

## Brief report

# COVID-19: Concerns and behaviours in Croatia

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**Objectives.** The COVID-19 pandemic has created uncertainty that has heightened fear and worry worldwide, thus elevating the potential for a growth in anxiety. This study aims to examine changes in levels of COVID-19 concern and safety behaviours among persons living in Croatia during the period in which the first COVID-19 case was identified and when the country recorded its first fatality. These changes were examined with respect to gender and family circumstances.

**Design.** The repeated cross-sectional data were conducted over two time points over the 3 weeks ( $N_1 = 888$ ;  $N_2 = 966$ ).

**Methods.** Participants completed online questionnaire regarding various COVID-19 concerns and safety behaviours aimed at disease prevention.

**Results.** Findings demonstrate dramatic increase in concern and safety behaviours among participants during the 3 weeks between the first identified case and the first fatality. The results suggest that parents, and mothers especially, represent the most concerned group, regardless of age. People with chronic health conditions also expressed greater concern and safety behaviour than healthy participants, but with small effect size.

**Conclusion.** These findings highlight the importance of developing clear guidelines for alleviating the negative effects on mental health through effective communication strategies that minimize fear and emphasize positive behavioural change.

## Statement of contribution

### What is already known on this subject?

- In times of pandemic, people react with elevated levels of anxiety and some will adjust their behaviours in order to protect themselves as well as their family and friends.
- Some of the measures introduced to protect the spread of the COVID-19 disease have induced an atmosphere of fear, which in turn can lead to an increase in maladaptive anxiety and a greater burden on mental health.

### What does this study add?

- By conducting the research in two waves representing two critical time points in the developing COVID-19 situation in Croatia, we were able to trace a large increase in anxiety levels and safety behaviours among the general population.
- There is a discordance between those who are at most risk from serious consequences of the disease and those who are at greatest risk for maladaptive anxiety. Parents, and mothers in particular, represent the most concerned group, regardless of age.

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- Lockdown measures have allowed us to ensure the safety of those vulnerable for serious COVID-19 illness. Now, we must focus on preserving the mental health of our whole community.

Research has demonstrated that infection outbreaks can have numerous psychosocial impacts. Individually, people are likely to experience fear for their health, family, safety, or finances (Taylor, 2019). The COVID-19 case is unique in human history due to the global flow of information, which allows advance warning long before any actual danger is near. This has allowed countries experiencing later outbreak onset to prepare their health systems for an epidemic. However, it has also created an extended period of uncertainty, which could elevate anxiety. For most, such a situation induces an anxiety reaction that is either adaptive (i.e., have a motivating role in behavioural change) or maladaptive (worsening overall mental health and quality of life).

Croatia is a southern European country that shares a sea border with Italy. The first case of COVID-19 in Croatia was identified on 24 February 2020. Nationwide lockdown was announced on March 16 and the first COVID-19 fatality was on 19 March 2020. National crisis headquarters provides daily public updates regarding disease control measures, which have become increasingly restrictive. To date, the number of patients with COVID-19 is increasing linearly, a trend that has been attributed to the implementation of quarantine-like measures. Although such measures are necessary to prevent exponential increase in patient numbers, their efficacy depends on the degree to which they are adhered. These measures also have a dark side, where a restriction in social contacts and induced atmosphere of fear can lead to growth in maladaptive anxiety (Ren, Gao, & Chen, 2020).

This study aims to examine changes in levels of concern about COVID-19 and safety behaviours among persons living in Croatia following the first diagnosed patient and the first COVID-19 fatality. These changes were examined with respect to gender and family circumstances (parental status and having parents and/or grandparents over 65).

## Method

### Participants

The analysis conducted in this study is based on data from two general population samples of people living in Croatia.

#### Sample 1

Sample 1 consisted of  $N = 888$  participants. The majority of participants were female (83.1%) and were aged between 18 and 72 years ( $M = 31.3$ ;  $SD = 10.45$ ). The sample consisted of predominantly well-educated participants, where 27.3% held a high school diploma and all remaining participants held graduate or postgraduate degrees. Almost one third of participants have children (28.9%) and 16.7% of participants reported having a chronic health condition.

#### Sample 2

Sample 2 consisted of  $N = 966$  participants. Again, most participants were female (75.8%) and were aged between 19 and 77 years ( $M = 40.0$ ;  $SD = 11.94$ ). This sample was also

made up of predominantly well-educated participants: 26.6% held a high school diploma and all other participants held graduate or postgraduate degrees. In this sample, half of the participants (50.9%) have children and 19.4% reported having a chronic health condition. Over half of participants have parents older than 65 years (26.9% – one parent; 26.2% – two parents) and 33.8% have living grandparents.

### **Procedure**

This study was conducted in two waves, where Wave 1 began on the day that the first patient with COVID-19 was diagnosed in Croatia and Wave 2 began 3 weeks later, on the day of the first COVID-19 fatality.

Researchers received approval from the Ethics Committee of the Department of Psychology, Faculty of Humanities and Social Sciences, University of Zagreb, prior to data collection.

Data were collected anonymously using a snowball method, in which invitations to complete an online survey and a link to the SurveyMonkey web domain was shared via social networks and acquaintances. In both waves, all data were collected within 1 week of the original invitation and a 75% rate of completion was reached. Dropout occurred gradually throughout the survey, with no single systematic factor noted. In Wave 2, participants were asked whether they had participated in Wave 1 and 34.4% answered positively. However, because we could not match the data from both surveys, we considered them to be independent samples despite the presence of overlapping participants.

### **Materials**

In both waves, we collected data regarding health concerns related to COVID-19 and safety behaviours related to disease prevention.

*The COVID-19 Safety Behaviour Checklist (CSBC)* is an 11-item checklist inspired by the Ebola Safety Behaviour Checklist (Blakey, Reuman, Jacoby, & Abramowitz, 2015). It assesses respondents' utilization of safety behaviours designed to prevent contracting COVID-19 (e.g. washing hands, avoiding strangers, avoiding leaving the house). On a 5-point scale ranging from 1 (not at all) to 5 (most of the time), participants indicate the extent to which they will engage in various activities due to concerns about COVID-19. Cronbach's alpha coefficient was  $\alpha = .86$  for Wave 1 and  $\alpha = .73$  for Wave 2.

To assess COVID-19-related health concerns, two versions of a single scale were used to reflect differing concerns during Waves 1 and 2. *The COVID-19 Anxiety Scale – Wave 1 (CAS-1)* is a six-item self-rating scale inspired by the Swine Flu Anxiety Items (Wheaton, Abramowitz, Berman, Fabricant, & Olatunji, 2012) and assesses various concerns including the perceived likelihood of contracting the virus, perceived severity of infection, and concerns about epidemic. Participants indicate the extent to which each item relates to them on a 5-point scale ranging from 1 (not at all) to 5 (very much).

*The COVID-19 Anxiety Scale – Wave 2 (CAS-2)* is a nine-item self-rating scale in which five items were the same as those in the CAS-1 (the epidemic item was not included because WHO had declared a pandemic by this time). Four items related to perceived likelihood of family members contracting the virus and mental health concerns were added.

A total score for the five items used in both samples (CAS-5 items) were calculated and used in the analysis presented here. Cronbach's alpha coefficient was  $\alpha = .76$  for Wave 1 and  $\alpha = .78$  for Wave 2.

# Analysis

Data from both samples were used to test differences in levels of concern and safety behaviours between Waves 1 and 2. Data from Wave 2 were used to determine which participants were prone to higher concerns and safety behaviour.

Univariate GLM analysis and simple main effect tests were performed in order to examine gender and parental group differences and potential interactions. To test differences between other groups, a *t*-test and ANOVA were performed. Effect sizes were measured with Cohen *d* and  $\eta^2$ .

# Results

Results indicate large effect size differences between Waves 1 and 2 ( $t_{\text{CAS-5 items}} = 27.3$ ;  $d = 1.3$ ;  $t_{\text{CSBC}} = 39.9$ ;  $d = 1.9$ ) for both COVID-19 concerns ( $M_{\text{sample1}} = 12.8$ ,  $SD_{\text{sample1}} = 4.17$ ;  $M_{\text{sample2}} = 17.6$ ,  $SD_{\text{sample2}} = 3.27$ ) and safety behaviours ( $M_{\text{sample1}} = 27.5$ ,  $SD_{\text{sample1}} = 8.92$ ;  $M_{\text{sample2}} = 41.7$ ,  $SD_{\text{sample2}} = 6.19$ ).

Women with children had higher levels of COVID-19 concern than women without children ( $F = 16.18$ ;  $p < .01$ ) and men, regardless of their parental status ( $F = 0.74$ ;  $p > .05$ ). All observed differences were of small effect size (all  $\eta^2 = .01$ ) (Table 1).

Gender and parental differences are also observed among safety behaviours. Women and parents report more safety behaviour than men ( $\eta^2 = .03$ ) and those without children ( $\eta^2 = .02$ ), respectively. No significant interaction was found (Table 1).

The correlation between age and concerns was small ( $r = .11$ ;  $p < .01$ ) and non-significant between age and behaviour ( $r = .01$ ;  $p > .05$ ).

Participants with chronic health conditions had higher concerns and more safety behaviours compared to those with no chronic conditions (Table 2).

**Table 1.** Descriptive statistics and *F*-values for COVID-19 concerns (CAS-5 items) and safety behaviours (CSBS)

Gender Children (N)	<i>n</i>	CAS-5 items <i>M</i> ( <i>SD</i> )	CSBC <i>M</i> ( <i>SD</i> )
Female			
Yes	373	18.5 (3.11)	43.2 (5.35)
No	347	17.1 (3.14)	41.4 (6.12)
Total	720	17.8 (3.20)	42.3 (5.81)
Male			
Yes	110	17.1 (3.58)	40.6 (6.12)
No	121	16.8 (3.29)	39.1 (7.53)
Total	231	16.9 (3.43)	39.8 (6.92)
Total			
Yes	483	18.2 (3.27)	42.6 (5.63)
No	468	17.0 (3.18)	40.8 (6.59)
All	951	17.6 (3.27)	41.7 (6.19)
<i>F</i>			
Gender		12.09**	29.63**
Children		11.69**	14.05**
Gender $\times$ Children		5.17*	0.13

Note. \* $p < .05$ ; \*\* $p < .01$ .

**Table 2.** Descriptive statistics and t-test values for COVID-19 concerns (CAS-5 items) and safety behaviours (CSBS) in relation to health status and family circumstances

Variable	CAS-5 items M (SD)	CSBC M (SD)
Chronic health condition		
Yes	19.1 (3.16)	42.9 (5.76)
No	17.2 (3.21)	41.4 (6.26)
t (d)	6.83** (0.6)	2.84** (0.3)
Parents older than 65		
No	17.4 (3.33)	42.0 (6.44)
One parent	17.8 (3.23)	41.6 (5.96)
Both parents	17.8 (3.24)	41.4 (6.02)
F	1.66	0.92
Living grandparents		
Yes	17.1 (3.40)	42.0 (6.62)
No	17.7 (3.17)	41.6 (5.92)
t (d)	3.45* (0.2)	0.96

Note. \* $p < .05$ ; \*\* $p < .01$ .

Although we hypothesized that people with older family members would have higher concerns and more safety behaviours, this was only true for concerns among participants with living grandparents. Here, the effect size is small (Table 2).

In order to control for whether the participants completed both Wave 1 and Wave 2 of the study, we re-run the analysis without them, and all obtained results were the same.

## Discussion

These results demonstrate a tremendous increase in concern and safety behaviours among residents of Croatia over the 3 weeks between the first identified COVID-19 case and the first fatality. This dramatic increase can be attributed to several factors: gender, parental status, and chronic health conditions, but not to one's age or the age of one's parents. Women are more worried than men, a finding consistent with previously reported research examining COVID-19-related anxiety (Xiang *et al.*, 2020). In both genders, the parental role is a risk factor for amplified concerns. It is important to emphasize that women with children are the most vulnerable group for COVID-19 concerns, despite the fact that neither women nor their children are at particular risk. Women also engage in more safety behaviours than men. Both mothers and fathers are more inclined to exhibit safety behaviours than those without children. Persons with chronic conditions are more anxiety prone and implement more behavioural changes than healthy participants, although the effect sizes are small to medium.

The results suggest that parents, and mothers especially, represent the most concerned group, regardless of age. This is consistent with previous research during the swine flu epidemic (Remmerswaal & Muris, 2011; Rubin, Amlôt, Page, & Wessely, 2009) where parental status was a risk factor for elevated fear and anxiety. Arguably, this is related to worries about what might happen to their children should they themselves fall ill. In future research, it would be necessary to study to what extent parents used threat information to warn children about the COVID-19, thereby possibly inducing fear in their offspring.

Important guidelines for identifying groups at higher risk for developing mental health problems can be drawn. The atmosphere of fear created globally in the last 2 months can contribute to a decrease in mental health among those who are not at risk for developing more severe cases of COVID-19. In these groups, anxiety has contributed to behavioural change. Ongoing focus on these concerns can have a negative effect on mental health. With lockdown, we ensure the safety of those vulnerable for serious COVID-19 illness. Now, we must focus on preserving the mental health of our community. To prevent increased mental health burdens, governments need to emphasize a more calming message and clear advice for coping with isolation (Ivchenko *et al.*, 2020). These results are consistent with a recently published report of the 'COVID-19 International Behavioural Science Working Group', which offers recommendations for changes in public communication emphasizing positive motivation for behavioural change.

## Conflicts of interest

All authors declare no conflict of interest.

## Author contribution

Anita Lauri Korajlija (Conceptualization; Data curation; Formal analysis; Methodology; Software; Validation; Writing – original draft; Writing – review and editing); Natasa Jokic-Begic (Conceptualization; Data curation; Formal analysis; Methodology; Supervision; Writing – original draft; Writing – review and editing).

## Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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