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COVID-19 lockdown distress, but not the infection concerns, shape psychological functioning during the pandemic: The mediating role of basic psychological needs

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This study examined the effect of COVID-19 lockdown and infection concerns on positive and negative aspects of psychological functioning during the first weeks of the new coronavirus pandemic, and the mediating role of basic psychological needs satisfaction and frustration. Slovene adults ($N = 425$; 79% female) filled in questionnaires measuring COVID-19-related stressors, satisfaction and frustration of basic psychological needs, well-being, and ill-being. Results of the path analysis with Bootstrap estimation procedure revealed that the perceived severity of the COVID-19 lockdown circumstances predicted diminished psychological functioning of participants both directly and via decreased needs satisfaction and increased needs frustration. Conversely, the infection concerns had a much weaker and direct only effect on the increased ill-being, but no effect on well-being. These findings indicate that lockdown circumstances, but not the possibility of COVID-19 infection, predominantly shape individuals' ability to satisfy their basic needs and subsequently their psychological functioning during the pandemic. The study suggests that public health responses should address not only risk of infection but also people's psychological needs.

Key words: COVID-19 pandemic, COVID-19-related stressors, basic psychological needs, psychological functioning, mediation.

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INTRODUCTION

In the spring of 2020, several countries used restrictive preventive measures to ensure physical distancing and slow down the spread of the novel coronavirus due to the COVID-19 pandemic. Consequently, life circumstances changed drastically, and several aspects of individuals' daily lives were impaired, possibly leading to dissatisfaction or even frustration of some of their needs. Commonly perceived stressors during this period were related to exposure to information regarding the severity of COVID-19 infection, uncertainty about the length of restrictions, physical distancing requirements, and changes to daily routines (Russell *et al.*, 2020). Individuals reported reduced well-being as well as increased depression and stress (Brailovskaia & Margraf, 2020; Cao, Fang, Hou *et al.*, 2020; Casagrande, Favieri, Tambelli & Forte, 2020; Odriozola-González, Planchuelo-Gómez, Iruña & de Luis-García, 2020; Petzold, Bendau, Plag *et al.*, 2020). The mechanisms by which these stressors contribute to diminished psychological functioning are not clear yet, however restricted fulfillment of basic needs could explain these associations.

The current study examined positive and negative aspects of psychological functioning during the COVID-19 pandemic. A differentiation between the indicators of well-being and ill-being is based on a theoretical reasoning suggesting that the presence of mental health is more than just the absence of mental illness, and that the absence of well-being does not imply the presence of ill-being (e.g., Keyes, 2007; Suldo & Shaffer, 2008). Accumulation of the research results clearly suggested that correlations between the

indicators of well-being and ill-being are at most moderate (e.g., Huppert & Whittington, 2003). In addition, well-being and ill-being have distinct correlates (Huta & Hawley, 2010; Karademas, 2007), even biological ones (Ryff, Dienberg Love, Urry *et al.*, 2006). These findings imply that individuals without ill-being symptoms (e.g., depression, anxiety) may experience either high or low levels of well-being. Some people, therefore, report no psychological problems but may still lack meaningful life engagement. These people are the most relevant group for health prevention interventions, as they do not seek any professional help but are at increased risk of mental disorders (Wood & Joseph, 2010).

The role of basic psychological needs in individual's well-being

According to the self-determination theory (Ryan & Deci, 2017), a psychological need is considered not just the presence of a specific desire or preference, but a psychological nutrient essential to an individual's adaptation, integrity, and growth. Many studies support the idea that the satisfaction of three basic psychological needs, as defined in the self-determination theory, is essential for individual's well-being (e.g., Church, Katigbak, Locke *et al.*, 2013; Reis, Sheldon, Gable, Roscoe & Ryan, 2000; Sheldon & Bettencourt, 2002). The need for relatedness is satisfied by having mutually caring emotional bonds with other people or feelings of belonging to a group. The satisfaction of the need for autonomy is achieved when one's own actions, thoughts, and feelings are perceived as self-endorsed and authentic. Finally, the need for competence is satisfied when a person seeks out and masters optimal challenges that require the use and advancement of their abilities and skills.

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In a large cross-cultural study including 123 countries (Tay & Diener, 2011), authors reported that the satisfaction of the needs for autonomy, competence, and relatedness positively correlated with three aspects of subjective well-being (life satisfaction, positive affect, negative affect). The findings are consistent with the theory that some universal psychological needs are wired into humans regardless of cultural background and should be satisfied to achieve subjective well-being. Subjective well-being is “an internal barometer of ‘how life is going’” (Su, Tay & Diener, 2014, p. 254) and represents one of the seven components (along with supportive and enriching relationships, interest and engagement in daily activities, meaning and purpose in life, a sense of mastery and accomplishment, feelings of control and autonomy, and optimism) of the thriving construct.

The link between the satisfaction of basic psychological needs and psychological functioning is also supported by a study carried out with French adults during the 2020 spring lockdown due to the COVID-19 pandemic showing moderate associations of need satisfaction with higher subjective well-being and lower perceived stress (Ginoux, Isoard-Gautheur, Teran-Escoba *et al.*, 2021). The results indicate that individuals’ functioning is non-optimal if basic psychological needs are not satisfied which was presumably the cause of diminished subjective well-being during the COVID-19 pandemic.

In addition to reducing the satisfaction of needs, the pandemic and associated preventive measures could also contribute to the frustration of the basic psychological needs, even further diminishing the well-being. Needs frustration refers to perceptions that one’s needs are not only unsatisfied but actively thwarted, leading to much more intense negative feelings (Warburton, Wang, Bartholomew, Tuff & Bishop, 2020). For example, a person with low satisfaction of the need for relatedness may experience not having enough social support, while the frustration of this need could be experienced if a person felt rejected by others. Compared to their satisfaction, the frustration of needs is differently related to measures of well-being and ill-being. For example, in an Italian study (Liga, Ingoglia, Cuzzocrea *et al.*, 2018) the frustration, but not the satisfaction, of all three psychological needs predicted depression. Moreover, the satisfaction of the psychological needs, but not their frustration, predicted vitality as an indicator of well-being. With samples of participants from four different countries (Chen, Vansteenkiste, Beyers *et al.*, 2015), both needs satisfaction and needs frustration was related to well-being and ill-being, but in different directions. These results suggest that although the differentiation between needs satisfaction and needs frustration is well grounded, needs satisfaction is not associated with positive outcomes and needs frustration with negative outcomes only.

COVID-19-related stressors contribute to diminished psychological functioning

Across the world, the pandemic caused people to worry about the infection and health consequences for themselves and their significant others, but equally or even more worried about everyday life restrictions, the general and financial consequences, and the existing social situation (Brailovskaia & Margraf, 2020; Odriozola-González *et al.*, 2020; Park *et al.*, 2020; Petzold *et al.*,

2020). A growing body of research conducted worldwide indicates that the COVID-19 pandemic has been causing intense concerns. A longitudinal study (Kavčič, Avsec & Zager Kocjan, 2020) with five measurement points spanning from the beginning to the end of the first wave of the COVID-19 epidemic in Slovenia, reported that specific concerns (e.g., about one’s own and others infection, lockdown circumstances, long-term consequences, interpersonal conflicts, lack of socializing) were highest during the first weeks of the epidemic and gradually decreased thereafter until Slovenia declared the end of the first wave of COVID-19 in May 2020. For example, the results of a study conducted on a sample of Slovenian emerging adults (Lep & Zupančič, 2020) showed higher concerns regarding long-term economic consequences of the COVID-19 epidemic compared to health-related concerns.

People’s concerns regarding the health threat and the lockdown situation could affect their physical and mental health. In a German sample (Petzold *et al.*, 2020), half of the participants reported being anxious about the consequences of the COVID-19 pandemic. In a Chinese student sample (Cao *et al.*, 2020), economic stressors, daily life stressors and stressors related to academic delay during the pandemic were linked to higher anxiety levels. Studies also suggest that COVID-19-related stressors are related not only to higher ill-being but to decreased mental health as well (e.g., Brailovskaia & Margraf, 2020).

The mediating mechanism of basic psychological needs

Basic needs satisfaction and needs frustration can be seen as potential mediators between individuals’ experience of specific stressors and their well-being and ill-being. Perceived stressors, such as changed life circumstances due to the lockdown, can affect well-being and ill-being directly due to the experiences of negative feelings (e.g., worries about future). Moreover, they can affect individuals’ psychological functioning through subjectively perceived inability to satisfy basic psychological needs or even through the frustration of basic needs (e.g., one cannot socialize, can feel forced to perform activities such as wearing a face mask, and may not have opportunities to exercise competence in sports). In previous studies, basic psychological needs satisfaction has already been explored as a mechanism mediating the relationship between environmental demands or stressors and various well-being outcomes (Aldrup, Klusmann & Lüdtkke, 2017; Bartholomew *et al.*, 2014; Boudrias, Gaudreau, Desrumaux *et al.*, 2014). A study by Ebersold, Rahm and Heise (2019) concurrently examined the satisfaction and frustration of basic psychological needs as mediators between lack of autonomy support and indicators of psychological functioning. Results revealed that autonomy support predicted positive affect and life satisfaction via basic needs satisfaction, and it predicted negative affect and life satisfaction via basic needs frustration, thus not completely supporting the differential role of basic needs satisfaction and frustration in well-being and ill-being. However, to the best of our knowledge these associations have not been tested yet in the context of the current or previous epidemics.

The present study

The aim of this study was to explain the underlying mechanism of the association between the COVID-19-related stressors and

individuals' psychological functioning during the lockdown due to the coronavirus epidemic in a sample of Slovene adults. In Slovenia, the epidemic was declared on 12 March 2020 and the government took strict measures aimed at slowing the infection rate, which were primarily focused on social distancing. All educational institutions, sales and service facilities were closed (except for pharmacy and food stores), the public transportation was stopped, and public gatherings were prohibited. The data collection was carried out between 24 and 26 March 2020. As the participants reported on their well-being and concerns for the last week, their self-assessment encompassed the feelings during the first week that strict measures in Slovenia were employed.

It was hypothesized that the perceived changes in life circumstances due to the lockdown and the concerns about possible COVID-19 infection would affect indicators of individuals' well-being and ill-being, whereby the average score of emotional, psychological and social well-being was used as an indicator of well-being and a perceived stress as an indicator of ill-being. Furthermore, basic psychological needs satisfaction and needs frustration were expected to mediate the relationship between the two COVID-19-related stressors and individuals' psychological functioning.

METHOD

Participants and procedure

The study included 425 adults, aged from 18 to 76 years ($M = 38.1$; $SD = 13.5$). Approximately a fifth of the participants were male and 79% were female. With respect to the educational level, 25% of participants attained a high school or lower education and 75% had a post-secondary education or graduate degree.

The convenience sample of the data was collected online using a survey platform and the link was distributed via social networks (e.g., Facebook, Twitter, LinkedIn) of the authors of the article and their academic institutions. The short information regarding the study was depicted on the National radio and television's website. Additionally, advertisement for the survey was paid on Facebook for 3 days, targeting males and older males. The cover page of the survey contained information on the aims of the study and the respondents were asked to confirm their informed consent to participate. The study was approved by the University of Ljubljana, Faculty of Arts Human Research Ethics Committee (#185-2020).

Measures

Demographics. Participants were asked to report gender, age, and educational level.

Stressors. The severity of two COVID-19 epidemic-related stressors was measured: (1) the perceived burden of the change in life circumstances due to the lockdown; and (2) the concern about a possible COVID-19 infection by themselves or their loved ones. The respondents assessed the subjectively perceived intensity of these two stressors along an 11-point rating scale ranging from 0 – "not stressful at all" to 10 – "extremely stressful."

Psychological needs. The Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen *et al.*, 2015) was used as a self-report measure of satisfaction and frustration of autonomy, relatedness and competence needs. It consists of 24 items rated along a five-point Likert scale, ranging from 1 – "completely disagree" to 5 – "completely agree." The scale has a six-factor structure with the six scales showing satisfactory internal consistency. Additionally, the items form two higher order scales,

reflecting needs satisfaction and needs frustration, and showing sound reliability and validity (Costa, Ingoglia, Inguglia, Liga, Lo Coco & Larcari, 2018; Haerens, Aelterman, Vansteenkiste, Soenens & Van Petegem, 2015; Heissel, Pietrek, Flunger *et al.*, 2018). The present study focused on these two scales with scores computed as mean values of the relevant item scores. The alpha coefficients were 0.91 and 0.88 for need satisfaction and need frustration, respectively.

Ill-being. Ill-being was operationalized as the overall stress experienced during the past week. The Perceived Stress Scale (PSS; Cohen & Williamson, 1988) was employed with 10 items rated on a five-point scale ranging from 0 – "never" to 4 – "very often." After reversing four item scores, the scale score was computed as mean of all item ratings. Previous studies showed good internal consistency, test-retest reliability, and criterion validity of the scale (Lee, 2012). With the present sample, the alpha coefficient was 0.91.

Well-being. The short form of the Mental Health Continuum (MHC-SF; Keyes, 2002) was used as a self-report measure of subjective well-being. It includes 14 items that are rated along a six-point scale ranging from 0 – "never" to 5 – "every day during the past week." The overall score is computed as a mean value of the three subscales reflecting emotional, psychological and social well-being. Past studies provided evidence on good internal consistency, satisfactory test-retest reliability and sound construct, convergent, and divergent validity of the scale (Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2010). In this study, the alpha coefficient for the overall score was 0.87.

Data analysis

First, we examined the descriptive statistics and computed Pearson correlations between the main variables. In line with Cohen's (1988) recommendations, correlation coefficients below 0.30 were interpreted as low, between 0.30 and 0.50 as medium and those above 0.50 as large. Possible gender differences in psychological functioning were estimated by independent samples *t*-tests and Cohen's *d* was calculated to determine the effect size. Values of Cohen's *d* up to 0.50 suggest small effect, those between 0.50 and 0.80 medium effect, and above 0.80 large effect (Cohen, 1988).

To test the mediating role of needs satisfaction and needs frustration in the association of the subjectively experienced severity of the two epidemic-related stressors with well-being and ill-being, we performed a path analysis with a maximum likelihood (ML) estimator using *Mplus* version 8.4 (Muthén & Muthén, 1998–2019). The two epidemic-specific stressor variables were treated as exogenous variables both having direct and indirect effects on well-being and ill-being, while needs satisfaction and needs frustration were treated as mediating variables. The indirect effects were modelled by: (1) regressing needs satisfaction and needs frustration on the two epidemic-specific stressors; and (2) regressing well-being and ill-being on needs satisfaction and needs frustration. The two outcome variables (well-being and ill-being) and the two mediating variables (needs satisfaction and needs frustration), respectively, were allowed to covary. Possible effects of participants' gender (male vs. female) on well-being and ill-being were statistically controlled by adding gender as a predictor of these outcome variables in the model. The indirect effects were estimated using the MODEL INDIRECT command in *Mplus*, and the Bootstrap estimation procedure with 2,000 bootstrap samples randomly selected from the full dataset was used to obtain confidence intervals for the indirect effects. We considered RMSEA values lower than 0.06, SRMR values lower than 0.08 (Hu & Bentler, 1999), and CFI values above 0.95 to indicate good model fit (Browne & Cudeck, 1992).

RESULTS

Descriptive statistics and correlations

Descriptive statistics and correlations between all the variables are presented in Table 1. The lockdown concerns had a large positive

Table 1. Descriptive statistics and correlations between the variables studied

	1	2	3	4	5	6
1 COVID-19 lockdown concerns						
2 COVID-19 infection concerns	0.44***					
3 Basic needs satisfaction	-0.43***	-0.13**				
4 Basic needs frustration	0.40***	0.12*	-0.76***			
5 Well-being	-0.42***	-0.16**	0.77***	-0.67***		
6 Ill-being	0.54***	0.31***	-0.67***	0.64***	-0.67***	
<i>M</i>	4.83	4.94	3.70	2.18	3.26	1.72
<i>SD</i>	2.68	2.52	0.72	0.75	0.92	0.69

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

correlation with ill-being and a medium negative correlation with well-being, and the infection concerns had a medium positive correlation with ill-being and a small negative correlation with well-being, indicating better psychological functioning during the epidemic in participants who found the COVID-19-related situation less stressful. Furthermore, the lockdown and the infection concerns had negative correlations of medium and small effect sizes, respectively, with basic needs satisfaction, and positive correlations of similar sizes with basic needs frustration. Finally, basic needs satisfaction had a large positive correlation with well-being and a large negative correlation with ill-being. The reversed pattern was observed for the correlations between basic needs frustration and the two indicators of psychological functioning.

Relationship between participant's age and gender and their well-being and ill-being was also examined. Participants' age was modestly associated with higher subjective well-being ($r = 0.21$, $p = 0.000$) and lower ill-being ($r = -0.20$, $p < 0.001$). Gender had no effect on their well-being ($t[2,423] = 0.02$, $p = 0.982$, $d = 0.002$), but a small effect on ill-being ($t[2,423] = -2.81$, $p = 0.005$, $d = 0.326$) with women reporting higher stress levels ($M = 1.76$, $SD = 0.67$) than men ($M = 1.53$, $SD = 0.74$). Although the associations between individuals' psychological functioning and their gender and age were relatively weak, we controlled for the effects of gender on psychological functioning

in the following path analysis due to unequal representation of men and women in the sample.

Path analysis and tests of indirect effects

In order to test the proposed model predicting well-being and ill-being with COVID-19 lockdown concerns and infection concerns, and examine the hypothesized mediating role of the basic psychological needs satisfaction and needs frustration, a path analysis was conducted. The model yielded good fit to the data with $\chi^2(2) = 4.506$ ($p = 0.105$), RMSEA = 0.054 (95% CI = 0.000, 0.123), CFI = 0.998, SRMR = 0.028. Although the RMSEA confidence interval was large with an upper limit exceeding 0.10, it should be noted that RMSEA confidence intervals tend to be wider in smaller models with lower degrees of freedom (Kenny, Kaniskan & McCoach, 2015). Standardized path coefficients for the model tested are presented in Fig. 1. In line with the expectations, the lockdown concerns predicted basic needs satisfaction and basic needs frustration in opposite directions, with path coefficients of similar size. Moreover, the path coefficients between infection concerns and the satisfaction and frustration of basic psychological needs were insignificant. Basic needs satisfaction predicted increased well-being and, to a somewhat weaker extent, decreased ill-being. Conversely, basic needs frustration predicted increased ill-being and, to a rather

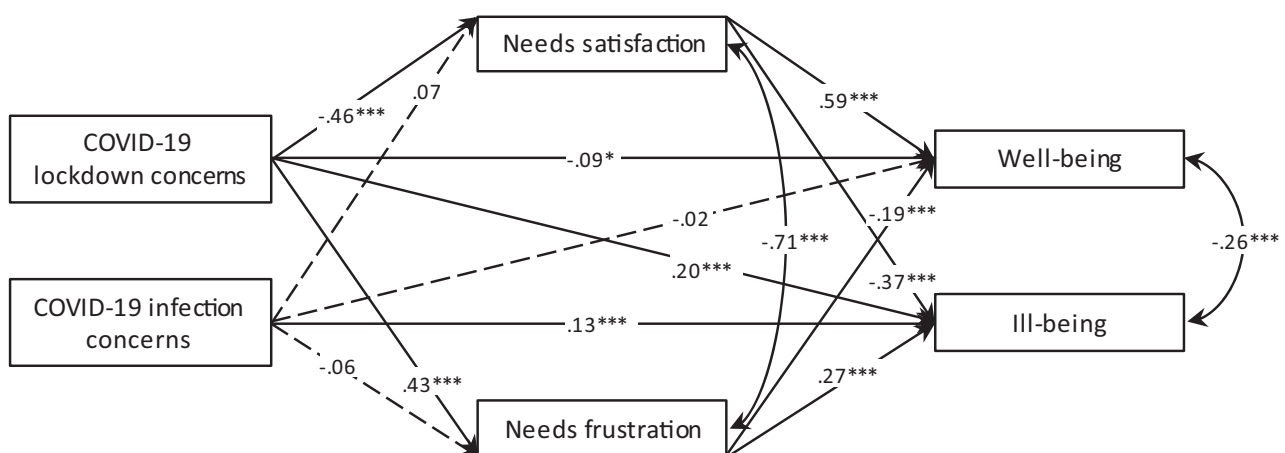


Fig. 1. Path diagram with standardized path coefficients linking COVID-19-related stressors with well-being and ill-being directly and through the satisfaction and frustration of basic psychological needs. Solid lines indicate significant effects ($*p < 0.05$, $**p < 0.01$, $***p < 0.001$), whereas dotted lines indicate insignificant effects ($p > 0.05$). Control variable (gender) is not presented for brevity.

weaker extent, decreased well-being. Also, the lockdown concerns had a significant positive effect on ill-being and a weak yet significant negative effect of well-being. Infection concerns predicted higher ill-being, but they had no effect on well-being. The model explained 18.9% of the variance in basic needs satisfaction, 16.2% in basic needs frustration, 58.9% in ill-being, and 61.5% in well-being.

Standardized total, direct, total indirect, and partial indirect effects for the model tested are presented in Table 2. Confidence intervals containing zero indicate non-significant effects ($p < 0.05$). The relationships between the lockdown concerns and individual's well-being and ill-being were both partially mediated by basic needs satisfaction and needs frustration. Specifically, the lockdown concerns predicted lower well-being and higher ill-being both directly and through decreased needs satisfaction and increased needs frustration. The mediation paths accounted for 79.9% of the total effect of the lockdown life circumstances on well-being (i.e., the proportion of the total indirect effect in the total effect; see Table 2). The larger share of this total indirect effect could be explained by the mediation path via basic needs satisfaction and the smaller share by the mediation path via basic needs frustration. Furthermore, 58.0% of the total effect of the lockdown concerns on ill-being could be attributed to the mediation paths, and again a somewhat larger share of this total indirect effect was due to the mediation via basic needs satisfaction compared to the mediation via basic needs frustration. The infection concerns had no direct or indirect effects on well-being, but they had a direct positive effect on ill-being, albeit this effect was relatively weak compared to the effects of the lockdown concerns.

DISCUSSION

The present study provided evidence that specific stressors relevant in the COVID-19 pandemic and the associated lockdown prominently affect adults' well-being and ill-being. Moreover, the findings suggest that basic psychological needs satisfaction and needs frustration provide a mechanism by which concerns regarding the changes in life circumstances due to the pandemic increase ill-being and diminish subjective well-being.

Recent research documented increased ill-being during the COVID-19 outbreak as a variety of negative effects such as elevated anxiety, depression, posttraumatic stress symptomatology, and poor sleep quality were revealed (e.g., Casagrande *et al.*, 2020; Odriozola-González *et al.*, 2020; Petzold *et al.*, 2020). In the present study, two specific stressors potentially important for individuals' psychological functioning during the COVID-19 outbreak were investigated. While lockdown concerns are certainly a much broader stressor than infection concerns and this difference in their extent could contribute to the difference in their predictive value, we targeted the infection concerns specifically as they are the most salient theme in media reports and governmental measures. Both types of stressors were linked with lower perceived stress and higher well-being, though the associations were somewhat higher for lockdown concerns than for infection concerns. Similar to our findings, lockdown-related stressors were moderately associated with increased anxiety in Chinese students (Cao *et al.*, 2020), and with increased stress levels and decreased positive mental health in German adults (Brailovskaia & Margraf, 2020).

Interestingly, the results obtained suggest that concerns regarding one's own or significant others' COVID-19 infection

Table 2. Standardized total, direct, total indirect, and partial indirect effects of the COVID-19 lockdown concerns and infection concerns on well-being and ill-being through the satisfaction and frustration of basic psychological needs

Paths	Effect	SE	<i>P</i>	95% CI
Lockdown concerns → well-being				
Lockdown concerns → well-being (total)	-0.438	0.052	<0.001	[-0.535, -0.337]
Lockdown concerns → well-being (direct)	-0.088	0.043	0.042	[-0.176, -0.006]
Lockdown concerns → well-being (total indirect)	-0.350	0.039	<0.001	[-0.425, -0.270]
Lockdown concerns → BNS → well-being	-0.270	0.036	<0.001	[-0.346, -0.200]
Lockdown concerns → BNF → well-being	-0.080	0.021	<0.001	[-0.122, -0.039]
Lockdown concerns → ill-being				
Lockdown concerns → ill-being (total)	0.486	0.045	<0.001	[0.397, 0.569]
Lockdown concerns → ill-being (direct)	0.204	0.042	<0.001	[0.120, 0.286]
Lockdown concerns → ill-being (total indirect)	0.282	0.032	<0.001	[0.218, 0.343]
Lockdown concerns → BNS → ill-being	0.170	0.030	<0.001	[0.116, 0.232]
Lockdown concerns → BNF → ill-being	0.113	0.025	<0.001	[0.067, 0.165]
Infection concerns → well-being				
Infection concerns → well-being (total)	0.036	0.053	0.496	[-0.067, 0.145]
Infection concerns → well-being (direct)	-0.019	0.038	0.616	[-0.092, 0.058]
Infection concerns → well-being (total indirect)	0.055	0.036	0.121	[-0.017, 0.124]
Infection concerns → BNS → well-being	0.043	0.029	0.129	[-0.013, 0.100]
Infection concerns → BNF → well-being	0.012	0.010	0.233	[-0.007, 0.031]
Infection concerns → ill-being				
Infection concerns → ill-being (total)	0.086	0.046	0.064	[-0.006, 0.175]
Infection concerns → ill-being (direct)	0.129	0.037	<0.001	[0.055, 0.202]
Infection concerns → ill-being (total indirect)	-0.044	0.029	0.131	[-0.101, 0.014]
Infection concerns → BNS → ill-being	-0.027	0.019	0.146	[-0.065, 0.008]
Infection concerns → BNF → ill-being	-0.016	0.013	0.221	[-0.043, 0.011]

Notes: Bootstrapping sample size = 2,000.

CI = confidence interval; BNS = basic needs satisfaction; BNF = basic needs frustration.

had a relatively weak direct intensifying effect on ill-being, yet they had no effect on well-being neither on basic needs satisfaction or needs frustration. Moreover, the overall effect of this stressor on psychological functioning was substantially weaker compared to the effect of the lockdown concerns. It seems that COVID-19 infection concerns directly invoked feelings of distress, nervousness, anger, and lack of personal control over the situation. The link between perceived severity of specific stressors and general feelings of distress is probably one of the most well-documented in stress research (Biggs, Brough & Drummond, 2017). Although concerns regarding the COVID-19 infection predicted individuals' ill-being, they did not affect their well-being, thus supporting the idea of a relative independence between well-being and ill-being and the necessity to concurrently examine "bright" and "dark" sides of psychological functioning (Keyes, 2007; Suldo & Shaffer, 2008).

The perceived severity of changes in life circumstances due to the COVID-19 lockdown was a prominent predictor of individuals' psychological functioning, predicting well-being and ill-being both directly and indirectly through the mediating role of psychological needs satisfaction and needs frustration. Changes in life circumstances due to restrictive measures affected daily routine within which people normally fulfill their basic psychological needs (Park *et al.*, 2020). Individuals who perceived this routine as essentially disrupted also experienced impediments in needs satisfaction or even active threats to their psychological needs (needs frustration), further hindering their psychological functioning (Behzadnia & FatahModares, 2020).

Our results also support the hypothesised role of psychological needs satisfaction and needs frustration as mechanisms by which perceived lockdown conditions exert their effect on psychological functioning. Individuals who perceived lockdown circumstances as stressful also reported reduced needs satisfaction and increased needs frustration. At this point it should be noted that subjective experiences, and not objective characteristics of the lockdown, were measured. The former could be affected by different dispositional traits (e.g., neuroticism, coping styles) and life situations (e.g., working in tourism, government, education) which were not controlled in the present study. The results further suggest that subjective experiences of the lockdown as stressful predicted diminished fulfillment of autonomy, relatedness, and competence needs as well as the frustration of these needs, consequently worsening people's psychological functioning. For example, an individual for whom maintaining fulfilling relationships in the context of physical distancing was an unsolvable problem could find that his or her need for relatedness was less satisfied or even frustrated, leading to reduced well-being and increased ill-being. The findings are consistent with previous studies showing that basic needs satisfaction and needs frustration partly mediate the relationship between subjective perceptions of stressors and indicators of psychological functioning (Ebersold *et al.*, 2019). Within the COVID-19 context, we found no comparable study, but a French study (Ginoux *et al.*, 2021) did find needs satisfaction to be related to higher well-being and lower stress.

Certain limitations of the current study should be noted. Foremost, the cross-sectional research design precludes causal conclusions regarding the direction of relationships between the constructs investigated. To exemplify, we tested whether

perceived severity of stressors affects psychological functioning through motivational channels, but it is also possible that prior psychological functioning affected people's evaluations of epidemic-related stressors (Brailovskaia & Margraf, 2020), possibly through the satisfaction and frustration of their basic psychological needs. Longitudinal research is needed to disentangle the dynamic nature of these associations. Moreover, the field would benefit by studies including measures of dispositional traits (e.g., the Big Five) that could further explain the consequences various stressors related to the COVID-19 and the associated lockdown have on individuals' psychological functioning. Furthermore, our study measured two rather broad COVID-19-related stressors, but other (specific) aspects of the epidemic and lockdown (e.g., home schooling, job loss, restricted social contacts) could represent a significant risk or protective factor of people's psychological functioning as well. Regarding the sampling procedure, the online data collection could confine the accessibility of the survey, though a vast majority of Slovenian adults use the Internet regularly (SURSA, 2019). Also, women responded to the invitation to participate in the study to a greater extent than men despite targeted advertisement of the survey among men, thus leading to a gender-imbalanced and unrepresentative sample. However, gender bias with higher female participation rates is a prevailing trend in online surveys (Smith, 2008). To counterbalance the overrepresentation of women, we have controlled for gender effects by including it as a covariate in path analysis.

CONCLUSIONS AND IMPLICATIONS

To review, our study has demonstrated that people's COVID-19 lockdown concerns were a powerful predictor of decreased well-being and increased ill-being during the first weeks after the coronavirus outbreak. This relationship was explained through the role of basic psychological needs, whereby individuals who perceived greater burden due to the lockdown were less able to find opportunities to satisfy their psychological needs or even felt their needs were frustrated, further leading to diminished psychological functioning. Moreover, the COVID-19 infection concerns had little power in explaining psychological functioning of individuals in this unprecedented period. As the virus spread across the globe, countries differed considerably by COVID-19 infection rate, death toll and the restrictiveness of protective measures applied. Consequently, the level and psychological impact of COVID-19 infection concerns vs. COVID-19 lockdown concerns could vary from region to region. Nevertheless, our findings highlight that during the COVID-19 pandemic it is not only the health threat that affects people's psychological functioning. Thus, policymakers should take into account both the effectiveness of preventive measures as well as their detrimental effects on individuals' basic psychological needs and consequently their mental health. The implications of our findings may be all the more important as psychological functioning seems to diminish with new waves of coronavirus outbreaks (Kimhi *et al.*, 2020) and prolonged continuation of pandemic and related preventive measures (Kavčič *et al.*, 2020).

From the scientific point of view, our study extended previous research on people's psychological functioning in adverse situations, suggesting that specific stressors encountered in such

circumstances, particularly the lockdown measures, may thwart individuals' ability to satisfy their basic psychological needs for autonomy, competence, and relatedness, thus contributing to reduced well-being and increased ill-being. In addition, our findings confirm the importance of a separate consideration of needs satisfaction and needs frustration, which despite their relatively strong negative association contribute independently to aspects of individuals' psychological functioning.

As regards practical implications, our findings unveiled that measures aimed at protecting people's physical health against the infection with the new coronavirus could at the same time impose high psychological burden upon individuals, leading to their diminished psychological functioning. Therefore, such measures should be proportionate, well thought out, and accompanied with appropriate supporting mechanisms to help people build resilience and face the changed life circumstances with little psychological cost for their mental health. An effective public health protection strategy thus requires not only successful management of the spread of the virus to protect people's physical health, but also protection of their mental health that could be affected by the altered life circumstances.

Furthermore, the present results also imply that clinical work during the pandemic should address people's need satisfaction and need frustration separately as both aspects are effected by the pandemic context and in turn, both represent a pathway to increased or diminished psychological functioning. By way of illustration, one's well-being may be decreased and distress increased by feelings of not having as many choices as one would like due to physical distancing measures (decreased autonomy need satisfaction), but this effect will be amplified if one also has feelings of being forced into activities (increased autonomy need frustration). In addition to various interventions, aimed at increasing well-being during this pandemic (e.g., Kanekar & Sharma, 2020), psychological interventions focused specifically on people's psychological needs may be beneficial for their mental health. For example, basic psychological need-satisfying activities (Weinstein, Khabbaz & Legate, 2016) were shown to alleviate need frustration, increase need satisfaction, and increase well-being during the COVID-19 outbreak (Behzadnia & FatahModares, 2020).

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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