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DIRECT AND INDIRECT EFFECT OF INTOLERANCE OF UNCERTAINTY ON DISTRESS DURING THE COVID-19 PANDEMIC

Since the coronavirus outbreak influenced the whole population in 2020, many individuals, both directly and indirectly affected, experienced increased levels of distress at that time. Such a global mental health crisis requires identification of key mechanisms which contribute to distress during pandemic. Specificity of COVID-19 outbreak was lack of sufficient information at the beginning and, consequently, a high level of perceived uncertainty. The main aim of this study was to examine the influence of the intolerance of uncertainty to the experienced level of distress during the pandemic. Additionally, influence of media exposure and fear were examined. Total of 740 participants took part in an online study during the coronavirus outbreak in Serbia. Moderately high level of distress was recorded in our sample. About ⅓ of participants were in each group: no distress, moderately high and highly elevated. Results of serial mediation analysis showed that the intolerance of uncertainty had a significant direct effect on distress, but also indirect via fear of COVID-19 and media exposure. Higher levels of intolerance of uncertainty lead to more time spent on media looking for information, and consequently to higher fear and distress levels. Furthermore, it was shown that media exposure also increased the level of fear. Such results emphasized the importance of unambiguous, clear informing during the time of crisis which can decrease uncertainty, and provided some practical implication for media and authorities.

Key words: COVID-19, distress, fear, intolerance of uncertainty, media exposure

Introduction

Outbreak of COVID-19 suddenly affected not just public health, but also all aspects of humans' lives across the globe. Despite the fact that the World Health Organization had declared a novel coronavirus outbreak on 30th of January (WHO, 2020), more than a month before the first COVID-19 case in Serbia, on March 6th, it seems that the entire health system and relevant governmental institutions were not properly prepared, so it had huge influence on strategy of dealing with pandemic. From initial neglect and government underestimating of threat, to complete lockdown, closed borders, and the introduction of mandatory quarantine – that would be the short description of the situation in Serbia during the first few weeks of pandemics.

Dealing with unknown virus, potential health issues and death, altogether with losing some basic human rights (e.g., freedom of movement) and disrupted social functioning (as a result of social distancing) undoubtedly increased the psychological burden and level of stress. Moreover, getting ambiguous, often mutually conflicted recommendations from authorities certainly could affect mental health and wellbeing. While there was a limited set of recommended actions and practices that someone could take in order to protect its own self and other people (even the effects of these measures were not quite known and not definitely proven) living in the time of pandemic requires dealing with uncertainty on a daily basis. Previous studies emphasized the importance of intolerance of uncertainty for anxiety and depressive disorders. We wanted to examine whether someone's intolerance of uncertainty could be the factor which influences functioning and the experienced level of distress during a pandemic. Additionally, we also wanted to examine the mutual relations between intolerance of uncertainty, media exposure, fear and level of experienced distress.

Intolerance of Uncertainty

Intolerance of uncertainty could be broadly defined as a cognitive bias that affects the way someone processes uncertain situations on emotional, cognitive and behavioral levels. High intolerance of uncertainty results in the perception of uncertain situations as stressful, negative, and those which should be avoided. In some cases, it could result in inability to react in uncertain situations. People with a higher intolerance of uncertainty tend to interpret ambiguous information as threatening (Dugas et al., 2005). Intolerance of uncertainty was often associated with various anxiety disorders or depression (Boswell et al., 2013; Carleton et al., 2012).

Intolerance of uncertainty is already described as an important predictor in the research of the pandemics. Study (Taha et al., 2014) that investigated psychological effects of H1N1 pandemics showed that intolerance of

uncertainty predicted higher levels of H1N1-related anxiety. Participants with greater intolerance to uncertainty had a lower appraisal of their own and other control, they were using more emotion-focused coping strategies, and more often they perceived pandemic as threatening. A similar pattern was obtained in a recent study (Satici et al., 2020) that investigated the effects of uncertainty in the current COVID-19 pandemic. It was shown that greater intolerance of uncertainty could provoke fear through rumination, which could negatively affect wellbeing. Intolerance of uncertainty during COVID-19 pandemic was also associated with insomnia (Voitsidis et al, 2020). It has a mediating role between fear of COVID-19 and positivity, but also has direct effects on depression, anxiety and stress (Bakioğlu et al., 2020). Positive relations between intolerance of uncertainty and depression, anxiety and stress were also shown in a study conducted in Brazil (Ferreira et al., 2020).

Knowing that the intolerance of uncertainty is relatively stable during lifespan, it is important to measure its effects on mental health during crisis situations. That could help practitioners to identify vulnerable groups and to provide them tailored programs or interventions. Identifying the role of intolerance of uncertainty on the level of experienced stress during a pandemic also could provide useful instruction for media and governmental institutions for proper informing and providing relevant information. At the time when our research was conducted, there were not many studies that investigated the effects of intolerance of uncertainty on mental health during pandemic. It was known that higher intolerance of uncertainty is associated with higher levels of anxiety (Taha et al., 2014). In order to get further insight, we also wanted to examine the relation of IUS, media exposure, fear and distress. We assumed that intolerance of uncertainty has not only a direct contribution to experienced levels of stress, but also influences someone's media behavior and experienced fear (which could also affect the level of distress).

Media Exposure and Level of Distress

It is not surprising that communication of relevant information during crisis time could affect perceived threat and experienced anxiety (e.g., Balaratnasingam & Janca, 2006). Getting practical and realistic information from governmental organizations could diminish treat and related anxiety. In addition, a study (Jungmann & Witthöft, 2020) that investigated COVID-19 related anxiety showed negative correlation between virus-related anxiety and subjective estimation of being informed about pandemic important issues (e.g., transmission, protective measures, etc.). Media also could contribute to specific, maladaptive behavior as panic buying. This is particularly the case with ambiguous, fear-inducing media reports (Garfin et al., 2020). Finally, some researchers (Trnka & Lorencova, 2020) emphasized that the communication used by mass media (anxious emotional tone, presenting stories with negative outcomes) nega-

tively affected mental health by increasing fear, distress and traumatic feeling during COVID-19 pandemic.

Not just type of content, but also exposure to media could determine the level of acute stress. In a study (Holman et al., 2014) that investigated the effects on media after the Boston Marathon bombing, it was shown that people who reported higher exposure to bombing-related media content experienced higher levels of acute stress compared with people who actually witnessed a bombing attack.

While traditional media (TV, radio, newspapers) still have stricter control over accuracy of presented content, that is not always the case with social media. In fact, some studies showed that false information that circulated over social media lead to misconception about COVID-19, or even death of almost 200 and poisoning of 1000 people as result of false belief that alcohol could cure COVID-19 (for details see Lin et al., 2020).

During the pandemic in Serbia, the media were extensively reporting about COVID-19 situation. However, many of these contents were not objective, in fact, they could be considered unreliable, sensationalistic and panic-inducing. Moreover, there was common practice that important changes (e.g., introducing more restrictive measures, possibility of complete lockdown) were dramatically announced, and people needed to regularly check the media in order to be informed about new rules and restrictions - otherwise they could be punished for breaking the rules. Knowing all of that, we wanted to examine whether media exposure was related to increased levels of experienced distress.

Fear and Experienced Level of Distress

Perceived severity of a threatening event, the probability of its occurrence, as well as our ability to prevent it, could greatly affect the level of experienced stress and someone's behavior. A study conducted in Hungary (Gabor et al., 2020) showed that COVID-19-related fears (about illness, death, financial issues, etc.) are associated with higher levels of stress. Also, children whose parents reported fears were under higher stress compared to children whose parents did not mention fears.

Knowing that intolerance of uncertainty led to interpreting ambiguous situations as threatening, it is expected that IUS could contribute to higher fear. In fact, Satici et al. (2020) confirmed association between IUS and corona-related fear.

Finally, it is reasonable to assume that the media could also have an important role in managing fear. Depending on the type of available information, as well as duration of exposure, someone's fear could be diminished or even increased. Mertens and colleagues (Mertens et al., 2020) reported the association between media exposure and increased level of distress, while Trnka and

Lorencova (2020) showed that type of content could contribute to traumatization. Furthermore, problematic social media use was associated with fear of COVID-19 and with COVID-19 misconceptions as well as distress and insomnia, both directly, and indirectly via increased fear and COVID-19 misunderstanding (Lin et al., 2020).

There is no doubt that fear has an important purpose, and it could be a good motivator for certain protective behavior, but overwhelming fear will negatively affect functioning, mental health and behavior. Therefore, better understanding of all factors that are associated with fear is required.

The aim of the present study was to define the relationship between intolerance of uncertainty, fear of COVID-19, media exposure and perceived distress at the time of COVID-19 pandemic. In order to do so, we examined the contribution of intolerance of uncertainty, media exposure and fear in increase of distress.

Method

Sample and Procedure

Study included 740 participants from the territory of The Republic of Serbia (Subotica 51.9%, Novi Sad 15.7%, Beograd 5.1%, Sombor 4.3%, Šabac 3.2%, Bačka Topola 2.3%, Other – 10.3%) Age of the participants was between 18 and 71 years (M = 34.64, SD =12.42), and most of them were employed (531, 71.8%). There were 537 female and 203 male participants in the sample.

Research was conducted during the coronavirus outbreak in Serbia (from April 5th to 16th 2020). It started about one month after the first COVID-19 case was confirmed and 20 days after the state of the emergency was declared. At that time, strict preventive measures were introduced and promoted in Serbia (i.e., social distancing, washing hands, wearing masks in lesser extent, and police hour during evening for the general population and during the whole day for the elderly).

A questionnaire was web-based and distributed online among the general population. It was promoted on the social media groups and pages, and also individually with the help of students from the College for Vocational Studies of Preschool Teachers and Coaches in Subotica. All participants gave consent, online by clicking on agreement prior to entering the procedure.

Instruments and Measures

Four-Dimensional Symptom Questionnaire (4DSQ)

Four-Dimensional Symptom Questionnaire (Terluin et al., 2004; Serbian adaptation Kalaj et al., 2011) measure stress and related symptoms in the working population. Only *Distress* scale, consisting of 16 items, was used in this research. 4DSQ was used based on the assumption that most of our participants will be from the working population (this research is part of a bigger study that aimed to investigate the relation of current employment situation and distress during pandemic). Since a number of unemployed participants also took part in the open online study, we decided to test described effects on the general population. A 5-point likert scale (from *never* to *always*) was used for answers. Original scoring was applied, changing the 5-point scale to 3-point (0 points stands for "*never*", 1 point for "*sometimes*", and 2 points for "*regularly*", "*often*" or "*very often or constantly*"). Distress score was represented as the sum of all answers, ranging from 0 to 32. Original scoring was applied, so scores range 0-10 represent low stress, 11-20 refers to moderately elevated stress, and 20-31 strongly elevated stress category. Reliability of distress scale was high (α = .93).

Intolerance of Uncertainty Scale (IUS)

IUS (Freeston et al., 1994; Serbian adaptation Sokić et al., 2012) measures a person's tendency to react negatively in uncertain situations. It is built by two main dimensions. The Prospective anxiety dimension refers to Cognitive and emotive aspects of intolerance, while Inhibitory anxiety influences everyday functioning. Originally, the scale consisted of 27 items, but Serbian adaptation and validation (Mihić et al., 2014) showed good metric characteristics of short 11-items solution (6 for Prospective and 5 for Inhibitory anxiety). Participants needed to answer whether some situation is characteristic for them (1 - *not at all*, to 5 - *entirely*). Since both subscales behaved similarly in our study and were highly correlated (*r* = .74), only the total IUS score was used. Reliability of 11-items scale on our sample was high (α = .93).

Fear of COVID-19

At the time this research was conducted, no instrument measuring fear of COVID-19 was available. We constructed an instrument based on Protection motivation theory (Rodger, 1993; cited in Maddux & Rodger, 1993) previously used in research of behavior and emotions related to health crises (Milne et al., 2002). The instrument consisted of 19 items measuring 7 different subscales, but only Fear of COVID-19 scale was used in this analysis. It consisted of three

items measuring anxiety, worry and scare of coronavirus infection (items "*The thought of developing COVID-19 makes me feel anxious / worried / scared*"). Scale showed high reliability on our sample (α = .94).

Media Exposure

Measure od media exposure refers to estimated mean time that someone spends following corona-related media content („*On average, how much time during the day you spend informing yourself about coronavirus*?"). Additionally, participants were asked to estimate specific amount of time they spent informing, or following news, about coronavirus on: TV or radio, reading articles on the internet or in newspapers, on social media, and also in conversation about the coronavirus with other people (formulated as: "*In conversation with others regarding coronavirus and undertaken measures*").

Results

Results of descriptive analysis (presented in Table 1) showed significant levels of distress in our sample. Mean Distress score was moderately high (*M* = 16.31, *SD* = 9.97). One third of the cases (*N* = 250, 33.8%) were classified in low distress category, 218 participants (29.5%) in moderately elevated distress category, and 282 participants (36.8%) were in strongly elevated distress category.

It is interesting to note that the most frequent individually obtained score was 32 - the highest possible score (*N* = 55, 7.4%). Despite that, curve estimation analysis showed that linear and nonlinear models perform equally well on our data.

Fear of COVID-19 was medium on our sample (2.84 out of 5). Compared to measures obtained on Serbian population (*M* = 19.11, *SD* = 6.34, Sokić et al., 2012), Intolerance of uncertainty was 9.11 higher on average in our study, indicating higher intolerance of uncertainty during the pandemic than in regular conditions. Mean media exposure in our sample was 1 hour and 42 minutes on the average.

Table 1
Descriptive statistics of all variables used in research

Scale	N	Min	Max	M	SD	Sk	Ku
Age	740	18	71	34.64	12.42	0.51	- 0.67
DSQ – Distress	740	0	32	16.31	9.87	0.05	- 1.23
IUS – Intolerance of uncertainty	740	11	55	28.21	10.81	0.45	- 0.44
Fear of COVID-19	740	1	5	2.84	1.29	0.07	-1.08
Media exposure	740	0	11	1.70	1.99	2.02	5.60

Note. N – number of participants; *Min/Max* – minimal and maximal score; *M* – mean; *SD* – standard deviation; *Sk* – skewness; *Ku* – kurtosis.

Prior to main analysis, we examined correlation coefficients between all variables. Results are presented in Table 2. The highest correlation was between Distress and Intolerance of uncertainty, indicating moderately strong direct relationship. Medium correlation was obtained between Distress and Fear of COVID-19, and low correlation between Distress and Media exposure. Interestingly, correlations between Intolerance of uncertainty and Fear of COVID-19, Intolerance of uncertainty and Media exposure, and also between Media exposure and Fear of COVID-19 were significant.

Table 2
Intercorrelations of all variables used in research

Variable	1	2	3	4
1. Distress	-	.58**	.36**	.22**
2. IUS – Intolerance of uncertainty		-	.42**	.22**
3. Fear of COVID-19			-	.18**
4. Media exposure				-

Note. ** $p < .01$.

Serial mediation analysis was performed using PROCESS macro in SPSS (Model 6, Hayes, 2018) to test direct and indirect influence of Intolerance of uncertainty on the Distress. Gender and Age was used as covariate in the model. Results of mediation analysis are presented on Figure 1.
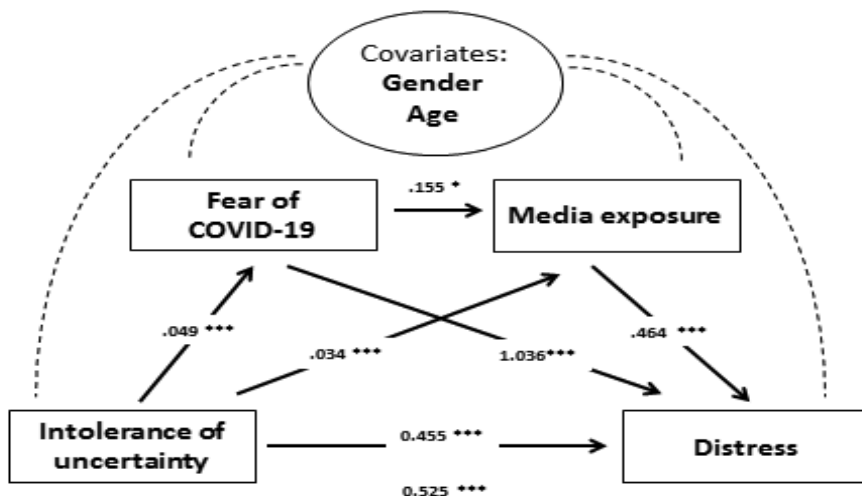
Figure 1. The result of serial multiple mediation model. Values shown are unstandardized coefficients. * $p < .05$, *** $p < .001$.

We found a strong direct effect of Intolerance of uncertainty on Distress ($B = 0.45$, $p < .001$). More one cannot tolerate uncertainty – distress gets higher. When mediators were included, Intolerance of uncertainty had a stronger total effect ($B = 0.53$, $p < .001$). Indirect effect of Intolerance of uncertainty on Distress was significant both via *Fear of COVID-19* ($B = 0.05$, *95% CI* [0.02, 0.08]) and Media exposure ($B = 0.02$, *95% CI* [0.01, 0.03]). If one cannot tolerate uncertainty, it is more exposed to media, and media exposure leads to higher distress levels. Similarly, greater intolerance leads to greater levels of experienced fear, and fear leads to elevated distress.

It is interesting to note there was also significant relationship between Media exposure and Fear of COVID-19 ($B = 0.16$, $p < .001$), and compound effect of IUS – Fear – Media exposure – Distress was significant ($B = 0.004$, *95% CI* [0.000, 0.008]). In this case, intolerance leads to greater levels of fear, which leads to greater media exposure, and both together leads to higher levels of distress.

It seems that the media have an important role in increasing distress, both directly and as mediators. It is important to consider time spent on particular media following news about coronavirus (all presented in Table 3). Participants most often watched TV (50.4 minutes) and read articles in newspapers or on the internet (42 minutes). Interestingly, participants reported to spend about 41 minutes of every day in conversation about coronavirus with other persons. Similar time was obtained for social media informing (39.6 minutes). The last frequent way of informing is listening to the radio (13.8 minutes).

Table 3
Descriptive statistics of exposure to particular media type

Scale	N	Min	Max	M	SD	Sk	Ku
Media exposure - overall	740	0	11	1.70	1.99	2.02	5.60
TV	740	0	11	0.84	1.49	3.75	20.05
Newspaper or online articles	740	0	11	0.70	1.51	3.96	20.08
Conversation about coronavirus	740	0	11	0.69	1.43	4.39	25.58
Social media	740	0	11	0.66	1.48	4.20	22.37
Radio	740	0	11	0.23	0.91	6.83	62.04

Note. N – number of participants; *Min/Max* – minimal and maximal score; *M* – mean; *SD* – standard deviation; *Sk* – skewness; *Ku* – kurtosis.

Contribution of particular media exposure on distress was tested using linear regression. Obtained model was significant ($R^2 = 0.07$, $F(5, 734) = 10.88$, $p < .001$), which indicates that total corona-related media consumption was associated with higher distress. However, only conversation about coronavirus turned out to be a significant single predictor ($\beta = 0.14$, $t = 3.20$, $p < .01$). Exposure to other particular media was not significant in explaining distress.

Discussion

This study confirmed a moderately high level of distress in the general population in The Republic of Serbia during the coronavirus outbreak. Two third of participants reported moderately or strongly elevated distress. Furthermore, 7.4% of them reported the highest possible score on distress scale. Similarly, we observed increased levels of intolerance of uncertainty. These results are not surprising considering the fact at that time coronavirus were novel, transmission was partially explained and possible negative outcomes were overestimated.

Our results confirmed the strong direct effect of intolerance of uncertainty on distress: increased levels of intolerance of uncertainty were associated with higher levels of distress. This result is in accordance with the results of the previous studies (Bakioğlu et al., 2020; Ferreira et al., 2020).

The most significant contribution of our study is identifying strong indirect effects of intolerance of uncertainty on distress via fear of infection and media consumption. Only complex interrelation of these four factors could lead to a satisfying explanation of the dynamics of increasing distress process during the time of crisis.

Fear of COVID-19 infection could directly increase the level of distress. It was also related to intolerance of uncertainty: higher levels of intolerance of uncertainty were associated with increased fear. These results are not sur-

prising and they are comparable with the results of the previous studies (e.g., Gabor et al., 2020; Satici et al., 2020).

Considering media exposure, we found that the amount of time someone will spend consuming media corona-related content could be influenced by intolerance of uncertainty: a person who cannot deal with uncertainty will spend more time searching for information that could provide further insight and concrete recommendations. Furthermore, higher media exposure actually leads to distress. As Holman and colleagues previously stated, media exposure could increase the level of acute stress and that results were also replicated in our study (Holman et al., 2014).

In addition, we wanted to identify whether the type of media had a different effect on the experienced level of distress. Although the higher exposure to all media was associated with higher levels of distress (same results were obtained in Trnka and Lorencova, 2020, but also in Holman et al., 2014), the only statistically significant relation was found between the amount of time that one spent in talking about coronavirus and level of distress. This could be a sign of worry for the beloved ones, but also could be due to distrust in the media. It could serve as a coping strategy for dealing with uncertainty: someone who does not trust the media needs another source of information and reassurance - and that is a trustworthy, familiar person.

Confirming the relation between intolerance of uncertainty and higher distress has both theoretical and practical implication. Maybe the most effective way of dealing with distress during a pandemic could be reducing observed uncertainty of the situation by a different approach to reporting. Changing style of informing, making information comprehensive and undoubtful, based on evidence, could lead to less uncertainty level, and consequently to lower level of distress in the general population. It could also help in avoiding mass panic and irrational behaviors. With clear information about virus transmission, it is possible to decrease the level of experienced fear and distress, and to promote self-protective practices.

Additionally, obtained results could serve as a starting point for improving practitioners' guidelines. Knowing that people with higher intolerance of uncertainty tend to spend more time on media, practitioners could make recommendations on how to stay informed without increasing fear and distress. Finally, understanding the role of intolerance of uncertainty could help us in identifying vulnerable groups that might need additional support during the time of crisis.

It is important to emphasize that our study does not have causal character, so alternative explanations could be considered, at the end. For example, it is possible that increased distress also has a reverse effect on time spent on informing: the more somebody is distressed, he could be looking for additional information. It could be true also for intolerance of uncertainty and fear. Exact nature of these interrelationships should be examined in some future studies.

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Subotici

DIREKTNI I INDIREKTNI EFEKTI NETOLERANCIJE NA NEIZVESNOST NA DISTRES TOKOM COVID-19 PANDEMIJE

Pandemija izazvana koronavirusom uticala je na celokupnu populaciju, izazivajući kod mnogih pojedinaca, indirektno ili direktno pogođenih, povišeni nivo distresa. Takva globalna kriza mentalnog zdravlja zahteva identifikaciju ključnih mehanizama koji dovode do povećanog distresa tokom pandemije. Specifičnost početka COVID-19 pandemije ogledala se u nedostatku informacija i, posledično, u visokom nivou procenjene neizvesnosti. Glavni cilj ovog istraživanja bio je ispitivanje efekta netolerancije na neizvesnost na doživljeni nivo distresa tokom pandemije. Dodatno, ispitivan je i posredni efekat medijske izloženosti, kao i straha u vezi sa COVID-19 infekcijom. Ukupno 740 ispitanika učestvovalo je u online istraživanju na početku pandemije u Republici Srbiji. U našem uzorku izmeren je umereno visok nivo distresa. Približno ⅓ ispitanika bila je u svakoj grupi: bez distresa, umereno visok i veoma povišen nivo distresa. Rezultati analize serijalne medijacije pokazali su da netolerancija na neizvesnost ima značajan direktan efekat na distres, ali i indirektan, preko straha od COVID-19 infekcije i preko medijske izloženosti. Viši nivo netolerancije na neizvesnost povezan je sa većom količinom vremena provedenom u traženju informacija u medijima i, nadalje, sa višim strahom i višim nivoom distresa. Pokazano je, takođe, da je medijska izloženost povezana sa povećanim nivoom straha od virusa. Ovakvi rezultati ukazuju na važnost nedvosmislenog i jasnog informisanja tokom krize, koje ima potencijal da smanji neizvesnost, i pružaju praktične implikacije za medije i državne institucije.

Ključne reči: COVID-19, distress, medijska izloženost, netolerancija na neizvesnost, strah