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Patients' and Parents' Concerns over Orthodontic Treatment during the COVID - 19 Pandemic

Zabrinutost pacijenata i roditelja zbog ortodontske terapije tijekom pandemije bolesti COVID-19

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Abstract

Objective: We aimed to assess the impact of the COVID-19 pandemic on the concern of adolescents in orthodontic treatment, and to determine whether personality traits and parental perception were predictors of adolescent patients' concerns. **Participants and methods:** The sample consisted of 229 adolescent patients (57.2% female) and 223 parents (65.1% female). Questionnaires included items about the importance of infection control and concern about treatment duration and results. Their latent structure was determined using exploratory factor analysis. The Big Five Inventory was used for assessing personality traits. Predictors of patients' and parental orthodontic concern and awareness of the importance of infection control measures were tested by the hierarchical multiple regression analysis. **Results:** Two factors were revealed for the patient questionnaire, Treatment concern (TC) and Awareness of the importance of measures (AM), and four factors for the parent questionnaire, Parents' treatment concern (PTC), Parents' awareness of the importance of measures (PAM), Parents' concern about the pandemic (PCP) and Parents' concern about their child with regards to the pandemic (PCC). Adolescents' personality traits were not predictors of either TC or AM. PTC was a predictor of TC ($p<0.001$), accounting for 28% of the variance. PAM and the patient's following of the news were predictors of AM ($p\leq0.022$), accounting for 24% and 2% of the variance, respectively. **Conclusion:** Parental concern and awareness of measures had an important role in attitudes of adolescent orthodontic patients during the COVID-19 pandemic, while personality traits did not. The clinician should put additional emphasis on communication with the parent.

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Introduction

The 2019 coronavirus pandemic (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV2), broke out in China in December 2019 (1). Children had a lower prevalence of COVID -19 compared with adults, and those younger than 10 years of age had a lower prevalence than the 10-19 year age group (2). Children were also more likely to contract coronavirus from an older household member than vice versa (2), although the risk of infection was comparable between adults and children (3), thus reflecting a high proportion of mild and asymptomatic cases in children.

In Croatia, to prevent the spread of COVID -19, a strict lockdown was imposed during the first months of the pan-

Uvod

Pandemija (COVID-19) prouzročena koronavirusom 2 teškoga akutnoga respiratornog sindroma (engl. *severe acute respiratory syndrome coronavirus 2* – SARS-CoV-2) buknula je u Kini u prosincu 2019. godine (1). Kod djece je prevalencija te bolesti niža nego kod odraslih te je kod mlađih od 10 godina niža nego u dobnoj skupini od 10 do 19 godina (2). Ujedno, djeca su sklonija zaraziti se koronavirusom od starijega člana kućanstva nego obrnuto (2), iako je rizik od infekcije usporediv između odraslih i djece (3), što vjerojatno odražava visok postotak blagih i asimptomatskih slučajeva kad je riječ o djeci.

Kako bi se suzbilo širenje bolesti COVID-19 u prvih nekoliko mjeseci pandemije, u Hrvatskoj je uvedena stroga ka-

demic, with only essential services in operation. During the summertime, restrictions were relaxed, while later in 2020, with the onset of winter and an increase in the number of COVID -19 cases, indoor masking became mandatory, and cafes and restaurants were closed. For children older than 10 years, the possibility of regional decisions on distance education was introduced, extracurricular activities, including sports, were suspended, and gatherings were restricted in the first quarter of 2021 in most Croatian regions. The impact of such physical distancing measures on child and adolescent development and mental health has remained to be determined in the coming years (4).

Since transmission of SARS-CoV2 is airborne through exhaled virus particles (5), the infection can spread easily and rapidly, especially indoors. Aerosol-generating dental procedures result in heavy contamination of the user's face shield and clothing (6) and may promote transmission (7). The prolonged wearing of face masks among dental practitioners worsened their self-reported symptoms of dry eye disease (8). Nevertheless, the clinical guidelines for orthodontic practice during the pandemic included strict infection control measures mask wearing and face shields, ventilation, thus minimizing patient volume, and avoiding aerosol-generating procedures (9). Since restoring health care availability was of paramount importance, all orthodontic procedures in Croatia were performed regularly after the initial closure in spring 2020. This included aerosol-generating procedures such as bracket bonding and removal, while following all other guidelines mentioned above.

Children and adolescents are often treated with a fixed orthodontic appliance, with appointments every six weeks. Although adolescents have a very low risk of developing a severe form of COVID -19 (10), repeated exposure to the risk of coronavirus infection may cause concern in some of them or their parents. Reduced patient volume in the orthodontic office and self-quarantine may have caused more appointment cancellations. Indeed, a delay in orthodontic treatment was identified as the greatest concern among patients in one study from 2020 (11). Martina et al. found that 92% of adult patients with a fixed appliance reported they would return to the dental office after the spring 2020 lockdown, while 45% reported discomfort from not seeing an orthodontist for more than two months (12). Because adolescents are motivated to undergo orthodontic treatment by the expected improvement in aesthetics, as well as self-confidence and self-esteem (13), they may consider the potentially worse treatment results and prolongation of orthodontic treatment as an additional disruption to their lives from the pandemic. Retrospective studies have shown that, although there were more absences and missed appointments for patients treated during the pandemic, the pandemic did not significantly affect total treatment time (14, 15). However, certain elements of the peer assessment rating and objective grading system indices, such as maxillary alignment and buccolingual inclination, were worse in patients treated during the pandemic (15).

Adolescents who visit the orthodontist during the pandemic may also be more aware of the importance of infec-

rantena pa su radile samo nužne djelatnosti. Tijekom ljeta ograničenja su ublažena, a poslije tijekom 2020. godine, s početkom zime i povećanjem broja oboljelih, uvedeno je obavezno nošenje maske u zatvorenim prostorijama, a kafići i restorani su zatvoreni. U prvom tromjesečju 2021. u većini hrvatskih županija uvedena je za djecu stariju od 10 godina mogućnost regionalnih odluka o nastavi na daljinu, a izvanškolske aktivnosti su ukinute, uključujući i sport. Tek će se u godinama koje su pred nama spoznati kako su te mjere fizičkog distanciranja utjecale na razvoj djece i adolescenata te na njihovo mentalno zdravlje (4).

S obzirom na to da se SARS-CoV-2 prenosi zrakom izdahnutima virusnim česticama (5), infekcija se širi lako i brzo, posebice u zatvorenom prostoru. Stomatološki postupci koji stvaraju aerosol rezultiraju teškim onečišćenjem zaštitnih vizira i odjeće (6) i mogu poticati transmisiju bolesti (7). Dugotrajno nošenje zaštitnih maski među stomatolozima pogoršalo je njihove samoreportirane simptome bolesti suhog oka (8). Unatoč tomu, kliničke smjernice za ortodontsku djelatnost tijekom pandemije obuhvaćale su stroge mjere za kontrolu infekcije, nošenje maski i vizira, provjetravanje, minimiziranje broja pacijenata i izbjegavanje postupaka koji stvaraju aerosol (9). Kako je ponovno uspostavljanje zdravstvene skrbi bilo iznimno važno, svi ortodontski postupci u Hrvatskoj obavljali su se redovito nakon početnog zatvaranja u proljeće 2020., uključujući i postupke koji stvaraju aerosol, poput postavljanja i uklanjanja bravica, uz poštovanje svih ostalih navedenih smjernica.

Djeca i adolescenti često su u ortodontskoj terapiji fiksnom napravom i imaju kontrolne preglede svakih šest tjedana. Iako je rizik za razvoj težeg oblika bolesti COVID-19 kod adolescenata vrlo nizak (10), ponavljana izloženost opasnosti od infekcije koronavirusom može izazvati zabrinutost kod nekih od njih, ili njihovih roditelja. Smanjenje broja pacijenata u ortodontskoj ordinaciji i samoizolacija mogli su prouzročiti više otkazivanja kontrolnih pregleda. U jednom istraživanju iz 2020. godine autori su pokazali da upravo odgađanje termina najviše zabrinjava ortodontske pacijente (11). Martina i suradnici istaknuli su da se 92 % odraslih pacijenata s fiksnom napravom željelo vratiti u stomatološku ordinaciju poslije karantene u proljeće 2020., a 45 % njih istaknulo je nelagodu zbog toga što nisu bili na ortodontskom kontrolnom pregledu dulje od dva mjeseca (12). S obzirom na to da su adolescenti motivirani za ortodontsku terapiju jer očekuju poboljšanje estetike, samopouzdanja i samopoštovanja (13), potencijalno lošije rezultate i produljeno trajanje ortodontske terapije zbog pandemije mogli bi smatrati dodatnim poremećajem u svojim životima. Retrospektivna istraživanja pokazala su da pandemija nije znatno utjecala na ukupno trajanje terapije, unatoč većem broju izostanaka i propuštenih kontrolnih pregleda (14, 15). No određeni elementi objektivnih indeksa poput nivelacije maksilarnoga zubnog luka i bukolingvalnoga nagiba zuba, bili su lošiji kod pacijenata tretiranih tijekom pandemije (15).

Adolescenti koji odlaze ortodontu tijekom pandemije također mogu biti svjesniji važnosti mjera za kontrolu infekcija i tako smanjiti rizik od zaraze koronavirusom za sebe i druge. Istraživanja iz ranije faze pandemije pokazala su da je vi-

tion control measures and thus reduce the risk of infecting themselves or others with coronavirus. Research from the early phase of the pandemic showed that more than 80% of respondents were willing to follow recommendations to keep their distance and wear masks (16), while more than one-third of adult orthodontic patients suffered from mental health problems (11).

The impact of the pandemic on adolescent concerns about orthodontic treatment remains unclear. Later during the pandemic, during the period of normalization of health care, the COVID-19 numbers of cases and deaths were the main news in the media, along with epidemiologic measures and restrictions. This may have been a factor influencing patients' perception of risk. The role of parental stress in children's psychological well-being is very important (17), perhaps even more important during the pandemic. The level of depression in mothers is related to the mood of their children (18). It is plausible that parental attitudes may have influenced adolescents' concerns about their orthodontic treatment. Personality dimensions are also related to the ability to cope with adversity. The Big Five model is one of the most widely used taxonomies of personality and has been studied extensively (19). The model includes the personality traits agreeableness, extraversion, openness, conscientiousness, and neuroticism. Ničkević et al. found that neuroticism is a vulnerability factor for COVID-19 psychological stress, whereas agreeableness, conscientiousness, and extraversion are protective in adults (20).

Most previous studies on orthodontic patients' perceptions of the pandemic were conducted in the early stages when there were still numerous unknown facts about the nature of COVID -19 and during the limited availability of health services. This study aimed to assess the impact of the pandemic on the concern of adolescents undergoing orthodontic treatment while health services were normalizing and yet a high number of COVID -19 cases were reported in the media. In addition, we aimed to determine whether personality traits and parental perception were predictors of adolescent patients' concerns.

Material and Methods

The sample size was estimated for detecting a medium effect size of f^2=0.15 in a multiple regression analysis with 11 predictors, a power ß=0.8, and a probability level of α=0.05. Considering a dropout rate of 20%, we assumed that 153 patients and 153 parents would be needed. To confidently detect effect sizes of less than f^2=0.15, we decided to overestimate and invited 250 patients and 250 parents.

The study was cross-sectional and was conducted from February to May 2021, during the so-called "third wave" of the pandemic in Croatia. Participants were recruited from among orthodontic patients treated at the Department of Orthodontics, Clinical Hospital Centre Zagreb, Croatia. The inclusion criteria for the patients were an age of 10 to 18 years and orthodontic treatment with a fixed appliance that had started at least three months before the enrolment in the study. Exclusion criteria for both patients and parents were

še od 80 % ispitanika željelo slijediti preporuke o održavanju razmaka i nošenju maski (16), a više od trećine odraslih ortodontskih pacijenata prijavilo je probleme u mentalnome zdravlju (11).

Utjecaj pandemije na zabrinutost adolescenata zbog ortodontske terapije još uvijek je nejasan. U kasnijoj fazi pandemije, tijekom normalizacije zdravstvene skrbi, brojevi oboljelih i umrlih od bolesti COVID-19 bili su glavna vijest u medijima, zajedno s epidemiološkim mjerama i ograničenjima. To je mogao biti čimbenik koji je kod pacijenata utjecao na percepciju rizika. Uloga roditeljskog stresa u psihološkom blagostanju djece vrlo je važna (17), možda još važnija tijekom pandemije. Razina majčine depresije povezana je s raspoloženjem njihove djece (18). Moguće je da su roditeljska stajališta utjecala na zabrinutost adolescenata zbog njihove ortodontske terapije. Dimenzije osobnosti također su povezane sa sposobnošću prevladavanja poteškoća. Model *velikih pet dimenzija osobnosti* jedna je od najčešće korištenih taksonomija osobnosti i opsežno je istražen (19). Uključuje dimenzije osobnosti ugodnost, ekstraverziju, otvorenost, savjesnost i neuroticizam. Ničkević i suradnici otkrili su da je neuroticizam čimbenik ranjivosti za psihološki stres prouzročen bolešću COVID-19, a ugodnost, savjesnost i ekstraverzija zaštitni su kad je riječ o odraslima (20).

Većina dosadašnjih istraživanja o percepciji pandemije kod ortodontskih pacijenata provedena je u ranim fazama kada su još postojale mnoge nepoznanice o prirodi bolesti COVID-19 i tijekom ograničene dostupnosti zdravstvenih usluga. Cilj ovog istraživanja bio je procijeniti utjecaj pandemije na zabrinutost adolescenata u ortodonskoj terapiji u razdoblju kada se zdravstvena skrb normalizirala, ali se pritom u medijima bilježio velik broj slučajeva te bolesti. Osim toga, cilj nam je bio utvrditi jesu li dimenzije osobnosti i percepcija roditelja prediktori za zabrinutost adolescentnih pacijenata.

Materijali i metode

Veličina uzorka procijenjena za detekciju srednje veličine učinka f^2 = 0,15 u multiploj regresijskoj analizi s 11 prediktora, snagom ß = 0,8 i razinom vjerojatnosti α = 0,05. S obzirom na stopu odustajanja od 20 %, pretpostavili smo da će biti potrebna 153 pacijenata i 153 roditelja. Kako bismo pouzdano otkrili veličine učinka manje od f^2 = 0,15, odlučili smo precijeniti potreban broj ispitanika te smo pozvali 250 pacijenata i 250 roditelja.

Istraživanje je bilo presječno i provedeno je od veljače do svibnja 2021., tijekom tzv. *trećeg vala* pandemije u Hrvatskoj. Sudionici su birani među ortodontskim pacijentima Zavoda za ortodonciju Kliničkoga bolničkoga centra Zagreb, Hrvatska. Kriteriji za uključivanje pacijenata bili su dob od 10 do 18 godina i da je ortodontska terapija fiksnom napravom počela najmanje tri mjeseca prije uključivanja u istraživanje. Kriteriji za isključivanje pacijenata i roditelja bili su intelek-

intellectual disability and mental illness. New parent and patient questionnaires were composed. Section 1 contained multiple-choice questions on demographic data, whereas section 2 contained questions assessing the perceived impact of the pandemic, answered on a Likert scale of 1 to 5. Participants were also administered the Big Five Inventory-10 (BFI-10) (21, 22), an instrument designed to assess the Big Five personality traits. The BFI can provide reliable information about the personality of participants aged 10 years and older (23).

The latent structure of section 2 of the questionnaires was determined using exploratory factor analysis with oblique promax rotation. For the parent questionnaire, separate analyses were conducted for items regarding the parents themselves and items regarding their children. The hierarchical multiple linear regression analysis was used to test predictors for the patient and parent care constructs. Statistical analysis was performed using SPSS (version 22.0; IBM, Armonk, USA), with significance set at $p<0.05$.

This study was approved by the authors' institution ethics committee and was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and its amendments. Written informed consent was obtained from all adult participants and the parents/guardians of all participants aged < 18 years before their participation in the study.

Results

Of the 250 individuals invited to participate, 15 declined, and six of the questionnaires were not analyzed because of unanswered questions. Six parents of siblings completed the questionnaire. Thus, the sample consisted of a total of 229 patients (age: 10-18 years; median: 15 years, interquartile range: 13-16 years; 57.2% female) and 223 parents (age: 32-65 years; median: 46 years, interquartile range: 42-50 years; 65.1% female). Descriptive statistics for the sample are presented in Table 1.

Regarding school attendance, 81.7% of participants attended school in person, and 12.2% attended classes from home, and 6.1% attended classes partly at school and partly from home. 26.2% participants had to cancel an orthodontic appointment due to self-isolation and 4.4% had to cancel an appointment more than once.

The Keiser-Meyer-Olkin measure verified sampling adequacy for exploratory factor analysis (KMO=0.82-0-74). Bartlett's test for sphericity indicated that correlations between items were sufficiently large for analysis ($p<0.001$). Two factors emerged in the patient questionnaire, treatment concern (TC) and awareness of the importance of measures (AM), which accounted for a total of 51.5% of the variance (Table 2.). Factor analysis revealed a two-factor structure for items concerning parents themselves in the parent questionnaire: parents' concern about the pandemic (PCP) and parents' concern about treatment (PTC), which accounted for a total of 59.4% of the variance (Table 3.). For the parent questionnaire items related to their children, two factors were also identified, parents' awareness of the importance of measures (PAM) and parents' concern for their child regarding

tualne poteškoće i duševna bolest. Sastavljen je novi upitnik za roditelje i pacijente. Prvi dio sadržavao je pitanja s više ponuđenih odgovora o demografskim podatcima, a u drugom dijelu bila su pitanja kojima se procjenjuje percepcija utjecaja pandemije s odgovorima na Likertovoj ljestvici od 1 do 5. Sudionicima je također dan inventar *pet velikih osobina* (engl. Big Five Inventory – BFI-10) (21, 22), instrument sastavljen za procjenu *pet velikih dimenzija osobnosti*. BFI pruža pouzdane informacije o osobnosti sudionika u dobi od 10 godina i starijih (23).

Latentna struktura drugog dijela upitnika određena je eksploratornom faktorskom analizom uz kosu promaks rotaciju. Kad je riječ o upitniku za roditelje, provedene su zasebne analize za čestice koje se odnose na same roditelje te za čestice koje se odnose na njihovu djecu. Za ispitivanje prediktora konstrukta zabrinutosti pacijenata i roditelja korištena je hijerarhijska multipla linearna regresija. Statistička analiza provedena je u SPSS-u (verzija 22.0; IBM, Armonk, SAD), uz razinu značajnosti $p < 0,05$.

Istraživanje je odobrilo Etičko povjerenstvo institucije u kojoj rade autori i provedeno je u skladu sa standardima Deklaracije iz Helsinkija iz 1964. godine i njezinim nadopunama. Prije sudjelovanja u istraživanju svi punoljetni sudionici te roditelji/skrbnici svih sudionika mlađih od 18 godina potpisali su informirani pristanak.

Rezultati

Od 250 pojedinaca pozvanih da sudjeluju u istraživanju, 15 je odbilo, a šest upitnika nije analizirano zbog neodgovorenih pitanja. Šestero roditelja braće i sestara ispunilo je upitnik. Uzorak se stoga sastojao od 229 pacijenata (dob: 10 – 18 godina; medijan: 15 godina, interkvartilni raspon: 13 – 16 godina; 57,2 % djevojaka) i 223 roditelja (dob: 32 – 65 godina; medijan: 46 godina, interkvartilni raspon: 42 – 50 godina; 65,1 % žena). Deskriptivna statistika prikazana je u tablici 1.

Kad je riječ o nastavi, 81,7 % sudionika pohađalo je nastavu u školi, 12,2 % pratilo je nastavu od kuće, a 6,1 % pohađalo je nastavu djelomično u školi i djelomično od kuće. Ortodontski termin zbog samoizolacije moralo je otkazati 26,2 % ispitanika, a 4,4 % moralo je otkazati termin više od jedanput.

Keiser-Meyer-Olkinova mjera potvrdila je primjerenost uzorkovanja za eksploratornu faktorsku analizu (KMO = 0,82-0-74). Bartlettov test sferičnosti pokazao je da su korelacije između stavki bile dovoljno velike za analizu ($p < 0,001$). U upitniku za pacijente pojavila su se dva čimbenika – zabrinutost zbog terapije (ZT) i svjesnost o važnosti mjera (SM), ukupno objašnjavajući 51,5 % varijance (tablica 2.). Faktorska analiza otkrila je dvofaktorsku strukturu za čestice koje su se odnosile na same roditelje u upitniku za roditelje – roditeljska zabrinutost zbog pandemije (RZP) i roditeljska zabrinutost zbog terapije (RZT) koje su ukupno objašnjavale 59,4 % varijance (tablica 3.). Za čestice upitnika za roditelje koje se odnose na njihovu djecu također su identificirana dva čimbenika – roditeljska svjesnost o važnosti mjera (RSM) i roditeljska zabrinutost za njihovo dijete u vezi s pandemijom

Table 1. Descriptive statistics
Tablica 1. Deskriptivna statistika

		Mean	SD	Median	IQR	Min.	Max.
Patients	gender (female= 131 (57.2%)[a])						
(N=229)	age	14.7	1.9	15	13-16	10	18
	extraversion	6.7	1.5	7	6-8	2	10
	agreeableness	11.5	2.2	12	10-13	3	15
	conscientiousness	6.9	1.9	7	6-8	2	10
	neuroticism	6.0	1.8	6	5-7	2	10
	openness	7.4	2.0	8	6-9	2	10
	TC	1.7	0.7	1.4	1.1-2.0	1.0	5.0
	AM	4.2	0.9	4.5	3.8-5.0	1.0	5.0
	The COVID-19 pandemic has had a negative psychological effect on me.	2.24	1.09	2.0	1.0-3.0	1.0	5.0
	I feel more anxious and worried than I did before the COVID-19 pandemic.	2.38	1.24	2.0	1.0-3.0	1.0	5.0
Parents	gender (female=149 (65.1%)[a])						
(N=223)	age	46.0	5.4	46	42-50	32	65
	extraversion	7.1	1.6	7	6-8	3	10
	agreeableness	11.6	2.0	12	10-13	6	15
	conscientiousness	8.8	1.3	9	8-10	5	10
	neuroticism	5.8	1.5	6	5-7	2	10
	openness	7.5	1.9	8	6-9	2	10
	PTC	1.6	0.8	1.2	1.0-1.8	1.0	5.0
	PCP	2.9	1.0	3.0	2.0-3.7	1.0	5.0
	PAM	4.3	0.9	4.8	4.0-5.0	1.0	5.0
	PCC	2.4	0.9	2.3	1.7-3.0	1.0	5.0
	The COVID-19 pandemic has had a negative psychological effect on my child.	2.48	1.14	2.0	2.0-3.0	1.0	5.0
	My child feels more anxious and worried than he/she did before the COVID-19 pandemic.	2.41	1.15	2.0	1.0-3.0	1.0	5.0

[a] N(%)
Abbreviations: N, sample size; SD, standard deviation; IQR, interquartile range; Min., minimum; Max. maximum; TC, treatment concern; AM, awareness of the importance of measures; PTC, Parents' treatment concern; PCP, Parents' concern about the pandemic; PAM, Parents' awareness of the importance of measures; PCC, Parents' concern about their child with regards to the pandemic.

the pandemic (PCC), which accounted for a total of 65.9% of the variance (Table 3.). Internal consistency was good (Cronbach α range of 0.666-0.923 with an average interitem correlation range of 0.413-0.704).

Predictors of latent constructs were examined with hierarchical multiple linear regression. The Big Five personality traits, PTC, and PCP were tested as predictors of TC, controlling for gender and age. The model explained 39.2% of the variance (Table 4, $p<0.001$). Regression analysis showed that PTC was the only significant predictor of TC, independently explaining 28% of the variance.

(RZD) koje su ukupno objasnile 65,9 % varijance (tablica 3.). Interna konzistencija bila je dobra (Cronbachova α u rasponu od 0,666 – 0,923 s prosječnim rasponom međučestičnih korelacija od 0,413 – 0,704).

Prediktori latentnih konstrukata ispitani su hijerarhijskom multiplom regresijskom analizom. *Pet velikih dimenzija osobnosti*, RZT i RZP ispitani su kao prediktori ZT-a, uz kontrolu spola i dobi. Model je objasnio 39,2 % varijance (tablica 4., $p < 0,001$). Regresijska analiza pokazala je da je RZT bio jedini značajni prediktor ZT-a, neovisno objašnjavajući 28 % varijance.

Table 2. Final factor matrix of the patient questionnaire
Tablica 2. Konačna faktorska matrica upitnika za pacijente

Item	F1 (TC)	F2 (AM)
Due to the pandemic, it is more difficult for me to get in contact with the orthodontist to receive information about my treatment.	0.795	
Due to the pandemic, it is more difficult for me to get a new appointment in case I had to cancel.	0.739	
I worry that my treatment results will be worse due to the pandemic.	0.659	
I worry that my treatment will last longer due to the pandemic.	0.658	
I struggle to understand what the orthodontist is saying due to his/her mask and face shield.	0.582	
I worry I might get infected with coronavirus while attending my orthodontic appointment.	0.575	
I worry my parent might get infected with coronavirus while accompanying me to the orthodontist.	0.507	
It is important that the orthodontist wears a mask so that I do not get infected with coronavirus during the examination.		0.892
Wearing a mask until the moment of examination is important so that I do not get infected with coronavirus at the orthodontist.		0.810
Hand disinfection when entering the office is important so that I do not get infected with coronavirus while visiting the orthodontist.		0.743
It is important that the orthodontist wears a face shield so that I do not get infected with coronavirus during the examination.		0.742
Total variance explained	27%	24.5%
Cronbach's alpha (95% CI)	0.817 (0.777-0.851)	0.871 (0.841-0.896)
Interitem correlations (range)	0.413 (0.178-0.693)	0.640 (0.567-0.753)

Abbreviations: TC, Treatment concern; AM, awareness of the importance of measures.

Personality traits, PCP, PCC, PAM, and patients' following of the news were tested for prediction of AM, controlling for gender and age. The model explained 33.2% of the variance in AM (Table 4, p<0.001). PAM and the patients' following of the news were the only significant predictors (p≤0.022), independently explaining 24% and 2% of the variance, respectively.

Gender was a significant predictor of higher PTC, while age and education level were not significant (Table 5, p=0.006). The addition of personality traits in the second stage strengthened the predictive value of the model, explaining 11.4% of the total variance in PTC (p<0.001). In the second stage, both conscientiousness and gender were significant predictors of PTC, independently explaining 4% and 2% of the variance, respectively (p≤0.036).

The model predicting PAM included the Big Five personality traits, parental education level, and the parents' following of the news, controlling for gender and age (Table 5., p=0.007), and explained 10% of the variance of PAM. Parents' news following and neuroticism were the only significant predictors (p≤0.043), independently explaining 4% and 2% of the variance, respectively.

Personality traits were tested as predictors of PCP, con-

Dimenzije osobnosti, RZP, RZD, RSM i praćenje vijesti pacijenata testirani su za predikciju SM-a, uz kontrolu spola i dobi. Model je objasnio 33,2 % varijance u SM-u (tablica 4., p < 0,001). RSM i to što su pacijenti pratili vijesti bili su jedini značajni prediktori (p ≤ 0,022), neovisno objašnjavajući 24 % varijance, odnosno 2 %.

Spol je bio važan prediktor većeg RZT-a, a dob i razina obrazovanja nisu bili značajni (tablica 5., p = 0,006). Dodavanje dimenzija osobnosti u drugom koraku pojačalo je prediktivnu vrijednost modela objašnjavajući 11,4 % ukupne varijance u RZT-u (p < 0,001). U drugom koraku značajni prediktori RZT-a bili su i savjesnost i spol, neovisno objašnjavajući 4 % varijance, odnosno 2 % (p ≤ 0,036).

Model za predikciju RSM-a uključivao je *pet velikih dimenzija osobnosti*, razinu obrazovanja roditelja i praćenje vijesti roditelja, uz kontrolu spola i dobi (tablica 5., p = 0,007), te je objasnio 10 % varijance RSM-a. Praćenje vijesti roditelja i neuroticizam bili su jedini značajni prediktori (p ≤ 0,043), neovisno objašnjavajući 4 % varijance, odnosno 2 %.

Dimenzije osobnosti ispitane su kao prediktori RZP-a, uz kontrolu spola, dobi i razine obrazovanja (tablica 6.). Model je objasnio 21,7 % varijance RZP-a (p < 0,001). Neuroticizam i ekstraverzija bili su značajni prediktori RZP-a (p ≤

Table 3. Final factor matrix of the parents answering about themselves and about their children
Tablica 3. Konačna faktorska matrica odgovora roditelja o sebi i svojoj djeci

Item	F1 (PCP)	F2 (PTC)
I feel more anxious and worried than I did before the COVID-19 pandemic.	0.941	
The COVID-19 pandemic has had a negative psychological effect on me.	0.791	
I often watch the news on the pandemic and epidemiological measures.	0.402	
Due to the pandemic, it is more difficult for me to get in contact with the orthodontist to get information about my child's treatment.		0.855
Due to the pandemic, it is more difficult for me to get a new appointment for my child in case we had to cancel.		0.841
I worry that my child's treatment will last longer due to the pandemic.		0.796
I worry that my child's treatment results will be worse due to the pandemic.		0.788
I struggle to understand what the orthodontist is saying due to his/her mask and face shield.		0.614
Total variance explained	21.3%	38.1%
Cronbach's alpha (95% CI)	0.734 (0.666-0.790)	0.876 (0.847-0.899)
Interitem correlations (range)	0.479 (0.318-0.741)	0.604 (0.445-0.783)
Item	**F1 (PAM)**	**F2 (PCC)**
It is important that the orthodontist wears a mask so that my child does not get infected with coronavirus during the examination	0.945	
It is important that the orthodontist wears a face shield so that my child does not get infected with coronavirus during the examination.	0.835	
It is important for my child to wear a mask until the moment of examination so that he/she does not get infected with coronavirus while visiting the orthodontist.	0.825	
Hand disinfection when entering the office is important so that my child does not get infected with coronavirus while visiting the orthodontist	0.756	
My child feels more anxious and worried than he/she did before the COVID-19 pandemic.		0.993
The COVID-19 pandemic has had a negative psychological effect on my child.		0.716
I worry that my child might get infected with coronavirus while visiting the orthodontist.		0.469
Total variance explained	41.1%	24.8%
Cronbach's alpha (95% CI)	0.904 (0.882-0.923)	0.746 (0.681-0.800)
Interitem correlations (range)	0.704 (0.615-0.826)	0.496 (0.311-0.724)

Abbreviations: PAM, Parents' awareness of the importance of measures; PCC, Parents' concern about their child with regards to the pandemic; PCP, Parents' concern about the pandemic; PTC, Parents' treatment concern.

trolling for gender, age, and education level (Table 6.). The model explained 21.7% of the variance in PCP ($p<0.001$). Neuroticism and extraversion were significant predictors of PCP ($p\leq0.005$), independently explaining 14% and 3% of the variance, respectively.

The model for PCC included personality traits controlling for gender, age, and education level (Table 6.). They explained 21.4% of the variance in PCC ($p<0.001$). Neuroticism and extraversion were significant predictors ($p\leq0.040$) and independently accounted for 11% and 2% of the variance in PCC, respectively.

0,005), neovisno objašnjavajući 14 % varijance, odnosno 3%.

Model za RZD uključivao je dimenzije osobnosti uz kontrolu spola, dobi i razine obrazovanja (tablica 6.). Objasnio je 21,4 % varijance u RZD-u ($p < 0,001$). Neuroticizam i ekstraverzija bili su značajni prediktori ($p \leq 0,040$) i neovisno su objašnjavali 11 %, odnosno, 2 % varijance u RZD-u.

Table 4. Hierarchical multiple linear regression for the prediction of TC and AM
Tablica 4. Hijerarhijska višestruka linearna regresija za predviđanje TC i AM

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	Sig.	Correlations		
						Zero-order	Partial	Part
TC 1	(Constant)	2.0	0.4					
	gender (0=male; 1=female)	-0.1	0.1	-0.1	0.324	-0.066	-0.066	-0.066
	age	-0.0	0.0	-0.1	0.483	-0.047	-0.047	-0.047
TC 2	(Constant)	2.7	0.6					
	gender	-0.1	0.1	-0.1	0.486	-0.066	-0.048	-0.047
	age	-0.0	0.0	-0.1	0.368	-0.047	-0.061	-0.061
	extraversion	-0.0	0.0	-0.1	0.410	-0.067	-0.056	-0.056
	agreeableness	-0.0	0.0	-0.1	0.285	-0.117	-0.073	-0.072
	conscientiousness	-0.0	0.0	-0.0	0.760	-0.088	-0.021	-0.021
	neuroticism	0.0	0.0	0.0	0.848	0.050	0.013	0.013
	openness	-0.0	0.0	-0.0	0.531	-0.072	-0.043	-0.042
TC 3	(Constant)	1.6	0.5					
	gender	-0.1	0.1	-0.1	0.376	-0.066	-0.061	-0.047
	age	-0.0	0.0	-0.1	0.309	-0.047	-0.070	-0.054
	extraversion	-0.0	0.0	-0.1	0.828	-0.067	-0.015	-0.012
	agreeableness	-0.0	0.0	-0.1	0.365	-0.117	-0.062	-0.048
	conscientiousness	-0.0	0.0	-0.1	0.444	-0.088	-0.052	-0.041
	neuroticism	0.0	0.0	0.0	0.945	0.050	0.005	0.004
	openness	-0.0	0.0	-0.0	0.557	-0.072	-0.040	-0.031
	PTC	0.5	0.1	0.6	**<0.001**	0.610	0.563	0.531
	PCP	0.1	0.0	0.1	0.301	0.283	0.071	0.055
AM 1	(Constant)	5.2	0.5					
	gender	0.1	0.1	0.0	0.518	0.043	0.044	0.043
	age	-0.1	0.0	-0.2	0.024	-0.151	-0.151	-0.151
AM 2	(Constant)	5.7	0.7					
	gender	0.1	0.1	0.1	0.536	0.043	0.042	0.041
	age	-0.1	0.0	-0.2	0.019	-0.151	-0.160	-0.158
	extraversion	-0.1	0.0	-0.2	0.022	-0.136	-0.156	-0.154
	agreeableness	0.0	0.0	0.1	0.455	0.037	0.051	0.050
	conscientiousness	-0.0	0.0	-0.0	0.682	-0.015	-0.028	-0.027
	neuroticism	-0.0	0.0	-0.0	0.819	-0.026	-0.016	-0.015
	openness	-0.0	0.0	-0.0	0.781	0.003	-0.019	-0.018
AM 3	(Constant)	2.4	0.7					
	gender	0.0	0.1	0.0	0.450	0.043	0.052	0.043
	age	-0.0	0.0	-0.1	0.235	-0.151	-0.082	-0.067
	extraversion	-0.1	0.0	-0.1	0.089	-0.136	-0.117	-0.096
	agreeableness	0.0	0.0	0.1	0.164	0.037	0.096	0.079
	conscientiousness	-0.0	0.0	-0.0	0.772	-0.015	-0.020	-0.016
	neuroticism	0.0	0.0	0.0	0.645	-0.026	0.032	0.026
	openness	-0.0	0.0	-0.0	0.718	0.003	-0.025	-0.020
	PCP	-0.0	0.1	-0.0	0.663	0.124	-0.030	-0.025
	PCC	0.0	0.1	0.0	0.847	0.126	0.013	0.011
	PAM	0.5	0.1	0.5	**<0.001**	0.543	0.513	0.488
	patient following the news	0.1	0.0	0.1	**0.022**	0.166	0.156	0.129

TC 1: R=0.081; R^2=0.007; Adjusted R^2=-0.002; p=0.481
TC 2: R=0.161; R^2=0.026; Adjusted R^2=-0.006; p=0.572
TC 3: R=0.626; R^2=0.392; Adjusted R^2=0.367; p<0.001
AM 1: R=0.157; R^2=0.025; Adjusted R^2=0.016; p=0.064
AM 2: R=0.225; R^2=0.051; Adjusted R^2=0.020; p=0.126
AM 3: R=0.576; R^2=0.332; Adjusted R^2=0.297; p<0.001
Bold indicates a statistically significant p-value (p<0.05)
Abbreviations: Std. Error, standard error; Sig, significance; TC, patient's treatment concern; PTC, Parents' treatment concern; PCP, Parents' concern about the pandemic.

Table 5. Hierarchical multiple linear regression for the prediction of PTC and PAM
Tablica 5. Hijerarhijska višestruka linearna regresija za predviđanje PTC i PAM

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	Sig.	Correlations		
						Zero-order	Partial	Part
PTC 1	(Constant)	2.0	0.6					
	gender	-0.4	0.1	-0.1	**0.006**	-0.194	-0.186	-0.185
	age	0.0	0.0	0.0	0.897	0.061	0.009	0.009
	education	-0.1	0.1	-0.1	0.409	-0.037	-0.056	-0.055
PTC 2	(Constant)	3.2	0.8					
	gender	-0.3	0.1	-0.2	**0.036**	-0.194	-0.143	-0.136
	age	0.0	0.0	0.0	0.796	0.061	0.018	0.017
	education	-0.1	0.1	-0.1	0.189	-0.037	-0.090	-0.085
	extraversion	0.0	0.0	0.0	0.863	-0.062	0.012	0.011
	agreeableness	-0.1	0.0	-0.1	0.135	-0.200	-0.102	-0.097
	conscientiousness	-0.1	0.1	-0.2	**0.004**	-0.240	-0.194	-0.186
	neuroticism	0.1	0.0	0.1	0.203	0.130	0.087	0.082
	openness	0.0	0.0	0.1	0.461	0.016	0.050	0.048
PAM 1	(Constant)	4.3	0.6					
	gender	-0.1	0.1	-0.1	0.330	-0.071	-0.066	-0.066
	age	0.0	0.0	0.0	0.943	0.028	0.005	0.005
PAM 2	(Constant)	2.9	1.0					
	gender	-0.2	0.2	-0.1	0.298	-0.071	-0.071	-0.069
	age	0.0	0.0	0.0	0.807	0.028	0.017	0.016
	extraversion	-0.1	0.0	-0.2	0.202	-0.107	-0.087	-0.085
	agreeableness	0.0	0.0	0.0	0.554	-0.009	0.040	0.039
	conscientiousness	0.1	0.1	0.1	0.173	0.063	0.093	0.091
	neuroticism	0.1	0.0	0.2	**0.009**	0.172	0.178	0.176
	openness	0.0	0.0	0.1	0.433	0.049	0.054	0.052
PAM 3	(Constant)	2.5	1.0					
	gender	-0.2	0.1	-0.1	0.245	-0.071	-0.080	-0.076
	age	-0.0	0.0	-0.0	0.785	0.028	-0.019	-0.018
	extraversion	-0.0	0.0	-0.1	0.448	-0.107	-0.052	-0.049
	agreeableness	0.0	0.0	0.1	0.517	-0.009	0.044	0.042
	conscientiousness	0.1	0.1	0.1	0.195	0.063	0.089	0.084
	neuroticism	0.1	0.0	0.2	**0.043**	0.172	0.138	0.132
	openness	0.0	0.0	0.0	0.537	0.049	0.042	0.040
	education	0.1	0.1	0.1	0.365	0.052	0.062	0.059
	parent following the news	0.2	0.1	0.2	**0.002**	0.251	0.211	0.205

PTC 1: R=0.202; R^2=0.041; Adjusted R^2=0.028; p=0.028
PTC 2: R=0.338; R^2=0.114; Adjusted R^2=0.081; p=0.001
PAM 1: R=0.071; R^2=0.005; Adjusted R^2=-0.004; p=0.571
PAM 2: R=0.237; R^2=0.056; Adjusted R^2=0.025; p=0.083
PAM 3: R=0.317; R^2=0.100; Adjusted R^2=0.062; p=0.007
Bold indicates a statistically significant p-value (p<0.05)
Abbreviations: Std. Error, standard error; Sig, significance; PTC, Parents' treatment concern; PAM, Parents' awareness of the importance of measures

Discussion

The results of the present study indicate that the adolescent participants had a relatively low concern about their orthodontic treatment and high awareness of the importance of infection control measures. Adolescent personality was not predictive of either concern about treatment or awareness of the measures. However, parental attitudes were a significant predictor of adolescent patients' perceptions.

Rasprava

Rezultati ovog istraživanja pokazuju da su adolescenti bili razmjerno malo zabrinuti zbog svoje ortodontske terapije i visoko su bili svjesni važnosti mjera nužnih za kontrolu infekcija. Osobnost adolescenata nije bila prediktor zabrinutosti zbog terapije, ni svjesnosti o mjerama. Međutim, stajališta roditelja bila su značajan prediktor percepcije adolescentnih pacijenata.

Table 6. Hierarchical multiple linear regression for the prediction of PCP and PCC
Tablica 6. Hijerarhijska višestruka linearna regresija za predviđanje PCP i PCC

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	Sig.	Correlations		
						Zero-order	Partial	Part
PCP 1	(Constant)	2.8	0.7					
	gender	-0.0	0.2	-0.0	0.881	-0.012	-0.010	-0.010
	age	0.0	0.0	0.0	0.992	0.008	0.001	0.001
	education	0.0	0.1	0.0	0.813	0.017	0.016	0.016
PCP 2	(Constant)	1.7	0.9					
	gender	0.1	0.1	0.0	0.712	-0.012	0.025	0.022
	age	0.0	0.0	0.0	0.668	0.008	0.029	0.026
	education	-0.0	0.1	-0.0	0.860	0.017	-0.012	-0.011
	extraversion	-0.1	0.0	-0.1	0.005	-0.218	-0.192	-0.173
	agreeableness	-0.0	0.0	-0.0	0.721	-0.153	-0.024	-0.022
	conscientiousness	-0.0	0.1	-0.0	0.990	-0.060	-0.001	-0.001
	neuroticism	0.3	0.0	0.4	<0.001	0.423	0.383	0.367
	openness	0.1	0.0	0.1	0.109	0.060	0.109	0.097
PCC 1	(Constant)	3.0	0.6					
	gender	-0.2	0.1	-0.1	0.104	-0.097	-0.110	-0.110
	age	-0.0	0.0	-0.1	0.448	-0.019	-0.051	-0.051
	education	-0.0	0.1	-0.0	0.926	-0.008	-0.006	-0.006
PCC 2	(Constant)	2.5	0.9					
	gender	-0.1	0.1	-0.1	0.274	-0.097	-0.075	-0.066
	age	-0.0	0.0	-0.0	0.600	-0.019	-0.036	-0.032
	education	-0.1	0.1	-0.0	0.576	-0.008	-0.038	-0.034
	extraversion	-0.1	0.0	-0.1	0.040	-0.185	-0.140	-0.126
	agreeableness	-0.1	0.0	-0.1	0.111	-0.230	-0.109	-0.097
	conscientiousness	-0.0	0.1	-0.0	0.619	-0.108	-0.034	-0.030
	neuroticism	0.2	0.0	0.4	<0.001	0.401	0.345	0.326
	openness	0.1	0.0	0.1	0.031	0.090	0.147	0.132

PCP 1: R=0.021; R^2<0.001; Adjusted R^2=-0.013; p=0.993
PCP 2: R=0.466; R^2=0.217; Adjusted R^2=0.188; p<0.001
PCC 1: R=0.111; R^2=0.012; Adjusted R^2=-0.001; p=0.434
PCC 2: R=0.462; R^2=0.214; Adjusted R^2=0.184; p<0.001
Bold indicates a statistically significant p-value (p<0.05)
Abbreviations: Std. Error, standard error; Sig, significance; PCP, Parents' concern about the pandemic; PCC, parent's concern about their child with regards to the pandemic.

Over 80% of the patients attended school in person. During the period of this study, Croatia was among the least stringent European countries in terms of school closure, with closure mandated at some levels for only three weeks in April 2021 (24). This may have contributed to the relatively low self-reported anxiety and psychological impact of the pandemic among the adolescents in our sample. Longitudinal studies have shown that students who attend school remotely have lower levels of social, emotional, and academic well-being (25).

A minority of 26.2% of participants had to cancel at least one orthodontic appointment due to self-quarantine, but this did not appear to result in a significant interruption of orthodontic treatment. The median score of 1.4 for TC indicates a rather low level of concern. This is consistent with a previous report that more than half of young adult orthodontic patients have a low level of anxiety about treatment duration and outcome (16). On one hand, it seems that adolescents

Više od 80 % pacijenata pohađalo je nastavu u školi. Tijekom ovog istraživanja Hrvatska je bila među europskim zemljama s najblažim mjerama kad je riječ o zatvaranju škola, s obvezom zatvaranja na nekoj razini samo tri tjedna u travnju 2021. godine (24). To je moglo pridonijeti razmjerno niskoj samoprijavljenoj anksioznosti i psihološkom utjecaju pandemije među adolescentima u našem uzorku. Longitudinalna istraživanja pokazala su da učenici koji pohađaju nastavu na daljinu imaju nižu razinu socijalnoga, emocionalnoga i akademskoga blagostanja (25).

Manjina od 26,2 % sudionika morala je otkazati barem jedan ortodontski termin zbog samoizolacije, ali čini se da to nije rezultiralo značajnim prekidom liječenja. Medijan rezultata od 1,4 za ZT upućuje na prilično nizak stupanj zabrinutosti. To je u skladu s ranijim istraživanjem prema kojemu više od polovine mladih odraslih ortodontskih pacijenata ima nizak stupanj anksioznosti zbog trajanja i rezultata terapije (16). S jedne strane, čini se da adolescenti nisu previše za-

are not very concerned about becoming infected with SARS-CoV2, which was also shown in a study by Magson et al. (26). On the other hand, the awareness of the importance of infection control measures, including mask wearing and hand disinfection, was high. Wearing masks was mandatory in health care settings for both staff and patients during the duration of our study. The fact that patients considered the measures important, apart from simply following the rule, is indicative of their social responsibility in a medical setting. PAM was a predictor of AM with a medium effect size according to Cohen and the patient's following of the news a predictor with a small effect size (27). It seems that parental attitude plays a more important role than messages in the media.

PTC was the only significant predictor of TC, with a large effect size. In contrast to parental effect on adolescent motivation and demand for orthodontic treatment, which was found to be weak or nonsignificant (13, 28), parental perceptions related to the COVID -19 pandemic appear to be important for adolescents' concern about their treatment.

Notably, PTC was predicted by the male gender and lower conscientiousness. Conscientiousness is associated with diligence and thoroughness (19). It could be that fathers with lower conscientiousness are less engaged in their children's treatment, and therefore feel less in control and more concerned.

Following news and neuroticism were significant predictors of PAM. Parental attitudes influenced their children's awareness, as mentioned earlier, whereas parents themselves were influenced by the news. Contrasting our results, a study by Al-Omiri et al. identified extraversion and conscientiousness as the most important personality traits associated with increased acceptance of cautions in adults (29). Our results show that higher neuroticism also predicted increased PCP and PCC with small to moderate effect sizes. Higher extraversion had a protective effect against high PCC and PCP, but with small effect sizes. Parents with high neuroticism and low extraversion felt more anxious and paid more attention to information about the pandemic. These findings are consistent with previous reports of neuroticism, extraversion, and COVID -19 concerning distress and fear (19, 29, 30). High neuroticism is a predisposing factor for negative affect, low subjective well-being, and poor mental health, especially under extreme conditions such as a pandemic (30). Extraversion is associated with social engagement, better health, and less experience of stress in stressful situations (31). However, since effect sizes of extraversion and neuroticism in our setting were medium at best, the role of these personality traits on parental attitudes and perceptions should not be overestimated. Personality traits were not significant predictors of adolescents' treatment concern or awareness. One possible explanation for this is a somewhat stronger effect of parental attitudes, which may override smaller effects of the adolescents' developing and not yet well-defined personalities.

The present study has several limitations. Because of the cross-sectional design of the study, the direction of the associations could not be determined with certainty. Although this is a single centered study, our institution is the largest

brinuti zbog zaraze virusom SARS-CoV2, što je također pokazano u studiji Magsona i suradnika (26). S druge strane, svjesnost o važnosti mjera za kontrolu infekcije, uključujući nošenje maski i dezinfekciju ruku, bila je visoka. Tijekom našeg istraživanja bilo je obvezno nošenje maski u zdravstvenim ustanovama kako za osoblje tako i za pacijente. Činjenica da pacijenti nisu samo slijedili pravila, nego su mjere smatrali važnima, pokazuje njihovu društvenu odgovornost u medicinskom okruženju. RSM je bio prediktor SM-a sa srednjom veličinom učinka prema Cohenu, a to što su pacijenti pratili vijesti bio je prediktor s malom veličinom učinka (27). Čini se da su stajališta roditelja važnija od poruka u medijima.

RZT je bio jedini značajni prediktor ZT-a s velikom veličinom učinka. Za razliku od utjecaja roditelja na motivaciju adolescenata i na njihovo traženje ortodontske terapije, koji se pokazao kao slab ili beznačajan (13, 28), roditeljske percepcije povezane s pandemijom bolesti COVID -19 čine se važnima za zabrinutost adolescenata zbog njihove ortodontske terapije.

Zanimljivo je da su muški spol i niža savjesnost bili prediktori većeg RZT-a. Savjesnost je povezana s revnošću i temeljitošću (19). Možda očevi niže savjesnosti manje sudjeluju u terapiji svoje djece i zato osjećaju manju kontrolu nad situacijom i veću zabrinutost.

Praćenje vijesti i neuroticizam bili su značajni prediktori RSM-a. Stajališta roditelja utjecala su na svjesnost njihove djece, kako je prije spomenuto, a na roditelje utjecale su vijesti. Suprotno našim rezultatima, Al-Omiri i suradnici u svojoj studiji ističu ekstraverziju i savjesnost kao najvažnije dimenzije osobnosti povezane s povećanim prihvaćanjem mjera opreza kod odraslih (29). Naši rezultati pokazuju da je viši neuroticizam ujedno prediktor višeg RZP-a i RZD-a s malim do umjerenim veličinama učinka. Veća ekstraverzija imala je zaštitni učinak protiv visokoga RZD-a i RZP-a, ali s malim veličinama učinka. Roditelji visokoga neuroticizma i niske ekstraverzije osjećali su veću anksioznost i posvećivali su više pozornosti informacijama o pandemiji. Ovi rezultati u skladu su s prethodnim zaključcima o neuroticizmu, ekstraverziji i bolesti COVID-19 u vezi s tjeskobom i strahom (19, 29, 30). Visoki neuroticizam predisponirajući je čimbenik negativnog afekta, niske subjektivne dobrobiti i lošega mentalnog zdravlja, posebno u ekstremnim uvjetima poput pandemije (30). Ekstraverzija je povezana s društvenim angažmanom, boljim zdravljem i nižim stresom u stresnim situacijama (31). Međutim, veličine učinka ekstraverzije i neuroticizma u našem su istraživanju bile u najboljem slučaju umjerene pa zato ne treba precijeniti ulogu tih dimenzija osobnosti u stajalištima roditelja. Dimenzije osobnosti nisu bile značajne odrednice zabrinutosti zbog terapije, ni svjesnosti adolescenata. Jedno potencijalno objašnjenje za to jest nešto jači efekt roditeljskih stajališta koji mogu prevladati manje učinke osobnosti adolescenata koja je još u razvoju i nije dobro definirana.

Ovo istraživanje ima nekoliko ograničenja. Zbog presječnog dizajna studije, smjer asocijacija nije mogao biti utvrđen sa sigurnošću. Iako je istraživanje provedeno na jednom mjestu, a naša ustanova najveća je u Hrvatskoj te se u njoj na go-

one in our country, beginning treatments in over 400 new orthodontic patients annually. Nevertheless, the patients at smaller regional facilities may have had different experiences with the availability and frequency of orthodontic appointments. One advantage is the large sample size, which allowed us to detect small effect sizes. In addition, administering questionnaires on site allowed us to control for the validity of results because parents and patients were not in the same room when completing the questionnaires.

The main findings of the present study are the low level of treatment concerns among adolescents in the later phase of the COVID -19 pandemic, their high awareness of the importance of infection control measures, and a statistically significant effect of parental attitudes on adolescents' concerns and awareness. It would be useful for clinicians to talk with both patients and parents when expressing concerns about missed appointments or prolongation of treatment due to the pandemic.

Conclusion

Adolescents have low concern about orthodontic treatment in the COVID-19 pandemic and a high awareness of the importance of infection-control measures. Parental concern and awareness are significant predictors of adolescents' attitudes; however, personality traits do not play a role in adolescents' orthodontic treatment concern.

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Author's contribution: **M.T.Z.** - conceptualization, methodology, data acquisition, data analysis, writing (original draft preparation); **P.A.**- methodology, data analysis, writing (review and editing); **Z.M.** - data acquisition, writing (original draft preparation); **S.A.M.** - writing (review and editing); **S.M.** - writing (review and editing); **M.L.V.** - conceptualization, writing (review and editing).

dinu počinje s terapijom za više od 400 novih ortodontskih pacijenata. Ipak, pacijenti u manjim regionalnim ustanovama mogli su imati različita iskustva s dostupnošću i učestalošću ortodontskih kontrolnih pregleda. Jedna prednost je veličina uzorka koja nam je omogućila otkrivanje malih veličina efekata. Uz to, davanje upitnika ispitanicima na kontrolnim pregledima omogućilo nam je kontrolu valjanosti rezultata jer roditelji i pacijenti nisu bili u istoj prostoriji pri ispunjavanja upitnika.

Glavni rezultati ove studije jesu niska razina zabrinutosti zbog terapije među adolescentima u kasnijoj fazi pandemije bolesti COVID-19, njihova visoka svjesnost o važnosti mjera za kontrolu infekcije i statistički značajan učinak roditeljskih stajališta na zabrinutost i svjesnost adolescenata. Bilo bi korisno za kliničara da razgovara i s pacijentima i s roditeljima kada pacijent izražava zabrinutost zbog propuštenih termina ili produžene terapije zbog pandemije.

Zaključak

Adolescenti su pokazali nisku razinu zabrinutosti u vezi s ortodontskom terapijom tijekom pandemije bolesti COVID-19 i visoku svjesnost o važnosti mjera za kontrolu infekcije. Zabrinutost roditelja i njihova svjesnost značajni su prediktori stajališta adolescenata, no dimenzije osobnosti nemaju ulogu u zabrinutosti adolescenata zbog ortodontske terapije.

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Doprinosi autora: **M. T. Z.** – konceptualizacija, metodologija, prikupljanje podataka, analiza podataka, pisanje (priprema izvornog teksta); **P. A.** – metodologija, analiza podataka, pisanje (pregled i uređivanje teksta); **Ž. M.** – prikupljanje podataka, pisanje (priprema izvornog teksta); **S. A. M.** – pisanje (pregled i uređivanje teksta); **S. M.** –- pisanje (pregled i uređivanje teksta); **M. L. V.** – konceptualizacija, pisanje (pregled i uređivanje teksta).

Sažetak

Cilj: Svrha istraživanja bila je procijeniti utjecaj bolesti COVID-19 tijekom pandemije na zabrinutost adolescenata u ortodonskoj terapiji te odrediti jesu li dimenzije osobnosti i percepcija roditelja prediktori za njihovu zabrinutost. **Sudionici i metode:** Uzorak se sastojao od 229 adolescentnih pacijenata (57,2 % djevojaka) i 223 roditelja (65,1 % žena). Upitnici su obuhvaćali čestice o važnosti kontrole infekcije i o zabrinutosti zbog trajanja terapije i njezinih rezultata. Njihova latentna struktura određena je eksploratornom faktorskom analizom. Inventar *velikih pet* korišten je za procjenu crta osobnosti. Prediktori zabrinutosti pacijenata i roditelja u vezi s ortodontskom terapijom i svjesnošću o važnosti mjera za kontrolu infekcija ispitani su hijerarhijskom multiplom regresijskom analizom. **Rezultati:** Kad je riječ o upitniku za pacijente otkrivena su dva čimbenika – zabrinutost zbog terapije (ZT) i svjesnost o važnosti mjera (SM), a za upitnik za roditelje otkrivena četiri – roditeljska zabrinutost zbog terapije (RZT), roditeljska svjesnost o važnosti mjera (RSM), roditeljska zabrinutost zbog pandemije (RZP) i roditeljska zabrinutost za njihovo dijete u vezi s pandemijom (RZD). Dimenzije osobnosti adolescenata nisu bile prediktori ni ZT-a, ni SM-a. RZT je bio prediktor ZT-a ($p < 0,001$), objašnjavajući 28 % varijance. RSM i to što su pacijenti pratili vijesti bili su prediktori SM-a ($p \leq 0,022$), objašnjavajući 24 %, odnosno 2 % varijance. **Zaključak:** Zabrinutost roditelja i svjesnost o mjerama važni su za stajališta adolescenata u ortodontskoj terapiji tijekom pandemije bolesti COVID-19, ali nemaju dimenzije osobnosti. Kliničar bi trebao staviti dodatni naglasak na komunikaciju s roditeljem.

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