Affirming Basic Psychological Needs Promotes Mental Well-Being During the COVID-19 Outbreak

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Abstract

We tested if challenges to basic psychological needs (BPN) for autonomy, competence, relatedness) during the COVID-19 pandemic undermine people's mental well-being. Furthermore, we tested if an intervention, affirmation of these psychological needs, enhances mental well-being. Results of Study 1 ($N = 153$) showed that higher levels of satisfaction of BPN was related to higher well-being during the COVID-19 outbreak. In Study 2 ($N = 215$) we employed an online intervention enhancing these BPN. We found increased mental well-being through bolstered relatedness in particular. The intervention also decreased perceived stress. Both studies showed that mental well-being during the COVID-19 pandemic is positively related to the ability to work as usual and the number of people contacted via phone or Internet, but not in person.

Keywords: well-being, psychological needs, interventions, coronavirus, COVID-19, pandemic

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The COVID-19 pandemic propelled various lifestyle restrictions. Some governments implemented strict lockdowns (e.g., China); others introduced mild restrictions (e.g., allowing grocery shopping only, e.g., Poland); yet others mainly required social distancing (e.g., Sweden). While such restrictive measures may slow down the spread of COVID-19, they can also take a toll on people's well-being. Indeed, some warn of emerging challenges such as loneliness (Stephenson 2020), and boredom (Wang et al., 2020). Quarantine can be detrimental to well-being (Brooks et al., 2020), ranging from irritability and lower mood (e.g., Lee et al., 2002), to depression (e.g., Hawryluck et al., 2004) and post-traumatic stress symptoms (e.g., Reynolds et al., 2008).

We propose that the potentially poorer mental well-being during the pandemic stems in part from challenges to basic psychological needs (BPN). Specifically, we proposed and examined if challenges to autonomy, competence, and relatedness undermine well-being during the COVID-19 pandemic. We furthermore examined if an online intervention that affirms these BPN, increases well-being.

Basic Psychological Needs and Well-Being

Self-determination theory proposes three basic psychological needs essential to human functioning and well-being: autonomy, competence, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2017; Vansteenkiste, Ryan, & Soenens, 2020). The need for autonomy reflects that people seek a sense of integrity and authenticity, achieved through volitional, self-directed behaviors. The need for competence holds that people value feeling effective through extending and exerting skills. The relatedness need corresponds to the objective to feel connected to important others and experiencing feelings of warmth and care (Vansteenkiste, Ryan, & Soenens, 2020). Satisfaction of BPN holds positive outcomes (e.g., Sheldon and

Bettencourt, 2010; Baard et al., 2004). For example, it contributes to daily emotional well-being (Reis et al., 2000) and reduced stress (i.e., lower cortisol; Quested et al., 2011). Church et al. (2013) found that their satisfaction relates to higher well-being across cultures.

It is plausible that COVID-19 related restrictions challenge the satisfaction of BPN. For example, government issued regulations potentially limit people's autonomy in decision making (e.g., Winick, 1992). Physical distancing plausibly undermines people's ability to feel connected to others (Cacioppo, Hawkley, & Thisted, 2010). Inability to work or job insecurity possibly undermines people's sense of competence (Hellgren, Sverke, & Isaksson, 1999; Winefield & Tiggeman, 1989).

How can possible negative impact of the COVID-19 pandemic on basic psychological needs, and its downstream effect on mental well-being, be alleviated? Research suggests that the fulfillment of BPN is malleable: changes in perception and emotional coping may help people to maintain their sense of autonomy, relatedness, and competence. Weinstein and Ryan (2011, p. 12) proposed that satisfaction of BPN "buffer in times of stress, reducing both initial appraisals of stress and encouraging adaptive coping after stress-related events occur." Importantly, the authors argue that *subjective* need gratification, and not *objective* need provision, matter for these effects. Consistently, perceived need satisfaction mediated the impact of effective emotion regulation on well-being (Benita et al., 2020). Furthermore, changes in competence and relatedness mediated the impact of emotional exhaustion and beneficial effects of work enthusiasm on daily stress (Aldrup et al., 2017). We propose accordingly that bolstering perceived BPN satisfaction increases mental well-being during the COVID-19 pandemic.

Interventions Increasing Well-being

According to the sustainable happiness model, subjective well-being is a function of three factors: genetical influences, circumstances, and intentional activities (Lyubomirsky,

Sheldon, & Schkade, 2005). As the latter factor is one that people can exert control over most easily, it is the focus of multiple well-being enhancing interventions (see Lyubomirsky & Della Porta, 2010). Intentional activities represent a broad spectrum of engagements. Their commonality is that people deliberately initiate them (Lyubomirsky et al., 2005). According to Lyubomirsky and colleagues (2005), intentional activities could be behavioral (e.g., sports), volitional (e.g., striving for personal goal) or cognitive. Interventions enhancing attitudes such as gratitude (e.g., Emmons & McCullough, 2003) or appreciation (e.g., Kurtz, 2008) have a positive impact on well-being.

We propose an intentional activity that may be particularly suitable for challenges of the current health crisis that is the COVID-19 pandemic: recalling those situations in which basic psychological needs—autonomy, competence, and relatedness—were satisfied despite lifestyle restrictions. We expect that reflecting on these experiences improves well-being. Appraisal theories (e.g., Tomaka et al., 1993) suggest that appraising a potentially stressful event can facilitate gaining from the stressor. Research has shown that focusing on positive aspects of adverse events increases positive emotionality and that connecting with need satisfying memories can help adjusting (Philippe et al., 2018). We reason that focusing on being able to satisfy BPN during the pandemic elevates perceptions of need satisfaction, and hence mental well-being.

We pursued this objective in two stages: First, we examined the relationship between satisfaction of BPN under the COVID-19 pandemic and mental well-being (Study 1). Second, we tested the restorative benefits of an intervention that affirmed BPN in terms of mental well-being and (reduced) stress (Study 2).

Brooks et al. (2020) point out that the duration of the quarantine and fear of infection are stressors, and suggest that communication with others may help to mitigate these negative effects. Therefore, we incorporated additional variables (e.g., duration of restrictions,

possibility to work, number of social contacts) that may play a significant role for well-being during the pandemic. We examined these variables in exploratory analyses.

Study 1

Participants and Design

Sample size was determined assuming effect size $f^2 = .08$, ($\alpha = .05$) with a power of $(1 - \beta) = .80$; we aimed at reaching at least 141 participants. One hundred fifty-three MTurk workers (56 women, 94 men, 3 undisclosed; age range from 20 to 69, $M_{age} = 36.39$ $SD_{age} = 10.97$) took part in the study in exchange for 0.50$. No cases were deleted. A sensitivity analysis with a power of $(1 - \beta) = .80$, Type I error of 0.05 (two-sided), indicated that this sample size allowed us to detect an effect size of $f^2 = .07$. The study had a correlational design.

Procedure and Materials

First, participants gave their informed consent to take part in the study. Participants indicated how the ongoing COVID-19 lockdown affected their functioning. Specifically, they indicated in a random order: "My sense of autonomy (e.g., feeling a sense of choice and freedom in the things I undertake)"; "My sense of competence (e.g., feeling that I am able to achieve my goals)" and "My sense of relatedness (e.g., feeling connected with people who care for me, and for whom I care)" along with a scale ranging from 1 = *has decreased a lot*, to 5 = *has increased a lot* scale. The items were inspired by the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS, Chen et al., 2015). We selected the particular items as representative of satisfaction of the three needs because (a) they had high face validity and (b) they loaded strongly on their corresponding latent factors in earlier work (autonomy .72, competence .74, relatedness .72; Chen et al., 2015). [1] Participants also filled

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[1] The online supplement contains results of Study S1, which demonstrated that the single items were moderately and positively related to their equivalents measured using an established measure of autonomy, competence, and relatedness satisfaction ($r \geq .62$).

the seven-item Short Warwick–Edinburgh Mental Well-being Scale that asked about their experiences in the last two weeks (SWEMWBS, α = .84, "I've been feeling optimistic about the future", 1 = *None of the time*, to 7 = *All of the time*, Ng Fat et al., 2017).

Subsequently, we asked participants to declare whether their current situation could be described as: "usual", "social distancing", "self-isolating", "quarantine", or "other". Participants also evaluated if they: 1) could perform their work in the usual way, 2) were afraid of getting sick with COVID-19, 3) were afraid that their close ones might get sick with the disease (1 = *strongly disagree*, to 7 = *strongly agree*).

We asked about the number of people currently living at home (with answers ranging from "1 – 20"), the number of people they knew that were experiencing the symptoms of the COVID-19 and the number of days they had experienced restrictions to their usual lifestyle. Additionally, participants stated the number of people that they had contact with 1) in person and 2) via Internet or phone. We also asked about the number of hours spent outside in public places. We asked participants to reply to these questions using a slider with answers ranging from "0 – 50", apart from the question on the number of days, where the answer could range between "0 – 100". Then, participants reported demographics, and a debriefing concluded the study.

Results

Participants had on average experienced restrictions to their regular lifestyle due to COVID-19 for 32 days (*M* = 31.84, *SD* = 23.49). Seventeen participants (11%) described their situation as self-isolating, 113 (74%) as social distancing, 10 participants were in quarantine (6%), 12 participants described their situation as usual (8%), and one participant (<1%) indicated their situation as 'other'.

Basic Psychological Needs and Well-being During the Pandemic

We conducted single sample mean comparison of the results on sense of autonomy, sense of competence, and sense of relatedness. We tested the means of the needs against value of '3', which was labelled as *has not changed*. The results showed that sense of autonomy decreased during COVID-19 outbreak as the mean was significantly lower that the tested value ($M = 2.73$, $SD = 1.12$), $t(152) = -2.95$, $p = .004$, $d = -0.24$. Participants' sense of competence has not significantly changed ($M = 3.12$, $SD = 0.95$), $t(152) = 1.53$, $p = .129$, $d = 0.13$. Interestingly, sense of relatedness has slightly increased during the pandemic ($M = 3.18$, $SD = 0.98$), $t(152) = 2.30$, $p = .023$, $d = 0.18$. A multiple regression analysis, in which we entered the satisfaction of autonomy, competence, and relatedness needs as separate predictors of psychological well-being, indicated that changes to satisfaction of the needs mattered to well-being. Specifically, sense of autonomy predicted well-being, $b* = .19$, $t(149) = 2.25$, $p = .026$. Well-being was greater for those who reported a higher sense of competence, $b* = .29$, $t(149) = 3.48$, $p = .001$, and for those who had a higher relatedness, $b* = .17$, $t(149) = 2.25$, $p = .026$.

Contact with Others and Possibility to Work and Well-being During the Pandemic

We conducted an exploratory regression analysis for mental well-being and variables potentially related to it (being able to work as usual, number of contacted people, being afraid of getting sick with COVID-19, being afraid that others get sick, number of days experiencing restrictions, number of people living at home, number of people with COVID-19 that participants knew and number of hours spent outside in public places)[2]. The results showed that the only significant predictors of well-being were being able to perform work as usual, $b* = .32$, $t(143) = 4.15$, $p < .001$, number of people contacted via Internet or phone, $b* = .40$,

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[2] Due to non-normal distribution of the variables, in Study 1 and Study 2 we log transformed variables except: being able to work as usual, being afraid of getting sick and being afraid that others can get sick with COVID-19, well-being and perceived stress in Study 2. The SOM contains correlations between the study variables.

$t(143) = 3.66$, $p < .001$, and number of days experiencing restrictions, $b^* = -.23$, $t(143) = -2.26$, $p = .025$. Contact in person, $b^* = .08$, $t(143) = 0.68$, $p = .495$, number of people living at home, $b^* = .11$, $t(143) = 1.30$, $p = .197$, being afraid of the coronavirus, $b^* = -.09$, $t(143) = -0.93$, $p = .353$, being afraid that others can get sick, $b^* = .05$, $t(143) = .45$, $p = .652$, number of personally known people with symptoms of COVID-19, $b^* = -.05$, $t(143) = -0.41$, $p = .685$, or number of hours spent outside, $b^* = -.01$, $t(143) = -0.06$, $p = .955$, were not significantly related to well-being.

The results suggest that especially autonomy need satisfaction is negatively affected by the pandemic. Changes to basic psychological need satisfaction relate to mental well-being during the pandemic. We also found that the more people were able to work as usual, the higher their well-being was. Interestingly, sense of relatedness increased amid COVID-19 outbreak. Perhaps when people are in lockdown, that is the need that can be most easily satisfied thanks to, among others, indirect communication with family, friends, and acquaintances. Additionally, it was above all contact with others via Internet or phone, and not in person, that was related to higher well-being. This study gave initial insight in that the threats to BPN are negative to well-being under COVID-19.

Study 2

We tested in Study 2 if an intervention designed to affirm people's sense of autonomy, relatedness, and competence enhanced mental well-being during the COVID-19 outbreak through changes in perceived satisfaction of BPN. We operationalized mental well-being using the corresponding Warwick–Edinburgh scale as well as with a measure of perceived stress. The study was pre-registered at https://aspredicted.org/blind.php?x=g9ei2r

Participants and Design

Sample size was determined assuming effect size $f^2 = .05$, ($\alpha = .05$) with a power of $(1 - \beta) = .80$; we aimed at reaching at least 196 participants. Two hundred and fifteen MTurk

workers (77 women, 126 men, 1 other, 11 undisclosed; age range from 20 to 70 (M_{age} = 37.06

SD_{age} = 11.51) took part in this online study in exchange for 1.10$). No cases were deleted.

These participants were randomly assigned to one of two conditions (intervention vs. control)

of a between-subjects design.

Procedure and Materials

Participants were randomly assigned to either the intervention or the control condition.

In the intervention condition they were asked: "Please think for a moment and write about a

situation where, despite the restrictions of your lifestyle due to Coronavirus Disease, you have

been able to feel either some, or all of the following: Sense of autonomy (e.g., when you have

been feeling a sense of choice and freedom in the things you are undertaking); Sense of

competence (e.g., when you have been feeling that you are able to achieve your goals); Sense

of relatedness (e.g., when you have been feeling connected with people who care for you, and

for whom you care)". The description of the three psychological needs was presented in a

random order. In the control condition participants were instead asked: "Please think for a

moment and write what is your favorite color. Please give an example of a situation where

you saw one or more objects of your favorite color."

Participants then indicated how the COVID-19 pandemic affected their BPN. We

presented the three items from Study 1 in a random order. The items described sense of

autonomy, sense of competence and sense of relatedness along with a response scale ranging

from 1 = *has decreased a lot*, to 5 = *has increased a lot* scale.

Next, participants completed two scales that operationalized mental well-being. They

filled-in the seven-item Short Warwick–Edinburgh Mental Well-being Scale that we adapted

to reflect their current state as we asked about their experience *right at the time*:

(SWEMWBS, α = .90, e.g., "I'm feeling optimistic about the future", 1 = *Not at all*, to 5 =

Very much, Ng Fat et al., 2017). Additionally, participants completed the four-item Perceived

Stress Scale, which was adapted to reflect participants' *current* psychological state (PSS-4, α = .63, "Do you feel that you are unable to control the important things in your life?", 1 = *Not at all*, to 5 = *Very much*, Cohen et al., 1983). The scales were presented in random order.

For exploratory purposes, we asked about sources of meaning using 9-items displayed in a random order. We used three items related to autonomy (e.g., "Taking decisions that reflect who I am"), three to competence (e.g., "Completing difficult tasks") and three to relatedness (e.g., "Contact with others that are outside my home, using Internet or phone"). The sentences were inspired by the items of the BPNSF Scale (Chen et al., 2015) and were presented in a random order[3]. This was followed by our manipulation check, where we asked participants to state the extent, to which during the experimental task they focused on describing each of the needs: *sense of autonomy*, *sense of competence*, *sense of relatedness* and *other*. The replies were gathered using a 1 = *Not at all*, to 5 = *Very much* scale.

Participants then responded to the same questions about their living situation during the pandemic as in Study 1. Finally, participants reported demographics and were debriefed.

Results

On average participants had experienced restrictions to their regular lifestyle due to COVID-19 for 27 days ($M = 26.53$, $SD = 24.40$). Twenty-eight participants (13%) described their situation as self-isolating, 146 (69%) as social distancing, 13 participants were in quarantine (6%), 24 participants described their situation as usual (11%) and two participants (1%) indicated their situation as "other".

Manipulation Check

We conducted a MANOVA and found that participants in the intervention condition focused more on the description of BPN than participants in the control condition, Pillai's trace $V = .18$, $F(3, 209) = 14.86$, $p < .001$, $\eta_p^2 = .18$. Specifically, participants focused more

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[3] The SOM contains results from this exploratory part.

on autonomy in the experimental, than the control condition, $F(1, 211) = 3.28$, $p = .071$, $\eta_p^2 = .02$, but this difference did not reach significance at $p < .05$. The intervention condition was more strongly related to describing competence, than the control condition, $F(1, 211) = 10.72$, $p = .001$, $\eta_p^2 = .05$. Relatedness was also more strongly described in the experimental condition, than the control one, $F(1, 211) = 44.29$, $p < .001$, $\eta_p^2 = .17$ (Table 1).

Table 1

Difference in Well-Being, Perceived Stress and Reference to Basic Psychological Needs in the Intervention vs. Control Condition.

	Intervention		Control	
	M	*SD*	*M*	*SD*
Well-being	3.87	0.76	3.56	0.88
Perceived stress	2.42	0.78	2.73	0.81
Sense of autonomy	3.21	1.08	2.83	1.31
Sense of competence	3.35	0.87	3.15	0.97
Sense of relatedness	3.63	0.98	3.12	1.16
Reference to autonomy	3.78	1.29	3.45	1.37
Reference to competence	3.59	1.32	2.97	1.43
Reference to relatedness	3.95	1.11	2.77	1.44

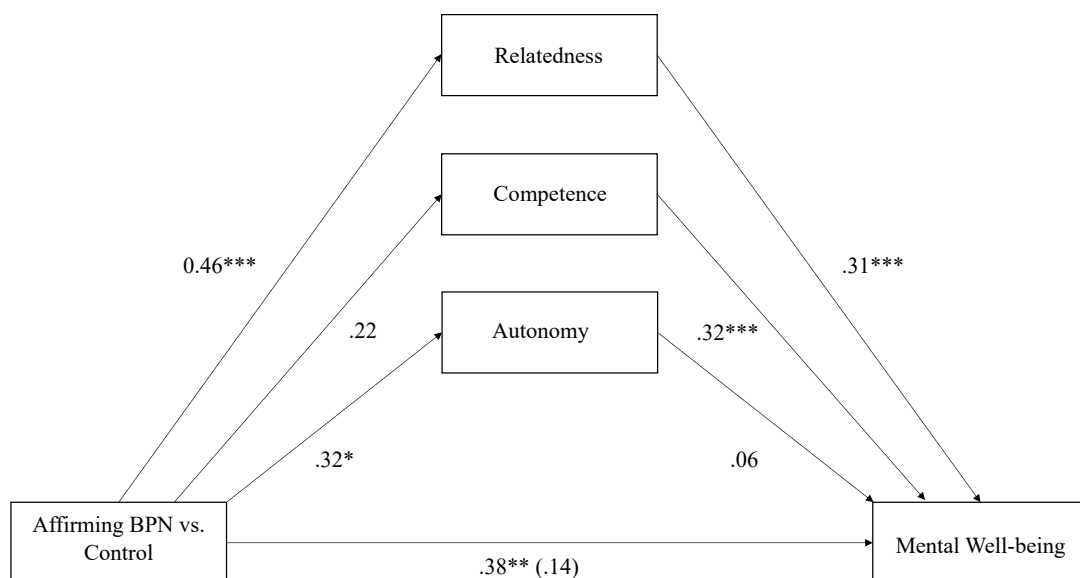**Basic Psychological Needs and Well-being During the Pandemic**

We next conducted the first pre-registered analysis. The results of independent samples *t*-tests showed that the intervention increased well-being, $t(212) = 2.80$, $p = .006$, $d = 0.38$ and decreased perceived stress, $t(212) = -2.79$, $p = .006$, $d = 0.39$ (Table 1).

We tested for a possible mediation effect using sampling with replacement, with a bias-corrected bootstrapping procedure (10,000 samples), Model 4 in PROCESS macro (Hayes, 2013). The independent variable was the dummy coded condition (experimental = 1, control = 0), well-being served as dependent variable, and the three BPN were mediators. The total effect of the intervention on well-being was significant ($c = 0.32$, $se = 0.11$, $t(212) = 2.80$, $p = .006$, 95% CI [0.09, 0.54]). The intervention increased sense of autonomy, $b^* = .32$,

$t(212) = 2.34$, $p = .020$, 95% CI [0.06, 0.71] and sense of relatedness, $b* = .46$, $t(212) = 3.44$,

$p < .001$, 95% CI [0.22, 0.80]. However, intervention did not significantly increase sense of

competence, $b* = .22$, $t(212) = 1.60$, $p = .112$, 95% CI [-0.05, 0.45].

Controlling for the mediators, the direct effect of the intervention was no longer

significant ($c' = 0.12$, $se = 0.09$, $t(209) = 1.28$, $p = .202$, 95% CI [-0.07, 0.31]). Sense of

autonomy did not predict well-being significantly, $b* = .06$, $t(209) = 0.81$, $p = .418$, 95% CI [-

0.06, 0.14]. However, sense of competence was related to higher well-being, $b* = .32$, $t(209)$

$= 4.65$, $p < .001$, 95% CI [0.17, 0.42], and so was sense of relatedness, $b* = .31$, $t(209) =$

4.57, $p < .001$, 95% CI [0.13, 0.34].

Critically, the total partially standardized indirect effects from intervention to well-

being through satisfaction of BPN were significant, $ab = 0.23$, bootSE $= 0.08$, 95% boot CI

[0.07, 0.39]. Closer inspection of the indirect effects showed that the only significant indirect

effects were through an increase in relatedness, $a_3b_3 = 0.14$, bootSE $= 0.05$, 95% boot CI

[0.05, 0.25]. They were not significant in the case of autonomy, $a_1b_1 = 0.02$, bootSE $= 0.02$,

95% boot CI [-0.03, 0.07], nor competence, $a_2b_2 = 0.07$, bootSE $= 0.05$, 95% boot CI [-0.01,

0.17] (Figure 1).

Figure 1. Mediation model showing standardized regression coefficients for the relationship between intervention enhancing basic psychological needs and mental well-being with BPN as mediators. Standardized regression coefficient between the intervention and well-being controlling for basic psychological needs is in parenthesis.

Next, we performed a similar analysis with perceived stress as the dependent variable. We tested for a possible mediation effect by again using sampling with replacement, with a bias-corrected bootstrapping procedure (10,000 samples), Model 4 in PROCESS macro (Hayes, 2013). The total effect of the intervention on perceived stress was significant (c = -0.30, se = 0.11, $t(212)$ = -2.79, p = .006, 95% CI [-0.52, -0.09]). The models testing the relationships between the intervention and the mediators were the same as in the previous analysis.

The direct effect of the intervention (controlling for the mediators) was significant (c' = -0.28, se = 0.11, $t(209)$ = -2.54, p = .012, 95% CI [-0.49, -0.06]). Sense of autonomy did not predict perceived stress significantly, $b*$ = .14, $t(209)$ = 1.62, p = .107, 95% CI [-0.02, 0.21] and neither did sense of relatedness $b*$ = -.03, $t(209)$ = -0.36, p = .722, 95% CI [-0.14, 0.10]. However, sense of competence was related to lower perceived stress, $b*$ = -.30, $t(209)$ = -3.62, p < .001, 95% CI [-0.41, -0.12].

The total partially standardized indirect effects from intervention to perceived stress through the satisfaction of BPN were not statistically significant, ab = -0.03, bootSE = 0.05, 95% boot CI [-0.14, 0.06]. Neither in the case of autonomy, a_1b_1 = 0.04, bootSE = 0.03, 95% boot CI [-0.003, 0.13], nor competence, a_2b_2 = -0.07, bootSE = 0.05, 95% boot CI [-0.17, 0.01], nor in an increase in relatedness, a_3b_3 = -0.01, bootSE = 0.03, 95% boot CI [-0.09, 0.05], (Figure 2).
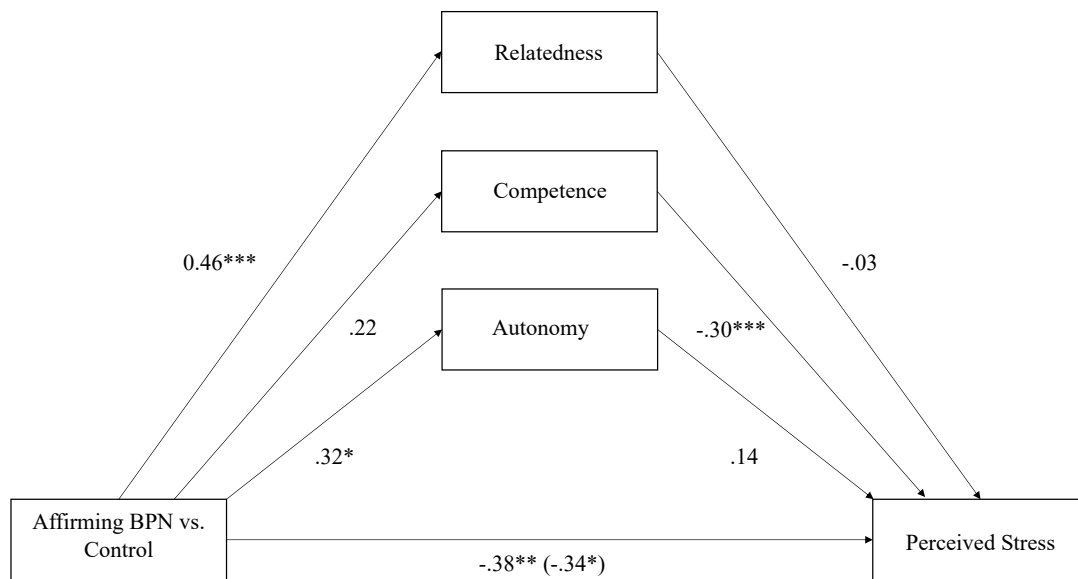
Figure 2. Mediation model showing standardized regression coefficients for the relationship between intervention enhancing basic psychological needs and perceived stress with BPN as mediators. Standardized regression coefficient between the intervention and perceived stress controlling for basic psychological needs is in parenthesis.

Contact with Others and Possibility to Work and Well-being During the Pandemic

We conducted a regression analysis with the same explanatory variables as in Study 1, and the intervention on well-being as an outcome variable. Intervention still significantly predicted well-being, $b^* = .21$, $t(201) = 3.22$, $p = .001$. Being able to perform one's work as usual predicted well-being, $b^* = .34$, $t(201) = 5.39$, $p < .001$. The more people participants had contact with via phone or Internet, the higher was their well-being, $b^* = .33$, $t(201) = 4.13$, $p < .001$. The more people participants knew personally with COVID-19 symptoms, the lower was their well-being, yet this relationship was not statistically significant, $b^* = -.19$, $t(201) = -1.74$, $p = .083$. No other predictor was significantly related to well-being, ($p \geq .256$).

We also conducted a regression analysis with the same predictors as in the former analysis, this time with perceived stress as an outcome variable. The intervention exerted an effect on perceived stress, $b^* = -.13$, $t(201) = -2.04$, $p = .042$. Being able to perform one's work as usual also predicted lower levels of perceived stress, $b^* = -.15$, $t(201) = -2.38$, $p = .018$. The more people participants had contact with via phone or Internet, the lower was the

perceived stress, $b* = -.27$, $t(201) = -3.39$, $p = .001$. Number of people known personally that showed symptoms of the COVID-19 was a strong predictor of perceived stress, $b* = .41$, $t(201) = 3.67$, $p < .001$. No other predictor was significantly related to perceived stress ($p \geq$ .224).

The results of this study showed that the intervention aimed at affirming satisfaction of BPN is related to increased mental well-being and decreased perceived stress. We found that it is above all an increase in perception of relatedness need satisfaction that mediated the effect of the intervention on well-being. Although the intervention decreased levels of perceived stress, there was no significant indirect effect through satisfaction of BPN. The pattern of correlations suggests that in the case of sense of relatedness, contact with others may give contradictory results as far as perceived levels of stress is concerned. We did not specify in the instruction of the intervention referring to relatedness whether the situation of contact with others was in person, or via phone. It might be that some people focused on having contact with others in person, which did not help in reducing perceived stress.

As in Study 1, we found that being able to work as usual was beneficial for mental well-being. Interestingly, although contact with others via phone or Internet was related positively to well-being, contacting others in person elevated levels of perceived stress.

General Discussion

We found that decrease in BPN satisfaction had negative consequences for mental well-being during the COVID-19 pandemic. Furthermore, an intervention that affirms perceived satisfaction of BPN counteracted these issues. Exploratory findings further showed that contact with others via Internet or phone was positively related to mental well-being, as did the ability to work as usual.

The results on contact with others may be linked to relatedness need satisfaction and are very interesting. It seems that during the pandemic it is not just any contact with others

that plays a positive role. Perhaps given the possibility of contracting the virus when contacting others in person, it is above all indirect communication with others that is positively related to well-being. We cannot exclude the possibility that the relationship between the number of contacted people and well-being stems from a third variable (e.g. extroversion). Yet, we would have probably found a positive relationship between well-being and the number of people contacted in person, had this relationship depended solely on extroversion. Should there be studies on the relationship between contact with others and well-being during pandemic, it would be worth controlling for extroversion.

Our studies enhance the understanding of how people can deal with lifestyle restrictions. While these findings are novel in the context of the COVID-19 pandemic, they fit well into the existing literature on well-being and satisfaction of BPN (e.g., Church et al., 2013). The satisfaction of competence needs corresponded to mental well-being in both studies. We have also repeatedly found that relatedness need satisfaction was an important predictor of well-being during the pandemic

In response to the current crisis, mental health researchers (Wind et al., 2020) have been quick to point out that this is a "black swan" moment—meaning an "unforeseen event that changes everything" (Blumenstyk, 2020) — which will lead to a shift in the implementation of care and interventions, namely accelerating their move into the domain of e-health. Yet, interventions like the one presented in this paper do not require physical presence or even technology which makes them low-maintenance, cheap, and easily implementable.

Limitations and Future Directions

One of the limitations of the research is that it was conducted with an online sample from mTurk. We have to be cautious about the generalizability of the obtained results to other cultures and other samples. It should be noted that it would be impossible to conduct the

research in laboratory due to the restrictions related to COVID-19. Another possible limitation is that we did not focus in the intervention on each of BPN separately. Instead, we chose a different approach and left the decision of which basic psychological need to focus on to participants. We think that the benefit of such an approach is that individuals may then choose the need and the situation most suitable for them. Additionally, research shows that both a general and specific approach to interventions is effective, at least as far as job crafting is concerned (Gordon et al., 2018). We acknowledge that the control condition could be more closely matched to the experimental condition. We were concerned, however, that had we asked participants to simply describe their day, some may have taken that opportunity to describe how they spend time with family, or try to work and thus it could also affirm their basic psychological needs.

Our research suggests that simple and short interventions are a promising tool to increase mental well-being during a pandemic. It remains to be determined whether the interventions have a long-lasting effect. One advantage of intentional activities that could make them relatively resistant to hedonistic adaptation is that they can vary (Lyubomirsky et al., 2005). Thus, if the restrictions to one's lifestyle due to the health crisis continued, other means of activating BPN could be used e.g., recalling the situations in which basic psychological needs were manifested in a conversation with a friend or on social media. Future studies could additionally focus on repeated measure design and test baseline levels of BPN.

Hopefully the results of these studies will be of use not only during the times of the COVID-19 pandemic, but can be helpful in bolstering individuals' well-being beyond this crisis. Researchers prognose that epidemics are expected to reoccur in the following years (Ferguson et al., 2020). Future studies, conducted in more peaceful times, can aim at testing

the effectiveness of the intervention employed in our research beyond the times of crisis and

whether they could be used in general to boost levels of mental well-being.

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