Risk and protective factors, stressors, and symptoms of adjustment disorder during the COVID- 19 pandemic – First results of the ESTSS COVID-19 pan-European ADJUST study

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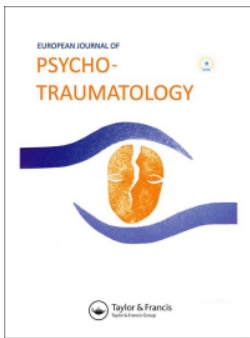
Mental health status and risk factors during Covid-19 pandemic in the Croatia's adult population

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BASIC RESEARCH ARTICLE

Mental health status and risk factors during Covid-19 pandemic in the Croatia's adult population

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ABSTRACT

Background: The Covid-19 pandemic is associated with adverse mental health outcomes for people worldwide.

Objective: The study aimed to assess mental health during the Covid-19 pandemic and the key risk factors from the human ecology perspective in Croatia's adult population.

Method: An online panel survey with 1,201 adult participants (50.1% women) was done with a nationally representative sample in terms of gender, age, and country region four months after the nation lockdown began and two months after most of the restrictions were lifted. Indicators of mental health included symptoms of adjustment disorder (ADNM-8); depression, anxiety, and stress (DASS-21); symptoms of post-traumatic stress disorder (PC-PTSD-5); and well-being (WHO-5).

Results: In the entire sample, 9.8% (95% confidence interval [CI]: 7.9%, 14.0%) of the participants were at risk of adjustment disorder, 7.7% (95% CI: 6.7%, 11.9%) were at risk of depression disorder, and 7.8% (95% CI: 5.3%, 10.3%) were at risk of anxiety disorder. In addition, 7.2% (95% CI: 5.3%, 10.2%) were experiencing high levels of stress. The average well-being score was 56.5 (SD = 21.91) on a scale from 0 to 100. Among the participants who have lifetime traumatic experience (n = 429), 14% (95% CI: 10.6%, 17.2%) were at risk for PTSD. Key risk factors for specific mental health outcomes differed, but the common ones included: current health status, previous mental health diagnosis, and psychological resilience. Being younger, having a below-average income, and excessively following news about Covid-19 were predictive for some of the mental health problems.

Conclusions: Together, the key risk factors identified in this study indicate the need for public health interventions addressing the general population's mental health, but also for specific risk groups. Lower rates of mental health symptoms assessed soon after lifting quarantine measures that have been found in other studies may indicate human resilience capacity.

Estado de salud mental y factores de riesgo durante la pandemia del COVID-19 en la población adulta croata

Antecedentes: La pandemia del COVID-19 está asociada con consecuencias de salud mental adversas para las personas alrededor del mundo.

Objetivo: Este estudio buscó evaluar la salud mental durante la pandemia del COVID-19 y los factores de riesgo claves desde la perspectiva de la ecología humana en una población adulta croata.

Método: Se realizó una encuesta panel online con 1.201 participantes adultos (50,1% mujeres) con una muestra nacionalmente representativa en términos de género, edad, y región del país, cuatro meses luego de que el confinamiento total nacional comenzara y dos meses después de que la mayoría de las restricciones fueran levantadas. Los indicadores de salud mental incluyeron síntomas de trastorno adaptativo (ADNM-8); depresión, ansiedad, y estrés (DASS-21); síntomas de trastorno de estrés postraumático (PC-PTSD-5); y bienestar (WHO-5).

Resultados: En la muestra completa, 9,8% (intervalo de confianza [IC] del 95%: 7,9%, 14,0%) de los participantes estaban en riesgo de un trastorno de adaptación, 7,7% (IC del 95%: 6,7%, 11,9%) estaban en riesgo de depresión, y 7,8% (CI del 95%: 5,3%, 10,3%) estaban en riesgo de un trastorno de ansiedad. Además, 7,2% (IC del 95%: 5,3%, 10,2%) estaban experimentando altos niveles de estrés. El puntaje promedio de bienestar fue 56,5 (DE = 21,91) en una escala de 0 a 100. Entre los participantes que tienen una experiencia traumática en algún momento de sus vidas (n = 429), 14% (CI del 95%: 10,6%, 17,2%) estaban en riesgo de TEPT. Los factores de riesgo clave para los resultados de salud mental específicos difirieron, pero los comunes incluyeron estado de salud actual, diagnóstico de salud mental previo, y resiliencia

HIGHLIGHTS
• Key risk factors for mental health disorders during the Covid-19 pandemic in Croatia were: current health status, previous mental health diagnosis, psychological resilience, younger age, below-average income, and excessively following news about the pandemic.

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psicológica. Ser más joven, tener un ingreso bajo el promedio, y seguir excesivamente las noticias sobre el COVID-19 fueron predictores de algunos de los problemas de salud mental.

Conclusión: En su conjunto, los factores de riesgo identificados en este estudio indican la necesidad de intervenciones de salud pública dirigidas a la salud mental de la población general, pero también para los grupos específicos de riesgo. Las tasas más bajas de síntomas de salud mental evaluados poco después del levantamiento de las medidas de cuarentena que las que se han encontrado en otros estudios podrían indicar capacidad de resiliencia humana.

克罗地亚成年人群中 Covid-19 疫情期间的心理健康状况和风险因素

背景: Covid-19 疫情与全世界人们的不良心理健康结果有关。

目的: 本研究旨在评估克罗地亚成年人群在Covid-19 疫情期间的心理健康状况以及人类生态学视角的关键风险因素。

方法: 在国家封锁开始四个月后和大部分限制解除两个月后, 对一个在性别, 年龄和国家地区方面具有全国代表性的1,201 名成年参与者样本 (50.1% 为女性) 进行了在线小组调查。心理健康指标包括适应障碍症状 (ADNM-8) ;抑郁, 焦虑和应激 (DASS-21) ;创伤后应激障碍症状 (PC-PTSD-5) ;和幸福感 (WHO-5) 。

结果: 在整个样本中, 9.8% (95% CI:7.9%, 14.0%) 的参与者有适应障碍风险, 7.7% (95% CI:6.7%, 11.9%) 有抑郁风险, 7.8% (95% CI: 5.3%, 10.3%) 有患焦虑症风险。此外, 7.2% (95% CI: 5.3%, 10.2%) 正在经历高水平的应激。幸福感在 0 到 100 的范围内的平均得分为 56.5 (SD = 21.91)。在有终身创伤经历的参与者 (*n* = 429) 中, 14% (95% CI: 10.6%, 17.2%) 有PTSD风险。特定心理健康结果的关键风险因素各不相同, 但共同因素包括当前的健康状况, 既往的心理健康诊断和心理韧性。年轻, 收入低于平均水平以及过度关注 Covid-19 相关新闻可以预测某些心理健康问题。

结论: 总体上, 本研究中识别的关键风险因素表明需要针对一般人群的心理健康进行公共卫生干预, 但同时也要顾及特定风险群体。解除隔离措施后不久评估的心理健康症状比率低于其他研究中发现的比率, 这可能表明人类的适应能力。

1. Introduction

The Covid-19 pandemic has influenced the everyday life of people worldwide. Since the World Health Organization (WHO) declared a pandemic in March 2020, most countries have been using various restrictions to prevent the virus from spreading and to protect people's lives. The Oxford Covid-19 Government Response Tracker (Hale, Webster, Petherick, Phillips, & Kira, 2020) evaluated protective measures imposed by the Croatian government from the beginning of 2020 to be among the most restrictive in the European Union. The declaration of a national disaster and the lockdown in March were rather severe; all educational activities went online, kindergartens were closed, only food stores remained open, travel between country regions was banned, and no gatherings were allowed. Additionally, the Croatian capital city Zagreb and its surroundings experienced a massive earthquake in March 2020 with devastating destruction of buildings and the loss of one child's life. However, at the time of this study in July 2020, the Croatian government had kept only a few epidemiological measures to contain the pandemic in place. Wearing masks in closed areas was obligatory, gatherings were limited to 100 people, and non-EU citizens were restricted from entering the country.

The general atmosphere of fear and uncertainty due to the risk of severe illness and virus-related death, as well as financial uncertainty from job loss and economic hardship (Altig et al., 2020), resulted in an increased risk of mental health problems.

Mental health problems after disasters have long-term consequences for both individuals and society (e.g. Chan, Lowe, Weber, & Rhodes, 2015; Kristensen, Weisæth, Hussain, & Heir, 2015), and increased mental health costs could be an additional burden in post-Covid society and hamper economic recovery. While governments strive to balance preventing virus diffusion with managing overstretched healthcare and economic decline, they must also consider mental health as a public health issue in their country. Consequently, they need information about possible risk and protective factors for mental health to enable policies to mitigate mental health problems.

Numerous studies about mental health in the Covid-19 pandemic were published in 2020, reporting different rates for mental health problem. Some differences can be attributed to methodological issues such as the various measures and cut-off scores used (Thombs et al., 2020), while other differences likely arose from cultural factors around disclosing mental health problems. A review of research literature from China, India, Nepal, Iran, Iraq, Japan, Nigeria, Great Britain, Italy, and Spain (Salari et al., 2020) showed that on average the depression rates were 33.7%, anxiety rates were 31.9%, and stress rates were 29.6%. In a recent study from Austria, 21% of participants had moderate depressive symptoms, 19% showed moderate anxiety symptoms, and 16% had scores that met clinical insomnia criteria (Pieh, Budimir, & Probst, 2020). In one of the first studies in the general population in Italy, 23.0% were at risk of adjustment disorder (Rossi et al., 2020). Post-traumatic stress disorder

(PTSD) rates were less frequently measured, but a recent study from Ireland (Karatzias et al., 2020) indicated a Covid-19–related PTSD rate of 17.7%, with a high level of comorbidity with generalized anxiety (49.5%) and depression (53.8%). Among the few studies examining it, well-being was found to be lower compared with pre-pandemic rates (Kwong et al., 2020; Zacher & Rudolph, 2020).

Croatia did not have population-based benchmark indicators of mental health prior to the Covid-19 pandemic, and baseline assessments to which the pandemic effects can be compared are lacking. However, in the first study on mental health in Croatia during the pandemic, 17.8% of participants reported severe and extremely severe depressive symptoms, 17.4% reported severe and extremely severe anxiety symptoms, and 19.1% reported severe and extremely severe stress symptoms (Jokić Begić et al., 2020).

Multiple interactive systems across three main ecological levels are related to the mental health outcomes in adversity. These levels include the bio-psychosocial level, social environment level, and societal environment level (Bronfenbrenner, 1979; Ungar & Theron, 2020). Studies conducted in the context of the Covid-19 pandemic show that mental health risk and resilience factors operate at all three levels.

At the bio-psychosocial level, women were found to be at more risk for depression, anxiety, and PTSD during the current pandemic (Fitzpatrick, Harris, & Drawve, 2020; Rossi et al., 2020; Zimmermann, Bledsoe, & Papa, 2020), although one study from Ireland showed that men were at more risk than women for PTSD (Karatzias et al., 2020). Younger age was identified as a risk factor for these mental health problems in several studies (Bäuerle et al., 2020; Ferrucci et al., 2020; Pieh, Budimir, et al., 2020), while Qiu et al. (2020) reported that younger (18–30 years old) and older people (60+ years old) face similar mental health risks. People with higher education and those at jobs with daily face-to-face contact are at more risk for anxiety, depression, and stress (Qiu et al., 2020; Salari et al., 2020; Zürcher et al., 2020). Lower socioeconomic status before the pandemic and reduced monthly income during the pandemic are also risk factors for mental health problems (Fitzpatrick et al., 2020; Li, Cao, Leung, & Mak, 2020; Wright, Steptoe, & Fancourt, 2020). Moreover, current health status, perceived possibility of infection, and previous mental health diagnoses were found to be risks for PTSD symptoms, depression, and anxiety (Fancourt, Steptoe, & Bu, 2020; Karatzias et al., 2020). In a study by Newby, O'Moore, Tang, Christensen, and Faasse (2020), participants with mental health diagnoses reported higher levels of Covid-19 fears and uncertainty, loneliness, and financial worries, indicating that this subpopulation has specific needs during the pandemic.

Regarding individuals' social environment, research showed that physical distancing and self-isolation pose a mental health risk. Physical distancing was associated with higher depression, general anxiety disorder symptoms, intrusive thoughts, and stress, while self-isolation was related to higher depression, anxiety symptoms, insomnia, and stress (Marroquín, Vine, & Morgan, 2020). Individuals who live alone and those who live with under-age children are at higher risk for mental health problems (Brooks et al., 2020; Kwong et al., 2020), while those who perceive higher social support have lower risk for anxiety (Cao et al., 2020), depression, anxiety, stress, intrusive thoughts, and insomnia (Marroquín et al., 2020).

At the societal environment level, factors such as urbanization rate (Cao et al., 2020) and media exposure during the pandemic (Gao et al., 2020) were related to more mental health symptoms.

Similar risk and resilience factors could be relevant for the Croatian population. The present study is the first in a nationally representative sample of adults, and it has two objectives. First, using several indicators of mental health, we aimed to determine the proportion of Croatia's general adult population showing mental health disorders during the Covid-19 pandemic. Second, we aimed to identify key risk and resilience factors from different levels of the ecological systems associated with mental health problems and well-being during the pandemic. Our findings could inform public policy to mitigate the harmful effects of the pandemic and assess the post-pandemic burden of mental health disease.

2. Method

2.1. Study design and sample

A survey of the Croatian general population was done from July 9 to 17 July 2020. The sample included 1,201 adult participants (18 to 65 years, with residence in Croatia) who were recruited by a survey company using an online panel. Probabilistic stratified quota sampling was done to ensure a nationally representative sample regarding age, gender, and country regions. Participants were invited to participate via email. If they agreed, they completed the survey online and were compensated for their time. Only fully completed responses were included in the analyses, while partial responses ($n = 492$) were excluded to preserve the representative characteristics of the sample. Sample characteristics are presented in Table 1. The Ethical Research Board of the Department of Psychology, University of Zagreb approved the study. The participants were extensively informed about the study and the data and privacy protection management, and they provided informed consent before accessing the

Table 1. Sample description.

	n (%)
Age	
18–24	162 (13.5)
25–34	257 (21.4)
35–44	252 (21)
45–54	279 (23.2)
55–64	241 (20.1)
≥65	10 (8)
Gender	
Female	602 (50.1)
Male	599 (49.9)
Education	
Primary	7 (0.6)
Secondary	546 (45.5)
High (college, university)	620 (51.6)
Postgraduate	28 (2.3)
Income (in HRK)	
< 3.000	45 (3.8)
> 3.000 < 6.000	170 (14.2)
> 6.000 < 10.000	361 (30.2)
> 10.000 < 17.000	486 (40.7)
> 17.000	132 (11.1)
Work status	
In training or study	121 (10.1)
Employed part-time	54 (4.5)
Employed full-time	746 (62.1)
Self-employed	29 (2.4)
Retired	115 (9.6)
Seeking work	119 (9.9)
Other	17 (1.4)
Relationship status	
Single	257 (21.4)
Temporary relationship(s)	35 (2.9)
Stable relationship, living separately	156 (13.0)
Stable relationship, living together	753 (62.7)
Living with children	748 (62.3)
Level of urbanization	
vLarge city	251 (20.9)
Medium size town	649 (54.1)
Small community	300 (25.0)
Current health	
Very poor	4 (0.3)
Poor	37 (3.1)
Satisfactory	256 (21.3)
Good	508 (42.3)
Very good	396 (33)
Previous mental health diagnosis	
No	1105 (92.0)
Yes, recovered	50 (4.2)
Yes, currently affected	46 (3.8)
Risk group for severe Covid-19 symptoms	220 (18.3)
Exposed to March 2020 earthquake	408 (34.0)
Infection risk at job	
Involves face to face (FTF) contact	761 (78.5)
Health care or emergency services	84 (7.0)
Retail or cleaning	135 (11.2)
Reduced monthly income	569 (47.4)
Know someone who was infected with coronavirus	358 (29.8)
Face-to-face contact with friends and loved ones	
No face-to-face contact with other people	293 (24.4)
Less than once a week	379 (31.6)
Once a week	172 (14.3)
1–2 times a week	152 (12.7)
3–6 times a week	77 (6.4)
Everyday	128 (10.7)
Virtual contact with friends and loved ones	
No contact by phone, skype, etc.	71 (5.9)
Less than once a week	86 (7.2)
Once a week	108 (9.0)
1–2 times a week	201 (16.7)
3–6 times a week	271 (22.6)
Everyday	464 (38.6)
Exposure to media	
Do not watch, read or listen to news about pandemic	31 (2.6)
Less than 30 minutes a day	309 (25.7)
30–60 minutes a day	362 (30.1)
1–2 hours a day	229 (19.1)
2–3 hours a day	148 (12.3)
	(Continued)

Table 1. (Continued).

	n (%)
More than 3 hours a day	122 (10.2)
Resilience	24.88 (7.29)[+]
Adjustment disorder	14.3 (5.41)[+]
Depression	6.8 (8.57)[+]
Anxiety	4.0 (6.96)[+]
Stress	8.3 (9.08)[+]
PTSD	1.4 (1.59)[+]
Well-being	56.5 (21.91)[+]

Resilience = Resilience Evaluation Scale; Adjustment disorder = Adjustment Disorder – New Module 8; Depression = depression subscale of Depression, Anxiety, and Stress Scale (DASS-21); Anxiety = anxiety sub-scale of DASS-21; Stress = stress subscale of DASS-21; PTSD = Primary Care PTSD Screen; Well-being = WHO-Five Well-Being Index.
[+]Continuous variable, M and SD are presented.

survey. With some exceptions, the study design mostly followed the study protocol of the European Society for Traumatic Stress Studies (ESTSS), a pan-European study conducted with large online convenience sampling in 10 European countries (Lotzin et al., 2020). Unlike the ESTSS protocol, this current study did not include a measure for adverse childhood experiences, but we included a scale to specifically assess depression, anxiety, and stress symptoms (DASS-21; Lovibond & Lovibond, 1995), and a set of questions specific to surviving the earthquake in March 2020.

2.2. Measures

Measures used in our study included sociodemographic characteristics (age, gender, education, work and income status, relationship and housing status, urbanization level), physical health and risks for Covid-19 infection, previous mental health diagnosis, exposure to the March 2020 earthquake, maintaining face-to-face contact during work or leisure time, practicing virtual contact, media exposure, six mental health indicators (symptoms of depression, anxiety, general distress, adjustment disorder, post-traumatic stress disorder, and well-being), and psychological resilience, in this order in the survey. The DASS-21 has been used and validated in the Croatian population (Selekcija.hr, 2019). The other instruments are widely used worldwide and we have adapted them using the standard back translation. In addition, three experts supervised the translation and resolved any discrepancy. In the current study the internal consistency was similar to previous research. Cut-off scores used to indicate 'caseness' for the mental health indicators were based on previous validation studies. Key scales measuring resilience and mental health indicators are further described below, while the other used variables are listed in Table 1.

2.3. Psychological resilience

The nine-item Resilience Evaluation Scale (van der Meer et al., 2018) was used to measure psychological

resilience. All items have a 5-point response format: from completely disagree (0) to completely agree (4). The total score was created by summing the individual item scores (ranging from 0 to 36), and higher scores indicated greater psychological resilience. The internal reliability in this study was excellent – Cronbach's alpha was $\alpha = .94$.

2.4. Symptoms of adjustment disorder

Symptoms of adjustment disorder were measured by the Adjustment Disorder – New Module 8 (ADNM-8; Einsle, Köllner, Dannemann, & Maercker, 2010; Kazlauskas, Gegieckaite, Eimontas, Zelviene, & Maercker, 2018). This self-report scale assesses symptoms of adjustment disorder in response to the most severe lifetime event experienced by and individual. In this study, we used a contextualized version of the ADNM-8 with the items referring to the Covid-19 pandemic. The 4-point response format ranging from 1 (never) to 4 (often) was used. The total score was the sum of the individual item scores, ranging from 8 to 32. Higher scores indicate a higher level of symptoms of adjustment disorder. Cronbach's alpha was $\alpha = .92$. A cut-off score 23 was used for identifying individuals at risk for Adjustment Disorder (Zelviene, Kazlauskas, Eimontas, & Maercker, 2017).

2.5. Depression, anxiety, and stress symptoms

Internalizing symptoms were measured by the Depression, Anxiety, and Stress Scale DASS-21 (Lovibond & Lovibond, 1995), which consists of 21 items (seven for each of the three subscales). For each item, participants indicated how they felt over the last week, using a 4-point response scale from 1 (did not apply to me at all) to 4 (applied to me very much or most of the time). The subscale scores were formed as a sum across seven items multiplied by 2 to correspond to the original DASS-42 scale. Cronbach's alphas were $\alpha = .93$ for Depression, $\alpha = .92$ for Anxiety, and $\alpha = .94$ for Stress subscale. To identify at-risk individuals, we used a cut-off score of 21 for depression, 15 for anxiety, and 26 for stress, corresponding to severe and extremely severe levels of symptoms (Lovibond & Lovibond, 1995).

2.6. Symptoms of PTSD

PTSD symptoms were assessed using the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5; Prins et al., 2016). First, the item about experiencing a traumatic event before or during the pandemic was asked, corresponding to criterion A of the PTSD definition. Those answering positively were asked to respond to five items about PTSD symptoms in a dichotomous (yes/no) response format. The total score was the sum

of the individual item scores, ranging from 0 to 5. Higher scores indicated a higher level of PTSD symptoms. A cut-off score of 4 was used for identifying individuals at risk for PTSD (Prins et al., 2016).

2.7. Well-being

Well-being was measured with the WHO-Five Well-Being Index (WHO-5; WHO, 1998), which is a short self-reported measure of current mental well-being. Participants responded to five items on a six-point scale, from 0 (at no time) to 5 (all of the time) in reference to the two past weeks. Scale score was the sum of individual item scores multiplied by 4 to correspond to 0–100 conventional score of health-related scale, with higher scores indicating higher well-being. Cronbach's alpha was $\alpha = .93$ in this study.

2.8. Data analysis

The analytical model was guided by an ecological perspective and included an assessment of bio-psychological, social, and societal levels. The bio-psychosocial level included variables such as current health, previous mental health diagnosis, belonging to a risk group for severe Covid-19, exposure to earthquake, psychological resilience, job characteristics including face-to-face contact, and reduced monthly income. The variables at the social level included maintaining close relationships with other people as a choice (e.g. face-to-face or virtual contact with important others, being in a relationship, living with children). At the societal level, variables included media consumption which was used as a proxy of a 'new normal', information about threats, behavioural guidance, and epidemiological measures, while the level of urbanization was used as a proxy of perceived level of exposure to the virus (i.e. greater in large cities).

First, we calculated descriptive statistics for the risk and resilience variables from bio-psychosocial, social, and societal ecological level systems, and for the mental health and well-being indicators. Second, we calculated bivariate correlations between these sets of variables to determine which variables from different ecological systems were significantly related ($p < .05$) to the mental health and well-being at the univariate level. To avoid overfitting of the multivariate models and multicollinearity, only variables that were significantly related to a particular mental health and well-being indicator at the univariate level were entered in the subsequent multivariate models. We then calculated hierarchical regression models to determine the relative contribution of different ecological systems to the mental health and well-being indicators. For mental health indicators with clinical cut-off points based on the severe and extremely severe levels of symptoms (PC-PTSD-5, ADNM-8, DASS Depression, DASS

Anxiety, DASS Stress), we calculated binary logistic regression models to identify the odds ratio associated with a positive screen. For the well-being indicator, we calculated a linear regression model. The steps of the hierarchical models reflected the human ecology theory. Sociodemographic variables were entered first both as control variables and as proxy indicators of the bio-psychosocial system. Then, other indicators of the bio-psychosocial system (health, psychological resilience, and pandemic-related environment) were entered. Variables reflecting social and societal environments were entered in the third and fourth steps, respectively. Continuous sample characteristics were split into categories according to the theoretical considerations (age, current health) or interquartile range (Resilience Evaluation Scale) to ensure comparability with other categorical variables. The change in the significance between the models' steps and the R square statistics (Nagelkerke R^2, adjusted R^2) was used to determine the significance of the models. All analyses were done in SPSS 24.

3. Results

Sample descriptive characteristics are presented in Table 1. In the entire sample, 9.8% (95% confidence interval [CI]: 7.9%, 14.0%) of participants were at risk of adjustment disorder, 7.7% (95% CI: 6.7%, 11.9%) of

depression disorder, 7.8% (95% CI: 5.3%, 10.3%) of anxiety disorder, and 7.2% (95% CI: 5.3%, 10.2%) of high levels of stress. Among the participants who reported experiencing a traumatic event prior to or during the pandemic ($n = 429$), 14% (95% CI: 10.6%, 17.2%) were at risk for PTSD.

Table 2 presents correlations between mental health and well-being indicators and variables from different levels of the ecological system. Correlations among the mental health and well-being indicators were medium to large, and between the variables from different ecological levels small to medium, mostly in the expected direction.

Tables 3–8 present a summary of the regression analyses outcomes. All the models' steps were statistically significant ($p < .05$), and the R^2 estimates from the final steps indicated moderate effects.

Having poor/very poor or only satisfactory current health (versus good or very good health), having previous mental health diagnosis, having a below-average resilience score, having had reduced income, and following news about the pandemic for more than 1 hour a day, were all risk factors associated with a positive screen for PTSD (Table 3).

Similarly, risk factors for the positive screen for adjustment disorder included having average or less income (versus above-average income), having poorer current health, having previous mental health

Table 2. Correlations between mental health and wellbeing and potential risk and resilience factors.

	1.	2.	3.	4.	5.	6.
Mental health and well-being						
1. Posttraumatic symptoms (PC-PTSD-5)	1					
2. Adjustment disorder symptoms (ADNM-8)	.42**	1				
3. Depression (DASS)	.47**	.38**	1			
4. Anxiety (DASS)	.41**	.38**	.67**	1		
5. Stress (DASS)	.41**	.36**	.75**	.65**	1	
6. Well-being (WHO-5)	−.37**	−.26**	−.28**	−.22**	−.27**	1
Sociodemographic variables						
Age	−.03	.05	−.10**	−.10**	−.10**	.02
Female	.05	.05	.01	.01	.04	.01
High education	−.07	−.03	−.01	.01	.00	.05
Above average income	.00	−.10**	−.06*	−.10**	−.06*	.10**
Student	−.02	−.03	.06	.04	.05	−.02
Employed	.01	−.03	−.05	−.02	−.06*	.07*
Retired	−.04	.03	−.03	−.03	−.02	−.01
Seeking work	−.01	.02	.04	.02	.04	−.06*
Bio-psychosocial system						
Current health	−.21**	−.26**	−.17**	−.21**	−.16**	.36**
Previous mental health diagnosis	.19**	.12**	.12**	.12**	.12**	−.17**
Risk group for severe Covid-19	.04	.11**	.05	.04	.04	−.12**
Exposure to earthquake	.03	−.01	−.01	.01	.01	−.04
Psychological resilience	−.16**	−.14**	−.19**	−.15**	−.19**	.43**
FTF contact at work	.06	.01	.01	.07*	.02	.06*
Health care and emergency services	−.04	.00	−.01	.02	.00	.04
Retail and cleaners	.09	.03	.01	.10**	.00	−.05
Reduced monthly income	.15**	.09**	.07*	.10**	.03	−.06*
Knows somebody who was infected	.02	.06*	.10**	.09**	.09**	−.05
Social environment						
FTF contact more than once a week	−.04	−.04	−.02	.03	−.03	.03
Virtual contact more than once a week	.06	.03	.00	.02	.02	.06
Stable relationship	.02	.06*	−.02	.04	.02	.10**
Living with children	.03	.05	−.05	−.03	−.04	.01
Societal environment						
News more than 2 hrs a day	.11*	.17**	.12**	.10**	.12**	−.05
Living in a large city	−.02	.01	−.02	−.03	−.01	−.05

* $p < .05$, ** $p < .01$.

Table 3. Risk factors for PTSD.

	At risk of PTSD			Last step		
Blocks and variables	N	n	%	OR	95% CI	Nagelkerke R^2
1. Bio-psychosocial system						.20***
Current health						
Bad or very bad	21	10	47.6%	5.36	[1.84, 15.57]**	
Satisfactory	102	22	21.6%	2.04	[1.05, 3.96]*	
Good or very good	306	28	9.2%	-		
Previous MH diagnosis						
No	374	43	11.5%	-		
Yes	55	17	30.9%	2.37	[1.12, 5.04]*	
Resilience						
Below average	129	33	25.6%	3.03	[1.18, 7.78]*	
Average	214	20	9.3%	1	[0.39, 2.59]	
Above average	86	7	8.1%	-		
Reduced income						
No	232	21	9.1%	-		
Yes	197	39	19.8%	2.45	[1.32, 4.55]**	
2. Societal environment						.25**
Media exposure						
Not at all or <30 min	104	7	6.7%	-		
30–60 min	144	15	10.4%	2.06	[0.74, 5.73]	
1–2 hrs	87	18	20.7%	4.97	[1.75, 14.15]**	
> 2 hrs	94	20	21.3%	4.06	[1.47, 11.24]**	

* $p < .05$, ** $p < .01$, *** $p < .001$.

diagnosis, perceiving oneself at risk for severe Covid-19 disease, having a below-average resilience score, and exposure to media about Covid-19 for more than 30 minutes a day (Table 4). Interestingly, being in a stable relationship, both when living with a partner or living separately, was associated with a higher risk than being single or in a temporary relationship(s).

Table 4. Risk factors for adjustment disorder.

	At risk of adjustment disorder			Last step		
Blocks and variables	N	n	%	OR	95% CI	Nagelkerke R^2
1. Sociodemographic						0.02**
Income						
Below average	215	27	12.6%	1.83	[1.0, 3.34]+	
Average	361	48	13.3%	1.93	[1.18, 3.14]**	
Above average	618	43	7.0%	-		
2. Bio-psychosocial system						0.18***
Current health						
Bad or very bad	41	18	43.9%	8.74	[3.91, 19.53]***	
Satisfactory	256	50	19.5%	3.14	[1.96, 5.03]***	
Good or very good	904	50	5.5%	-		
Previous MH diagnosis						
No	1105	97	8.8%	-		
Yes	96	21	21.9%	1.77	[0.96, 3.26]	
Risk group						
No	981	81	8.3%	-		
Yes	220	37	16.8%	0.97	[0.59, 1.62]	
Resilience						
Below average	344	56	16.3%	3.06	[1.49, 6.26]**	
Average	598	51	8.5%	1.56	[0.76, 3.17]	
Above average	259	11	4.2%	-		
Reduced income						
No	632	46	7.3%	-		
Yes	569	72	12.7%	1.43	[0.93, 2.2]	
Knows infected						
No	843	73	8.7%	-		
Yes	358	45	12.6%	1.53	[0.98, 2.39]	
3. Social environment						0.2***
Relationship status						
Single or temporary	292	19	6.5%	-		
Stable, living separate	156	17	10.9%	2.31	[1.06, 5.02]*	
Stable, living together	753	82	10.9%	2.27	[1.24, 4.14]**	
4. Societal environment						0.27***
Media exposure						
Not at all or <30 min	340	9	2.6%	-		
30–60 min	362	26	7.2%	2.66	[1.18, 5.98]*	
1–2 hrs	229	31	13.5%	5.91	[2.61, 13.36]***	
> 2 hrs	270	52	19.3%	7.84	[3.62, 16.94]***	

+ $p = .05$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5. Risk factors for depression disorder.

	At risk of depression					
Blocks and variables	N	n	%	Last step OR	95% CI	Nagelkerke R^2
1. Sociodemographic						.04**
Age						
18–24	162	20	12.3%	4.49	[1.95, 10.3]***	
25–34	257	28	10.9%	3.55	[1.62, 7.77]**	
35–44	252	16	6.3%	1.93	[0.82, 4.51]	
45–54	279	16	5.7%	1.54	[0.67, 3.5]	
≥55	251	13	5.2%	-		
Income						
Below average	215	28	13.0%	1.67	[0.92, 3.01]	
Average	361	27	7.5%	1.05	[0.6, 1.84]	
Above average	618	38	6.1%	-		
2. Bio-psychosocial system						.21***
Current health						
Bad or very bad	41	14	34.1%	8.09	[3.43, 19.1]***	
Satisfactory	256	32	12.5%	2.56	[1.5, 4.36]**	
Good or very good	904	47	5.2%	-		
Previous MH diagnosis						
No	1105	75	6.8%	-		
Yes	96	18	18.8%	1.89	[0.98, 3.62][++]	
Resilience						
Below average	344	56	16.3%	3.71	[1.73, 7.96]**	
Average	598	28	4.7%	1.03	[0.46, 2.3]	
Above average	259	9	3.5%	-		
Reduced income						
No	632	38	6.0%	-		
Yes	569	55	9.7%	1.30	[0.81, 2.08]	
Knows infected						
No	843	51	6.0%	-		
Yes	358	42	11.7%	2.04	[1.26, 3.29]**	
3. Societal environment						.24**
Media exposure						
Not at all or <30 min	340	21	6.2%	-		
30–60 min	362	17	4.7%	0.81	[0.4, 1.64]	
1–2 hrs	229	18	7.9%	1.44	[0.7, 2.94]	
> 2 hrs	270	37	13.7%	2.46	[1.31, 4.61]**	

++ $p < .06$, + $p = .05$, * $p < .05$, ** $p < .01$, *** $p < .001$.

For depression disorder, being in a younger age group (below 35), having satisfactory or poorer current health, having a previous mental health diagnosis, having a below-average resilience score, knowing someone with Covid-19, and following the news about Covid-19 for more than 2 hours a day, were risk factors associated with a positive screen (Table 5).

Risk factors for the positive screen for anxiety disorder were being younger than 45, having a below-average income, having satisfactory or poorer current health, having had mental health diagnosis, having a below-average resilience score, having a face-to-face contact at work, knowing someone with Covid-19, and exposure to news about Covid-19 for more than 2 hours a day (Table 6).

For a high level of stress, being in any age group other than the oldest, having satisfactory or poorer current health, having had mental health diagnosis, having a below-average resilience score, knowing an infected individual, and following news about Covid-19 for more than 2 hours a day, were the risk factors (Table 7).

Finally, risk factors related to lower well-being were having poorer current health, having had a mental health diagnosis, and an average or lower resilience score (Table 8). Being in a stable relationship and living together with the partner were associated with increased well-being.

4. Discussion

The assessment of the mental health status of Croatia's general adult population four months after the national lockdown due to Covid-19 disease and two months after the most restrictive quarantine measures were lifted shows that 9.8% of the participants were at risk of probable adjustment disorder, 7.7% had a moderate to high risk for a depression disorder, and 7.8% were at risk for an anxiety disorder. High levels of stress were present in 7.2% of the participants. Probable PTSD prevalence among participants who experienced at least one traumatic event during the pandemic was 14%. The numbers for depression, anxiety, stress, and adjustment disorder were lower than those reported in previous studies on the effect of the Covid-19 pandemic on mental health in Europe and elsewhere (Karatzias et al., 2020; Newby et al., 2020; Pieh, Budimir, et al., 2020; Rossi et al., 2020; Salari et al., 2020). Although these differences may be attributed to different methodologies (sample recruitment, measures), the timing of the study also differs. For example, based on a large online convenience sample,

Table 6. Risk factors for anxiety disorder.

	At risk of anxiety					
Blocks and variables	N	n	%	Last step OR	95% CI	Nagelkerke R^2
1. Sociodemographic						.05***
Age						
18–24	162	20	12.3%	6.72	[2.71, 16.64]***	
25–34	257	22	8.6%	3.62	[1.51, 8.68]**	
35–44	252	24	9.5%	4.38	[1.82, 10.54]**	
45–54	279	18	6.5%	2.09	[0.87, 5.01]	
≥55	251	10	4.0%	-		
Income						
Below average	215	28	13.0%	2.13	[1.15, 3.95]*	
Average	361	34	9.4%	1.59	[0.91, 2.78]	
Above average	618	32	5.2%	-		
2. Bio-psychosocial system						.25***
Current health						
Bad or very bad	41	15	36.6%	13.49	[5.47, 33.26]***	
Satisfactory	256	38	14.8%	4.06	[2.39, 6.9]***	
Good or very good	904	41	4.5%	-		
Previous MH diagnosis						
No	1105	76	6.9%	-		
Yes	96	18	18.8%	1.90	[0.98, 3.7][++]	
Resilience						
Below average	344	48	14.0%	2.92	[1.33, 6.41]**	
Average	598	37	6.2%	1.32	[0.6, 2.92]	
Above average	259	9	3.5%	-		
FTF contact at work						
No	440	24	5.5%	-		
Yes	761	70	9.2%	1.82	[1.05, 3.18]*	
Retail and cleaners						
No	1066	73	6.8%	-		
Yes	135	21	15.6%	1.78	[0.94, 3.37]	
Reduced income						
No	632	34	5.4%	-		
Yes	569	60	10.5%	1.43	[0.88, 2.34]	
Knows infected						
No	843	52	6.2%	-		
Yes	358	42	11.7%	1.76	[1.08, 2.88]*	
3. Societal environment						.27*
Media exposure						
Not at all or <30 min	340	21	6.2%	-		
30–60 min	362	17	4.7%	0.83	[0.41, 1.7]	
1–2 hrs	229	21	9.2%	1.75	[0.86, 3.54]	
> 2 hrs	270	35	13.0%	2.02	[1.06, 3.86]*	

++ $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Jokić Begić et al. (2020) reported the presence of severe and extremely severe symptoms of depression, anxiety, and stress from 17.4% to 19.1%, respectively, among Croats during the lockdown (May 2020). Our results show that these mental health problems measured by the same instrument were lower by more than half in July 2020, when pandemic-related restrictions had mostly been lifted for two months. Restrictions in the country were only relaxed after the number of infected individuals declined and the Covid-19-related death rate was reduced to zero. These metrics signalled a lower threat level and permitted a more normal state of life and a positive economic outlook. National and international travel was reinstated, which was vital for the country owing to the tourist industry contributing a large share of the GDP. The shock of facing the pandemic and imposed change of daily patterns had decreased, while very few references were being made in the media and in professional and public discourse regarding a possible second wave of the pandemic. The people felt that the immediate threat of Covid-19 had passed and they were approaching normality. This belief was likely reflected in the decreased level of mental health symptoms in the national population, which indicates a high level of adaptability and resilience to the pandemic disaster.

As previously stated, there are no mental health benchmarks for the Croatian general population to which the current findings could be compared. However, WHO (2017) estimated that global rates of 4.4% and 3.6% for depression disorders and anxiety disorders, respectively. The probable PTSD rates in our study were significantly lower than those reported in May 2020 in Ireland (Karatzias et al., 2020) and in Italy (Rossi et al., 2020). The discrepancy possibly reflects the human ability to adapt to major stressful events and quickly bounce back after the stressor is

Table 7. Risk factors for stress.

Blocks and variables	At risk of stress			DASS Stress		Nagelkerke R^2
	N	n	%	OR	95% CI	
1. Sociodemographic						.04*
Age						
18–24	162	21	13.0%	7.49	[2.97, 18.87]***	
25–34	257	20	7.8%	3.79	[1.53, 9.42]**	
35–44	252	19	7.5%	4.22	[1.65, 10.81]**	
45–54	279	17	6.1%	2.55	[1.02, 6.35]*	
≥55	251	9	3.6%	-		
Income						
Below average	215	21	9.8%	1.16	[0.61, 2.23]	
Average	361	30	8.3%	1.36	[0.78, 2.36]	
Above average	618	35	5.7%	-		
Employed						
No	390	36	9.2%	-		
Yes	811	50	6.2%	0.81	[0.46, 1.42]	
2. Bio-psychosocial system						.20***
Current health						
Poor or very poor	41	13	31.7%	8.62	[3.59, 20.68]***	
Satisfactory	256	28	10.9%	2.35	[1.35, 4.09]**	
Good or very good	904	45	5.0%	-	-	
Previous MH diagnosis						
No	1105	69	6.2%	-		
Yes	96	17	17.7%	2.02	[1.04, 3.93]*	
Resilience						
Below average	344	52	15.1%	3.42	[1.59, 7.34]**	
Average	598	25	4.2%	0.90	[0.4, 2.02]	
Above average	259	9	3.5%	-		
Knows infected						
No	843	48	5.7%	-		
Yes	358	38	10.6%	2.00	[1.22, 3.29]**	
3. Societal environment						.23**
Media exposure						
Not at all or <30 min	340	19	5.6%	-		
30–60 min	362	19	5.2%	1.13	[0.56, 2.26]	
1–2 hrs	229	13	5.7%	1.16	[0.53, 2.55]	
> 2 hrs	270	35	13.0%	2.76	[1.45, 5.28]**	

* $p < .05$, ** $p < .01$, *** $p < .001$.

removed, which was the case in Croatia when data were collected for the present study. Heightened post-traumatic reactions assessed in May (Jokić Begić et al., 2020) could represent natural, transitional reactions to a highly stressful situation while it was acutely present.

This study also aimed to identify the critical risk factors from different levels of the ecological environments for individuals' mental health in the Croatian general population during the Covid-19 pandemic. Several known risk factors for well-being, PTSD, adjustment disorder, depression, anxiety, and stress were evaluated. On the bio-psychosocial ecological level, we found that the current health status, a previous mental health diagnosis, and psychological resilience significantly predicted almost all measured mental health outcomes. In our study, lower age was a risk factor for depression, anxiety, stress, and well-being. These findings accord with those from several previous studies that identified the relationship between younger age and mental health problems in terms of increased depression, anxiety, and stress during the pandemic (Karatzias et al., 2020; Qiu et al., 2020; Rossi et al., 2020). Our findings add to the growing body of evidence that the pandemic's mental health toll falls heaviest on the younger adult population. Imposed protective measures likely disrupted young people's lives more as they restricted the possibility to gather and socialize, travel, participate in sports and regular schooling, and so on. Unlike previous studies, age was not a significant predictor of possible PTSD and adjustment disorder in our study. The presence of likely PTSD in the current study was assessed only for participants who experienced a traumatic event as defined by DSM-V; it did not reflect post-traumatic reactions to the pandemic itself as a traumatizing experience, as was conceptualized in other studies. The influence of pandemic on the post-traumatic symptoms in our sample will be evaluated over time in planned follow-up studies, mainly because a subgroup of the sample experienced a life-threatening earthquake in Zagreb and surroundings amid the Covid-19 lockdown. Reduced income, a risk factor from bio-psychosocial ecological level, was a significant predictor of PTSD and adjustment disorder, but not other mental health outcomes, in contrast to other studies (Fitzpatrick et al., 2020; Li et al., 2020; Wright et al., 2020). Together with other economic relief packages, the Croatian government provided financial reimbursements for those unable to work due to the anti-Covid measures. This action, coming from the societal environment level, could have mitigated the financial burden of job loss and decreased

Table 8. Risk factors for wellbeing.

Blocks and variables	Wellbeing			β	95% CI (b)	Adjusted R^2
	N	M	SD			
1. Sociodemographic						
Age						.01*
18–24	162	56.15	21.80	0.00	[−4.17, 4.63]	
25–34	257	55.61	20.83	−0.05	[−6.39, 0.67]	
35–44	252	57.19	21.75	−0.06	[−6.44, 0.54]	
45–54	279	56.90	22.03	−0.03	[−4.78, 1.85]	
≥55	251	56.49	23.21	-		
Income						
Below average	215	53.82	23.75	0.02	[−1.97, 4.41]	
Average	361	54.43	21.61	−0.01	[−2.78, 2.2]	
Above average	618	58.77	21.24	-		
Employed						
No	390	54.31	22.85	-		
Yes	811	57.55	21.38	0.03	[−2.17, 4.58]	
Seeking work						
No	1082	56.91	21.88	-		
Yes	119	52.77	21.96	−0.01	[−4.67, 3.97]	
2. Bio-psychosocial system						.27***
Current health						
Bad or very bad	41	30.63	20.05	−0.19	[−28.89, −16.53]***	
Satisfactory	256	47.84	21.08	−0.17	[−11.84, −6.24]***	
Good or very good	904	60.12	20.74	-		
Previous MH diagnosis						
No	1105	57.57	21.43	-		
Yes	96	44.21	23.69	−0.06	[−9.02, −0.95]*	
Risk group						
No	981	57.75	21.45	-		
Yes	220	50.95	23.10	−0.04	[−5.03, 0.93]	
Resilience						
Below average	344	42.90	22.00	−0.52	[−28.11, −21.88]***	
Average	598	58.06	18.63	−0.27	[−14.52, −9]***	
Above average	259	70.97	18.01	-		
FTF contact at work						
No	440	54.74	22.26	-		
Yes	761	57.52	21.66	−0.01	[−3.29, 2.32]	
Reduced income						
No	632	57.72	21.70	-		
Yes	569	55.15	22.09	−0.02	[−3.09, 1.2]	
3. Social environment						.27*
Relationship status						
Single or temporary	292	52.77	23.06	-		
Stable, living separate	156	57.41	19.92	0.04	[−1.15, 6.28]	
Stable, living together	753	57.76	21.71	0.09	[1.28, 6.87]**	

* $p < .05$, ** $p < .01$, *** $p < .001$.

income, and created a sense of being cared for, in turn lowering stress, depression, and anxiety reactions.

From the social environment level, only being in a stable relationship, regardless of living with a partner or living separately, was associated with a higher risk for adjustment disorder, than being single or in a temporary relationship(s), while being in a stable relationship and living together with the partner was associated with increased well-being (Pieh, O´Rourke, Budimir, & Probst, 2020; Wieczorek et al., 2021).

In terms of the societal environment level, an interesting result was that exposure to Covid-19-related news for two or more hours per day was a risk factor for adjustment disorder, depression, and anxiety but not stress. The impact of an 'infodemic' (Rothkopf, 2003) on mental health has not yet been thoroughly investigated. Gao et al. (2020) reported similar results in the Chinese population when they investigated the effects of media exposure. Availability of reliable information mitigates fear; however, during the present

study there were many unknowns about the pandemic, which allowed different interpretations and could have caused distress. The general population's mental health at the time of pandemic appeared to be related to risk factors on all three main ecological levels (i.e. bio-psychosocial, social environment, and societal environment).

Contrary to previous studies (Fitzpatrick et al., 2020; Rossi et al., 2020; Zimmermann et al., 2020), gender was not a significant predictor of mental health outcomes in our study. A possible explanation is that the pandemic characteristics and protective measures were harder for men than for women. In pre-pandemic times, women were found to score higher on measures of depression and anxiety (e.g. Gutman, Peck, Malanchuk, Sameroff, & Eccles, 2017). During the pandemic, men were at higher risk for Covid-19 complications and had a higher death rate (Hanif et al., 2020). In addition, a cultural expectation is that men occupy the role of a family's provider – a role that the pandemic has challenged through increased family financial insecurity,

job lay-offs, and quarantine. However, women, particularly mothers of young children, have also experienced increased pressure during the pandemic (Bauer, Buckner, Estep, Moss, & Welch, 2021). These observations indicate that the gender differences during the pandemic should be further investigated.

Study strengths and limitations

The study has several strengths, such as a large sample that is nationally representative of gender, region, and age. Nationally representative studies using probabilistic sampling are rare in Covid-19 pandemic research. The study included several mental health measures that allowed a systematic approach in determining several possible mental health outcomes. Both protective and non-risk factors were included. This study gives insight into the status of mental health four months after the pandemic outbreak when the highly restrictive lockdown measures had been considerably relaxed.

Still, the study has some shortcomings. People over the age of 65 were not included in the study, limiting the findings on people in late adulthood considered to be at special risk for Covid-19 disease. The sample is not representative of a full range of educational levels since it failed to recruit enough participants with no or very low education. This population may not use the Internet often; however, the education ratio was better than reported in studies using convenience sampling through online social networks which are typically heavily biased towards higher education. Possible bias in determining the risk factors due to educational level was decreased by using the logistic regression. The length of the survey could have led to some participants submitting incomplete responses, therefore introducing potential bias in terms of motivation to complete the survey. The study used an online data collection method as was done in practically all Covid-19-related research; therefore, potential participants who do not use the Internet or are not familiar with online surveys were excluded. In general, online surveys do not allow an analysis of the drop-out sample and researchers have no information on whether the participants are providing true information about themselves (i.e. even socio-demographic data). Finally, the survey was based on self-reporting, potentially causing over- or under-reporting. Future studies on prevalence should include face-to-face interviews when conditions allow for it.

5. Conclusion

The present study reports lower rates of probable PTSD, adjustment disorder, depression, anxiety, and high stress levels than found in studies done during or close to the lockdowns and in the early days of the pandemic in Croatia and the world. This suggests that lifting the highly restrictive epidemiological measures combined with the lower perceived threat of Covid-19

and an optimistic outlook at ending the pandemic may have a rather quick positive effect on mental health and recovery from the consequences of severe national lockdown. However, the pandemic continues to pose a significant threat to mental health, with its prolonged duration, worldwide rising numbers of Covid-19-related deaths, and vaccination uncertainties. This requires ongoing monitoring of the impact on mental health.

Unlike most of the similar studies that used convenience samples, we were able to recruit a large nationally representative sample. The study design mostly followed the protocol of the ESTSS that was implemented about the same time in another ten European countries, which allowed extensive comparisons.

The consistency of predictive power of bio-psychological variables, such as previous mental health diagnoses, psychological resilience, or age, clearly highlighted that the groups of special interest for the mental health consequences are people at a higher risk for Covid-19-related health complications, with pre-existing mental health issues, reduced income and young people who are silent victims of the pandemic. Psychological resilience proved to be a significant protective factor for all mental health outcomes. From the societal level, prolonged daily exposure to the news about the pandemic is a risk factor. Researchers, clinicians, and media professionals should work towards creating responsible reporting on the Covid-19-related news for the sake of the population's mental health. This study contributes to scholarship showing how challenging it is to predict mental health outcomes in a pandemic because of a dynamic interplay of numerous factors, which makes it similar to research on post-disaster recovery.

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