***)
Subjektivno zdravlje / Subjective health	0,07	(0,04)
ΔR ²	0,230**	
R ²	0,397***	
Korigirani R ² / Adjusted R ²	0,390***	
3. korak / 3 rd step		
<i>Psihološki i socijalni resursi / Psychological and social resources</i>		
Optimizam / Optimism	0,14***	(0,14***)
Otpornost / Resilience	0,08*	(0,08*)
Socijalna podrška / Social support	0,11***	(0,11***)
Socijalna uključenost / Social inclusion	0,02	(0,02)
ΔR ²	0,040***	
R ²	0,437***	
Korigirani R ² / Adjusted R ²	0,428***	

*p < 0,05, **p < 0,01, ***p < 0,001; (β) - β-koeficijent u završnom koraku / *p < 0,05, **p < 0,01, ***p < 0,001; (β) - β- coefficient in the final step

imale značajan pozitivan doprinos. U zadnjem koraku analize značajnim prediktorima (među svim ispitanima) pokazali su se isti oni koji se se značajnima pokazali i u standardnoj regresijskoj analizi, potvrđujući ponovno najveći doprinos mentalnog zdravlja i financijskog stanja zadovoljstvu životom u starijoj dobi.

significant positive contribution. In the last step of the analysis, significant predictors (among all the examined predictors) were the same as those that proved to be significant in the standard regression analysis, confirming that mental health and financial status have the greatest contribution to life satisfaction in older age.

Bez obzira na rastući interes za teme dobrobiti i kvalitete života u starijoj dobi, potaknut kontinuiranim porastom dužine života i udjela starijih osoba u populaciji, još uvijek nedostaje istraživačkih nalaza u pogledu usporedbe doprinosa različitih skupina čimbenika (npr. zdravstvenih varijabli, funkcionalne sposobnosti, psiholoških i socijalnih resursa) zadovoljstvu životom starijih osoba. Stoga je provedeno istraživanje na uzorku od 790 starijih osoba od 65 i više godina s ciljem utvrđivanja doprinosa potencijalnih prediktora iz različitih skupina (sociodemografskih, zdravstvenih i funkcionalnih, psiholoških i socijalnih) objašnjenju individualnih razlika u njihovom zadovoljstvu životom. Kako populacija stari, nužno je identificirati čimbenike koji štite zdravlje i dobrobit kako bi se zaustavio porast incidencije kroničnih bolesti i troškova zdravstvene zaštite povezanih sa sve dužim životnim vijekom (53) te, općenito, osigurao što kvalitetniji i dostojanstveniji život u starosti. Zadovoljstvo životom jedan je od ključnih indikatora kvalitete života te pokazatelj uspješnosti suočavanja s različitim životnim izazovima i tjelesnim, zdravstvenim, kognitivnim i socijalnim gubitcima s kojima se osoba suočava u starijoj dobi (7,8). Ono je determinirano većim brojem različitih čimbenika, od genetskih, situacijskih, do širih društveno-strukturnih čimbenika (5,6).

Među različitim ispitanim skupinama potencijalnih prediktora zadovoljstva životom u provedenom istraživanju, značajnim prediktorima zadovoljstva životom pokazali su se percipirani financijski status, funkcionalna sposobnost, mentalno zdravlje, optimizam, otpornost i socijalna podrška. I svi ostali zahvaćeni pojedinačni prediktori iz skupine zdravstvenih, funkcionalnih i psihosocijalnih bili su značajno i u očekivanom smjeru povezani sa zadovoljstvom životom, iako se svi nisu pokazali njegovim značajnim prediktorima u provedenim regresijskim analizama. Najznačajnijim prediktorima

Regardless of the growing interest in topics concerning the well-being and quality of life in older age, which is encouraged by the continuously increasing life expectancy and the proportion of older people in the population, there is still a lack of research findings referring to the comparison of the contributions that different groups of factors (e.g. health variables, functional abilities, psychological and social resources) have to life satisfaction in older people. This study was, therefore, conducted on a sample of 790 older people aged 65 years and above, with the aim of determining the contributions of potential predictors from different groups (sociodemographic, health and functional, psychological and social) to the explanation of individual differences in their life satisfaction. As the population ages, it is necessary to identify the factors which protect health and well-being in order to stop the increase in the incidence of chronic diseases and health care costs associated with the increasing life expectancy (53) and, generally, to ensure a life of better quality and dignity in old age. Life satisfaction is one of the key indicators of quality of life, and an indicator of successful coping with different life challenges and physical, health, cognitive and social losses that people face in older age (7, 8). It is defined by a large number of different factors, from genetic and situational ones, to wider sociostructural factors (5, 6).

Among the different groups of potential predictors of life satisfaction assessed in the present study, perceived financial status, functional ability, mental health, optimism, resilience and social support proved to be significant predictors of life satisfaction. All the other health, functional and psychosocial predictors included in the study were also significantly and expectedly associated with life satisfaction, although not all of them proved to be its significant predictors in the conducted regression analyses. Mental health and perceived finan-

zadovoljstva životom ispitanih starijih osoba pokazali su se mentalno zdravlje i percipirani financijski status. Dobiveni rezultati sukladni su nekim ranijim nalazima. Primjerice, ranija istraživanja također su pokazala da je dobro mentalno zdravlje, primjerice, manje izražena depresivnost, povezano s većim zadovoljstvom životom starijih osoba (2,11,16). Sasvim je očekivano da bolje mentalno zdravlje, odnosno niže razine depresivnosti, anksioznosti, stresa i drugih problema mentalnog zdravlja, doprinose većem zadovoljstvu životom. Međutim, moguće je i obrnuti smjer međusobnog utjecaja ovih varijabli pri čemu veće zadovoljstvo životom može pozitivno pridonijeti različitim pokazateljima dobrog mentalnog zdravlja, kao što su veća otpornost, izraženije pozitivne emocije, manja usamljenost ili niže razine depresivnosti (2).

Uz mentalno zdravlje, u provedenom istraživanju se najznačajnijim prediktorom zadovoljstva životom pokazalo percipirano financijsko stanje. I neki raniji nalazi ukazuju na pozitivnu vezu višeg socioekonomskog statusa, uključujući i bolje financijsko stanje, i zadovoljstva životom (15,16,35-37). Pritom je važno ne samo objektivno nego i percipirano financijsko stanje tj. način na koji osoba procjenjuje svoju financijsku situaciju. U psihologijskim istraživanjima se često zanemaruje ova materijalna komponenta koja je očigledno važna odrednica dobrobiti pojedinca jer mu financijski resursi omogućuju zadovoljavanje različitih potreba, od osnovnih egzistencijalnih, do onih društvenih i rekreativnih, koje utječu na njegovo zadovoljstvo životom. Materijalni status nakon umirovljenja ozbiljno je ugrožen u mnogih starijih osoba pa tim više značajno doprinosi zadovoljstvu životom u starijoj dobi. Jedno recentnije kvalitativno istraživanje provedeno u Hrvatskoj pokazalo je da starije osobe u nas, među ostalim čimbenicima, ističu važnost materijalne sigurnosti za uspješno starenje općenito (54). Suprotno očekivanjima, druge ispitane sociodemografske varijable, kao što su spol, dob, obrazovanje i (ne)samački život, nisu

provedeno u Hrvatskoj pokazalo je da starije osobe u nas, među ostalim čimbenicima, ističu važnost materijalne sigurnosti za uspješno starenje općenito (54). Suprotno očekivanjima, druge ispitane sociodemografske varijable, kao što su spol, dob, obrazovanje i (ne)samački život, nisu

cial status proved to be the most significant predictors of life satisfaction among the older people included in the study. The obtained results correspond to certain previous findings. For example, previous studies have also shown that good mental health, e.g. less pronounced depression, correlates to higher life satisfaction in older people (2, 11, 16). It is expected that better mental health, i.e. lower levels of depression, anxiety, stress, and other mental health problems contribute to greater life satisfaction. However, a reverse direction of interaction among these variables is also possible, whereby greater life satisfaction can positively contribute to different indicators of good mental health, such as greater resilience, more positive emotions, less loneliness or lower levels of depression (2).

In addition to mental health, the study found that perceived financial status was the most significant predictor of life satisfaction. Some previous findings also show a positive correlation between a higher socioeconomic status, including better financial status, and life satisfaction (15, 16, 35-37). In this context, beside the objective status, the perceived financial status, i.e. how an individual assesses their own financial status, is important as well. This material component is often neglected in psychological research, however, it is obviously an important determinant of an individual's well-being since the financial resources allow them to meet their different needs, from the basic existential ones to the social or recreational ones, all of which have an impact on life satisfaction. Material status after retirement is seriously jeopardised in a large number of older people, and this contributes more significantly to life satisfaction in older age. A recent qualitative study conducted in the Republic of Croatia has shown that, among other factors, older people in our country emphasise the importance of material security for successful ageing in general (54). Contrary to expectations, other assessed sociodemographic variables, such as gender, age, education, and (non)single life, did not play a significant role

imale značajnu ulogu u objašnjenju zadovoljstva životom ispitanih starijih osoba.

Utvrđen pozitivni doprinos funkcionalne sposobnosti zadovoljstvu životom rezultat je koji ne iznenađuje. Naime, očuvana pokretljivost i mogućnost samostalnog obavljanja svakodnevnih aktivnosti i aktivnosti samozbrinjavanja omogućuje starijim osobama da sudjeluju u različitim radnim, društvenim te drugim produktivnim i smislenim aktivnostima u vlastitom domu i zajednici. Nadalje, očuvana funkcionalna sposobnost doprinosi osjećaju autonomije i kontrole nad vlastitim životom. Sve to doprinosi kvaliteti i zadovoljstvu životom u starijoj dobi. S druge strane, istraživanja pokazuju da ograničenja u samostalnom izvođenju svakodnevnih aktivnosti i ovisnost o pomoći drugih, najčešće uzrokovani narušenim zdravljem, mogu značajno ugroziti zadovoljstvo životom (11,13,16,17). Suprotno očekivanjima, broj kroničnih bolesti te subjektivna samoprocjena zdravlja nisu značajno pridonijeli zadovoljstvu životom, što je suprotno nekim ranijim nalazima koji pokazuju značajnu povezanost objektivnog, kao i subjektivnog zdravstvenog statusa sa zadovoljstvom životom (2,7,9-13, 15-19).

Među ispitanim psihološkim i socijalnim resursima, u ovom je istraživanju potvrđena značajna uloga optimizma, otpornosti i socijalne podrške u zadovoljstvu životom starijih osoba. To je sukladno nalazima nekih ranijih istraživanja koja su pokazala da ovi psihosocijalni resursi mogu olakšati uspješno nošenje s promjenama u procesu starenja. Optimizam koji se odnosi na pozitivna očekivanja budućih ishoda olakšava nošenje s izazovnim životnim situacijama te je povezan s boljim tjelesnim i mentalnim zdravljem, većim zadovoljstvom životom i dobrobiti u skupinama osoba različite dobi, uključujući i one starije (21,22,30). Istraživanja također potvrđuju doprinos otpornosti mentalnom i tjelesnom zdravlju i zadovoljstvu životom u starijoj dobi (24,25). Otpornije osobe lakše izdržavaju i brže se oporavljaju od stresnih događaja (23).

in the explanation of life satisfaction among the older people interviewed.

The identified positive contribution of functional ability to life satisfaction is not surprising. Namely, preserved mobility and ability to independently perform the daily and self-care activities enables older people to participate in various work, social and other productive and meaningful activities in their own homes and in the community. Furthermore, preserved functional ability contributes to the feeling of autonomy and control over one's own life. All of this contributes to the quality of life and life satisfaction in older age. On the other hand, research has shown that limitations in independent performance of daily activities and dependence on the help from others, mostly caused by impaired health, can significantly jeopardise life satisfaction (11, 13, 16, 17). Contrary to expectations, the number of chronic diseases and subjective self-rated health did not significantly contribute to life satisfaction, which contradicts some previous findings showing a significant correlation between objective, as well as subjective, health status and life satisfaction (2, 7,9-13,15-19).

Among the examined psychological and social resources, this study has confirmed the important role of optimism, resilience and social support when it comes to life satisfaction among the elderly. This is in accordance with the findings of some previous studies which have shown that these psychosocial resources could facilitate successful coping with changes in the ageing process. Optimism which refers to positive expectations of future outcomes facilitates coping with challenging life situations, and is associated with better physical and mental health, greater life satisfaction and well-being in groups of people of different age, including the elderly (21, 22, 30). The studies also confirm the contribution of resilience to mental and physical health and life satisfaction in older age (24, 25). More resilient people endure stressful events more easily and recover from them better (23). They are better at coping with stress because they

Bolje se nose sa stresom jer učinkovitije koriste resurse koji su im na raspolaganju. Otpornije osobe lakše prihvaćaju neizbježne promjene u procesu starenja i bolje održavaju uključenost u one aktivnosti koje su im važne. Na sve te opisane načine otpornost pozitivno doprinosi zadovoljstvu životom i dobrobiti općenito. U kontekstu socijalnih resursa, koji su usko povezani sa psihološkima, treba naglasiti da istraživanja dosljedno potvrđuju doprinos socijalne podrške i uključenosti u različite društvene i produktivne aktivnosti kao što su druženje s prijateljima, sudjelovanje u religijskim aktivnostima, hobiji itd., zadovoljstvu i kvaliteti života starijih osoba te njihovom uspješnom starenju općenito (7,13,15,26-29). Socijalna podrška je značajan čimbenik zaštite od nepovoljnog utjecaja stresa te neugodnih emocionalnih stanja u starijoj dobi (31, 32). Također, kvalitetni socijalni odnosi mogu smanjiti rizik smrtnosti (55).

Jača strana provedenog istraživanja zasigurno je relativno veliki uzorak ispitanih starijih osoba. Međutim, ne možemo zanemariti ni njegova ograničenja. Jedno od njih je provedba istraživanja u vrijeme pandemije COVID-19 bolesti (premda u razdoblju manjih epidemioloških ograničenja) u kojem su ljudi, uključujući i stariju populaciju, bili manje socijalno aktivni što se moglo odraziti na percipiranu socijalnu podršku i uključenost u aktivnosti u zajednici. Nadalje, mogućnost generalizacije dobivenih rezultata na opću populaciju starijih osoba, uključujući i one koje žive u institucionalnom smještaju, je ograničena jer je istraživanje provedeno na prigodnom izvaninstitucionalnom uzorku starijih osoba čije je zdravlje relativno dobro, a funkcionalna sposobnost i zadovoljstvo životom dobro očuvani. Jedno od ograničenja je i kros-sekcijski korelacijski nacrt istraživanja, kao i korištenje mjera samoiskaza koje bi u budućim istraživanjima bilo uputno nadopuniti objektivnim mjerama (npr. liječničkom procjenom zdravstvenog statusa ili funkcionalne sposobnosti pojedinca).

use the available resources in a more efficient manner. More resilient people accept inevitable changes in the ageing process more easily, and they are better at maintaining inclusion in the activities which they find important. Resilience has a positive contribution to life satisfaction and well-being in general, in all the manners described above. In the context of social resources, which are closely connected with the psychological ones, it must be pointed out that research consistently confirms the contribution of social support and inclusion in various social and productive activities, such as socialising with friends, participation in religious activities, hobbies, etc., to life satisfaction and quality of life in older people, and their successful ageing in general (7, 13, 15, 26 - 29). Social support is an important factor contributing to the protection from the negative impacts of stress and adverse emotional states in old age (31, 32). Furthermore, quality social relations can reduce the risk of mortality (55).

The strength of the conducted study is certainly the relatively large sample of the older people interviewed. However, its limitations cannot be neglected either. One of them is the fact that the study was conducted during the pandemic of COVID-19 disease (although it was the period of milder epidemiological restrictions) when people, including the older population, were less socially active, which could have had an impact on perceived social support and inclusion in activities in the community. Furthermore, the possibility of generalising the obtained results to the general population of older people, including those living in institutional care, is limited because the study was conducted on a convenience community-dwelling sample of older people in relatively good health and with well-preserved functional ability and life satisfaction. Some of the limitations are also the cross-sectional correlation research design and the use of self-report measures, which should be complemented with objective measures in future research (e.g. medical assessment of an individual's health status or functional ability).

ZAKLJUČAK

Provedeno istraživanje pokazuje da je zadovoljstvo životom starijih osoba uvjetovano djelovanjem većeg broja različitih čimbenika, od onih eksternalnih (poput financija) preko funkcionalne sposobnosti i mentalnog zdravlja, do unutarnjih psiholoških resursa (optimizma i otpornosti) te socijalnih resursa poput socijalne podrške. U kontekstu praktičnih implikacija ovoga i sličnih istraživanja, posebno je važno identificirati one determinante zadovoljstva životom u starijoj dobi koje su podložne promjeni i na koje se može djelovati u svrhu njegovog očuvanja ili unaprjeđenja. U tom su pogledu izuzetno važni svi javnozdravstveni programi (npr. promicanje preventivnih pregleda i tjelesne aktivnosti), kao i psihosocijalne intervencije (npr. poticanje održavanja socijalne mreže i socijalne uključenosti, jačanje otpornosti, pozitivnog pogleda na svijet i doživljaja smisla života i dr.) koje će olakšati prilagodbu starijih osoba promjenama zdravlja i životnih okolnosti te pridonijeti zadovoljstvu i kvaliteti života u starijoj dobi (ali i u ranijim životnim razdobljima).

CONCLUSION

The conducted study shows that life satisfaction among older people is influenced by a larger number of different factors ranging from external factors (e.g. finances), functional ability and mental health, to internal psychological resources (optimism and resilience) and social resources such as social support. In the context of practical implications of this and similar studies, it is of particular importance to identify the determinants of life satisfaction in old age which are subject to changes and which can be influenced, in order to preserve or improve life satisfaction in older people. In that respect, all public health programmes (e.g. promotion of preventive health examinations and physical activity) are of vital importance, including the psychosocial interventions (e.g. encouraging the maintenance of social networks and social inclusion, strengthening of resilience and positive life attitude, as well as the meaning of life etc.) that will facilitate the adaptation of older people to changes in their health and life circumstances, and will contribute to life satisfaction and quality of life in old age (as well as in the earlier periods of life).

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Kognitivni prediktori oklijevanja s cijepljenjem protiv bolesti SARS-CoV-2 među mladima u Hrvatskoj

/ Cognitive Predictors of SARS-CoV-2 Vaccine Hesitancy Among Young People in Croatia

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Cilj ovog istraživanja je proučiti kognitivne prediktore oklijevanja s cijepljenjem protiv bolesti SARS-CoV-2 među mladima u Hrvatskoj. U kontekstu globalne pandemije COVID-19 cijepljenje je postalo ključno za suzbijanje širenja virusa i zaštitu populacije. Međutim, u Hrvatskoj je udio cijepljenih relativno mali u usporedbi s drugim europskim zemljama. Oklijevanje s cijepljenjem, odnosno odbijanje ili odugovlačenje s cijepljenjem unatoč dostupnosti cjepiva, je ozbiljan izazov za javno zdravlje. Podatci su prikupljeni na prigodnom online uzorku od 398 sudionika i obrađeni hijerarhijskom logističkom regresijom. Zanima nas mogu li i u kolikoj mjeri kognitivni čimbenici poput korištenja različitih izvora informiranja i svjetonazora predviđati vjerojatnost oklijevanja s cijepljenjem. Rezultati pokazuju kako su se skloniji cijepiti stariji sudionici koji procjenjuju svoju političku orijentaciju više lijevo, a važnost vjere manjom. Nadalje, skloniji su se cijepiti oni koji informacije dobivaju putem TV-a i od drugih ljudi, kao i oni koji pokazuju znanstveni svjetonazor i ne vjeruju u teorije zavjera.

/ The aim of this study was to analyse the cognitive predictors of SARS-CoV-2 vaccine hesitancy among the young people in Croatia. Within the context of the COVID-19 global pandemic, vaccination has become crucial to prevent the spread of the virus and protect the population. However, the proportion of vaccinated people in Croatia is relatively small compared to the other European countries. Vaccine hesitancy, i.e. vaccine refusal or delay in vaccination despite the availability of vaccines, represents a serious challenge for public health. The data were collected based on an online convenience sample of 398 participants and were processed using hierarchical logistic regression. Our aim was to determine whether and to what extent cognitive factors such as access to different sources of information and points of view can predict the likelihood of vaccine hesitancy. The results indicate that older participants who consider themselves to be politically more left-oriented and regard religion as less important are more likely to get vaccinated. Furthermore, individuals who obtain information through television and from other people, as well as those who display a scientific worldview and do not believe in conspiracy theories, are more likely to get vaccinated.

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Globalna pandemija COVID-19 prouzrokovana virusom SARS-CoV-2 proširila se svijetom od prvih slučajeva zabilježenih krajem 2019. godine. Do kraja lipnja 2023. godine ukupno je zabilježeno gotovo 800 milijuna slučajeva, kao i gotovo 7 milijuna smrti (1). Bolest se pokazala posebno opasnom za starije ljude kao i one s ranijim zdravstvenim problemima. Pandemija je postala javno-zdravstveno pitanje od iznimne važnosti i veliki izazov za zdravstvene sustave širom svijeta (2). Brojne vlade uvele su restrikcije na kretanje, obveze nošenja maski, kao i brojne druge mjere u pokušaju da se uspori širenje virusa. Stoga dugoročne posljedice pandemije nisu samo fizičke (3), već i mentalne (4). Opaženo je otežanje ranijih psihijatrijskih simptoma kao i smanjenje dobrobiti kod zdrave populacije (5). Autori navode povećanje anksioznih i depresivnih simptoma kod djece i mladih (6) poput samoozljeđivanja (7).

U nedostatku efikasnog lijeka razvijeno je cjepivo koje je moglo potencijalno smanjiti pritisak na zdravstvene sustave ali i smanjiti vjerojatnost fatalnog ishoda kod ugroženih skupina. Općenito, cijepljenje je jedno od najvažnijih napredaka u povijesti medicine i zaslužno je za smanjenje smrtnosti kao i gotovo potpuno istrijebljenje nekih bolesti poput dječje paralize, ospica ili tetanusa (8). Cijepljenje, kao i bilo koja medicinska procedura, nosi sa sobom određene rizike i nuspojave, pa je u demokratskim zemljama odluka o cijepljenju protiv bolesti COVID-19 prepuštena pojedincu. Različite su vlade provodile akcije kojima bi potaknule ljude na cijepljenje, što je u kombinaciji s različitim socijalnim normama rezultiralo različitim razinama procijepljenosti ovisno o zemlji i regiji (9).

Udio ljudi koji su se odlučili cijepiti protiv COVID-19 je u Hrvatskoj relativno mali, pogotovo u usporedbi s ostatkom EU. Skandinavske zemlje i zemlje zapadne Europe predvode ljestvicu procijepljenosti od oko 80 %, dok je ta vrijednost u Hrvatskoj tek oko 55 % (9). Zbog

Since the first cases recorded in late 2019, the global pandemic of COVID-19 caused by the SARS-CoV-2 virus has spread worldwide. Until the end of June 2023, a total of nearly 800 million cases were recorded, including almost 7 million deaths (1). The disease proved to be especially dangerous for the elderly and for those with pre-existing health problems. The pandemic became an extremely important public health issue and a major challenge for health systems worldwide (2). Numerous governments imposed movement restrictions, mandatory face masks and many other measures in an attempt to slow the spread of the virus. The long-term consequences of the pandemic are, therefore, not only physical (3), but also mental (4). An aggravation of previous psychiatric symptoms has been observed, as well as a decrease in the well-being of the healthy population. (5). The authors indicate that there has been an increase in the occurrence of anxiety and depressive symptoms, such as self-injury (7), in children and youth (6).

In the absence of an effective drug, a vaccine was developed that could potentially reduce the pressure on healthcare systems and also minimise the risk of fatal outcomes in vulnerable groups. In general, vaccination is one of the greatest advances in the history of medicine and has contributed to reducing mortality rates, in addition to almost completely eradicating certain diseases such as polio, measles or tetanus (8). Like any medical procedure, vaccination carries certain risks and may cause side effects, so in democratic countries the decision to vaccinate against the COVID-19 disease was left to the individuals. Different governments implemented campaigns aimed at encouraging people to get vaccinated, which, combined with different social norms, resulted in varying levels of vaccination depending on the country and the region (9).

The proportion of people who decided to get vaccinated against COVID-19 in Croatia is relatively small, especially when compared to the rest of the

dalekosežnih posljedica za pojedinca, njegovu blisku okolinu ali i šire društvo, odluka hoće li se cijepiti ili ne trebala bi biti rezultat kompleksnog procesa vaganja rizika i potencijalnih pozitivnih ishoda. Cijepljenje bi stoga trebalo biti i osobno i društveno pitanje te bi trebalo povlačiti određenu dozu odgovornosti prema zajednici. Iz perspektive društva, visoka procijepljenost je veliki plus i odbijanje cijepjenja je rizik za društvo i najugroženije pojedince.

Oklijevanje s cijepljenjem (eng. *vaccine hesitancy*) je pojava da ljudi odugovlače s cijepljenjem ili ga odbijaju, iako je ono dostupno (10). Ovaj je fenomen Svjetska zdravstvena organizacija (WHO) 2019. godine, netom prije početka pandemije, proglasila jednom od 10 najvećih prijetnji globalnom zdravlju (prema 11). Problem je u tome što sve veći broj ljudi cijepjenje vidi kao nepotrebno ili čak nesigurno, pa se broj onih koji oklijevaju s cijepljenjem povećava (8,12).

Odbijanje cijepjenja je kompleksan fenomen s mnogo potencijalnih uzroka. U fokusu istraživača prije globalne pandemije bilo je odbijanje cijepjenja djece od njihovih roditelja ili skrbnika, no istovjetni se razlozi mogu primijeniti i na oklijevanje s vlastitim cijepljenjem protiv bolesti poput gripe ili COVID-19 (13). Istraživači su se usmjerili na demografske čimbenike, osobnost, svjetonazor (skup uvjerenja o svijetu) te povjerenje prema institucijama i zdravstvenim djelatnicima kao glavne determinante odluke o cijepljenju (npr. 14-16). U obzir se trebaju uzeti i specifičnosti vezane uz konkretno cjepivo kao i ekonomska odnosno politička situacija u kojoj se cijepjenje odvija.

Dubé i suradnici (8) predlažu konceptualni model oklijevanja s cijepljenjem koji odluku o cijepljenju doživljava kao kontinuum od odbijanja do prihvaćanja na koji utječu osobinski faktori poput znanja i informiranosti, ranijih iskustava, doživljene važnosti cjepiva, procjene rizika, subjektivnih normi ali i moralnih odnosno religijskih uvjerenja. S druge strane na odluku utječu i povjerenje prema javno-zdravstvenom sustavu,

EU. Scandinavian and Western European countries lead the rankings with the vaccination rates of about 80%, while these figures in Croatia only amount to about 55% (9). Due to the long-term consequences for individuals, their immediate surroundings and the wider society, the decision whether or not to get vaccinated should be the result of a complex process of weighing the risks and the possible positive outcomes. Vaccination should, therefore, be both a personal and a social issue, and should entail a certain amount of responsibility towards the community. From the perspective of society, high vaccination rates are a great advantage, while vaccine refusal represents a risk for the society and the most vulnerable individuals.

Vaccine hesitancy refers to a delay in acceptance of vaccination or refusal thereof despite the availability of vaccines (10). Shortly before the pandemic started, in 2019, the World Health Organization (WHO) identified this phenomenon as one of its top ten threats to global health (according to 11). The fact that an increasing number of people considers vaccination to be unnecessary, or even unsafe, thus increasing the number of people hesitating to get vaccinated, represents a problem (8,12).

Vaccine refusal is a complex phenomenon with many potential causes. Before the global pandemic, researchers focused on the parents or caretakers who refused to vaccinate their children, however the same reasons may be applied to the hesitation to vaccinate oneself against diseases such as influenza or COVID-19 (13). Researchers focused on demographic factors, personality, worldview (a set of beliefs about the world) and the trust in institutions and healthcare professionals as the main determinants when making a decision about vaccination (e.g. 14 - 16). The specificities relating to a particular vaccine and the economic, i.e. political situation in which the vaccination process takes place, should also be taken into consideration.

Dubé et. al (8) propose a conceptual model of vaccine hesitancy that views the decision to get

povjerenje prema preporukama zdravstvenih djelatnika i povjerenje prema informacijama iz medija i ostalih komunikacijskih kanala.

Pod okriljem Svjetske zdravstvene organizacije (prema 16) razvijen je teorijski model 3C (engl. *complacency, convenience and confidence*) koji razloge za odbijanje cijepljenja svrstava u tri kategorije. *Complacency* se odnosi na pretjeranu opuštenost koja proizlazi iz činjenice da se neka bolest smatra pod kontrolom u populaciji (zbog visoke procijepljenosti), pa pojedinac doživljava da cijepljenje nije nužno. Paradokсно, što je kampanja cijepljenja uspješnija, to će kod ljudi više prevladati strah od nuspojava u odnosu na strah od same bolesti. *Convenience* se odnosi na dostupnost cijepljenja (u smislu geografske blizine, cijene i sl.), kao i kvalitetu te prikladnost te usluge. *Confidence* se odnosi na uvjerenja da je cijepljenje efikasno i sigurno, na povjerenje prema zdravstvenim djelatnicima i vladama koje donose odluke o cijepljenju.

Upravo je ovaj zadnji skup razloga u fokusu ovog istraživanja, kao i osobinski faktori iz modela Dube i sur. (8). U podlozi i jednog i drugog seta čimbenika nalazi se svjetonazor pojedinca koji se može odrediti kao set pretpostavki o fizičkoj i društvenoj stvarnosti koji može imati snažne posljedice na obrasce razmišljanja i ponašanje pojedinca (17). Svjetonazor se može promatrati kao interpretativna leća pomoću koje ljudi spoznaju svijet i svoje mjesto u njemu (18). Kao relevantne manifestacije svjetonazora odabrani su povjerenje u znanost i sklonost vjerovanju u teorije zavjere, kao konstrukti koji bi mogli biti povezani s odbijanjem cijepljenja.

Povjerenje u znanost je skup vjerovanja o znanstvenoj metodi i filozofskim postulatima empirijske znanosti kao najkvalitetnijim putevima koje ljudi imaju za spoznaju svijeta oko sebe. Prema nekim istraživanjima (19) ovaj se konstrukt sastoji od dva povezana elementa: povjerenju prema metodama i principima s jedne, te povjerenju prema znanstvenim institucijama s druge strane. Više rezultate na ljestvicama

vaccinated as a continuum spanning from refusal to acceptance, influenced by personality factors such as knowledge and level of information, previous experiences, perceived importance of vaccination, risk assessment, subjective norms and moral, i.e. religious beliefs. On the other hand, the decision-making process is also influenced by the trust in the public health system and the recommendations issued by healthcare professionals, as well as in the information reported by the media and other communication channels.

The 3C model theory which classifies the reasons for vaccine refusal into three categories (complacency, convenience and confidence) was developed under the auspices of the World Health Organization (according to 16). *Complacency* refers to the exaggerated unconcern arising from the fact that a disease is considered to be under control in the population (due to high vaccination rates), so the individual does not perceive vaccination as necessary. Paradoxically, the more successful the vaccination campaign, the more people will fear the side effects rather than the disease itself. *Convenience* refers to the availability of vaccination (in terms of geographical proximity, price, etc.), as well as the quality and suitability of the service. *Confidence* refers to the belief that vaccination is effective and safe, and to the trust in the healthcare professionals and governments making decisions about vaccination.

It is this last set of reasons that is the focus of this study, in addition to the personality factors referred to in the model presented by Dubé et al. (8). Underlying both sets of factors is the worldview of each individual, which can be defined as a set of assumptions about the physical and social reality that can have a strong impact on the thinking patterns and behaviour of an individual (17). Worldview can be seen as an interpretive lens through which people perceive the world and their place in it (18). Trust in science and a tendency to believe in conspiracy theories were selected as relevant manifestations of a worldview, as constructs that could be associated with vaccine refusal.

povjerenja u znanost postižu mlađi sudionici muškog spola i liberalne političke orijentacije (prema 20). Ljudi koji vjeruju u znanost kao pristup i koji vjeruju znanstvenicima općenito i medicinskim znanstvenicima specifično bi trebali biti otvoreniji prema cijepljenju.

Teorije zavjera su pokušaji objašnjavanja uzroka važnih društvenih i političkih događaja pomoću tajnih dogovora malog broja jako moćnih pojedinaca ili organizacija (21). One često podrazumijevaju ideje o tome kako različite tajne organizacije i društva pokušavaju kontrolirati ljude koristeći se nedozvoljenim sredstvima poput ugradnje mikročipova ili prskanja kemikalija iz aviona. Mentalitet zavjera (engl. *Conspiracy mentality*) je set bazičnih uvjerenja koji se nalazi u podlozi vjerovanja u specifične teorije zavjera. Ovaj mentalitet odražava stabilne individualne razlike između ljudi u tome da se značajni događaji pripisuju zlokočnim uzrocima ili tajnim zavjerama (22). Istraživanja pokazuju kako pojedinci s razvijenijim mentalitetom zavjera zaista vjeruju i u više specifičnih teorija zavjera (23, 24).

Vjerovanje u teorije zavjera može imati brojne negativne posljedice za pojedinca i društvo u cjelini (25). Ljudi koji vjeruju u teorije zavjera manje su skloni uključivati se u društveno korisne aktivnosti poput aktivnosti za sprječavanje klimatskih promjena (26) ili pridržavanja propisanih mjera za kontrolu pandemije (27,28). I prije COVID-19 pandemije postojale su brojne teorije zavjere povezane s cijepljenjem. Vjerojatno je najraširenija ideja da su nuspojave cijepljenja puno veće nego se prikazuje u službenoj medicinskoj literaturi (29). S cijepljenjem protiv COVID-19 najviše se povezuju teorije zavjere o korištenju cjepiva kako bi se ljudima ubrizgali mikročipovi za praćenje i kontrolu. Vjerovanje u ove teorije zavjere, kao i teorije zavjere o COVID-19 općenito, pokazalo se povezanim s oklijevanjem s cijepljenjem (30,31). S druge strane, neki nalazi pokazuju da su namjeru za cijepljenje predviđale specifične teorije zavjere povezane s cijepljenjem, a ne općenite teorije zavjere povezane s pandemijom (32).

Trust in science is a set of beliefs relating to a scientific method and philosophical postulates of empirical science as the best ways in which people can perceive the world around them. According to some studies (19), this construct consists of two related elements: trust in the methods and principles on the one hand, and trust in the scientific institutions on the other hand. Younger male participants with a liberal political orientation achieve higher results on scales referring to trust in science (according to 20). People who trust science as an approach and who trust scientists in general and medical scientists in particular, should be more open to vaccination.

Conspiracy theories represent an attempt to explain the causes of important social and political events by attributing them to secret agreements among a small number of very powerful individuals or organisations (21). They often involve ideas about various secret organisations and societies trying to control people by using illicit means, such as implanting microchips or spraying chemicals from airplanes. Conspiracy mentality is a set of basic convictions that underlies the beliefs in specific conspiracy theories. This type of mentality reflects stable individual differences between people in the attribution of significant events to sinister causes or secret conspiracies (22). Research has shown that individuals with more developed conspiracy mentalities also truly believe in several specific conspiracy theories (23, 24).

Believing in conspiracy theories can have numerous negative consequences for individuals and for the society as a whole (25). People who believe in conspiracy theories are less likely to be included in socially useful activities such as those aiming at preventing climate change (26) or at adhering to the measures prescribed in order to control the pandemic (27, 28). Numerous conspiracy theories associated with vaccination existed even before the COVID-19 pandemic. Probably the most widespread idea is that the side effects of vaccination are much greater than those reported in the official medical literature (29). The conspiracy theories mostly associated with vaccination against COVID-19 are those relating to the use of

U današnjem modernom svijetu ljudima je na raspolaganju širok spektar izvora informacija. Još uvijek se koriste tradicionalni izvori poput novina, televizije i radija, ali su dostupni i moderni izvori kao što su internetski portali i društvene mreže. Važno je naglasiti da odluka o cijepljenju ovisi o informiranosti, kako o samom cjepljivom tako i procesu cijepljenja (8). No, problem s korištenjem neuređenih izvora informacija, poput društvenih mreža, leži u tome što su one često leglo dezinformacija i lažnih vijesti (33). Posebno je opasno kada osoba posjećuje samo stranice koje podržavaju njihov svjetonazor. U takvim slučajevima postoji opasnost da se osoba zatvori u vlastiti "balon" informacija koje samo potvrđuju već postojeće stavove i vrijednosti. Umjesto da proširuju svoje znanje putem različitih izvora, ljudi mogu zaglaviti sve dublje u ideološkoj rupi, vjerujući da su informirani, dok zapravo gube objektivnost i perspektivu (34).

Cilj ovog istraživanja je proučiti doprinos kognitivnih čimbenika poput korištenja različitih izvora informiranja i *online* platformi te svjetonazora (povjerenja u znanost, mentaliteta teorija zavjera i vjerovanja u teorije zavjere o pandemiji) u predviđanju vjerojatnosti oklijevanja s cijepljenjem. Želimo vidjeti mogu li izvori informiranja, a onda i povjerenje u znanost i vjerovanje u teorije zavjera, predviđati ishod nakon statističke kontrole nekih demografskih varijabli. U analizu su uključeni i ranije poznati čimbenici odluke o cijepljenju poput političke orijentacije ili važnosti vjere (kao operacionalizacije religioznosti).

METODA

Sudionici

Istraživanje je provedeno *online*, a sudjelovalo je ukupno 398 sudionika koji su vrbovani preko različitih studentskih mailing-lista kao i putem društvenih mreža. Prosječna dob sudionika bila je 26,5 godina (SD = 11,1). U tablici 1 prikazane su neke demografske odrednice uzorka. Kao što se može vidjeti, većina sudionika su žene

vaccine for the purpose of injecting people with microchips used for monitoring and control. In general, believing in these conspiracy theories, as well as the theories relating to COVID-19, has proved to be associated with vaccine hesitancy (30, 31). On the other hand, some findings indicate that vaccination intentions were anticipated in specific vaccine-related conspiracy theories, and not in general conspiracy theories relating to the pandemic (32).

In the modern world that we live in today, people have a wide spectrum of information sources at their disposal. Traditional sources of information such as newspapers, television and radio are still being used, but modern sources such as internet portals and social networks are available as well. It is important to note that a decision to get vaccinated depends on the individual's level of information, as well as the vaccine itself and the vaccination process (8). However, the problem with using unregulated sources of information such as social networks lies in the fact that they are often a hotbed of misinformation and fake news (33). A particularly troubling situation arises when an individual only visits the websites that support their worldview. In such cases, there is a risk of being enclosed in one's own "balloon" of information that only confirm the already existing attitudes and values. Instead of expanding their knowledge by looking into various sources, people may get stuck deeper and deeper in their ideological holes believing that they are informed, while they are actually losing objectivity and perspective (34).

The objective of this study was to examine the contribution of cognitive factors, such as the use of various sources of information and *online* platforms, and worldviews (trust in science, conspiracy mentality and believing in conspiracy theories associated with the pandemic) for the purpose of predicting the likelihood of vaccine hesitancy. Our aim was to establish whether the sources of information, and then the trust in science and belief in conspiracy theories, can predict the outcome after a statistical control of some demographic variables. Previously known

koje studiraju ili su zaposlene i žive u mjestu s preko 500,000 ljudi. Podatci za ovo istraživanje prikupljeni su u svibnju 2021., nakon što je u Hrvatskoj počela kampanja cijepljenja, ali svi koji se žele cijepiti još nisu stigli na red.

Instrumenti

Sociodemografska obilježja

Osim demografskih varijabli spomenutih ranije i prikazanih u tablici 1, još su prikupljeni podatci o političkoj orijentaciji (na ljestvici od 1 – ekstremno lijevo do 7 – ekstremno desno) i važnosti vjere u životu sudionika (na ljestvici od 1 – nimalo važno do 7 – vrlo važno). Informacije o cijepljenju prikupljene su uz pomoć dva pitanja. Prvo smo sudionike pitali jesu li se do sada cijepili, a ako nisu imaju li namjeru (sigurno da, ne znam, sigurno ne).

Broj online platformi i izvori informiranja

Sudionike smo pitali da označe koje od različitih društvenih mreža i kanala komunikacije koriste (*Facebook, Twitter, YouTube, Instagram,*

factors influencing vaccination decisions, such as political orientation or the importance of religion (as the operationalisation of religiousness), were also included in the analysis.

METHOD

Participants

The study was conducted online, with a total of 398 participants who were recruited through various student mailing lists and social networks. The average age of participants was 26.5 years (SD = 11.1). Table 1 shows some demographic characteristics of the sample. As can be seen, the majority of participants were women studying or working and living in a city of over 500 000 inhabitants. The data for this study were collected in May 2021, after the start of the vaccination campaign in Croatia, but before all of the people wanting to get vaccinated had the opportunity to do so.

Instruments

Sociodemographic characteristics

In addition to the demographic variables mentioned above and shown in Table 1, data on political orientation (on a scale from 1 - far left to 7 - far right) and the importance of religion in the participants' lives (on a scale from 1 - no importance to 7 - very important) were collected as well. Information on vaccination was collected by asking the participants two questions. The participants were first asked whether they had been vaccinated thus far, and if they hadn't, whether they had such intentions (definitely yes, I do not know, definitely no).

The number of online platforms and sources of information

We asked the participants to indicate which of the different social networks and communication channels they used (*Facebook, Twitter, YouTube,*

TABLICA 1. Raspodjela sudionika prema rodu, radnom statusu i veličini mjesta u kojem žive

TABLE 1. Distribution of participants according to gender, employment status and size of place of residence

Rod / Gender	Frekvencija / Count	%
Muško / Male	143	36.0%
Žensko / Female	254	64.0%
Radni status / Employment status		
Student / Student	288	72.4%
Nezaposlen-a / Unemployed	11	2.8%
Zaposlen-a / Employed	94	23.6%
Umirovljenik-ca / Retired	5	1.3%
Veličinamjesta / Size of place of residence		
< 1000	21	5.3%
1000 - 10 000	80	20.1%
10 000 - 100 000	86	21.6%
100 000 - 500 000	30	7.5%
> 500 000	181	45.5%

Reddit, TikTok, Snapchat, Whatsapp, Viber, Signal, Telegram). Od sudionika smo tražili da označe samo one platforme koje aktivno koriste (kojima su pristupili barem jednom u zadnjih tjedan dana). U ovom nas istraživanju nije zanimala svaka platforma pojedinačno, već koliko različitih platformi sudionik koristi kao mjera širine izloženosti različitim utjecajima. Nadalje, pitali smo ih da procijene na ljestvici od 5 stupnjeva (1 - nikad, 5 - svakodnevno) koje izvore koriste za informiranje (TV, internetske portale, društvene mreže, radio, tiskani materijal i/ili druge ljude).

Povjerenje u znanost

Povjerenje u znanost odmjereno je kratkom ljestvicom koja je konstruirana za potrebe ovog istraživanja. Instrument se sastoji od 5 tvrdnji za koje sudionici daju odgovore na ljestvici od 7 stupnjeva (1 – uopće se ne slažem, 7 – u potpunosti se slažem). Čestice su konstruirane tako da viši rezultat ukazuje na veće povjerenje u znanost. Primjeri čestica su „Ako želimo riješiti probleme modernog društva trebali bismo više slušati znanstvenike.“ ili „Nikada se ne bih podvrgnuo/la medicinskom postupku koji nema znanstveno utemeljenje.“ Jednodimenzionalni mjerni model dobro odgovara podacima ($\chi^2=17,9$; $df=5$; $CFI=0.98$; $SRMR=0,025$; $RMSEA=0,08$). Pouzdanost je procijenjena McDonaldovim (35) *omega total* koeficijentom ($\omega_t=0,8$) i Cronbachovim koeficijentom ($\alpha = 0,78$) te je na zadovoljavajućoj razini za ljestvicu ove dužine.

Mentalitet teorija zavjera

Upitnik za mjerenje mentaliteta teorija zavjera (CMQ; 22) sastoji se od 5 tvrdnji, a zadatak sudionika je odrediti svoje slaganje sa svakom tvrdnjom na ljestvici od 11 stupnjeva. Ljestvica je izražena kao postotno slaganje sa svakom tvrdnjom – od 0 % do 100 % sigurnosti. Primjeri tvrdnji su „Smatram da postoje tajne organizacije koje imaju velik utjecaj na političke

Instagram, Reddit, TikTok, Snapchat, WhatsApp, Viber, Signal, Telegram). We asked the participants to indicate only those platforms that they actively used (which they had accessed at least once in the previous week). In the course of this study we were not interested in individual platforms, but rather in the number of different platforms a participant used as a measure of the breadth of exposure to different influences. Furthermore, we asked them to evaluate on a 5-point scale (1 - never, 5 - every day) which sources they used to obtain information (television, internet portals, social networks, radio, printed material and/or other people).

Trust in science

Trust in science was measured using a short scale which was constructed for the purposes of this study. The instrument consisted of five statements for which the participants provided answers on a 7-point scale (1 - completely disagree, 7 - completely agree). The items were constructed in such manner that a higher score indicated higher trust in science. Item examples were the following: “If we want to solve the problems existing in the modern society, we should listen to scientists more” or “I would never undergo a medical procedure that has no scientific basis”. The one-dimensional model matched well with the data ($\chi^2=17.9$; $df=5$; $CFI=0.98$; $SRMR=0.025$; $RMSEA=0.08$). Reliability was assessed by McDonald's (35) *omega total* coefficient ($\omega_t = 0.8$) and Cronbach's coefficient α ($\alpha = 0.78$) and was at a satisfactory level for a scale of this length.

Conspiracy mentality

The Conspiracy Mentality Questionnaire (CMQ; 22) consisted of five statements, and the participant's task was to determine their level of agreement with each statement, using an 11-point scale. The scale was expressed as a percentage of agreement with each statement - from 0% to 100% certainty. Some examples included the following: “I believe that there are secret organisations that have great influence on political decisions” or “I believe that government officials

odluke.“ ili „Smatram da vladini zaposlenici pomno nadziru sve građane.“. Viši rezultat na ovoj ljestvici ukazuje na izraženiji mentalitet za vjerovanje u teorije zavjera. Pouzdanost ove ljestvice pokazala se zadovoljavajućom ($\omega_t=0,83$; $\alpha = 0,82$).

Vjerovanje u teorije zavjere o pandemiji COVID-19

Vjerovanje u specifične teorije zavjere povezane s COVID-19 pandemijom odmjereno je instrumentom preuzetim iz istraživanja Banai i sur. (27). Sudionici procjenjuju svoje slaganje s devet tvrdnji na ljestvici od 5 stupnjeva (0 – uopće se ne slažem, 5 – u potpunosti se slažem). Primjeri tvrdnji su „Širenje koronavirusa je povezano s 5G tehnologijom.“ ili „Podatci Svjetske zdravstvene organizacije o broju oboljelih i umrlih od koronavirusa su lažni.“. Viši rezultat na ovoj ljestvici ukazuje na veće vjerovanje u teorije zavjere o pandemiji, a ljestvica također pokazuje dobru pouzdanost ($\omega_t=0,9$; $\alpha = 0,89$).

Obrada podataka

Kako bismo odgovorili na postavljeni problem proveli smo hijerarhijsku logističku regresijsku analizu. Kao kriterij je korištena varijabla oklijevanja s cijepljenjem u kojoj su kao oni koji oklijevaju označeni ispitanici koji se još nisu cijepili, a izjavili su ili da se sigurno neće cijepiti ili da nisu sigurni hoće li se cijepiti. Drugu skupinu su činili oni koji su se već cijepili i oni koji su izjavili da će se sigurno cijepiti čim im se pruži prilika. Prediktore smo unosili u analizu u blokovima u svrhu kontrole utjecaja ranijih prediktora.

REZULTATI

Kako bi se ispitaio doprinos pojedinih prediktorskih varijabli u predviđanju vjerojatnosti oklijevanja s cijepljenjem izračunate su hijerar-

closely monitor all citizens”. A higher score on this scale indicated a more pronounced conspiracy mentality. The reliability of this scale proved to be satisfactory ($\omega_t = 0.83$; $\alpha = 0.2$).

Belief in conspiracy theories associated with the COVID-19 pandemic

Belief in specific conspiracy theories associated with the COVID-19 pandemic was measured by an instrument taken from a study conducted by Banai et al. (27). The participants rated their agreement with nine statements on a 5-point scale (0 - completely disagree, 5 - completely agree). Some statement examples were the following: “The spread of coronavirus is connected with the 5G technology” or “The data provided by the World Health Organization regarding the number of cases and deaths caused by the coronavirus are false”. A higher score on this scale indicated a greater belief in conspiracy theories relating to the pandemic, while the scale showed good reliability as well ($\omega_t = 0.9$; $\alpha = 0.89$).

Data processing

In order to address the problem at hand, we conducted a hierarchical logistic regression analysis. As the criterion, we used a vaccine hesitancy variable in which respondents who had not yet been vaccinated and who stated either that they would certainly not be vaccinated or that they were not sure whether they would be vaccinated were designated as hesitant. The second group consisted of those who had already been vaccinated and those who declared that they would certainly get vaccinated as soon as they had the opportunity. We input the predictors into the analysis in blocks, in order to control the impact of earlier predictors.

RESULTS

In order to analyse the contribution of individual predictor variables when predicting the likelihood of vaccine hesitancy, hierarchical logistic regression analyses were calculated in which sociode-

hijske logističke regresijske analize u kojima su kao prediktori redom uvedene sociodemografske varijable (dob, rod, politička orijentacija i važnost vjere), varijable informiranosti (izvori informiranosti i broj korištenih platformi), svjetonazor (povjerenje u znanost i mentalitet vjerovanja u teorije zavjere) te u zadnjem koraku vjerovanje u specifične teorije zavjere povezane sa COVID-19 pandemijom. U tablici 2 prikazana je deskriptivna statistika za kontinuirane varijable koje nisu opisane ranije.

Kao pomoć pri interpretaciji i alat za bolji uvid u podatke prvo su izračunate bivarijatne korelacije između svih korištenih prediktorskih varijabli i oklijevanja s cijepljenjem (tablica 3). Kako je ishod dihotomna varijabla, korišten je *point*-biserijalni koeficijent korelacije, a za povezanost s rodom koeficijent *phi*. Možemo vidjeti kako su na bivarijatnoj razini s oklijevanjem povezani dob, politička orijentacija, važnost vjere, korištenje TV-a kao izvora informacija te tri svjetonazorske varijable (povjerenje u znanost, mentalitet zavjera i vjerovanje u teorije zavjere vezane uz COVID-19). Nadalje, možemo primijetiti relativno visoke korelacije između tri svjetona-

mographic variables (age, gender, political orientation and importance of religion), information variables (sources of information and number of platforms used), worldview (trust in science and conspiracy mentality) and, in the final step, belief in specific conspiracy theories associated with the COVID-19 pandemic, were each introduced as predictors. Table 2 shows the descriptive statistics for continuous variables which were not described earlier.

As an aid to interpretation and a tool for better insight into the data, bivariate correlations between all used predictor variables and vaccine hesitancy were calculated first (Table 3). Since the outcome is a dichotomous variable, the point-biserial correlation coefficient was used, while the phi coefficient was used for gender correlation. We can see how age, political orientation, importance of religion, use of television as a source of information and three worldview variables (trust in science, conspiracy mentality and belief in conspiracy theories associated with COVID-19) correlate with hesitance at the bivariate level. Furthermore, relatively high correlations are observed between the three worldview variables, therefore those individuals displaying a higher conspiracy mentality will also believe

TABLICA 2. Deskriptivna statistika za kontinuirane varijable korištene kao prediktori u ovom istraživanju
TABLE 2. Descriptive statistics for continuous variables used as predictors in this study

	N	Aritmetička sredina / Arithmetic mean	Median	SD	Minimum	Maximum
Politička orijentacija / Political orientation	394	2,858	3	1,566	1	7
Važnost vjere / Importance of religion	397	3,783	4	2,257	1	7
Broj platformi / Number of platforms	398	3,445	3	1,341	0	7
Informacije od ljudi / Information from people	397	3,617	4	,966	1	5
Informacije s radija / Information from the radio	397	2,335	2	1,177	1	5
Informacije iz tiska / Information from newspapers	397	1,544	1	,763	1	5
Informacije s društvenih mreža / Information from social networks	398	3,952	4	1,252	1	5
Informacije s portala / Information from portals	398	3,829	4	1,123	1	5
Informacije s TV-a / Information from television	398	2,771	3	1,225	1	5
Povjerenje u znanost / Trust in science	393	29,786	30	7,237	6	42
Mentalitet zavjera / Conspiracy mentality	396	32,177	32	10,308	3	50
Zavjere o Covid-19 / Covid-19 conspiracies	397	19,408	18	7,991	9	45

TABLICA 3. Korelacijska matrica korištenih prediktorskih varijabli i kriterija
TABLE 3. Correlation matrix of the predictor variables and criteria used

Varijabla / Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Dob / Age	—														
2 Rod - ženski / Gender - Female	-,094	—													
3 Politička orijentacija / Political orientation	,046	-,159**	—												
4 Važnost vjere / Importance of religion	,046	,154**	,529**	—											
5 Broj platformi / Number of platforms	-,231**	,096	-,076	,06	—										
6 Informacije od ljudi / Information from people	-,157**	,175**	,042	,071	,042	—									
7 Informacije s radija / Information from the radio	,267**	,132**	,024	,178**	,039	,218**	—								
8 Informacije iz tiska / Information from newspapers	,110*	-,083	,023	,069	,126*	,058	,216**	—							
9 Informacije s društvenih mreža / Information from social networks	-,284**	,201**	,052	,105*	,377**	,199**	0,07	,140**	—						
10 Informacije s portala / Information from portals	,196**	0,02	-,006	,014	,102*	-,018	,124*	,235**	,329**	—					
11 Informacije s TV-a / Information from television	,309**	-,039	,047	,110*	,001	,022	,319**	,387**	,047	,378**	—				
12 Povjerenje u znanost / Trust in science	,094	-,026	-,311**	-,410**	,081	-,058	-,014	,035	-,057	,115*	,119*	—			
13 Mentalitet zavjera / Conspiracy mentality	-,047	,123*	,307**	,360**	,152**	,072	-,035	,011	,123*	,002	-,024	-,301**	—		
14 Zavjere o Covid-19 / Covid-19 conspiracies	,032	,084	,358**	,419**	,026	,022	-,03	,051	,049	-,037	-,014	-,433**	,634**	—	
15 Oklijevanje s cijepljenjem / Vaccine hesitancy	-,127*	-,024	,332**	,345**	-,008	-,006	-,048	,043	,092	-,065	-,111*	-,335**	,330**	,542**	—

Napomena: * p<,05; ** p<,01 / Note: * p<,05; ** p<,01

zorske varijable, dakle oni koji pokazuju viši mentalitet zavjera će i vjerovati u više teorija zavjere vezano uz COVID-19, dok su obje ove varijable negativno povezane s povjerenjem u znanost.

Rezultati hijerarhijske logističke regresije prikazani su u tablici 4, gdje se mogu vidjeti ne-standardizirani koeficijenti za sve prediktore u sva četiri koraka. Prikazani su i omjeri izgleda (engl. *odds ratio*) za svaku varijablu, koji govore o razlici u vjerojatnosti oklijevanja s cijepljenjem za porast od jedne jedinice u nekom prediktoru. Za svaki korak (model) prikazani su i podatci omnibust testa (χ^2 , df i p – ekvivalent F testu kod OLS regresijske analize) kao i pseudo R^2 (Cox i Snell verzija – ekvivalent R^2 kod OLS regresije).

U prvom su koraku u analizu unesene demografske varijable. Dob, politička orijentacija i važnost vjere pokazali su se kao značajni prediktori oklijevanja s cijepljenjem. Stariji ispi-

in several conspiracy theories associated with COVID-19, while both of these variables have a negative correlation with the trust in science.

The results of hierarchical logistic regression analysis are shown in Table 4, where non-standardised coefficients for all predictors in all four steps are presented. The odds ratios for each variable are also presented, indicating the difference in the likelihood of vaccine hesitancy for a one-unit increase in a predictor. The omnibus test (χ^2 , df and p – equivalent to F-test in OLS regression analysis) and the pseudo R^2 (Cox and Snell version – equivalent to R^2 in OLS regression) data are also shown for each step (model).

The demographic variables were analysed in the first step. Age, political orientation and importance of religion proved to be significant predictors in vaccine hesitancy. Older respondents were less likely to hesitate when it comes to vaccination – it is visible that the likelihood of vaccine hesitancy reduces by approximately 4% with each year of age. Furthermore, the likelihood

TABLICA 4. Rezultati provedene hijerarhijske logističke regresijske analize nakon svakog od 4 koraka
TABLE 4. Results of conducted hierarchical logistic regression analysis after each of the four steps

Model	Prediktor / Predictor	b	Omjerizgleda / Odds ratio
1	Dob / Age	-,042**	,959
	Rod - ženski / Gender - female	-,404	,668
	Politička orijentacija / Political orientation	,34**	1,405
	Važnost vjere / Importance of religion	,306**	1,358
$\chi^2 = 75,719$; df = 4; p < ,001; R ² (CS) = 0,198			
2	Dob / Age	-,035*	,965
	Rod - ženski / Gender - female	-,442	,642
	Politička orijentacija / Political orientation	,361**	1,435
	Važnost vjere / Importance of religion	,353**	1,424
	Broj platformi / Number of platforms	-,253*	,777
	Informacije od ljudi / Information from people	-,299*	,741
	Informacije s radija / Information from the radio	,031	1,032
	Informacije iz tiska / Information from newspapers	,357	1,430
	Informacije s društvenih mreža / Information from social networks	,222	1,249
	Informacije s portala / Information from portals	-,088	,916
	Informacije s TV-a / Information from television	-,461**	,631
	$\chi^2 = 99,315$; df = 11; p < ,001; R ² (CS) = 0,251		
3	Dob / Age	-,04*	,961
	Rod - ženski / Gender - female	-,583	,558
	Politička orijentacija / Political orientation	,274*	1,315
	Važnost vjere / Importance of religion	,256**	1,292
	Broj platformi / Number of platforms	-,292*	,747
	Informacije od ljudi / Information from people	-,321*	,725
	Informacije s radija / Information from the radio	,08	1,083
	Informacije iz tiska / Information from newspapers	,347	1,415
	Informacij s društvenih mreža / Information from social networks	,171	1,186
	Informacije s portala / Information from portals	-,049	,952
	Informacije s TV-a / Information from television	-,403**	,668
	Povjerenje u znanost / Trust in science	-,049*	,952
	Mentalitet zavjera / Conspiracy mentality	,051**	1,053
	$\chi^2 = 119,208$; df = 13; p < ,001; R ² (CS) = 0,293		
4	Dob / Age	-,058**	,944
	Rod - ženski / Gender - female	-,933*	,393
	Politička orijentacija / Political orientation	,229	1,258
	Važnost vjere / Importance of religion	,253**	1,288
	Broj platformi / Number of platforms	-,328*	,721
	Informacije od ljudi / Information from people	-,278	,757
	Informacije s radija / Information from the radio	,19	1,209
	Informacije iz tiska / Information from newspapers	,283	1,327
	Informacije s društvenih mreža / Information from social networks	,23	1,259
	Informacije s portala / Information from portals	-,029	,971
	Informacije s TV-a / Information from television	-,442**	,643
	Povjerenje u znanost / Trust in science	,006	1,006
	Mentalitet zavjera / Conspiracy mentality	-,01	,990
	Zavjere o Covid-19 / Covid-19 conspiracies	,191**	1,210
	$\chi^2 = 174,352$; df = 14; p < ,001; R ² (CS) = 0,398		

Napomena: * p<,05; ** p<,01 // Note: * p<,05; ** p<,01

tanci manje su skloni oklijevati s cijepljenjem – možemo vidjeti da se za svaku godinu života vjerojatnost oklijevanja s cijepljenjem smanjuje za oko 4 %. Nadalje, za svaki bod više prema desno na ljestvici političke orijentacije kao i bod više na ljestvici važnosti vjere vjerojatnost oklijevanja s cijepljenjem se povećava za oko 40 %. Omnibus test pokazuje da već i prvi korak statistički značajno razlikuje ove dvije skupine sudionika.

U drugom su koraku unesene varijable povezane s informiranjem. Nakon kontrole varijabli iz prvog koraka, kao značajni prediktori su se pokazali broj platformi, dobivanje informacija od drugih ljudi i dobivanje informacija s TV-a. Sudionici koji koriste više platformi te oni koji informacije dobivaju od drugih ljudi i s TV-a skloniji su cijepljenju.

U trećem su koraku dodane varijable koje se odnose na svjetonazor: povjerenje u znanost i mentalitet zavjera. Kao što možemo vidjeti, obje varijable značajno doprinose objašnjenju kriterija nakon kontrole svih varijabli iz prva dva koraka. S cijepljenjem će oklijevati oni koji su skloniji mentalitetu zavjera kao i oni koji pokazuju manje povjerenje u znanost.

U četvrtom je koraku unesena varijabla vjerovanja u konkretne teorije zavjere povezane s pandemijom COVID-19. Ova varijabla značajno doprinosi objašnjenju varijance kriterija čak i uz kontrolu svih ranije unesenih varijabli. Za svaki bod više na ovoj ljestvici vjerojatnost oklijevanja s cijepljenjem raste za 20 %. Zanimljivo je spomenuti da su oba prediktora iz prethodnog koraka prestala biti značajni prediktori nakon što je unesena ova varijabla. Drugim riječima, povjerenje u znanost i mentalitet zavjera objašnjavaju isti dio varijance kriterija kao i vjerovanje u teorije zavjere o pandemiji COVID-19. Ukupno je ovim testom prediktora objašnjeno oko 40 % varijance kriterija, a model točno klasificira 82 % sudionika u ove dvije skupine.

of vaccine hesitancy increases by approximately 40% with each point to the right on the political orientation scale, as well as with each additional point on the scale referring to the importance of religion. The omnibus test results indicate that there are statistically significant differences between these two groups of participants already in the first step.

The variables associated with the provision of information were entered in the second step. After having controlled the first-step variables, the number of platforms, obtaining information from other people and obtaining information from television proved to be significant predictors as well. The participants who used several platforms and those who obtained information from other people and from television were more likely to get vaccinated.

Variables referring to the worldview, such as trust in science and conspiracy mentality, were added in the third step. As can be seen, both variables contributed significantly to the explanation of the criteria after controlling all the variables from the first two steps. Individuals prone to conspiracy mentality, as well as those expressing lower trust in science, proved to be hesitant to get vaccinated.

The variable referring to belief in specific conspiracy theories associated with the COVID-19 pandemic was entered in the fourth step. This variable contributes significantly to the explanation of the criteria variance even after controlling all of the previously entered variables. The likelihood of vaccine hesitancy increased by 20% with each additional point on this scale. Interestingly, both predictors referred to in the previous step ceased to be significant predictors after this variable was entered. In other words, trust in science and conspiracy mentality provide an explanation for the same part of the criteria variance as does belief in conspiracy theories associated with the COVID-19 pandemic. Approximately 40% of the criteria variance was explained by means of this predictor test, while the model provides an accurate classification of 82% of the participants in these two groups.

Okljevanje s cijepljenjem je kompleksan fenomen koji je posljedica mnogih osobinskih i situacijskih čimbenika. U ovom nas je istraživanju zanimala mogućnost predviđanja tog ishoda na temelju sociodemografskih i kognitivnih odnosno svjetonazorskih varijabli. Uzimajući u obzir bivarijatne korelacije prediktora s kriterijem (tablica 3), kao i pojedinačne samostalne doprinose nakon kontrole ostalih prediktora (tablica 4) niz se konstrukata pokazao kao koristan u predviđanju oklijevanja s cijepljenjem.

Dob se pokazala kao značajan prediktor oklijevanja s cijepljenjem u očekivanom smjeru – stariji sudionici skloniji su se cijepiti. Iako je naš uzorak relativno homogen po dobi, dovoljno je varijabiliteta da se ovaj efekt opazi. Ovaj je nalaz u skladu s ranijim istraživanjima koja su pokazala da mlađi imaju manje povjerenja prema cijepljenju te više oklijevaju s cijepljenjem (36-38), čak i na školskom uzorku suženog dobnog raspona (39). Za pregled odnosa dobi i oklijevanja s cijepljenjem upućujem na rad Hudsona i Montelparea (40). Jedan od mehanizama koji bi mogao objasniti ovaj efekt povezan je s većom izloženošću mladih dezinformacijama na društvenim mrežama (40).

Desna politička orijentacija i veća važnost vjere pokazali su se povezanim s oklijevanjem s cijepljenjem. Ove varijable su i međusobno blisko povezane i definiraju svjetonazor koji se često dovodi u vezu s oklijevanjem s cijepljenjem (41-43). Rezultati opaženi na našem uzorku tako su dodatna potpora trendu opaženom u velikom broju istraživanja preko različitih kultura (38). Važno je napomenuti da u nekim istraživanjima nije opažen takav učinak (44,45). Desna politička uvjerenja često su povezana s populističkim političkim diskursom koji gradi svoj zamah na nepovjerenju prema institucijama (46). Kako upravo vlade i nevladine udruge pozivaju ljude na cijepljenje, opažena povezanost između ovih varijabli ne čudi.

Vaccine hesitancy is a complex phenomenon that is the result of many personal and situational factors. In this study, we were interested in the possibility of predicting these outcomes based on the sociodemographic and cognitive, i.e. worldview-related variables. Taking into consideration the bivariate correlations of the predictors with the criterion (Table 3) and the individual contributions after the control of other predictors (Table 4), a series of constructs proved to be useful in predicting vaccine hesitancy.

Age proved to be a significant predictor of vaccination hesitancy in the expected direction - older participants are more likely to get vaccinated. Although our sample is relatively homogeneous in terms of age, there is enough variability for this effect to be observed. These findings are consistent with previous studies which found that the younger population has less trust in vaccination and is more likely to hesitate when it comes to vaccination (36 - 38), even in a school sample of a narrow age range (39). For the purposes of examining the correlation between age and vaccine hesitancy, I refer to the work of Hudson and Montelpare (40). One of the mechanisms that might explain this effect is associated with the higher exposure of young people to misinformation that can be found on social networks (40).

A right-wing political orientation and higher importance of religion proved to be linked to vaccine hesitancy. These variables are closely interlinked and define a worldview that is often associated with vaccine hesitancy (41 - 43). The results obtained from our sample provide an additional support to the trend observed in a large number of studies across different cultures (38). It is important to note that in some studies no such effects were observed (44, 45). Right-wing political orientation is often associated with populist political discourse that builds its momentum on distrust towards institutions (46). Since the governments and non-governmental organisations are the ones encouraging people to get vaccinated, it is no surprise that a connection between these variables was observed.

Ranija su istraživanja u vezu dovela korištenje društvenih mreža kao izvora informacija i oklijevanje s cijepljenjem (47). Na našem uzorku ovaj obrazac nije opažen, već se pokazalo da su se skloniji cijepiti oni koji više koriste druge ljude kao izvor informiranja, kao i TV. Nadalje, veći broj korištenih platformi (društvenih mreža i aplikacija za komunikaciju) povezan je s manjim oklijevanjem s cijepljenjem. Pojedine platforme komunikacije imaju svoje norme i obrasce ponašanja koje su definirale i krug korisnika platforme. Dakle, za pretpostaviti je da je iz perspektive informacijske vrijednosti korisnije imati po jedan kontakt na dvije različite platforme nego dva na istoj. Također, korisnici većeg broja platformi imaju manju vjerojatnost da će upasti u informacijsku „slijepu ulicu“, odnosno da će im se servirati samo jedna strana neke kontroverzne teme.

Ljudi su skloni različitim kognitivnim pristranostima, a jedna od najraširenijih je sklonost potvrdi (eng. *confirmation bias*). Ovaj se fenomen odnosi na traženje i interpretaciju informacija koje su u skladu s ranijim uvjerenjima ili očekivanjima (48). Za pretpostaviti je da će se ova pristranost teže manifestirati kod ljudi koji primaju informacije s TV-a i od drugih ljudi u odnosu na izvore informacija gdje ljudi imaju veću kontrolu nad time čemu će biti izloženi (poput društvenih mreža). Nadalje, istraživanja pokazuju da pojedinci koji su skloni oklijevati s cijepljenjem iznimno teško mijenjaju stavove unatoč tome što su argumenti za cijepljenje norma na brojnim *online* izvorima (49).

Povjerenje u znanost se pokazalo korisnim prediktorom oklijevanja s cijepljenjem – ljudi koji više vjeruju u znanost i znanstvenicima skloniji su se cijepiti. Taj je nalaz u skladu s ranijim istraživanjima koja su pokazala da je ovaj ishod povezan s povjerenjem prema stručnjacima (30) i može se objasniti pozitivnom vezom između povjerenja prema znanosti i povjerenja prema cjepivu (50). Drugim riječima, ljudi koji vjeruju u znanstvene principe imat će i više

Earlier studies indicated that there was a correlation between the use of social networks as sources of information and vaccine hesitancy (47). This pattern was not observed in our sample, but it turned out that those who were more likely to get vaccinated were those who used other people and television as sources of information. Furthermore, a larger number of platforms used (social networks and communication applications) is associated with less hesitancy to get vaccinated. Certain communication platforms have their own standards and behaviour patterns which have also defined the range of platform users. Presumably then, from the information value perspective, it is more useful to have one contact on two different platforms than two contacts on one platform. Moreover, those using a larger number of platforms are less likely to encounter an informational “dead end”, i.e. to only be exposed to one side of a controversial topic.

People are prone to a variety of cognitive biases, one of the most prevalent being the confirmation bias. This phenomenon refers to people looking for, or interpreting, information that is consistent with their existing beliefs or expectations (48). It is to be presumed that this bias would be less pronounced in people who obtain information from television and from other people compared to sources of information where people have more control over what they will be exposed to (such as social networks). Furthermore, research has shown that individuals who tend to hesitate to get vaccinated have a hard time changing their attitudes despite the fact that pro-vaccination arguments represent the norm in numerous online sources (49).

Trust in science has proved to be a useful predictor when it comes to vaccine hesitancy - people who have a greater trust in science and scientists are more likely to get vaccinated. These findings are consistent with previous studies that have shown that this outcome is associated with trust in experts (30) and can be explained by a positive link between trust in science and trust in the vaccine (50). In other words, people who believe in scientific principles will have more trust in vacci-

povjerenje prema cijepljenju kao znanstveno utemeljenoj metodi, što će rezultirati i manjim oklijevanjem.

Vjerovanje u teorije zavjere povezano je s odbacivanjem znanosti i znanstvenog načina razmišljanja (51). Ovo potvrđuje i umjerena negativna korelacija između povjerenja prema znanosti i mentaliteta zavjera opažena i u ovom istraživanju. Posjedovanje mentaliteta zavjera pokazalo se kao značajan prediktor oklijevanja s cijepljenjem, ljudi koji su skloni vjerovati teorijama zavjera općenito, manje su skloni cijepiti se. Istraživanja pokazuju kako je vjerovanje u teorije zavjera povezano s negativnim stavom prema cijepljenju (52,53). Ta veza može biti moderirana subjektivnim normama bliskih pojedinaca, odnosno pozitivni stavovi prema cijepljenju prijatelja ili članova obitelji mogu reducirati ovu povezanost (42).

Važni događaji s globalnim utjecajem poput globalne pandemije jako su dobar kandidat za nastanak i širenje brojnih teorija zavjera. Ovo je definitivno slučaj s pandemijom COVID-19 oko koje su nastale brojne teorije zavjera, poput one da je pandemija namjerno iscenirana ili da se cijepljenje koristi za ubrizgavanje čipova za kontrolu populacije. Naši rezultati pokazuju vrlo jasnu vezu između vjerovanja u ovakve teorije zavjera i oklijevanja s cijepljenjem. Ovaj je nalaz u skladu s ranijim istraživanjima (30, 31). Zanimljivo je da su uvođenjem ovog prediktora u analizu na značajnosti izgubili i povjerenje u znanost i mentalitet teorija zavjera. Jedno od objašnjenja ovog efekta je da je vjerovanje u specifične teorije zavjera medijator veze između ova dva konstrukta i opaženog ishoda. Dakle, iako ljudi koji ne vjeruju u znanost i pokazuju viši mentalitet zavjera pokazuju veće oklijevanje s cijepljenjem, ova se veza može objasniti vjerovanjem u specifične teorije zavjere povezane s pandemijom COVID-19.

Zaključno, naši rezultati sugeriraju kako je oklijevanje s cijepljenjem kompleksan fenomen s puno korelata. Ako želimo potaknuti ljude na

nation as a scientifically based method, which will result in less hesitation.

Believing in conspiracy theories is associated with the rejection of science and the scientific way of thinking (51). This is also confirmed by the moderate negative correlation between trust in science and conspiracy mentality, which was observed in this study as well. Having a conspiracy mentality has proved to be a significant predictor of vaccine hesitancy, and people who tend to believe in conspiracy theories are generally less likely to get vaccinated. Studies have shown that there is a correlation between believing in conspiracy theories and a negative attitude towards vaccination (52, 53). This link can be moderated by subjective norms of close individuals, i.e. positive attitudes towards vaccination displayed by friends or family members can reduce this correlation (42).

Major events that have a global impact, such as a global pandemic, are very good candidates for the creation and spread of numerous conspiracy theories. This has definitely been the case with the COVID-19 pandemic, in relation to which numerous conspiracy theories have been formed, such as the theory that the pandemic was deliberately staged or that vaccination was being used for the purpose of injecting population control chips. Our results indicate that there is a very clear connection between belief in such conspiracy theories and hesitancy to get vaccinated. These findings are consistent with the previously conducted studies (30, 31). Interestingly, both trust in science and conspiracy mentality lost their relevance after this predictor was introduced into the analysis. One of the possible explanations for this effect is that belief in specific conspiracy theories serves as a mediator in the link between these two constructs and the resulting outcome. Therefore, although individuals who do not trust science and display a higher conspiracy mentality are more hesitant to get vaccinated, this link can be explained by belief in specific conspiracy theories associated with the COVID-19 pandemic.

In conclusion, our results indicate that vaccine hesitancy is a complex phenomenon with many

cijepljenje potrebno je djelovati na razvoj kritičkog razmišljanja. Kritička analiza informacija iz više izvora kao i povjerenje u znanost mogu se učiti i vježbati. Ovi su elementi jedan od potencijalno vrlo važnih smjerova kako obrazovanja djece u okviru školskog sustava tako i edukacije odraslih izvan sustava. Važno je upozoriti i na neke nedostatke ovog istraživanja. Prigodan uzorak u velikoj mjeri onemogućuje generalizaciju naših nalaza. Krajnji uzorak sudionika nije reprezentativan za sve mlade u Hrvatskoj jer je u njemu veći udio sudionika iz velikih mjesta kao i visokoobrazovanih sudionika. Nadalje, nacrt istraživanja onemogućuje bilo kako uzročno-posljedično zaključivanje već samo opis povezanosti između različitih konstrukata.

correlates. If we want to encourage people to get vaccinated, we need to work on developing critical thinking. Critical analysis of multiple-source information and trust in science can be taught and trained. These elements represent potentially very important directions both in the education of children within the school system and in the education of adults outside the system. It is important to point out some of the shortcomings of this study as well. A convenient sample largely precludes the generalisation of our findings. The final sample of participants is not representative of all young people in Croatia because it includes a larger share of female participants from large cities, as well as highly educated participants. Furthermore, the study design precludes any causal inference, but only allows for a description of the connection between the different constructs.

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Utjecaj pandemije COVID-19 na oboljele od shizofrenije

/ The Impact of COVID-19 Pandemic on Patients with Schizophrenia

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Strah od prijenosa zaraze COVID-19 pridonio je pojavi anksioznosti i depresije kod osoba koje do sada nisu bolovale od mentalnih bolesti, te do pogoršanja simptoma u osoba s prethodno dijagnosticiranim mentalnim bolestima. Pokazano je da oboljeli od shizofrenije imaju povećan rizik od zaraze COVID-19 kao i da su češće hospitalizirani te imaju veću smrtnost, što se povezuje s velikim brojem komorbiditeta, pušenjem te korištenjem velikog broja lijekova. Uočena je i veza između imunološkog i upalnog profila COVID-19 i shizofrenije. Problem su također nejednakost zdravstvene skrbi i stigma koji doprinose lošijem ishodu COVID-19 kod osoba oboljelih od mentalnih bolesti. Pandemija COVID-19 može dovesti do pogoršanja psihotičnih simptoma i pojave relapsa u osoba s prethodno dijagnosticiranim mentalnim bolestima. Nadalje, uočena je veza između socijalne izolacije i pogoršanja mentalnog zdravlja u smislu razvoja stresa i anksioznosti. Kako bi se nastavila pružati kontinuirana skrb oboljelima od shizofrenije, a smanjio rizik od zaraze, telemedicina pruža najbolje moguće rješenje, no za teže slučajeve fizički posjeti ostaju i dalje ključni. Oboljeli od shizofrenije su vulnerabilna skupina u smislu zaraze COVID-19 i mogućeg smrtnog ishoda i potrebno ih je zaštititi senzibiliziranjem društva i medicinskih djelatnika kako bi se uklonila stigma i smanjile nejednakosti u pružanju zdravstvene skrbi.

/ The fear of transmission of COVID-19 infection has contributed to the occurrence of anxiety and depression in individuals who have not previously suffered from mental illness, and to the worsening of symptoms in patients previously diagnosed with mental illness. It has been shown that patients with schizophrenia have an increased risk of contracting COVID-19, are more often hospitalized and have a higher mortality rate. This is correlated with many comorbidities, tobacco consumption, and extensive use of medications. It has been noted that there is a connection between the immune and inflammatory response of COVID-19 and schizophrenia. Healthcare inequality and stigma result in a poorer outcome of COVID-19 in persons suffering from mental illness. The COVID-19 pandemic can cause a worsening of psychotic symptoms and the reoccurrence of relapses in those with a prior mental illness diagnosis. Additionally, it has been noted that social seclusion can cause a decline in psychological wellbeing, leading to increased levels of stress and anxiety. To ensure that patients with schizophrenia receive uninterrupted care and minimize the risk of infection, telemedicine offers an optimal solution; however, for more severe cases, physical visits remain imperative. Patients with schizophrenia are particularly exposed to contraction and potential death from COVID-19 and require the support of society and medical professionals to help eliminate the stigma they often face, and guarantee equal access to healthcare.

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Stigma / Stigma

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Veliki broj slučajeva atipične upale pluća uzrokovane novim koronavirusom koji je kasnije identificiran kao virus SARS-CoV-2, opažen je u Wuhanu u Kini u prosincu 2019. godine (1). Bolest se naglo proširila diljem svijeta pa je Svjetska zdravstvena organizacija 11. ožujka 2020. proglasila pandemiju COVID-19 (2). Strah od prijenosa bolesti COVID-19 pridonio je pojavi depresije, stresa i anksioznosti među pojedincima koji do sada nisu bolovali od mentalnih bolesti (3). Anksioznost se može javiti kao posljedica straha od zaraze te zbog nedovoljno jasnih uputa vezanih za socijalno distanciranje i manje pouzdanim informacijama iz medija koje doprinose strahu (4). Osim što strah u pandemiji povećava razinu anksioznosti i stresa kod psihički zdravih osoba, zapaženo je i da pojačava simptome kod osoba s ranije dijagnosticiranim psihijatrijskim poremećajima. Skupine koje su posebno ranjive u pandemijama su osobe starije dobi, imunokompromitirani bolesnici te bolesnici s ranije dijagnosticiranim psihijatrijskim bolestima (5). Pojedinci s ranije dijagnosticiranom mentalnom bolešću imaju povećan rizik od zaraze COVID-19 te su i pod povećanim rizikom od negativnih tjelesnih i psiholoških učinaka koji proizlaze iz pandemije (6). Smatra se da u tih bolesnika čimbenici rizika poput pušenja, pretilosti te neaktivnosti pridonose razvoju bolesti i posljedično tome povećanom morbiditetu i mortalitetu. U pojedinaca

COVID-19 AND MENTAL HEALTH

In December 2019, Wuhan, China, reported a great number of unusual pneumonia cases due to the novel coronavirus, later identified as the SARS-CoV-2 virus (1). The World Health Organization proclaimed a pandemic of COVID-19 on March 11, 2020 as the disease spread quickly around the world (2). The fear of transmitting COVID-19 has led to the emergence of depression, stress, and anxiety in individuals who were not already suffering from mental illness (3). Anxiety is a possible consequence of fear of infection, with unclear social distancing instructions and a lack of reliable sources from the media intensifying the fear (4). Fear of the pandemic not only raises the levels of stress and anxiety in people with sound mental health, but it has also been seen to exacerbate the symptoms of those already struggling with psychiatric disorders. Elderly individuals, those who are immunocompromised, and those who have existing psychiatric illnesses are especially at risk from pandemics (5). Individuals with a history of mental health difficulties are more likely to contract COVID-19 and are more vulnerable to physical and psychological impacts resulting from the pandemic (6). It is thought that risk factors such as smoking, obesity and inactivity are implicated in the onset of the disease, resulting in higher morbidity and mortality rates in these patients. For indi-

kojima je dijagnosticirana teška mentalna bolest opaženo je smanjenje životnog vijeka za 13 do 30 godina. Najčešće su u komorbiditetu prisutne kardiovaskularne bolesti, koronarna bolest te šećerna bolest tip 2 (7). S obzirom da je tijekom pandemije medicinska pomoć usredotočena na liječenje oboljelih od COVID-19, starije osobe te bolesnici s kroničnim bolestima koje nisu povezane s COVID-19 suočeni su s promjenama ranije dostupnih zdravstvenih usluga što ima za posljedicu smanjenu zdravstvenu skrb. Nadalje, u tih je ranjivih skupina zabilježen veći rizik od negativnih posljedica socijalnog distanciranja na njihovo mentalno zdravlje. Osim toga brzi prijenos zaraze i veći broj smrtnih slučajeva u tim skupinama mogu povećati rizik od psihičke dekompenzacije i pogoršati već prisutne psihijatrijske poremećaje (8). Ograničavanje socijalnih kontakata može imati negativan utjecaj na psihijatrijske bolesnike, budući da je održavanje međuljudskih odnosa ključna komponenta u postupku njihovog zbrinjavanja i liječenja. Isto tako, negativan utjecaj može imati i smanjen pristup psihijatrijskim pregledima koji su često puta otkazani jer se ne smatraju nužnima, iako su korisni za bolesnika (4). Standardne preporuke za sprječavanje širenja zaraze poput pranja ruku, pokrivanja usta i nosa pri kihanju i kašljanju te izbjegavanja bliskog kontakta s ljudima koji pokazuju simptome respiratorne bolesti, mogu biti teško provedive u mentalno oboljelih pojedinaca, koji osim što imaju povećani rizik od razvoja infekcije, mogu pridonijeti samom prijenosu bolesti. Nadalje, potrebne mjere samoizolacije, koje su inače teško provedive, mogu dodatno pogoršati mentalno stanje ovih bolesnika što uključuje razvoj osjećaja ljutnje i anksioznosti četiri do šest mjeseci nakon izlaska iz karantene (7). S pojavom pandemije COVID-19 pojavila se i stigma. Stvara se odbojnost prema skupinama koje karakterizira visoka stopa infekcije što kod njih rezultira stigmom, a ona je dalje povezana s povećanom anksioznošću i depresijom. Kombinacija stigme prema mentalnim bolestima i stigme prema COVID pozitivnim bolesnicima

viduals with severe mental illness, there was a noted decrease in life expectancy of between 13 and 30 years. Cardiovascular disease, coronary disease, and type 2 diabetes mellitus tend to occur together (7). With the pandemic, medical resources being dedicated to the treatment of COVID-19, elderly and those with chronic diseases unrelated to COVID-19 were experiencing a shift in available health services, leading to a decline in healthcare. Additionally, these at-risk populations have experienced greater odds of detrimental effects on their mental health as a result of social distancing. Furthermore, swift transmission of the virus and higher mortality rates in these populations can lead to psychological decompensation and worsen existing mental health issues (8). A restriction in social interaction can detrimentally affect psychiatric patients, since sustaining human contact is an essential element in the process of their recovery. Similarly, limited access to psychiatric assessments can have an adverse effect. These are frequently cancelled since they are not considered necessary, despite the fact that they are beneficial for the patient (4). It can be challenging to get mentally ill individuals to adhere to standard preventive measures for infection control such as hand washing, covering the nose and mouth when sneezing and coughing, and staying away from people who manifest signs of respiratory illness. Aside from the greater risk of infection, they can facilitate its transmission. Moreover, the necessary self-isolation protocols, which are hard to put into practice, can further worsen the mental state of these patients, like creating anger and anxiousness four to six months after the quarantine is finished (7). The emergence of the COVID-19 pandemic brought with it an issue of stigma. An antipathy to groups with a high rate of infection develops, causing a stigma, which is then associated with augmented anxiety and depression. Stigmatization of both mental illness and COVID-positive patients creates a double stigma. Thus, the patient's compliance with psychiatric treatment

ima kao posljedicu dvostruku stigmatu. To negativno utječe na suradljivost bolesnika u psihijatrijskom liječenju što dovodi do povećanog morbiditeta (9). Stigma prema ranjivim pojedincima može biti dodatno produbljena socijalnom deprivacijom te neadekvatnim informacijama i može rezultirati marginalizacijom, ali i povećanim institucionaliziranjem tih pojedinaca (8).

COVID-19 I SHIZOFRENIJA

Stopa zaraze od COVID-19

Oboljeli od shizofrenije mogu imati povećan rizik od zaraze COVID-19 zbog niza razloga. Naime, oboljeli od shizofrenije susreću se s poteškoćama oko provođenja preporučenih protuepidemijskih mjera poput pranja ruku i fizičke distance, što može biti posljedica slabijeg kognitivnog funkcioniranja, smanjene svijesti o riziku te smanjene sposobnosti prosuđivanja i donošenja odluka. Osim toga, često ih karakterizira život u skupini ili domovima, što zbog loših higijenskih uvjeta i gužve ima povišeni rizik od zaraze. To ujedno podrazumijeva i izloženost većoj količini virusa što korelira s težinom bolesti i stopom mortaliteta (10-12). Nadalje, shizofrenija je rizični čimbenik za institucionalno zbrinjavanje, što također može pridonijeti većem riziku od zaraze (13).

Istraživanja su pokazala da je među populacijom beskućnika povećana prevalencija shizofrenije i, prema meta-analizi koja je obuhvatila 31 studiju, iznosi 10,29 % (14). Veliki broj beskućnika ima kronične mentalne i tjelesne bolesti, povezuje ih se s višom stopom zloporabe droga te imaju smanjen pristup zdravstvenoj skrbi što znatno otežava provođenje probira, mjera karantene te liječenje onih koji razviju COVID-19 (15). Beskućnici koji imaju mentalnu bolest nalaze se pod povećanim rizikom od zaraze COVID-19 zbog toga jer žive u lošim higijenskim uvjetima, imaju otežan pristup zdravstvenim informacijama (a time i otežanu primjenu preventivnih zaštitnih mjera)

declines, which increases morbidity (9). Social deprivation and lack of information can worsen the stigma faced by vulnerable individuals and may lead to their exclusion from society, as well as greater institutionalization (8).

COVID-19 AND SCHIZOPHRENIA

COVID-19 infection rate

The risk of contracting COVID-19 may be heightened for patients with schizophrenia due to a range of reasons. Patients with schizophrenia have a hard time following the suggested anti-epidemic measures like handwashing and physical distancing, which can be caused by impaired cognitive functioning, lack of risk awareness, and decreased capacity to assess and decide. Additionally, they are usually found in groups or homes, which, due to inadequate hygiene and overcrowding, increases the risk of infection. This suggests that increased exposure to the virus is connected to a more extreme form of the disease and a higher mortality rate (10-12). Additionally, schizophrenia is a risk factor that can lead to institutional care, raising the risk of infection (13).

Research has revealed that the rate of schizophrenia among individuals without permanent housing has grown, and a meta-analysis of 31 studies concluded that it is 10.29% (14). Homeless individuals, many of whom suffer from chronic mental and physical health problems, have a higher propensity for drug use, and limited access to healthcare, leading to difficulties in screening, isolating and treating individuals with COVID-19 (15). Mentally ill homeless people are especially susceptible to COVID-19 due to inadequate hygiene, lack of access to health information (and thus difficulty applying preventive protective measures), and weaker immune systems (16). Conversely, a study carried out in Israel did not demonstrate a higher prevalence of infection among

i slabiji imunološki sustav (16). S druge strane, rezultati studije koja je provedena u Izraelu nisu potvrdili povećanu stopu zaraze među oboljelima od shizofrenije u odnosu na opću populaciju, što može biti posljedica obveznog testiranja u psihijatrijskim institucijama i domovima te u klinikama pri prijmu na liječenje (17). Osim toga, dodatni čimbenik koji bi mogao biti odgovoran za nižu stopu zaraze je činjenica da većina oboljelih od shizofrenije nije u braku, a upravo je zaraza preko člana obitelji jedan od glavnih načina infekcije.

Smrtnost od COVID-19

Oboljeli od shizofrenije i COVID-19 imaju povećani rizik od hospitalnog liječenja za više od dva puta te čak tri puta veću smrtnost od COVID-19 u odnosu na zdravu populaciju (17).

Lošijoj prognozi COVID-19 pridonosi veliki broj komorbiditeta prisutnih među ovom populacijom, no isto tako čimbenici povezani s liječenjem osnovne bolesti. Osim toga, oboljelima od shizofrenije nije jednako dostupna zdravstvena skrb kao ostalim bolesnicima, što ima za posljedicu zakašnjelo dijagnosticiranje i liječenje drugih bolesti, što dodatno negativno utječe na prognozu COVID-19. Povećani rizik od lošijeg ishoda posljedica je nepovoljnog životnog stila, lošeg stambenog zbrinjavanja te slabijeg društvenog života oboljelih od shizofrenije (10).

Oboljeli od shizofrenije u dobi od 65 do 80 godina mogu imati povećani rizik smrtnog ishoda od COVID-19 u odnosu na osobe iste dobi koje nemaju dijagnosticiranu težu mentalnu bolest što se može povezati s ubrzanim biološkim starenjem koje je izraženo kod oboljelih od shizofrenije (18). Kod njih je ubrzano starenje i tijela i mozga, pa tako i stanica imunološkog sustava, što je vrlo značajno u kontekstu COVID-19.

Komorbiditeti

Oboljeli od shizofrenije imaju povećani rizik od smrtnog ishoda u odnosu na opću populaciju zbog lošijeg fizičkog zdravlja (11). U više od

patients with schizophrenia in comparison to the general population, which may be due to the mandatory testing done in mental health facilities, care homes and clinics upon admittance to care (17). Additionally, another factor that could be the cause of the reduced infection rate is that the majority of schizophrenia patients are not married, and contagion through a family member is a major source of infection.

COVID-19 mortality

Those suffering from schizophrenia and having COVID-19 have more than double the risk of hospitalization and three times the risk of death from COVID-19 when compared to a healthy population (17).

The presence of multiple comorbidities among this population leads to a worse prognosis for COVID-19, as well as factors related to the management of the underlying disease. Schizophrenia patients have less access to health care than other patients, leading to a delayed diagnosis and treatment of other diseases, worsening the prognosis of COVID-19. Patients with schizophrenia are more likely to experience a poorer outcome because of an unfavourable lifestyle, inadequate housing care, and lacking social life (10).

Individuals aged 65-80 with schizophrenia could be at greater risk of death from COVID-19 than the individuals of similar age without more serious mental illness, due to the accelerated biological aging seen in schizophrenia (18). Accelerated aging of the body, brain, and the cells of the immune system is observed in them, which is of great significance to COVID-19.

Comorbidities

Compared to the general population, schizophrenia patients have a higher probability of death due to diminished physical health (11). In more than 70% of patients with schizophrenia, at least one comorbidity is present, such as car-

70 % bolesnika oboljelih od shizofrenije prisutan je barem jedan komorbiditet, poput kardiovaskularnih bolesti, bolesti dišnog sustava te šećerne bolesti. Upravo su te bolesti povezane s lošijom prognozom kod oboljelih od COVID-19 (10,13). Također, u 27 % bolesnika oboljelih od shizofrenije u usporedbi s općom populacijom (21 %) prisutan je nedostatak vitamina D, što doprinosi lošijem ishodu u oboljenih od COVID-19 (19,20). U jednom je istraživanju uočena povezanost između shizofrenije i demencije u smislu da je 25,2 % ispitanika oboljelih od shizofrenije imalo demenciju, pogotovo žene, a demencija je prepoznata kao čimbenik rizika za smrtnost kod bolesnika s COVID-19 (21).

Pušenje i lijekovi

Prevalencija pušenja u oboljelih od shizofrenije iznosi 50 % do 90 % (13). Nikotin povećava aktivnost i ekspresiju angiotenzin konvertirajućeg enzima 2 u plućima (ACE-2), a budući da je ACE-2 mjesto ulaza virusa SARS-CoV-2 u stanice, očito je da pušenje povećava rizik od progresije bolesti te doprinosi teškim komplikacijama COVID-19 utječući na imunološki odgovor i stanje pluća (13). Pušenje čini bolesnike podložnima za razvoj bolesti koje su inače povezane s pušenjem poput kronične opstruktivne plućne bolesti, a ona je sama rizični čimbenik za smrtnost od COVID-19 (17). Uočena je povezanost polifarmakoterapije s povećanim rizikom od razvoja COVID-19, a psihotropna polifarmakoterapija česta je u bolesnika koji boluju od teške mentalne bolesti (18). Nema provedenih istraživanja o tom problemu na bolesnicima koji boluju isključivo od shizofrenije, ali su provedena na bolesnicima koji boluju od teških mentalnih bolesti što uključuje i shizofreniju. Naime, prema jednom takvom istraživanju 25 % bolesnika koji boluju od različitih psihičkih poremećaja uključujući i shizofreniju, a kojima su propisani antipsihotici, u terapiji su imali dva ili više antipsihotika (18). Barcella i sur. pokazali su da je broj pro-

diovascular diseases, respiratory diseases and diabetes mellitus. It is these diseases that are associated with a less favourable prognosis for COVID-19 patients (10,13). In comparison to the 21% of the general population, 27% of those with schizophrenia have lower levels of vitamin D, resulting in a worse outcome if they contract COVID-19 (19, 20). A study established a link between schizophrenia and dementia, whereby 25.2% of those with schizophrenia also had dementia, particularly amongst women, and dementia was identified as a risk factor for mortality in those affected by COVID-19 (21).

Smoking and medication

The prevalence of smoking in people with schizophrenia is 50% to 90% (13). Nicotine increases the activity and expression of angiotensin converting enzyme 2 in the lungs (ACE-2). Since ACE-2 is the primary access for SARS-CoV-2 virus to enter cells, it is no surprise that smoking increases the risk of disease progression and worsens the complications of COVID-19 by impacting the immune system and lung health (13). Smoking makes people more likely to contract diseases typically associated with smoking, like chronic obstructive pulmonary disease, and it raises the risk of death from COVID-19 (17). There has been an association of polypharmacotherapy with an increased risk of developing COVID-19, and psychotropic polypharmacotherapy is common in patients suffering from severe mental illness (18). No research has been conducted on this issue specifically for individuals with schizophrenia, however, studies have been done on people with serious mental illness, schizophrenia included. A study revealed that out of patients with different mental health issues, such as schizophrenia, who were given antipsychotics, 25% were on two or more antipsychotics (18). It was demonstrated by Barcella et al. that the amount of prescribed psychotropic drugs was linked to an increased risk of severe forms of

pisanih psihotropnih lijekova korelirao s povišenim rizikom od teških oblika COVID-19 i smrti, sugerirajući vezu između težine bolesti i lošijeg ishoda COVID-19 (12). Liječenje klopazinom može biti povezano s povećanim rizikom od lošijeg ishoda COVID-19. Naime, kao nuspojava primjene klopazina primijećeni su otežano gutanje, sedacija, hipersalivacija te kao posljedica aspiracijska upala pluća (10,11). Liječenje klopazinom povezano je s oko dva puta većim rizikom od razvoja upale pluća. Osim toga djeluje na prirodenu imunost u obliku prolazne eozinofilije, oslobađanja citokina te vrućice u ranoj fazi liječenja, a rjeđe uzrokuje neutropeniju i agranulocitozu, koja je vjerojatni čimbenik rizika COVID-19. Nadalje, liječenje klopazinom povezano je i sa smanjenom razinom cirkulirajućih imunoglobulina IgM, IgA i IgG. Također, tijekom imunološkog odgovora dolazi do porasta koncentracije klopazina, što dodatno povećava rizik od nuspojava. Rezultati istraživanja upućuju na veći rizik od zaraze COVID-19 u bolesnika koji su liječeni klopazinom (13,22).

Nejednakosti u zdravstvenoj skrbi

Stigma povećava rizik za COVID-19 u oboljelih od shizofrenije jer su često diskriminirani i nailaze na teškoće u ostvarivanju zdravstvene skrbi. Stoga je manje vjerojatno da će dobiti odgovarajuću dijagnostičku obradu te će sukladno tome somatske bolesti biti pogrešno dijagnosticirane ili uopće neće biti dijagnosticirane (23). Stigma može pridonijeti nižoj stopi prijema u jedinice intenzivnog liječenja (JIL) oboljelih od shizofrenije iz domova ili sa psihijatrijskih odjela. Ponekad je premještaj oboljelih od shizofrenije s psihijatrijskih odjela u jedinice intenzivne skrbi otežan zbog potencijalnog poremećaja ponašanja i agresivnosti te smanjene mogućnosti adekvatnog monitoriranja (21).

Stigma mentalnih bolesti dovodi do pojave autostigme i gubitka samopouzdanja što obolje-

COVID-19 and death, implying a correlation between the severity of the disease and a worse outcome of COVID-19 (12). Clozapine treatment may be associated with an increased risk of a more severe outcome of COVID-19. Clozapine use was associated with side effects such as difficulty swallowing, sedation, and hypersalivation, leading to aspiration pneumonia (10,11). The use of clozapine has been associated with around a twofold increase in the risk of pneumonia. Additionally, it has an effect on congenital immunity in the form of transient eosinophilia, production of cytokines and fever in the early stages of treatment, and infrequently triggers neutropenia and agranulocytosis, which is a potential risk factor of COVID-19. Furthermore, clozapine treatment is also associated with reduced levels of circulating immunoglobulins IgM, IgA and IgG. Furthermore, during an immune response, clozapine concentrations increase, which in turn amplifies the potential of side effects. The results of the study suggest a higher risk of contracting COVID-19 in patients treated with clozapine (13,22).

Inequalities in health care

The stigma associated with schizophrenia makes it harder for those affected to receive proper health care, increasing their risk of COVID-19. As a result, they are less likely to receive appropriate diagnostic treatment and thus somatic diseases can be misdiagnosed or not diagnosed in any way (23). Stigma can contribute to a lower rate of admission to intensive care units (ICU) of patients with schizophrenia from homes or psychiatric wards. Sometimes the transfer of schizophrenia patients from psychiatric wards to intensive care units can be difficult due to a potential behavioural disorder, aggressiveness and a compromised capacity to adequately assess (21).

The stigma surrounding mental illness creates autostigma and a decrease in self-esteem, which

lima od shizofrenije dodatno otežava traženje zdravstvenih usluga. Nadalje, stigma koja prati mentalne bolesti često puta može biti prisutna i među medicinskim djelatnicima, iako na nesvjesnoj razini. Često se događa da čak ni liječnici se shvaćaju ozbiljno tjelesne simptome kod oboljelih od shizofrenije te ih nastoje objasniti kao njihova sumanutu uvjerenja. Općenito govoreći, medicinsko osoblje manje učinkovito i manje temeljito liječi tjelesne bolesti u osoba sa psihičkim bolestima u usporedbi sa psihički zdravim osobama (24).

Udio broja prijмова u bolnicu ili na hitnu pomoć zbog akutne tjelesne bolesti uvelike otpada i na bolesnike s teškim mentalnim bolestima. Prije pandemije je među ovom populacijom uočena niska razina kvalitete skrbi akutnih stanja poput akutnog koronarnog sindroma te kronične opstruktivne bolesti pluća. Opterećenje koje COVID-19 stavlja na zdravstvene ustanove nesrazmjerno može utjecati na bolesnike koji boluju od teških mentalnih bolesti u smislu da bi njihov dolazak na prijam zdravstveni djelatnici mogli percipirati kao nepotreban, odnosno da bi se mogao izbjeći, što bi moglo rezultirati dodatnom stigmom i diskriminacijom prema ovoj skupini bolesnika (25).

U odnosu na predpandemijsko razdoblje, uočene su značajne razlike u korištenju zdravstvenih usluga među psihijatrijskom populacijom što se očitovalo u smanjenju hitnih prijмова (14 %), kao i ukupnog broja prijмова (30,7 %) kod oboljelih od shizofrenije, demencije i afektivnih poremećaja u odnosu na neke druge dijagnostičke kategorije poput bolesnika s mentalnim poremećajima povezanim s alkoholom i psihoaktivnim tvarima te intelektualnim poteškoćama (26). To je smanjenje korištenja zdravstvenih usluga među oboljelima od shizofrenije bilo vidljivo već u prvom valu pandemije COVID-19 (27). Rezultati ovih istraživanja ukazuju da veliki broj oboljelih od shizofrenije nije dobio adekvatnu zdravstvenu zaštitu tijekom trajanja pandemije.

makes it even more difficult for patients with schizophrenia to access health care services. Moreover, the stigma related to mental health can sometimes be found among health care providers, even if they are not aware of it. It often happens that even doctors do not take physical symptoms seriously in patients with schizophrenia, trying to explain them as delusions. Overall, medical personnel tend to be less effective and comprehensive in their treatment of physical illnesses in patients with mental illnesses as compared to mentally healthy people (24).

A large percentage of the admissions to the hospital or emergency room for acute physical illness is attributed to patients suffering from severe mental illness. Prior to the pandemic, this population received an inadequate level of care for critical conditions like acute coronary syndrome and chronic obstructive pulmonary disease. The burden that COVID-19 places on health institutions can disproportionately affect patients suffering from severe mental illness in the sense that their arrival at admission could be perceived by health care professionals as unnecessary, i.e. that it could be avoided. This could in turn result in additional stigma and discrimination against this group of patients (25).

Compared to the pre-pandemic period, significant differences were observed in the use of health services among the psychiatric population, which was manifested in the reduction of emergency admissions (14%), as well as the total number of admissions (30.7%) in patients with schizophrenia, dementia and affective disorders compared to some other diagnostic categories such as patients with mental disorders associated with alcohol and psychoactive substances and intellectual disabilities (26). This decrease in the use of health services among schizophrenia patients was evident already in the first wave of the COVID-19 pandemic (27). The results of these studies indicate that many schizophrenia patients did not receive adequate health care during the pandemic.

Potreba za liječenjem u JIL-u

Kod oboljelih od shizofrenije zapažene su više stope prijema u jedinice intenzivnog liječenja, više stope akutnog respiratornog zatajenja, mehaničke ventilacije te bolničke smrtnosti u usporedbi s većinom bolesnika tijekom liječenja plućnih bolesti. Također, tijekom hospitalizacije u jedinicama intenzivnog liječenja, neovisno o uzroku, u oboljelih od shizofrenije prisutan je veći rizik od akutnog organskog zatajenja u odnosu na opću populaciju (28). Nadalje, potreba za mehaničkom ventilacijom, liječenje u JIL-u te smrtni ishod veći su za 63,8 % u oboljelih od COVID-19 koji su imali dijagnosticiranu mentalnu bolest. To može biti posljedica sumanutih ideja i obmana osjetila koje u tih bolesnika pridonose kognitivnom oštećenju što rezultira izostankom traženja skrbi ili liječenja (29).

Rizik od tromboembolijskih incidenata

U bolesnika koji boluju od psihotičnih poremećaja poput shizofrenije, opažen je dva do tri puta veći rizik od razvoja duboke venske tromboze ili plućne embolije. Naime, pretilost, ateroskleroza i kardiovaskularne bolesti koje su česte u oboljelih od shizofrenije, povezane su s poremećajem protoka krvi i pridonose tromboembolijskom riziku. Također, uočena je povezanost između shizofrenije i endotelne disfunkcije. Smatra se da povišenom riziku od tromboembolijskih incidenata doprinosi i liječenje antipsihoticima, no nije jasno je li povišen rizik posljedica terapijskog učinka lijeka ili pak tome pridonose drugi učinci, poput sediranosti ili dobivanja na težini (30,31). Nadalje, postoje dokazi koji ukazuju na povezanost psihoze i abnormalnosti u sastavu krvi u smislu hiperkoagulabilnog stanja (30). Budući da je u COVID-19 bolesnika zapažena visoka incidencija tromboembolijskih incidenata u vidu arterijske i venske tromboze (32), smatra se da su oboljeli od psihotičnih poremećaja koji

The need for ICU treatment

In patients with schizophrenia, admissions to intensive care units, rates of acute respiratory failure, mechanical ventilation and mortality during hospital treatment for lung disease were found to be higher than in most other patients. During ICU hospitalization, patients with schizophrenia are more likely to experience acute organic failure than the general population, regardless of the cause (28). Furthermore, the need for mechanical ventilation, ICU treatment and death increased by 63.8% in COVID-19 patients who had been diagnosed with mental illness. Cognitive decline in these patients can be attributed to delusions and hallucinations which leads to an absence of seeking medical help (29).

Risk of thromboembolic incidents

Patients with psychotic disorders like schizophrenia have a two to three times greater risk of developing deep vein thrombosis or pulmonary embolism. Specifically, obesity, atherosclerosis and cardiovascular diseases that are common in people with schizophrenia, are associated with a blood flow disorder and contribute to thromboembolic risk. Also, an association between schizophrenia and endothelial dysfunction has been observed. Treatment with antipsychotics is also considered to contribute to an increased risk of thromboembolic incidents, but it is not clear whether the increased risk is due to the therapeutic effect of the drug or whether other effects, such as sedation or weight gain, contribute to this (30,31). Furthermore, there is evidence suggesting an association between psychosis and abnormalities in blood composition in terms of hypercoagulable condition (30). Since a high incidence of thromboembolic incidents in the form of arterial and venous thrombosis (32) has been observed in COVID-19 patients, it is considered that patients with psychotic disorders and

se zaraze COVID-19 pod povećanim rizikom od razvoja tromboembolijskih komplikacija (30).

Imunološke osobitosti

Varijacija u kompleksu humanog leukocitnog antigena (engl. *human leukocyte antigen*, HLA) jedan je od najdosljednijih nalaza u cijelogenomskim asocijacijskim studijama (engl. *genome-wide association studies*, GWAS) kod oboljelih od shizofrenije i bipolarnog poremećaja. HLA pretežno sudjeluje u regulaciji virusne infekcije, posebno COVID-19. Varijabilnost među genima HLA klase I može doprinijeti razlikama u imunološkom odgovoru na COVID-19, a neodgovarajući odgovor T-stanica opažen je kod nepovoljnih ishoda COVID-19 (20).

U prethodnim pandemijama respiratornih virusa uočen je utjecaj neuroinvazije i pojave upalnog odgovora na razvoj psihoze, a sposobnost neuroinvazije i razvoj upale uočeni su i kod COVID-19 (33). Poznato je da je ACE-2 mjesto ulaza virusa SARS-CoV-2 u stanice (13). Iako je ekspresija ACE-2 u središnjem živčanom sustavu niska, ipak postoje područja veće ekspresije, točnije dopaminergičke i serotoninergičke jezgre, glutamatergički neuroni, lateralne komore i *substantia nigra*. Ta su područja strukturno i neurokemijski povezana sa shizofrenijom i smatra se da njihova povećana osjetljivost na infekciju može imati ulogu u razvoju psihopatologije. COVID-19 također dovodi do masivnog sistemskog upalnog odgovora, poznatog kao citokinska oluja, te je povezan s indikatorima sistemske upale kao što je aktivacija komplementa, povišena razina C reaktivnog proteina te brzina sedimentacije eritrocita i feritina. Poznato je da su sistemski upalni parametri u shizofreniji povišeni uz mogućnost razvoja neuropalnog odgovora (33). Iako su akutne neurološke manifestacije COVID-19 potaknule na razmišljanje o dugotrajnim neuropsihijatrijskim posljedicama, upalni profil

infected with COVID-19 are at increased risk of developing thromboembolic complications (30).

Immune system characteristics

In patients with schizophrenia and bipolar disorder, a variation in the human leukocyte antigen (HLA) is one of the most consistent findings in all-genome association studies (GWAS). HLA predominantly participates in the regulation of viral infection, especially COVID-19. Variability between HLA class I genes may contribute to differences in immune response to COVID-19 while an inadequate T-cell response has been observed in adverse COVID-19 outcomes (20).

Previous pandemics of respiratory viruses have exhibited the impact of neuroinvasion and inflammatory response on the progress of psychosis. Neuroinvasion and an increase in inflammation have been observed in cases of COVID-19 (33). Research has revealed that ACE-2 is the point of entry for SARS-CoV-2 into cells (13). Despite the low expression of ACE-2 in the central nervous system, there are nevertheless areas of greater expression, namely dopaminergic and serotonergic nuclei, glutamatergic neurons, lateral ventricles and *substantia nigra*. These areas are structurally and neurochemically correlated to schizophrenia and it is thought that their increased susceptibility to infection may play a role in the development of psychopathology. COVID-19 also leads to a massive systemic inflammatory response, known as a cytokine storm, and is associated with indicators of systemic inflammation such as complement activation, elevated reactive protein C levels, and erythrocyte sedimentation rate and ferritin. There is evidence to suggest that people with schizophrenia have higher levels of inflammation in their body, potentially causing a neuroinflammatory reaction (33). Although the acute neurological manifestations of COVID-19 have prompted reflection on the long-term neu-

COVIDa-19 može biti relevantniji za razvoj shizofrenije (33).

Utjecaj COVID-19 na stopu relapsa shizofrenije

Pandemija COVID-19 posebno je utjecala na osobe s prethodno dijagnosticiranim mentalnim poremećajima rezultirajući pojavom recidiva ili pogoršanjem već postojećeg stanja zbog povećane osjetljivosti tih bolesnika na stres, u usporedbi s općom populacijom. Populacija koja pati od teških mentalnih poremećaja, poput psihotičnih osoba, osjetljiva je na restriktivne mjere i na promjene u dnevnoj rutini. Stresori koji tome doprinose tijekom karantene jesu njeno trajanje, strah od zaraze, gubitak aktivnosti i manjak informacija (34). Oboljelima od shizofrenije može biti otežan pristup liječenju što također povećava rizik od relapsa (35). Strah od zaraze u oboljelih od shizofrenije može pogoršati paranoju kao i sumanute ideje. Dodatno pogoršanje kod ove vrste bolesnika u smislu strahova i neizvjesnosti mogu potencirati shizotipske, neurotične i anksiozne osobine (36). Bitno je napomenuti da egzacerbaciji psihotičnih simptoma može doprinijeti i prisutna infodemija. Kao korisna intervencija smatra se smanjena izloženost medijima i vijestima o stresnim situacijama koje imaju štetan učinak na mentalno zdravlje (10).

Posljedice socijalne izolacije u oboljelih od shizofrenije

Socijalna izolacija je rizični čimbenik za povećan morbiditet i mortalitet poput pušenja, pretilosti, sjedilačkog načina života te povišenog krvnog tlaka. Dokazano je da je socijalna izolacija povezana s pogoršanjem mentalnog zdravlja. Jun Ma i sur. istraživali su utjecaj socijalne izolacije na psihološke karakteristike bolesnika oboljelih od shizofrenije koji su zbog bliskog kontakta s COVID-19 pozitivnim bolesnicima bili izolirani i pokazali da u izoliranih bolesnika

ropsychiatric consequences, the inflammatory profile of COVID-19 may be more relevant to the development of schizophrenia (33).

The impact of COVID-19 on the rate of relapse in schizophrenia

The COVID-19 pandemic has particularly affected people with previously diagnosed mental disorders resulting in the appearance of a relapse or worsening of a pre-existing condition having in mind that these patients are more prone to stress than the general population. A population suffering from severe mental disorders, such as psychotic individuals, is vulnerable to restrictive measures and to changes in their daily routine. The stressors that contribute to this during quarantine include its duration, fear of contagion, lack of activity and lack of information (34). Individuals with schizophrenia may find it difficult to access medical care, which also increases the risk of relapse (35). Fear of infection in people with schizophrenia can exacerbate paranoia as well as delusional ideas. A decrease in mental wellbeing amongst this patient group can cause an intensification of schizotypic, neurotic and anxiety traits (36). It is important to note that the infodemia can also contribute to the exacerbation of psychotic symptoms. It is beneficial to reduce the amount of media and news about disturbing events that can have a negative effect on mental health (10).

Consequences of social isolation in patients with schizophrenia

Social isolation is a risk factor for increased morbidity and mortality similar to smoking, obesity, sedentary lifestyle and high blood pressure. Research has demonstrated a link between social isolation and a decrease in mental wellbeing. Jun Ma et al. investigated the impact of social isolation on the psychological characteristics of patients with schizophrenia who were isolated due to a close contact with

postoji viša razina psihološkog stresa, teži oblik anksioznosti, lošija kvaliteta spavanja i viša razina CRP-a, u odnosu na skupinu koja nije bila izolirana (37). Socijalna izolacija je, kao oblik stresa, povezana s mentalnom bolešću. Ona dovodi do razvoja oksidativnog stresa i aktivacije osi hipotalamus-hipofiza-nadbubrežna žlijezda te do smanjene ekspresije gena koji kontroliraju upalu i sudjeluju u regulaciji glukokortikoidnog odgovora. Poznato je da taj biološki mehanizam potencijalno sudjeluje u razvoju shizofrenije (37). Socijalna izolacija je povezana s lošijom kvalitetom života i paranojom te je rizični čimbenik za samoubojstvo u oboljelih od shizofrenije. Također, pretpostavlja se da tijekom izolacije raste uporaba sredstava ovisnosti što može dodatno pogoršati zdravstveno stanje ove populacije (10).

U istraživanju Iasevoli i sur. pokazano je da su ispitanici s teškim mentalnim bolestima nakon jednomjesečne karantene imali četiri puta veću razinu stresa povezanu s pandemijom, kao i dva do tri puta veći rizik od razvoja teških simptoma anksioznosti i depresije u usporedbi s kontrolnom skupinom (38).

POTENCIJALNA RJEŠENJA U PRISTUPU ZBRINJAVANJA

Telemedicina može biti korisna pomoćna metoda za zdravstveni sustav i društvo općenito te pomoći u smanjenju stope zaraze COVID-19. Telekomunikacija kao što je *FaceTime* dobar je način da se pojedinci povežu s obitelji tijekom socijalne izolacije. Iako postoje telekomunikacijski alati, nepovjerenje ili nepoznavanje tehnologije može biti prepreka za starije osobe oboljele od shizofrenije (36). Postoje dokazi da e-kognitivno bihevioralna terapija ima sličan učinak kao i terapija uživo kod psihijatrijskih poremećaja (39). Telemedicina i e-mentalno zdravlje mogli bi poslužiti za održavanje kontinuiteta skrbi za oboljele od shizofrenije bez povećanja rizika od zaraze i širenja virusa fi-

COVID-19 positive patients. They showed that those who were isolated experienced more psychological stress, a worse form of anxiety, worse sleep quality, and higher CRP than those who were not isolated (37). Social isolation, a source of stress, has a correlation to mental illness. It leads to the development of oxidative stress and activation of the hypothalamic-pituitary-adrenal axis and to reduced expression of genes that control inflammation and participate in the regulation of the glucocorticoid response. This biological mechanism is known to potentially participate in the development of schizophrenia (37). Social isolation is associated with poorer quality of life and paranoia and is a risk factor for suicide in individuals with schizophrenia. It is also thought that during times of quarantine, addiction to certain substances is more prominent, which can further compromise the health of this population (10).

In their study, Iasevoli et al. discovered that subjects with serious mental illnesses post-one month quarantine had quadruple the amount of pandemic-induced stress, and two to three times the risk of developing extreme symptoms of anxiety and depression as opposed to the control group (38).

POTENTIAL SOLUTIONS FOR CARE APPROACH

Telemedicine can be a helpful supplemental tool for the health system and society in general to help reduce the rate of COVID-19 infection. Social network telecommunication such as *FaceTime* is a good way for individuals to connect with families during social isolation. Although there are many telecommunication tools, distrust or lack of knowledge about technology can be a barrier for older patients with schizophrenia (36). There is evidence that e-cognitive behavioural therapy has a similar effect to live therapy in psychiatric disorders (39). Telemedicine and e-mental health could

zičkim posjetima. Međutim, u liječenju oboljelih od shizofrenije, fizički posjeti i dalje ostaju ključni pri procjeni slučajeva prve epizode bolesti, pogoršanja bolesti kod osoba koje su se prethodno nalazile u remisiji te bolesnika s više komorbiditeta i općenito složenih slučajeva (40).

Što se tiče primjene antipsihotika klopazina treba imati na umu da se simptomi COVID-19 kod bolesnika koji uzimaju klopazin mogu teško razlikovati od miokarditisa. U Ujedinjenom Kraljevstvu, bolesnicima koji uzimaju klopazin, a imaju povišenu tjelesnu temperaturu, savjetuje se da se odmah testiraju na koronavirus i da obave pretrage za agranulocitozu, pogotovo ako se žale na kašalj, grlobolju, kratkoću daha i curenje iz nosa. Preporuča se u bolesnika s COVID-19 dozu klopazina smanjiti za oko 25 % uz daljnje praćenje. Ako se nizak broj leukocita javi u kombinaciji s normalnom razinom neutrofila smatra se da se liječenje klopazinom može normalno nastaviti. Također, simptome povezane s COVID-19 treba razlikovati od malignog neuroleptičkog sindroma, pogotovo u slučaju dispneje, vrućice, promjene stanja svijesti te autonomne disfunkcije (39).

Ako bolesnici liječeni klopazinom razviju vrućicu i simptome slične gripi, pojava simptoma i znakova koji upućuju na nuspojave klopazina može zahtijevati smanjenje doze klopazina za čak 50 %. Preporuka je nastaviti s nižom dozom do 3 dana nakon nestanka vrućice, a zatim postupno povećavati do doze prije pojave vrućice (41).

U smjernicama Hrvatskog društva za shizofreniju i poremećaja iz spektra shizofrenije navodi se kako se prema dostupnim podacima opasnost od zaraze COVID-19 ne povećava redovitim primjenom svih skupina psihofarmaka te se preporuča nastavak liječenja psihofarmacima, ako je bolest u remisiji (42).

U liječenju psihijatrijskih bolesnika tijekom pandemije može biti prikladno odabrati psi-

serve to maintain continuity of care for schizophrenia patients without increasing the risk of contracting and spreading the virus during physical visits. However, in the treatment of schizophrenia patients, physical visits still remain crucial for assessing cases of the first episode of the disorder, exacerbation in patients in remission, patients with multiple comorbidities and complex cases in general (40).

As for the use of the antipsychotic clozapine, it is important to remember that the signs and symptoms of COVID-19 in patients on clozapine can be hard to distinguish from myocarditis. In the UK, patients taking clozapine who have a fever are advised to be tested for coronavirus immediately and to perform tests for agranulocytosis, especially if they complain of cough, sore throat, shortness of breath and runny nose. It is recommended in patients with COVID-19 to reduce the dose of clozapine by about 25% with further monitoring. If a low leukocyte count occurs in combination with normal neutrophil levels, it is usually recommended to keep the clozapine treatment. Also, symptoms associated with COVID-19 should be distinguished from malignant neuroleptic syndrome, especially in the case of dyspnea, fever, change in state of consciousness and autonomic dysfunction (39).

If patients treated with clozapine develop fever and flu-like symptoms, the appearance of symptoms and signs suggesting side effects of clozapine may require a 50% reduction in the dose of clozapine. It is recommended to continue with a lower dose for up to 3 days after the fever disappears, and then gradually increase to the dose before the onset of fever (41).

The guidelines of the Croatian Society for Schizophrenia and Schizophrenia Spectrum Disorders state that according to available data, the risk of contracting COVID-19 does not increase with regular use of all groups of psychopharmaceuticals and it is recommended to continue treatment with psychopharmaceuticals, if the disease is in remission (42).

hotropne lijekove koji su pokazali antivirusna svojstva, poput haloperidola i klorpromazina. Naime, opaženo je da haloperidol smanjuje stopu smrtnosti bolesnika na mehaničkoj ventilaciji snižavanjem razine citokina i prevencijom citokinske oluje (43). S druge strane, klorpromazin je pokazao imunomodulatorno djelovanje povećanjem razine protuupalnih citokina te smanjenjem razine upalnih citokina (44). Ova se dva lijeka sada koriste rjeđe nego u prošlosti, no zbog njihovih mogućih antivirusnih i anticitokinskih svojstava preporučuje se razmotriti ulogu ovih lijekova za liječenje oboljelih od shizofrenije tijekom pandemije uzimajući u obzir potencijalnu korist u odnosu na rizik od nuspojava lijeka te mogućih interakcija (45).

Potencijalni pristup liječenju rane faze COVID-19 u oboljelih od shizofrenije uključuje liječenje stanja koja su zajednička COVID-19 i shizofreniji, a utječu na težinu zaraze, kao što su pretilost i predijabetes te hiperkoagulabilno stanje i upala (46). Takav pristup uključuje korištenje antitrombocitnih i antikoagulacijskih lijekova kao što su aspirin i heparin, nesteroidne antimitotičke lijekove poput kolhicina te oralne hipoglikemike poput metformina. Treba uzeti u obzir i moguće interakcije između lijekova koji se koriste u liječenju COVID-19 te antipsihotika u smislu smanjene djelotvornosti, tolerancije i sigurnosti lijeka. Treba imati na umu da provođenje mjera samoizolacije može spriječiti bolesnike u uzimanju antipsihotika, pogotovo u slučajevima kada je riječ o primjeni dugodjelujućih antipsihotika u obliku injekcija ili kada je potrebno praćenje bolesnika prilikom primjene klopazina. Neredovito uzimanje antipsihotika može povećati rizik od relapsa psihoze (46).

Kada je riječ o mentalnim bolestima, posebice o shizofreniji, neadherentnost bolesnika u dugotrajnoj terapiji doseže visokih 75 %. Dugodjelujući antipsihotici pokazali su se superiorni-

In the treatment of psychiatric patients during the pandemic, it may be appropriate to choose psychotropic drugs that have shown antiviral properties, such as haloperidol and chlorpromazine. Specifically, haloperidol has been observed to reduce the mortality rate of patients on mechanical ventilation by lowering cytokine levels and preventing cytokine storm (43). On the other hand, chlorpromazine showed immunomodulatory activity by increasing the level of anti-inflammatory cytokines and reducing the level of inflammatory cytokines (44). These two medications are used less frequently than in the past, but due to their possible antiviral and anticytokine properties, it is recommended to consider their role in the treatment of schizophrenia during the pandemic taking into account the potential benefits in relation to side effects and possible interactions (45).

Taking care of the mutual symptoms of COVID-19 and schizophrenia, such as obesity and prediabetes, hypercoagulable condition and inflammation, which may affect the intensity of the infection, is possibly an avenue for treating the early stages of COVID-19 in schizophrenia patients (46). Such an approach involves the use of antiplatelet and anticoagulation drugs such as aspirin and heparin, nonsteroidal antimitotic drugs such as colchicine, and oral hypoglycemics such as metformin. Possible interactions between drugs used in the treatment of COVID-19 and antipsychotics in terms of reduced efficacy, tolerance and safety of the drug should also be taken into account. It should be kept in mind that self-isolation measures can stop patients from taking antipsychotics, mainly when it comes to the usage of long-acting antipsychotics in the form of shots or when tracking of patients using clozapine is needed.

Irregular use of antipsychotics may increase the risk of psychosis relapse (46).

When it comes to mental illness, especially schizophrenia, the non-adherence of patients in long-term therapy is as high as 75%.

ma nad oralnim antipsihoticima u prevenciji relapsa i smanjenju smrtnosti kod oboljelih od shizofrenije, ali se još uvijek nedovoljno primjenjuju zbog ekonomskih razloga kao i zbog straha i stigme (47). Bolesnici odbijaju taj oblik liječenja zbog načina primjene lijeka, protokola koji uključuje nadzor nakon primjene injekcije, te zbog osjećaja da više ne odlučuju o vlastitom liječenju (47).

Nakon što se u Rumunjskoj u ožujku 2020. ograničio pristup bolnicama te je sukladno tome bio zatvoren odjel za primjenu dugodjelujućih antipsihotika, 78 % bolesnika prešlo je na liječenje oralnim antipsihotikom, dok su preostali nastavili liječenje dugodjelujućim antipsihoticima. U sljedećih šest mjeseci zabilježen je relaps kod 71,4 % bolesnika koji su prešli na oralni oblik terapije, dok su bolesnici koji su nastavili s primjenom dugodjelujućih antipsihotika ostali u remisiji (48).

Uočeno je da primjena antipsihotika može utjecati na zarazu koronavirusom te spriječiti teže oblike bolesti. Canal-Rivero i sur. pokazali su da je kod bolesnika liječenih dugodjelujućim antipsihoticima utvrđena niža prevalencija zaraze te niža stopa teških oblika bolesti (49). Međutim, nije jasno je li to posljedica farmakološke upotrebe samih antipsihotika ili su bolesnici liječeni dugodjelujućim antipsihoticima bolje slijedili javnozdravstvene smjernice. U svakom je slučaju važno kontinuirano pružanje usluga mentalnog zdravlja pojedincima koji boluju od psihotičnih poremećaja kako bi se spriječili negativni ishodi osnovne bolesti te eventualno ublažio COVID-19 te smanjila smrtnost od COVID-19 u ovoj ranjivoj populaciji (50).

ZAKLJUČAK

Oboljeli od shizofrenije imaju povećani rizik od zaraze COVID-19 zbog niza sociodemografskih i kliničkih karakteristika zastuplje-

Long-acting antipsychotics have proven to be superior to oral antipsychotics in preventing relapse and reducing mortality in schizophrenia patients, but they are still insufficiently used for economic reasons as well as fear and stigma (47). Patients refuse this form of treatment because of the route of administration of the drug, a protocol that includes supervision after injection, and because of the feeling that they no longer decide on their own treatment (47).

After access to hospitals was restricted in Romania in March 2020 and the department for the use of long-acting antipsychotics was closed accordingly, 78% of patients switched to oral antipsychotic treatment, while the remaining continued treatment with long-acting antipsychotics. In the next six months, relapse was recorded in 71.4% of patients who switched to oral therapy, while patients who continued to use long-acting antipsychotic drugs remained in remission (48).

It has been observed that the use of antipsychotics can affect coronavirus infection and prevent more severe forms of the disease. Canal-Rivero et al. demonstrated that patients treated with long-acting antipsychotics had a lower prevalence of infection and a lower rate of severe forms of the illness (49). However, it is not clear whether this is due to the pharmacological use of the antipsychotics or whether patients treated with long-acting antipsychotics followed the public health guidelines better. In any case, it is important to continuously provide mental health services to individuals suffering from psychotic disorders in order to prevent negative outcomes of the underlying disease and possibly mitigate COVID-19 and reduce COVID-19 mortality in this vulnerable population (50).

CONCLUSION

Patients with schizophrenia have an increased risk of contracting COVID-19 due to a number of sociodemographic and clinical characteristics

nih u ovoj populaciji, što rezultira otežanim provođenjem protuepidemijskih mjera. Oboljeli od shizofrenije su više od dva puta češće hospitalizirani te imaju više od tri puta veću smrtnost od COVID-19. Lošijoj prognozi COVID-19 pridonose brojni komorbiditeti prisutni kod oboljelih od shizofrenije, poglavito kardiovaskularne bolesti, bolesti dišnog sustava te šećerna bolest. Oboljeli od shizofrenije povezani su s visokom stopom pušenja i korištenjem velikog broja lijekova što se također povezuje s lošijim ishodom COVID-19. Uočen je i nepovoljan utjecaj liječenja klopazinom na stopu smrtnosti od COVID-19. Veliki problem je nejednakost u zdravstvenoj skrbi te sveprisutna stigma prema mentalno oboljelim pojedincima što često rezultira neadekvatom zdravstvenom skrbi. U bolesnika sa psihotičnim poremećajem koji razvijaju COVID-19 povećan je rizik od razvoja tromboembolijskih incidenata. Varijacija u HLA kompleksu čvrsto je povezana sa shizofrenijom, a HLA pretežno sudjeluje u regulaciji virusne infekcije, posebno COVID-19. Varijabilnost među genima HLA klase I može doprinijeti razlikama u imunološkom odgovoru na COVID-19, dok je neodgovarajući odgovor T-stanica opažen kod lošijih ishoda infekcije COVID-19. Pandemija utječe na osobe s već ranije dijagnosticiranim mentalnim poremećajima u obliku pojave recidiva ili pogoršanja već postojećeg stanja. Dokazano je da je socijalna izolacija povezana s pogoršanjem mentalnog zdravlja te dovodi do povišenih razina psihološkog stresa, razvoja težih oblika anksioznosti te problema sa spavanjem. Kao potencijalna rješenja nude se telemedicina i e-mentalno zdravlje koji bi mogli poslužiti za održavanje kontinuiteta zdravstvene skrbi osoba oboljelih od shizofrenije bez povećanja rizika od zaraze i širenja virusa fizičkim posjetima. Međutim, pri procjeni prve psihotične epizode bolesti i općenito složenih slučajeva, fizički posjeti i dalje ostaju nezamjenjiv oblik skrbi.

represented in this population, resulting in difficulties in implementing anti-epidemic measures. The hospitalization rate of schizophrenia patients is more than double, and their mortality rate from COVID-19 is more than triple, compared to the general population. Patients with schizophrenia who have multiple comorbidities, such as cardiovascular diseases, respiratory diseases and diabetes mellitus, tend to have a worse prognosis with COVID-19. Schizophrenia patients are associated with high rates of smoking and the use of a large number of medications, which is also associated with a worse outcome of COVID-19. An adverse effect of clozapine treatment on the COVID-19 mortality rate was also observed. A major challenge is the inequality in health care and the pervasive stigma concerning individuals with mental illness, leading to deficient health care. In patients with psychotic disorder who develop COVID-19, the risk of developing thromboembolic incidents is increased. There is a strong correlation between schizophrenia and variations in the HLA complex, and HLA predominantly participates in the regulation of viral infection, especially COVID-19. Variations in HLA class I genes may contribute to differences in immune response to COVID-19, while an inadequate T-cell response has been observed in poorer COVID-19 infection outcomes. The pandemic affects individuals with previously diagnosed mental disorders in the form of relapses or worsening of a pre-existing condition. It has been proven that social isolation is associated with deterioration of mental health and leads to increased levels of psychological stress, development of severe forms of anxiety and sleep problems. As potential solutions, telemedicine and e-mental health care are offered that could serve to maintain the continuity of health care for people suffering from schizophrenia without increasing the risk of infection and spreading the virus during physical visits. However, when assessing the first psychotic episode of the illness and generally complex cases, physical visits still remain an indispensable form of care.

Oboljeli od shizofrenije su vulnerabilna skupina s obzirom na zarazu i smrtnost tijekom pandemije COVID-19 te ih treba zaštititi ulaganjem dodatnih napora u smanjivanju nejednakosti zdravstvene skrbi, kao i provođenjem javnozdravstvenih akcija sa ciljem otklanjanja stigme prema mentalnim bolestima. Isto je tako potrebno provoditi i edukaciju oboljelih od shizofrenije kako bi se što učinkovitije moglo primijeniti mjere zaštite od infekcije COVID-19.

Schizophrenia patients are a vulnerable group with regard to infection and mortality during the COVID-19 pandemic and should be protected by making additional efforts to reduce health care inequality, as well as by conducting public health actions aimed at eliminating the stigma towards mental illness. It is also necessary to conduct education of schizophrenia patients in order to apply measures of protection against COVID-19 infection as effectively as possible.

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Utjecaj klimatskih promjena na mentalno zdravlje

/ *The Impact of Climate Change on Mental Health*

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U radu se ističe da se različita emocionalna stanja mogu javiti kao reakcije na klimatske promjene, od osjećaja manjeg distresa i anksioznosti do psihičkih poremećaja iz skupine poremećaja uzrokovanih stresom, anksioznih poremećaja, poremećaja raspoloženja i poremećaja spavanja, a ovisno o otpornosti pojedinaca i podržavajućih faktora okoline i društva. Potrebno je raditi na razvoju otpornosti, zaštitnih čimbenika i mehanizama suočavanja s klimatskim promjenama, kako kod pojedinaca, tako i na razini zajednica i društava. Naročito je važno brinuti o jačanju otpornosti kod osoba i populacija koje su osjetljive te osigurati dostupnost adekvatne skrbi i zbrinjavanja uz pomoć nadležnih službi u kriznim situacijama. Naglašava se važnost prevencije reakcija na stres i prilagodbu na posljedice događaja proizašlih iz klimatskih promjena te što ranijeg pružanja psihološke i psihijatrijske pomoći onima kojima je potrebna.

/ The paper highlights the notion that different emotional states can occur as reactions to climate change, ranging from a sense of minor distress and anxiety to mental disorders pertaining to the group of stress-related disorders, anxiety disorders, mood disorders and sleep disorders, all depending on the psychological resilience of individuals and the supportive factors in their surroundings and the society. It is necessary to work towards developing resilience, protective factors and mechanisms for coping with climate change at the individual as well as the community and societal levels. It is of particular importance to build resilience in sensitive individuals and populations, and to ensure the availability of adequate care and treatment with the help of the competent emergency services. The paper emphasises the importance of stress reaction prevention and adaptation to the consequences of events resulting from climate change and the early provision of psychological and psychiatric support to those in need.

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Klima predstavlja prosječne vremenske prilike u određenom području tijekom vremena, dok klimatske promjene označavaju promjene u tim prosječnim vremenskim uvjetima (1). U svakodnevnom govoru pojam „klimatske promjene“ uglavnom označava globalno zatopljenje, no klimatske promjene obuhvaćaju i šire promjene u klimatskom sustavu Zemlje (1).

Potrebno je razumjeti da klima na Zemlji nije jednostavan, nego složeni sustav koji je karakteriziran i redovitim promjenama, ali i fluktuacijama u različitim vremenskim ljestvicama, kao i na pojedinim područjima. Tijekom Zemljine povijesti javljala su se različita klimatska razdoblja koja su bila povezana s velikim termodinamičkom promjenama (2–4). Promjene temperature i vremenskih obrazaca mogu biti prirodne kao posljedica sunčeve aktivnosti ili aktivnosti samog planeta Zemlje, kao što su velike vulkanske erupcije, no od početka devetnaestog stoljeća ljudske aktivnosti su glavni čimbenik koji utječe na klimatske promjene (5).

Istraživanja ukazuju da je aktualni porast prosječne temperature brži od prethodnih promjena temperature u Zemljinoj povijesti i smatra se da je primarno uzrokovan ljudskim djelovanjem (6). Korištenje fosilnih goriva, kao i različite poljoprivredne i industrijske aktivnosti, povećavaju količinu stakleničkih plinova među kojima osobito značajnu ulogu imaju ugljični dioksid, metan, dušični oksid, halogenirani plinovi te lakohlapljivi organski spojevi i ugljični monoksid (7). Staklenički plinovi apsorbiraju određenu količinu topline koju Zemlja ispušta nakon što se zagrije zbog Sunčevog djelovanja (8). Što su veće količine tih plinova, to zadržavaju više topline u donjim dijelovima Zemljine atmosfere uzrokujući globalno zatopljenje.

Klimatske promjene ne znače samo promjene u temperaturi s obzirom da je Zemlja sustav u kojem je mnogo čimbenika međusobno povezano,

Climate is defined as the average weather conditions in a specific area over a period of time, while climate change refers to changes in these average weather conditions (1). In everyday speech, the term “climate change” usually refers to global warming, but climate change encompasses broader changes in the Earth’s climate system (1).

It is important to understand that the Earth’s climate is not a simple system, but a complex one characterised by regular changes, and fluctuations in different time scales and in specific areas. Various climatic periods associated with large thermodynamic changes occurred throughout the Earth’s history (2–4). Changes in temperature and weather patterns can occur naturally as a result of solar activity or autonomous activities of the planet Earth, such as large volcanic eruptions. However, since the early 19th century, human activities have been considered the main driver of climate change (5).

Research has shown that the current increase in average temperature is happening at a faster rate than the previous temperature changes in the Earth’s history, and it is considered that its primary cause is human activity (6). The use of fossil fuels and the various agricultural and industrial activities increase the amount of greenhouse gases, among which carbon dioxide, methane, nitrogen oxide, halogenated gases, as well as volatile organic compounds and carbon monoxide, play a particularly important role (7). Greenhouse gases absorb a certain amount of the heat emitted by the Earth after it is heated by the Sun (8). The larger the amount of these gases, the more heat they trap in the lower parts of the Earth’s atmosphere, thus causing global warming.

Climate change does not imply only changes in temperature, considering that the Earth is a system of many interconnected factors where

pa promjene klime u jednom području mogu utjecati na promjene u drugim područjima.

Ekstremni klimatski događaji se rijetko događaju i izvan su normalnog opsega te ih se treba promatrati unutar konteksta u kojem se zbivaju. Promjene i trendovi promjena srednje temperature i precipitacije izravno su povezani s povećanom učestalošću pojave oluja, suša, toplinskih valova i pojačane kiše i smatra se da je utjecaj čovjeka značajno doprinio povećanju ekstremnih klimatskih događaja (9). Klimatske promjene dovode do niza posljedica kao što je povećana učestalost toplinskih valova i šumskih požara, proširenje pustinskih područja, otapanja permafrosta, povlačenja glečera i gubitka ledenjaka. Zbog promjena u okolini mnoge biljne i životinjske vrste relociraju se i nestaju (5).

Mnoge klimatske promjene već se osjećaju s trenutnim porastom od 1,1 °C (6), a dodatno zagrijavanje će pojačati te učinke i može dovesti do točki s kojih nema povratka. Zbog toga se sve se više napora ulaže u proizvodnju energije iz izvora koji nisu fosilna goriva i u značajno povećanje korištenja izvora obnovljive energije, u cilju smanjenja emisija stakleničkih plinova.

Klimatske promjene mogu utjecati na zdravlje na različite načine kao što su mogućnost uzgoja hrane, sigurnost i posao i svakako će dovesti do određenih promjena u životnim stilovima ljudi.

Klimatske promjene mogu imati značajan utjecaj na mentalno zdravlje ljudi djelovanjem putem niza uzročnih puteva, kao što su značajni ekonomski gubici, narušavanje uobičajenih lanaca proizvodnje i distribucije vode i hrane, povećanje broja tjelesnih bolesti, migracija i društvenih sukoba (10).

Istraživanja pokazuju da iako siromašnije zemlje imaju manji doprinos globalnim emisijama stakleničkih plinova, osjetljivije su na klimatske promjene i imaju manje mogućnosti prilagodbe (8).

climate change in one area can bring about changes in other areas.

Extreme climatic events are rare and outside of the normal range, meaning that they should be observed within the context in which they take place. Shifts and trends in mean temperature and precipitation changes are directly correlated with the increased frequency of storms, droughts, heat waves and heavy rainfall, and human impact is considered to have greatly contributed to the increased occurrence of these extreme climatic events (9). Climate change leads to a series of consequences such as an increased frequency of heat waves and wildfires, expansion of desert areas, permafrost melting, as well as the retreat and loss of glaciers. Due to the changes in their environments, many plant and animal species relocate and disappear (5).

With the current temperature increase of 1.1°C (6), many climate changes are already visible, while further warming will only amplify these effects and may lead to points of no return. Increased efforts are, therefore, being made to produce energy from sources other than fossil fuels, as well as to significantly increase the use of renewable energy sources with the aim of reducing greenhouse gas emissions.

Climate change can impact health in various ways, by affecting our food production, safety and work, and will surely lead to certain changes in people's lifestyles.

Climate change can have a significant impact on people's mental health through a number of causal pathways which include significant economic losses, disruption of normal water and food production and distribution chains, increased rates of physical illnesses, migration and social conflicts (10).

Studies have shown that although poorer countries contribute less to the global greenhouse gas emissions, they are more sensitive to climate change and have less capacity to adapt (8).

UTJECAJ KLIMATSKIH PROMJENA TIJEKOM VREMENA

Istraživanja pokazuju da se kao izravna posljedica klimatskih promjena kod znatnog broja osoba mogu javiti poteškoće mentalnog zdravlja (11). Klimatske promjene odvijaju se u različitim vremenskim razdobljima i mogu biti akutne, subakutne i dugoročne (10,12,13). Psihičke reakcije i određeni obrasci ponašanja mogu se razvijati prije, tijekom i nakon klimatskog događaja (14). Neki posljedični poremećaji su specifični, dok se drugi općenito javljaju u različitim ekstremnim događajima (15).

Akutne klimatske promjene označavaju iznenadne promjene vremenskih uvjeta i prirodnih pojava i mogu dovesti do poplava, oluja, toplinskih valova, šumskih požara i dr. Akutne klimatske promjene uglavnom su prolazne, no zbog brzine nastanka mogu biti iznenadne i neočekivane. Kod takvih promjena osobe su neposredno izložene stresorima (16,17). Učinci akutnih promjena na mentalno zdravlje dobro su istraženi i uključuju poremećaje iz dijagnostičkih kategorija reakcija na stres, anksioznih poremećaja, smetnji spavanja (18).

Subakutne klimatske promjene odnose se na promjene tijekom više mjeseci ili godina i uključuju promjene u prosječnoj temperaturi i padalinama, promjene vremenskih obrazaca i regionalnih klimatskih uvjeta. Posljedice subakutnih klimatskih promjena uključuju osjećaje koje doživljavaju ljudi zahvaćeni klimatskim promjenama, kao što su anksioznost povezana sa sumnjom u opstanak ljudi i prirode, osjećaji prepuštenosti i pasivnosti (19).

Dugotrajne klimatske promjene odnose se na promjene koje se događaju tijekom dugih razdoblja i uglavnom se koriste za opisivanje dugotrajnih promjena u globalnim vremenskim obrascima. Navedeno uključuje globalno povišenje temperature, porast razine mora, dugotrajne promjene obrazaca padalina i sve češća pojava ekstremnih vremenskih zbivanja. Po-

THE IMPACT OF CLIMATE CHANGE OVER TIME

Research has shown that a significant number of people may experience mental health difficulties as a direct consequence of climate change (11). Climate change occurs over different time periods and can be acute, subacute and long-term (10, 12, 13). Psychological reactions and certain behavioural patterns can develop before, during or after a climatic event (14). Some resulting disorders are specific, while others generally emerge due to various extreme events (15).

Acute climate changes include sudden changes in weather conditions and natural phenomena and can lead to floods, storms, heat waves, wildfires etc. Acute climate changes are mostly transient; however, due to the quickness of their formation they can be sudden and unexpected. When such changes occur, people are directly exposed to stressors (16, 17). The effects of these acute changes on mental health are well-researched and include disorders pertaining to the diagnostic categories of stress responses, anxiety disorders, sleep disturbances (18).

Subacute climate changes refer to the changes occurring over several months or years and include changes in the average temperature and precipitation, weather patterns and regional climatic conditions. The consequences of subacute climate changes include emotions experienced by people living in the areas affected by these climate changes, such as anxiety associated with uncertainty about the survival of people and nature or a sense of abandonment and passivity (19).

Long-term climate changes refer to the changes occurring over long periods of time and are mainly used to describe long-term changes in global weather patterns. These include global temperature increase, sea level rise, long-term changes in precipitation patterns and an in-

sljedice dugotrajnih klimatskih promjena uključuju široko rasprostranjene društvene učinke koji se mogu manifestirati kao ekonomske poteškoće, natjecanje za resurse, raseljavanje, prisilne migracije, kronične okolinske stresove, pojavu nasilja, oporavak nakon katastrofe (16,17,20).

Iako sva područja Zemlje ne doživljavaju akutne ili subakutne ekstremne promjene vremenskih zbivanja, dugoročna zbivanja povezana s klimom poput promjena okoliša, ekonomskih događaja i sukoba utječu na sve (21).

Povezanost psihičkih poteškoća s klimatskim promjenama je složena i klimatske promjene mogu utjecati na mentalno zdravlje nizom izravnih i neizravnih puteva. Izravne učinke na mentalno zdravlje ima neposredno djelovanje klimatskih promjena, koje uključuju ekstremnu toplinu, poplave, oluje, porast razine mora, suše i požare, dok okolinske i socioekonomske promjene, kao što su nezaposlenost, poteškoće smještaja i ekonomske poteškoće djeluju kao neizravne posljedice (22–24).

Faktori osjetljivosti na klimatske promjene obuhvaćaju zdravstvene (osobe s kroničnim bolestima, osobe s tjelesnim invaliditetom, osobe koje imaju psihičke poremećaje), socioekonomske (siromaštvo, nesigurno stanovanje, neformalni i nesiguran posao), demografske (dob, spol, etnička pripadnost, autohtoni status), zemljopisne (područja konflikata, udaljene zajednice, područja s manjkom vode, područja u kojima se češće javljaju ekstremni vremenski uvjeti) i sociopolitičke čimbenike (politička nestabilnost, raseljeno stanovništvo i diskriminirane grupe) (22).

EMOCIONALNE REAKCIJE NA KLIMATSKE PROMJENE

Iako većina osoba koja doživi ekstremno klimatsko zbivanje može imati određeni psihološki i sociološki distress, neće se kod svih ra-

creasing frequency of extreme weather events. The consequences of long-term climate changes include widespread social effects that can manifest as economic difficulties, competition for resources, displacement, forced migration, chronic environmental stresses, outbreaks of violence, post-disaster recovery (16, 17, 20).

Although acute or subacute extreme changes in weather events do not occur in all areas of the Earth, all areas are affected by the climate-related long-term events such as environmental changes, economic events and conflicts (21).

The link between psychological difficulties and climate change is complex, and climate change can affect mental health in a number of direct or indirect ways. Immediate climate changes have a direct impact on mental health, and they include extreme heat, floods, storms, sea level rise, droughts and fires, while indirect effects include environmental and socioeconomic changes such as unemployment, housing difficulties and economic difficulties (22–24).

Climate change sensitivity factors encompass health-related factors (people with chronic illnesses, physical disabilities, or mental disorders), socioeconomic factors (poverty, unsafe housing, informal and unstable employment), demographic factors (age, gender, ethnicity, autochthonous status), geographical factors (areas of conflict, remote communities, areas with water scarcity, areas with frequent extreme weather conditions) and sociopolitical factors (political instability, displaced population and discriminated groups) (22).

EMOTIONAL REACTIONS TO CLIMATE CHANGE

Although most people who go through an extreme climatic event may experience psychological and sociological distress, not all of them will develop a mental disorder. The majority of people are able to fully recover after a disas-

zviti psihički poremećaj. Većina ljudi može se u potpunosti oporaviti nakon katastrofe, a mnogi simptomi ranih reakcija na stresni događaj imaju tendenciju nestati s vremenom (25). Međutim, neki ljudi koji razviju simptome mogu razviti i psihičke poremećaje (25–27), osobito ako je istovremeno prisutno više čimbenika osjetljivosti koji međusobno djeluju (8,28,29). S druge strane, postojanje dobre socijalne mreže i sposobnost osoba za suočavanje i nošenje sa psihičkim poteškoćama čimbenici su koji pozitivno utječu na otpornost i prilagodbu nakon katastrofe povezane s vremenskim prilikama (30,31). Uz osobne čimbenike razina izloženosti osobe neizravnim učincima klimatskih promjena također ima značajnu ulogu u oporavku (32). Potrebno je uzeti u obzir da su kod mnogih ljudi psihičke reakcije prolazne i prilagodbeni su odgovor na događaje te ne dosežu razinu psihičkog poremećaja (32–35).

Kao reakcije na klimatske promjene može se javiti niz emocionalnih stanja, od osjećaja manjeg distresa i anksioznosti, do kliničkih poremećaja poput posttraumatskog stresnog poremećaja, poremećaja prilagodbe, anksioznih poremećaja, poremećaja raspoloženja i poremećaja spavanja (24,36).

Klimatske promjene utječu na osnovne potrebe i korištenje usluga u zajednici te mogu negativno utjecati na osjećaje osobne autonomije i kontrole (37,38). Osobe mogu imati osjećaj distresa i nepovjerenja u sustav s obzirom na ono što smatraju „klimatskim nedjelovanjem“ (34). Svjedočenje polaganim učincima klimatskih promjena dovodi do zabrinutosti za budućnost, osjećaja bespomoćnosti, gubitka i frustracije jer se osobe mogu osjećati nesposobnima zaustaviti klimatske promjene (38–40).

Promjene povezane s klimom mogu dovoditi i do napetosti u međuljudskim odnosima i porasta nasilja među intimnim partnerima (39–41). Jedno istraživanje je ustanovilo značajnu korelaciju između prosječne mjesečne temperature i stope nasilnog kriminala tijekom razdoblja od

ter, while many symptoms of early reactions to stressful events tend to disappear over time (25). However, some people who develop symptoms may also develop mental disorders (25–27), especially if several interacting sensitivity factors are present at the same time (8, 28, 29). On the other hand, a good social network and the individual's ability to cope with and handle psychological difficulties represent factors that have a positive impact on their resilience and adaptation following a weather-related disaster (30, 31). In addition to the personal factors, an individual's level of exposure to the indirect effects of climate change also plays a significant role in their recovery (32).

It should be taken into account that many people experience psychological reactions which are temporary and represent an adaptive response to the events, and they do not reach the level of a mental disorder (32–35).

Reactions to climate change may encompass a range of emotional states, from a sense of minor distress and anxiety, to clinical disorders such as post-traumatic stress disorder, adjustment disorder, anxiety disorder, mood disorder and sleep disorder (24, 36).

Climate change affects the people's basic needs and the use of community services, and can have a negative impact on the sense of personal autonomy and control (37, 38). Individuals may experience a sense of distress and distrust of the system in light of what they perceive as "climate inaction" (34). Witnessing the slow effects of climate change leads to anxiety about the future, a sense of helplessness, loss and frustration, as people may feel powerless when it comes to stopping climate change (38–40).

Climate-related changes can lead to tensions in interpersonal relationships and increased violence between intimate partners (39–41). One study found a significant correlation between the average monthly temperature and violent crime rates recorded over a 16-year period, us-

16 godina koristeći nasilni zločin kao zamjenu za individualnu agresiju (42).

Ostali psihosocijalni učinci uključuju odvajanje obitelji i nepovezanost sa sustavima socijalne podrške (npr. privremeno premještanje djece i pohađanje druge škole ili izostajanje iz škole).

Ima radova koji ukazuju na određene emocionalne reakcije koje su isključivo povezane s klimatskim promjenama. U ovu skupinu poremećaja uključeni su „ekoanksioznost“ i „ekodepresija“ koji su potaknuti sviješću o klimatskim promjenama i odnose se na osjećaje brige i straha o budućnosti ljudi, flore i faune na Zemlji (43,44). Solastalgija označava psihološke promjene koje se javljaju uglavnom kod autohtonih naroda nakon destruktivnih promjena osobito važnih mjesta ili područja u kojima su živjeli do kojih je došlo zbog posljedica klimatskih promjena ili ljudskih aktivnosti (8,38,45).

PSIHIČKI POREMEĆAJI VEZANI S KLIMATSKIM PROMJENAMA

Kada se govori o pojedinim dijagnostičkim entitetima u okviru psihičkih poremećaja, kao neposredna posljedica akutnih klimatskih zbiljanja izdvajaju se poremećaji uzrokovani stresom.

Većina ljudi doživi neki oblik distresa nakon hitne situacije, ali se može učinkovito nositi s tim nakon što se zadovolje osnovne potrebe i ponovno uspostavi sigurnost (40,46), no dio osoba može razviti akutnu reakciju na stres, poremećaj prilagodbe ili posttraumatski stresni poremećaj (11). Istraživanja ukazuju da bez obzira na prostor ili populaciju gotovo svaka vrsta vremenske nepogode može dovesti do posttraumatskog stresnog poremećaja (11,18,47). Visoke stope izloženosti traumi uzrokovane su ekstremnim vremenskim prilikama, uključujući izloženost okolnostima opasnim za život koje proizlaze iz katastrofa i pozadine naknadnog porasta međuljudskog nasilja kako unutar obi-

ing violent crime as a substitute for individual aggression (42).

Other psychosocial effects include family separation and disconnection from social support systems (e.g. temporary relocation of children and transfer to other schools or absence from school).

Some studies indicate certain emotional reactions that are associated exclusively with climate change. “Eco-anxiety” and “eco-depression” also belong to this group of disorders, triggered by the awareness of climate change and relating to the sense of worry and fear about the future of people, flora and fauna on Earth (43, 44). Solastalgia refers to psychological changes that occur mainly among indigenous peoples after experiencing destructive changes to particularly important sites or areas where they lived, and which were caused by the effects of climate change or human activity (8, 38, 45).

MENTAL DISORDERS ASSOCIATED WITH CLIMATE CHANGE

In terms of individual diagnostic entities within the framework of mental disorders, stress-related disorders stand out as a direct consequence of acute climatic events.

After going through an emergency situation, the majority of people experience some form of distress, but are able to cope effectively with these situations once their basic needs have been met and safety has been restored (40, 46). Some people, however, may develop an acute stress reaction, adjustment disorder or post-traumatic stress disorder (11). Studies have shown that regardless of the location or the population, almost any type of adverse weather conditions may lead to post-traumatic stress disorder (11, 18, 47). High rates of trauma exposure are caused by extreme weather events, including exposure to life-threatening circumstances arising from disasters and the background of subsequent increases in interpersonal violence within

telji tako i u široj zajednici (48,49). Posttraumatski stresni poremećaj povezan s katastrofom učestalije se javlja kod žena, starijih osoba, osoba s lošijim socioekonomskim položajem ili nezaposlenih osoba, kao i osoba s već postojećim psihičkim poteškoćama (50). Čini se da postoji povezanost ovisna o razini između stupnja izloženosti iskustvu prirodne katastrofe i pojave simptoma posttraumatskog stresnog poremećaja, što pokazuju rezultati istraživanja vezanih uz šumske požare i poplave (51,52). Čimbenici osjetljivosti za razvoj posttraumatskog stresnog poremećaja uključuju i postojeće prethodne traume, težina i neposrednost prijetnje osobi, njezinoj obitelji ili skrbnicima te subjektivni osjećaj mogućnosti kontrole situacije (49,53). Posttraumatski stresni poremećaj povezan s katastrofom može trajati godinama nakon početne katastrofe (54).

Anksiozni poremećaji i poremećaji prilagodbe mogu nastati i kao izravna reakcija na klimatski uvjetovane ekstremne vremenske prilike (49,55), no i neizravni učinci klimatskih promjena, kao što je narušena sigurnost u održavanju lanaca prehrane, migracije, poteškoće zapošljavanja i obrazovanja doprinose porastu učestalosti anksioznih poremećaja (49,53,55). Potrebno je izdvojiti da u određenim uvjetima snižena dostupnost zdravstvenog sustava, lošije funkcioniranje obitelji kao i društvene promjene mogu biti povezani s kasnijom prezentacijom ili odgoditi početak liječenja anksioznih ili drugih psihičkih tegoba što može osobito utjecati na osjetljivu populaciju, kao što su djeca i mladi (53). Tijekom vremena uz kumulativnu izloženost manifestacije psihičkih teškoća mogu postajati sve učestalije i ozbiljnije (49). Specijalizirane službe, posebice one za djecu i adolescente, sve se češće susreću s poremećajima u obliku somatskih simptoma koji se javljaju u kontekstu konverzivnih reakcija (53).

Nakon proživljenih ekstremnih vremenskih nepogoda mogu se pojaviti kao dugotrajna po-

the family and in the wider community (48, 49). Disaster-related post-traumatic stress disorder occurs more frequently among women, the elderly, people with a lower socioeconomic status, the unemployed, and people with pre-existing mental health problems (50). There appears to be a connection depending on the degree of exposure to a natural disaster and the onset of post-traumatic stress disorder symptoms, as evidenced by the results of studies relating to wildfires and floods (51, 52). Sensitivity factors associated with the development of post-traumatic stress disorder also include the existence of previous trauma, the severity and immediacy of the threat to the individual, their family or caregivers, as well as the subjective sense of having control over the situation (49, 53). Disaster-related post-traumatic stress disorder can persist for years after the initial disaster (54).

Anxiety disorders and adjustment disorders may also occur as a direct reaction to climate-related extreme weather conditions (49, 55), but the indirect effects of climate change, such as impaired security in the maintenance of food chains, migrations, difficulties in employment and education, contribute to the increased frequency of anxiety disorders as well (49, 53, 55). It should be noted that under certain conditions the reduced availability of the health system, poorer family functioning and social changes may be associated with a later onset of anxiety or other psychological difficulties or may delay the start of their treatment, which can particularly affect the vulnerable population such as children and youth (53). Over time and with cumulative exposure, the manifestations of psychological difficulties may become more frequent and more severe (49). Specialised services, particularly those for children and adolescents, increasingly encounter disorders in the form of somatic symptoms that occur in the context of conversion reactions (53).

Depressive symptoms and major depressive disorder can occur as a long-term consequence

sljedica depresivni simptomi i veliki depresivni poremećaj. Istraživanja ukazuju da između jedne četvrtine i jedne trećine ljudi može doživjeti simptome depresije nakon šumskih požara (50), a značajan broj osoba razvija simptome depresije i nakon uragana. Nakon uragana Sandy stope simptoma depresije bile su visoke i nakon godinu dana (56). Nakon uragana Katrina 23 % pojedinaca je nakon katastrofe pokazalo znakove klinički značajne depresije (57), a oni koji su već imali problema s mentalnim zdravljem imali su veću vjerojatnost da će doživjeti novu depresivnu epizodu. Podatci pokazuju da suša povećava prevalenciju depresivnih bolesti u ruralnim područjima (49). Osim povećanja stope depresije, klimatske promjene povećavaju i učestalost bolesti koje se prenose putem vektora poput nekih virusa (49). Neki podatci upućuju na to da izloženost onečišćenom zraku povećava vjerojatnost razvoja depresivnih poremećaja (58). Učinci klimatskih promjena mogu pogoršati socioekonomske odrednice zdravlja kao što su beskućništvo, nesigurnost dostupnosti hrane, prisilna migracija i nezaposlenost, a svi su oni povezani s većom mogućnošću razvoja depresivnog ili anksioznog poremećaja (8,59). Kašnjenja u pružanju skrbi ili otežana dostupnost skrbi zbog klimatskih uvjeta mogu imati negativan učinak na kliničke ishode pacijenata (60).

Interesantno je da na depresiju i druge poremećaje raspoloženja mogu značajno utjecati biološki uzročnici klimatskih promjena. Naime, postoji korelacija između depresije i visokih temperatura koje su u skladu s očekivanim povećanjem globalnog zatopljenja (61). Povećanje varijabilnosti temperature, još jedan utjecaj klimatskih promjena, također je značajno povezan s većom vjerojatnošću samoprijavljene anksioznosti, beznađa i besmisla (62). Pojedini zagađivači iz zraka (dizel, ugljični monoksid, dušikov oksid, sumporni dioksid, ozon i čestice), mijenjaju funkciju neurotransmitera u serotoninergičkim i dopaminergičkim puto-

of experiencing extreme adverse weather conditions. Studies have shown that between one quarter and one third of people may experience symptoms of depression after wildfires (50), while a significant number of people develop these symptoms after hurricanes as well. The depression symptom rates after Hurricane Sandy were still high one year later (56). After Hurricane Katrina, 23% of individuals showed signs of clinically significant depression after the disaster (57), and those with pre-existing mental health issues were more likely to experience a new depressive episode. Data indicate that droughts increase the prevalence of depressive illnesses in rural areas (49). In addition to increasing the depression rates, climate change also increases the incidence of vector-borne diseases, such as certain viruses (49). Some data suggest that exposure to polluted air increases the likelihood of developing depressive disorders (58). The impacts of climate change may exacerbate the socio-economic determinants of health, such as homelessness, food insecurity, forced migration and unemployment, all of which are associated with a higher risk of developing a depressive or anxiety disorder (8, 59). Delays in the provision of care or difficult access to care due to climatic conditions can have a negative impact on the clinical outcomes of patients (60).

Interestingly, biological causes of climate change can have a significant impact on depression and other mood disorders. In fact, there is a correlation between depression and high temperatures that are consistent with the expected increase in global warming (61). Increased temperature variability, another consequence of climate change, is also closely associated with a higher likelihood of self-reported anxiety, sense of hopelessness and meaninglessness (62). Certain air pollutants (diesel, carbon monoxide, nitrogen oxide, sulphur dioxide, ozone and particulate matter) alter the function of neurotransmitters in serotonergic and

vima (63) s mogućim utjecajem na razvoj psihijatrijskih poremećaja, uključujući depresiju. Osim toga, smatra se da izloženost stresu, bilo da se radi o izravnim ili neizravnim posljedicama klimatskih promjena, značajno povećava rizik od depresije (63). Toplina snižava razinu hormona štitnjače, što dovodi do funkcionalne hipotireoze, koja može uzrokovati kognitivno oštećenje, disforiju i smanjenu energiju (64).

Zajednice pogođene ekstremnim vremenskim prilikama imaju povećanje prevalencije i ozbiljnosti poremećaja ovisnosti o drogama (49). Rizik intoksikacije vjerojatniji je u uvjetima ekstremnih vremenskih prilika (65). Prekid obrazovanja, nezaposlenost i izloženost oružanim sukobima među neizravnim su učincima klimatskih promjena koji također povećavaju vjerojatnost poremećaja ovisnosti (53).

Pogoršanje simptoma akutnih i kroničnih mentalnih poremećaja može se javiti kao posljedica toplinskih valova (66,67), dok je izloženost povišenim temperaturama okoline i zagađivačima zraka povezana i s višim stopama samoubojstva (68). Jedno istraživanje ukazuje da je 2 %-tni porast pojave negativnih događaja mentalnog zdravlja povezan s porastom temperature od jednog stupnja tijekom pet godina (69).

Kao posljedica viših temperatura dolazi i do povećane učestalosti javljanja osoba u hitne ambulante zbog mentalnog distresa, suicidalnih misli, agitacije ili pogoršanja psihotičnih poremećaja ili delirija superponiranog na demenciju (55,65,70).

Ekstremne temperature povećavaju mogućnost pojave delirija i pogoršavaju kognitivne probleme kod pacijenata s demencijom. Delirij je posebno opasan za vrlo mlade, vrlo stare i osobe s tjelesnim bolestima poput dijabetesa melitusa (71). Konkretno, lijekovi s antikolinergičkim nuspojavama poput starijih antipsihotika i antidepresiva mogu uzrokovati štetne

dopaminergičke putanje (63) s potencijalnim utjecajem na razvoj psihijatrijskih poremećaja, uključujući depresiju. Nadalje, izloženost stresu, bilo direktno ili indirektno, smatra se da značajno povećava rizik od depresije (63). Toplota snižava razinu hormona štitnjače, što dovodi do funkcionalne hipotireoze, koja može uzrokovati kognitivno oštećenje, disforiju i smanjenu energiju (64).

Postojeći povećani prevalencija i težina ovisnosti o drogama u zajednicama pogođenim ekstremnim vremenskim prilikama (49). Rizik intoksikacije je veći u ekstremnim vremenskim prilikama (65). Prekid obrazovanja, nezaposlenost i izloženost oružanim sukobima među neizravnim su učincima klimatskih promjena koji također povećavaju vjerojatnost poremećaja ovisnosti (53).

Učesto se javljaju simptomi akutnih i kroničnih mentalnih poremećaja kao posljedica toplinskih valova (66, 67), dok je izloženost povišenim temperaturama okoline i zagađivačima zraka povezana i s višim stopama samoubojstva (68). Jedno istraživanje ukazuje da je 2 %-tni porast pojave negativnih događaja mentalnog zdravlja povezan s porastom temperature od jednog stupnja tijekom pet godina (69).

Povišene temperature također dovode do povećane učestalosti javljanja osoba u hitne ambulante zbog mentalnog distresa, suicidalnih misli, agitacije ili pogoršanja psihotičnih poremećaja ili delirija superponiranog na demenciju (55, 65, 70).

Ekstremne temperature povećavaju mogućnost pojave delirija i pogoršavaju kognitivne probleme kod pacijenata s demencijom. Delirij je posebno opasan za vrlo mlade, vrlo stare i osobe s tjelesnim bolestima poput dijabetesa melitusa (71). Konkretno, lijekovi s antikolinergičkim nuspojavama poput starijih antipsihotika i antidepresiva mogu uzrokovati štetne

učinke psihotropnih lijekova koji su vjerojatniji u uvjetima ekstremnih toplina (72). Neželjena posljedica koja se posebno pogoršava za osobe koje uzimaju antidepresive tijekom viših temperatura je hiponatrijemija (73).

Povišene temperature nose i povećan rizik smrtnosti kod osoba s psihotičnim poremećajima, demencije i zlouporabe psihoaktivnih tvari zbog višestrukih čimbenika poput dehidracije ili samoubojstva (67).

RASPRAVA

Pri neposrednim katastrofičnim vremenskim prilikama potrebno je djelovati u smislu neposrednih reakcija na događaje i pružanja društvene i psihološke podrške. Međutim, s obzirom da su klimatske promjene već prisutne te ako se i zajedničkim djelovanjem uspiju postići pozitivne promjene, učinci će trajati barem još neko vrijeme.

Socio bihevioralni čimbenici, kultura, informacije i pripremljenost imaju važnu ulogu u određivanju hoće li društvo biti otporno ili će doći do psihološkog poremećaja i iscrpljenosti (19). U tom okviru potrebno je raditi na razvoju otpornosti i zaštitnih čimbenika i mehanizama suočavanja s klimatskim promjenama, kako kod pojedinaca, tako i na razini zajednica i društava (23). Prioritet treba dati izgradnji otpornosti zajednice kako ozbiljnost globalnog klimatskog problema raste. Za razliku od pasivnih primatelja vanjske pomoći ili podrške, pristupi temeljeni na zajednici vide one pogođene hitnim slučajevima kao aktivne vođe i sudionike u naporima za promicanje individualnog i društvenog mentalnog zdravlja i dobrobiti (74).

Potrebno je pažljivo planirati aktivnost i jačanje mogućnosti zdravstvenog sustava kako bi se mogla pružiti pomoć u okviru akutnih zbiljanja, ali i prevenirati poremećaje uzrokovane klimatskim promjenama.

more likely to occur in extreme heat conditions (72). An undesirable side-effect that becomes worse during periods of high temperatures, especially in people taking antidepressants, is hyponatremia (73).

Elevated temperatures also carry an increased risk of mortality for people with psychotic disorders, dementia and psychoactive substance abuse, due to multiple factors such as dehydration or suicide (67).

DISCUSSION

In the event of immediate catastrophic weather conditions action is required in terms of ensuring immediate response to events and providing social and psychological support. However, considering that climate changes are already present and provided that collective actions succeed in achieving positive change, the effects will last at least for a while.

Socio-behavioural factors, culture, provision of information and preparedness play an important role in determining whether the society will develop resilience or psychological disorders and exhaustion (19). In that context, it is necessary to work towards developing resilience, protective factors and mechanisms for coping with climate change at the individual, as well as the community and societal levels (23). As the severity of the global climate problem increases, priority should be given to building community resilience. As opposed to passive recipients of external aid or support, community-based approaches view those affected by emergency situations as active leaders and participants in the efforts to promote individual and social mental health and well-being (74).

It is necessary to carefully plan the activities of the healthcare system and strengthen its capacities to provide assistance in case of acute events and prevent the occurrence of disorders caused by climate change.

Kontinuirano razumijevanje odnosa između sustava mentalnog zdravlja i klimatskih promjena može zahtijevati prilagođavanje postojećih ili razvoj novih intervencija, iako i postojeće mogu biti od pomoći (23).

Može se očekivati da će utjecaj klimatskih promjena na mentalno zdravlje povećati potrebu za psihijatrijskom stručnom pomoći i liječenjem. Planiranje je potrebno i za predvidljive poremećaje zdravstvene skrbi izazvane pojavama povezanim s klimatskim promjenama (75). Ključno je započeti s planiranjem odmah, kako bi se usluge mentalnog zdravlja bile spremne nositi se s rastućom potražnjom koju donose klimatske promjene u budućnosti.

ZAKLJUČAK

S obzirom na sve intenzivnije klimatske promjene, naročito toplinske udare te prijeteće oluje koje sa sobom nose ne samo materijalne štete već i opasnost od ugroze ljudi, važno je raditi na jačanju otpornosti, osobito kod osoba i populacija koje su osjetljive, te osigurati dostupnost adekvatne skrbi i zbrinjavanja uz pomoć nadležnih službi u kriznim situacijama. U tome je posebno važna prevencija reakcija na stres i prilagodba posljedično događajima proizašlim iz klimatskih promjena te što ranije pružanje psihološke i psihijatrijske pomoći onima kojima je potrebna. Sve je to potrebno tijekom akutnih, subakutnih i trajnih klimatskih zbivanja, ali i planiranje programa za podizanje svijesti i izgradnju otpornosti društva u cjelini, kao i izrada strategija zaštite mentalnog zdravlja u novim civilizacijskim okolnostima kojima smo izloženi.

Continuous understanding of the relationship between mental health systems and climate change may require the adaptation of existing or the development of new interventions, although the existing ones may also prove to be helpful (23).

The impact of climate change on mental health is expected to increase the need for psychiatric expertise and treatment. Planning is also required for the predictable healthcare disruptions caused by the occurrences associated with climate change (75). It is crucial to start planning now, so that the mental health services are prepared to deal with the increasing demand brought about by climate change in the future.

CONCLUSION

In view of the ever-increasing intensity of climate change, particularly the heat waves and impending storms that not only cause material damage, but also pose the threat of endangering people, it is important to work on the strengthening of resilience, especially among sensitive individuals and populations, and to ensure the availability of adequate care and treatment with the help of competent emergency services. In this context, particularly relevant are stress reaction prevention and adaptation to the consequences of climate change, and the provision of psychological and psychiatric support to those in need as soon as possible. All of this is necessary during acute, subacute and permanent climatic events, in addition to planning programs that will raise awareness and build the resilience of the society as a whole, and developing mental health protection strategies in the new civilisational circumstances to which we are exposed.

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Upute autorima

O časopisu

Socijalna psihijatrija je recenzirani časopis koji je namijenjen objavljivanju radova iz područja socijalne psihijatrije, ali i iz kliničke psihijatrije i psihologije, biopsihijske psihijatrije, psihoterapije, forenzičke psihijatrije, ratne psihijatrije, alkoholologije i drugih ovisnosti, zaštite mentalnog zdravlja osoba s intelektualnim teškoćama i razvojnim poremećajima, epidemiologije, deontologije, organizacije psihijatrijske službe. Praktički nema područja psihijatrije iz kojeg do sada nije objavljen pregledni ili stručni rad.

Svi radovi trebaju biti pisani na hrvatskom i engleskom jeziku.

Svi zaprimljeni radovi prolaze kroz isti proces recenzije pod uvjetom da zadovoljavaju i prate kriterije opisane u Uputama za autore i ne izlaze iz okvira rada časopisa.

Uredništvo ne preuzima odgovornost za gledišta u radu - to ostaje isključivom odgovornošću autora.

Časopis objavljuje sljedeće vrste članaka: uvodnike, izvorne znanstvene, stručne i pregledne radove, prikaze bolesnika, lijekova i metoda, kratka priopćenja, osvrti, novosti, prikaze knjiga, pisma uredništvu i druge priloge iz područja socijalne psihijatrije i srodnih struka.

Iznimno Uredništvo časopisa može prihvatiti i drugu vrstu rada (prirodni rad, rad iz povijesti struke i sl.), ako ga ocijeni korisnim za čitateljstvo.

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/>.

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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.

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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.).

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There should be a title, name and surname, address, town, state and e-mail indicated for the corresponding author.

The title page should contain: the full and shortened title of the article, full names and full surnames of all authors of the article, and the institution they work for. All the authors should also provide an ORCID ID (please check the following website: <https://orcid.org/register>). The article should have a summary not exceeding 200 words. The summary should briefly describe the topic and aim, the methods, main results,

Cilj je kratak opis što se namjerava istraživati, tj. što je svrha istraživanja.

Metode se prikazuju tako da se čitatelju omogući ponavljanje opisanog istraživanja. Metode poznate iz literature ne opisuju se, već se navode izvorni literaturni podaci. Ako se navode lijekovi, rabe se njihova generička imena (u zagradi se može navesti njihovo tvorničko ime).

Rasprava sadrži tumačenje dobivenih rezultata i njihovu usporedbu s rezultatima drugih istraživača i postojećim spoznajama na tom području. U raspravi treba objasniti važnost dobivenih rezultata i njihova ograničenja, uključujući i implikacije vezane uz buduća istraživanja, ali uz izbjegavanje izjava i zaključaka koji nisu potpuno potvrđeni dobivenim rezultatima.

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In case the manuscript has six or fewer Authors, all of them should be listed. Should the manuscript have more than six Authors, the first six should be listed and the rest of them marked with the abbreviation *et al.* or *i sur.* First list the surname and then the initials of the first name(s). Multiple initials for the same person should be written without spaces.

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