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Coping styles mediate the association between psychological inflexibility and psychological functioning during the COVID-19 pandemic: A crucial role of meaning-centered coping

Andreja Avsec [a,*], Nikolett Eisenbeck [b], David F. Carreno [c], Gaja Zager Kocjan [a], Tina Kavčič [d]

[a] Department of Psychology, Faculty of Arts, University of Ljubljana, Ljubljana, Slovenia
[b] Department of Psychology, University of Seville, Seville, Spain
[c] Department of Psychology, University of Almeria, Almeria, Spain
[d] Faculty of Health Sciences, University of Ljubljana, Ljubljana, Slovenia

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ABSTRACT

People's psychological response to the COVID-19 pandemic is significantly affected by their psychological inflexibility. One possible mechanism explaining the association between psychological inflexibility and psychological functioning concerns coping styles. While avoidance and approach coping styles were previously found to mediate this association, the mediating role of meaning-centered coping has not yet been explored. However, meaning-centered coping it is likely to be crucial in circumstances as uncertain as those at the onset of the COVID -19 pandemic. This study explored the mediating role of the three coping styles in the relationship of psychological inflexibility with ill-being and well-being. Slovenian adults ($N = 1365$) aged 18–81 years provided self-reports on the Acceptance and Action Questionnaire, the Depression Anxiety Stress Scale, the PERMA Profiler, the Brief COPE Inventory, and the Meaning-Centered Coping Scale. In the context of the highly stressful beginning of the pandemic, psychological inflexibility contributed to higher ill-being and lower well-being directly and through increased use of avoidance coping, decreased use of meaning-centered coping, and, to a lesser extent, decreased use of approach coping. Avoidance coping predicted higher levels of ill-being, suggesting a maladaptive effect of this coping strategy. Approach coping positively but weakly predicted well-being, indicating a diminished value of this coping style in low-controllable circumstances of the pandemic. Finally, meaning-centered coping appeared to be the most beneficial in such circumstances, as it was associated with both lower levels of ill-being and higher levels of well-being. This finding suggests that meaning-centered coping should be studied as a stand-alone strategy, rather than as a combination of specific approach coping strategies. Consistent with previous research, this study demonstrates the importance of psychological inflexibility in effectively adapting to and actively coping with aversive situations. Furthermore, the results suggest that seeking or making meaning is vital, at least in a context characterized by low levels of control and high levels of uncertainty.

The outbreak of the COVID-19 pandemic and subsequent restrictive measures intended to slow the spread of the virus and relieve the pressure on the health care system have had a significant impact on people's psychological functioning (e.g., Gloster, Walder, et al., 2020; Rajkumar, 2020; Torales et al., 2020). A variety of studies have examined different stable predispositions, such as neuroticism, resilience, and psychological inflexibility that are relevant for an adaptive psychological response in this unprecedented situation (e.g., Kavcic, Avsec, & Kocjan, 2021; Pakenham et al., 2020; Zacher & Rudolph, 2021; Zager Kocjan et al., 2021) and may be more or less susceptible to possible psychological interventions. The aim of this work is to contribute to the understanding of the mechanisms by which psychological inflexibility might predict people's well-being and ill-being during the novel coronavirus pandemic by examining the mediating role of different coping styles, including a meaning-centered coping, which has been proposed as the most adaptive coping style in situations of low control.

* Corresponding author. Department of Psychology, Faculty of Arts, University of Ljubljana, Aškerčeva 2, 1000, Ljubljana, Slovenia.
E-mail address: andreja.avsec@ff.uni-lj.si (A. Avsec).

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1. Psychological inflexibility and its role in the pandemic

Psychological inflexibility refers to "the rigid dominance of psychological reactions over chosen values and contingencies in guiding actions" (Bond et al., 2011, p. 678). The most frequently used measure of psychological inflexibility is the Acceptance and Action Questionnaire (AAQ-II; Bond et al., 2011), which places experiential avoidance as the central feature of psychological inflexibility, and was also used in the present study. Experiential avoidance refers to "the attempt to alter the form, frequency, or situational sensitivity of difficult private events (i.e., thoughts, feelings, and physiological sensations), even when doing so leads to actions that are inconsistent with one's values and goals" (Bond et al., 2011, p. 678). In recent years, researchers have developed new questionnaires that measure dimensions of flexibility rather than just the lack of it (e.g., Gloster et al., 2021; Rolffs et al., 2016; Kashdan et al., 2020) and they have emphasized the importance of distinguishing between psychological inflexibility and flexibility because the two constructs may not belong to the same bipolar continuum (Cherry et al., 2021; Kashdan et al., 2020). Like AAQ-II, these newer questionnaires are based on the original Acceptance and Commitment Therapy (ACT), which conceptualises psychological flexibility as a set of interrelated skills (acceptance, defusion, present moment awareness, stable self-awareness, values, and committed action), but they are much more precise in terms of item wording (e.g., acceptance rather than avoidance) and coverage of all relevant skills (e.g., Gloster et al., 2021). Accordingly, we have used the term "psychological flexibility" in the following text when referring to studies that rely on measures tapping acceptance or other components of psychological flexibility rather than avoidance. Because of the potential differences in the correlates of psychological flexibility and inflexibility, we have focused on psychological inflexibility in the following text whenever possible.

Several systematic reviews and meta-analyses have found significant relationships of psychological flexibility or inflexibility or its components with indicators of well-being or ill-being (e. g. Carpenter et al., 2019; Hayes et al., 2006; Plys et al., 2022; Reilly et al., 2019). In a meta-analysis examining the relationship between psychological inflexibility and measures of ill-being (e.g., anxiety, depression, post-traumatic stress, pain, negative affectivity) and well-being (e.g., job performance, perceived health), the weighted effect size of the correlations was .42, indicating a moderately strong relationship between psychological inflexibility and psychological outcomes (Hayes et al., 2006). On the other hand, the most recent scoping review found medium to large correlations of psychological flexibility and inflexibility with ill-being but inconsistent results for well-being in late adulthood samples (Plys et al., 2022). Since psychological flexibility is a core component of the ACT, the findings of meta-analyses regarding the efficacy of this therapy (Gloster, Walder, et al., 2020) provide further, though indirect evidence for the positive effect of psychological flexibility on mental health.

Measures of psychological flexibility and psychological inflexibility have been associated with indicators of psychological functioning also in the context of the novel coronavirus pandemic. A study with Italian adults showed that psychological flexibility attenuated the negative effects of COVID-19 risk factors, such as lockdown duration and family infection, on depression, anxiety, and distress due to COVID-19, while psychological inflexibility exacerbated these effects (Pakenham et al., 2020). In a sample of participants from the US, three aspects of psychological flexibility (openness to experience, behavioral awareness, and valued action) were associated with both lower general and COVID-19-related distress (Kroska et al., 2020). A significant role of psychological inflexibility in predicting depression, anxiety, and insomnia was also found in Swedish adults during the first wave of COVID-19 pandemic (McCracken et al., 2021). Moreover, psychological inflexibility predicted lower life satisfaction and, together with meaning in life, mediated the association between coronavirus stress and life satisfaction in Turkish students (Arslan & Allen, 2021). Psychological inflexibility also had a significant mediating role in the association between perceptions of COVID-19 illness threat and well-being in a sample of Hong Kong citizens (Chong et al., 2021). Finally, psychological flexibility was found to be a consistent predictor of well-being alongside social support and educational attainment in a large international study (Gloster, Lamnisos et al., 2020).

2. Coping responses during the pandemic

People use many diverse ways to cope with life challenges, such as the pandemic and its associated circumstances. Given the large number of possible coping strategies, researchers tended to reduce them to a smaller number of broader coping responses, also referred to as coping styles (e.g., Nielsen et al., 2016). For example, coping strategies can be differentiated based on the function they serve. Folkman and Lazarus (1980) describe problem focused coping, which is aimed at reducing the source of the stress by active coping, planning, and seeking instrumental social support, while emotion focused coping is used to regulate the emotional distress by seeking emotional social support, venting, self-distraction, and positive reframing. Roth and Cohen (1986) suggested differentiating between approach and avoidance coping. The former refers to any behavioral, cognitive, or emotional activity that is directed toward a threat (e.g., problem solving or seeking information), while the latter describes any behavioral, cognitive, or emotional activity directed away from a threat (e.g., denial, behavioral disengagement, substance use). Later, researchers called attention to another coping style, not specifically recognized in previous coping strategies classifications, namely they pointed out that finding or making meaning in aversive situations may be crucial in adjustment to stress (Park & Folkman, 1997; Thompson, 1985; Wong, 2020).

Meaning-centered coping refers to facing adversities in a resilient and transformative way, developing, or reaffirming a sense of meaning during stressful situations and engaging in activities that help one find redeeming or transcendent aspects of a situation (Eisenbeck et al., 2021; Park, 2010; Thompson, 1985). It encompasses a range of components such as acceptance, positive reframing, self-transcendence, courage, responsibility, life appreciation, faith, and hope (Eisenbeck et al., 2021; Wong, 2020). This coping style has been measured predominantly via individual subscales of existing coping measures, such as the Positive reframing and the Acceptance subscales (e.g., Lachnit et al., 2020), but none of these scales encompass all aspects of it Recently, a specific measure of meaning-centered coping was developed and validated (Eisenbeck et al., 2021), i.e., the Meaning-Centered Coping Scale (MCCS), which is based on previously well-supported elements of this coping style.

As proposed by the authors of one of the most widely applied models of coping (Carver et al., 1989), various strategies can be adaptive or maladaptive in specific contexts (Carver & Connor-Smith, 2010), thus they cannot be categorized as such per se. The adaptiveness of specific strategies depends on characteristics of a given situation, especially its controllability (e.g., Terry & Hynes, 1998), as captured by 'the goodness-of-fit' hypothesis (Lazarus & Folkman, 1984; Zeidner & Saklofske, 1996). For example, a meta-analysis showed that in case of trauma experiences, avoidance coping strategies, either problem- or emotion-focused, are associated with increased psychological distress, while approach coping strategies showed very weak negative associations with distress, though these links increased with the duration of trauma (Littleton et al., 2007). Recent studies conducted across the globe also investigated the functionality of coping strategies in the present pandemic (e.g., Chwaszcz et al., 2021; Dawson & Golijani-Moghaddam, 2020; Gurvich et al., 2020; Margetić et al., 2021; Rettie & Daniels, 2020; Shamblaw et al., 2021; Zacher & Rudolph, 2021; Yang, Soltis, Ross, & Labianca, 2021). Overall, the results of these studies suggest the maladaptiveness of substance use, denial, venting, behavioral disengagement, self-blame, and self-distraction, while active coping, acceptance, positive reframing, and emotional support seem to

be adaptive. The role of some coping strategies seems rather elusive. For instance, humor showed links with lower levels of anxiety, depression, and stress in the Australian study (Gurvich et al., 2020), but also with reduced positive affect in the German study (Zacher & Rudolph, 2021). Similarly, planning was linked to higher quality of life (Chwaszcz et al., 2021) and lower levels of depression, but also to higher anxiety (Dawson & Golijani-Moghaddam, 2020) and lower life satisfaction (Zacher & Rudolph, 2021). Generally, the unfavorable effect of avoidance strategies seems stronger than the favorable effect of approach coping, though the later may need to be used repeatedly to yield beneficial outcomes (Littleton et al., 2007).

Regarding meaning-centered coping, it has been suggested, that it is often the most adaptive way of coping in low control situations (e.g., Park et al., 2001), as can be claimed for many circumstances of the COVID-19 pandemic. In support of this, a Canadian longitudinal study carried out during the COVID-19 pandemic found positive reframing, often considered a proxy for meaning-centered coping, to be the most efficient coping strategy, relating to favorable baseline levels and changes across time in depression, anxiety, and quality of life (Shamblaw et al., 2021). Using the newly developed MCCS, Eisenbeck et al. (2021) revealed robust predictive value of meaning-centered coping on diminished symptoms of stress, anxiety, and depression in a large sample of adults from 30 countries.

3. Psychological inflexibility and coping responses

The constructs of psychological inflexibility and coping are quite closely related, but nevertheless distinct (Dawson & Golijani-Moghaddam, 2020). People high in psychological inflexibility are characterized by a generalized tendency not to be in contact with aversive experiences (Bond et al., 2011) and accordingly research supports links of psychological inflexibility with emotion-focused and avoidance coping strategies (Karekla & Panayiotou, 2011; Kashdan et al., 2006; Nielsen et al., 2016), such as self-distraction, behavioral disengagement, self-blame, emotional support, avoidance, or substance use. Associations between psychological inflexibility and approach coping strategies are weaker and less consistent across studies. A study with Greek adults (Karekla & Panayiotou, 2011) found no significant links of psychological inflexibility with active coping, planning and instrumental social support, while a study with US students (Kashdan et al., 2006) revealed negative associations between psychological inflexibility and rational coping, and a study with UK adults found negative associations between psychological inflexibility and approach coping (Nielsen et al., 2016).

Previous studies supported the mediating role of coping in associations between personal (e.g., resilience; Gori, Topino, Sette, & Cramer, 2020) or situational (e.g., gain and loss of resources; Chwaszcz et al., 2021) factors and various psychological outcomes. For example, empirical evidence revealed the mediating role of coping in association between psychological inflexibility and mental health. Specifically, Rueda and Valls (2020) found that psychological inflexibility had direct effect on measures of mental health problems and quality of life in patients who attended a public mental health center. However, these associations were partially mediated by coping strategies: denial mediated the links of psychological inflexibility with somatic anxious and depressive symptoms and mental health; lower levels of acceptance mediated the relationship of psychological inflexibility with depressive symptoms; and venting mediated the links of psychological inflexibility with psychological dimensions of quality of life. The partially mediating role of coping (but not approach coping) on relationships of psychological flexibility with well-being, anxiety, and depression was revealed also in UK general population adults during the COVID-19 pandemic (Dawson & Golijani-Moghaddam, 2020). Together these results suggest that psychological inflexibility acts as an overarching response style, that affects psychological functioning of people in diverse stressful situations both directly and indirectly via coping strategies. To our knowledge, the mediating role of meaning-centered coping in associations between psychological inflexibility and mental health has not been investigated yet.

4. Research problem

Our aim in this study was to investigate the mechanisms by which psychological inflexibility might affect people's psychological functioning during the new coronavirus pandemic. We hypothesized that this relationship might be mediated by the use of various coping strategies. In addition to the 'traditional' approach and avoidance coping (Folkman & Lazarus, 1980; Roth & Cohen, 1986), we examined the role that the creation of personal meaning in a stressful situation, i.e., meaning-centered coping (Eisenbeck et al., 2021; Park, 2010), might have in the associations between psychological inflexibility and indicators of psychological functioning during the pandemic. We simultaneously examined aspects of mental health or well-being and mental problems or ill-being to capture the now well-established view of well-being not as an absence of mental problems but as an important constitutive part of health (World Health Organization - WHO, 1946) that is only weakly associated with indicators of ill-being (the dual continua model; Keyes, 2005; Lamers et al., 2011).

Based on the literature reviewed (e.g., Rueda & Valls, 2020), we expected that both approach- and avoidance coping could mediate the effects of psychological inflexibility on well-being and ill-being also in the specific context of beginning of the pandemic. Though this is the first study to examine the possible mediating role of meaning-centered coping on links between psychological inflexibility and psychological functioning, we supposed psychologically inflexible people would be less likely to use this coping style and in turn have less favorable psychological functioning.

5. Method

5.1. Participants and procedure

The study included 1363 Slovene adults (83% female), aged from 18 to 81 years ($M = 34.5$; $SD = 13.7$). With respect to the educational level, 28% of participants attained a high school or lower education and 72% had a post-secondary education or graduate degree or were students at the time of participating in the survey.

The convenience sample of participants was collected online via a survey platform and the link was shared via social networks (e.g., Facebook, Twitter, LinkedIn) of the authors of the article and their academic institutions. In addition, a paid advertisement for the survey was placed on Facebook for three days. Brief information about the survey was posted on the National radio and television's website. The survey cover page included information about the objectives of the study and respondents were asked to provide their informed consent to participate. The study was approved by the Human Research Ethics Committee (#186–2020). The data collection started two weeks after Slovenia declared epidemic and preventive lockdown measures entered into force (i.e., movement was limited to municipalities, all educational, cultural, and religious institutions, and non-essential shops were closed, service activities and public traffic were stopped) and lasted three weeks.

5.2. Measures

After answering demographic questions (sex, age, education), participants filled in the following questionnaires.

Psychological inflexibility. The Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011) was used to measure psychological inflexibility. The AAQ-II contains seven items and asks respondents to indicate how true each statement is for them on a response scale from 1 ('never true') to 7 ('always true'). Responses are summed to obtain a total score, with higher scores indicating higher levels of psychological

inflexibility. The original (Bond et al., 2011) and the Slovene translation of the scale (Baković, 2019) have a unidimensional factor structure, adequate internal consistency, and construct validity. In the present sample, the alpha coefficient was 0.92.

Ill-being. The Depression Anxiety and Stress Scale (DASS-21; Henry & Crawford, 2005; Lovibond & Lovibond, 1995) contains 21 items with three subscales of seven items each, measuring depression, anxiety, and stress. Respondents rate each item on a scale from 0 ('did not apply to me at all') to 3 ('applied to me very much, or most of the time'). In this study, only the total score, calculated as the sum of all the ratings, was used, with higher scores indicating higher levels of negative emotional symptoms. Henry and Crawford (2005) reported the best fit of the bifactor model with one general factor and three specific factors, and adequate internal consistency of subscale and total scale scores. Satisfactory psychometric characteristics were found also for the Slovenian version of the scale (Čolić, 2013). The alpha coefficient in the present sample was .95.

Well-being. The PERMA Profiler was used as a self-report measure of general well-being (Butler & Kern, 2016). It includes 15 items, originally scored along an 11-point scale. We used a 7-point scale anchored at variously labeled extremes to be consistent with the rest of the questionnaires employed (such change in the rating scale should not lead to any data distortions, see Dawes, 2008). The total score used in the present study is calculated as the sum of the five subscales reflecting domains of flourishing (positive emotions, engagement, relationships, meaning, and accomplishment) with 3 items each. The authors of the scale reported good internal consistency and satisfactory test-retest reliability of the scale scores (Butler & Kern, 2016). In this study, the alpha coefficient for the total score was 0.92. The hierarchical factor model as well as the bifactor model were confirmed with the original scale (e.g., Wammerl et al., 2019) and the Slovene translation (Avsec et al., 2022), thus justifying the use of the total PERMA score.

Coping strategies. The brief version of the COPE inventory (Brief-COPE; Carver, 1997) was used to measure various coping strategies. The Brief-COPE consists of 28 items arranged into 14 subscales (active coping, planning, instrumental support, emotional support, self-distraction, venting, behavioral disengagement, positive reinterpretation, denial, acceptance, religion, substance use, humor, and self-blame). Participants respond to the items on a rating scale ranging from 0 ('I never do this') to 3 ('I always do this'). Carver (1997) reported alpha reliability coefficients for the subscales ranging from 0.50 to 0.90. In the present study, alphas ranged from 0.59 to 0.88 with one exception. The alpha coefficient for the self-distraction scale was only 0.26, so this scale was excluded from further analyses. Following author's recommendations, we conducted a principal component analysis of the 13 subscales using an oblimin rotation to determine the composition of the higher-order coping components. Two component scores were calculated and used in subsequent analyses, one representing approach coping (active coping, planning, instrumental support, emotional support, positive reframing, venting, acceptance, religion, and humor) and the other representing avoidance coping (behavioral disengagement, denial, substance use, and self-blame). A similar structure classification of the subscales has been used in some of the previous studies measuring coping during the epidemics (e.g., Huang et al., 2020; Yeung & Fung, 2007).

Meaning-centered coping. The Meaning-Centered Coping Scale MCCS (Eisenbeck et al., 2021) uses nine items to measure the extent to which one copes with a given situation by creating personal meaning. Items are rated on a 7-point scale ranging from 1 ('I do not agree at all') to 7 ('I completely agree'). The authors of the scale report a single-factor structure across 30 countries, including Slovenia, good internal consistency, and test–retest reliability for the scale (Eisenbeck et al., 2021). In the present sample, the alpha coefficient was 0.83.

5.3. Data analysis

First, we examined the descriptive statistics and calculated Pearson correlations between the variables and under study. Consistent with the recommendations of Cohen (1988), correlation coefficients below 0.30 were interpreted as small, between 0.30 and 0.50 as medium, and those above 0.50 as large. To test the mediating role of coping strategies in the relationship between psychological inflexibility and well-being and ill-being, we conducted a path analysis with a maximum likelihood estimator (ML) using M*plus* version 8.6 (Muthén & Muthén, 1998-2017). Psychological inflexibility was modelled to have both direct and indirect effects on well-being and ill-being. The indirect effects were modelled by (a) regressing the three coping styles (approach coping, avoidance coping, and meaning-centered coping) on psychological inflexibility and (b) regressing well-being and ill-being on the three coping styles. The two outcome variables (well-being and ill-being) and the three coping styles were allowed to covary. Possible effects of participants' gender (male vs. female) and age were statistically controlled by adding them as predictors for all variables in the model, as many previous studies reported significant differences between genders and between different age groups in these variables (e.g., Batz & Tay, 2018; Lansford, 2018; Scheibe & Carstensen, 2010). Indirect effects were estimated using the MODEL INDIRECT command in M*plus*. The bootstrap estimation procedure with 2000 bootstrap samples was used to obtain confidence intervals (CI) for the indirect effects. Model fit was evaluated using chi-square test statistic (χ^2), root mean square error of approximation (RMSEA) with 90% confidence interval (CI), and standardized root mean square residual (SRMR). Incremental fit was assessed using the comparative fit index (CFI). We considered RMSEA values below 0.06, SRMR values below 0.08, and CFI values above 0.95 to distinguish good-fitting models from poor-fitting models (Hu & Bentler, 1999).

6. Results

6.1. Descriptive statistics and correlations

Descriptive statistics and correlations between all variables are shown in Table 1. Psychological inflexibility had a large positive correlation with ill-being and a large negative correlation with well-being, indicating better psychological functioning in participants with lower psychological inflexibility. In addition, psychological inflexibility had a positive correlation of medium effect size with avoidance coping, and negative correlations of medium and small effect size with meaning-centered coping and approach coping, respectively. Finally, avoidance coping had a large positive correlation with ill-being and a medium negative correlation with well-being. The opposite pattern was observed for the correlations between approach coping and meaning-centered coping and the two indicators of psychological functioning, although the correlations of approach coping were of smaller magnitude. Table 2 shows the correlations between the Meaning-Centered Coping Scale and the Brief-COPE scales. The highest correlations suggest that meaning-centered coping is moderately positively associated with positive reframing (r = 0.59), acceptance (0.45), planning (0.44), and active coping (0.42), all included in the approach coping component.

Higher age had small negative correlations with psychological inflexibility, avoidance coping, and ill-being, small positive correlations with meaning-centered coping and well-being, and it was unrelated to approach coping (see Table 1). In comparison to women, men reported on somewhat lower levels of psychological inflexibility ($M_f = 22.03$, $SD_f = 9.53$, $M_m = 20.20$, $SD_m = 8.42$; $t(1361) = 2.72$, $p < 0.01$, $d = -0.20$), approach coping ($M_f = 0.03$, $SD_f = 0.99$, $M_m = -0.30$, $SD_m = 0.98$; $t(1361) = 5.10$, $p < 0.01$, $d = -0.36$), avoidance coping ($M_f = 0.05$, $SD_f = 1.00$, $M_m = -0.24$, $SD_m = 0.96$; $t(1361) = 4.01$, $p < 0.01$, $d = -0.29$), meaning-centered coping ($M_f = 43.31$, $SD_f = 8.72$, $M_m = 40.70$, $SD_m = 8.84$; $t(1361) = 4.14$, $p < 0.01$, $d = -0.30$), ill-being ($M_f = 15.95$, $SD_f = 13.29$, $M_m = 12.10$, $SD_m = 11.03$; $t(1361) = 4.12$, $p < 0.01$, $d = -0.30$),

Table 1
Descriptive statistics and correlations between the variables studied.

	1		2		3		4		5		6	
1 Psychological inflexibility												
2 Approach coping	−.16	***										
3 Avoidance coping	.48	***	.01									
4 Meaning-centered coping	−.38	***	.53	***	−.35	***						
5 Ill-being	.60	***	−.15	***	.58	***	−.46	***				
6 Well-being	−.61	***	.41	***	−.35	***	.69	***	−.55	***		
7 Age	−.29	***	.05		−.32	***	.20	***	−.26	***	.19	***
M	21.72		0		0		42.87		15.30		69.87	
SD	9.37		1		1		8.8		13.02		14.88	

Note. $^{**}p < 0.01$, $^{***}p < 0.001$.

Table 2
Correlations between the scales of the Brief-COPE and the Meaning-Centered Coping Scale (MCCS).

COPE Scale	MCCS
Active coping	.42
Emotional support	.22
Instrumental support	.20
Venting	.20
Positive reframing	.59
Planning	.44
Humor	.12
Acceptance	.45
Religion	.29
Denial	−.15
Substance use	−.21
Disengagement	−.18
Self-blame	−.27

Note. All correlations are significant at the 0.001 level (2-tailed).

and well-being ($M_f = 70.47$, $SD_f = 14.66$, $M_m = 66.92$, $SD_m = 15.60$; $t(1361) = 3.32$, $p < 0.01$, $d = -0.24$). Given the significant associations with age and sex, we controlled for the effects of these two demographic variables in the following path analysis.

6.2. Path analysis and tests of indirect effects

To test the proposed model predicting well-being and ill-being with psychological inflexibility and to examine the hypothesized mediating role of coping strategies, a path analysis was conducted. First, a saturated model was constructed, which incorporated the psychological inflexibility as predictor, three types of coping as mediators, and well-being and ill-being as outcome variables. The effects of age and gender on all variables were controlled. Paths from approach coping to ill-being and from avoidance coping to well-being along with the paths from age to avoidance coping and ill-being were non-significant and were thus deleted from the final model depicted in Fig. 1. The model yielded a good fit to the data with $\chi^2(2) = 0.484$ ($p = 0.975$), RMSEA = 0.000 (95% CI = 0.000, 0.000), CFI = 1.000, SRMR = 0.002. Standardized path coefficients for the tested model are shown in Fig. 1. Consistent with expectations, psychological inflexibility predicted higher avoidance coping, lower approach coping and lower meaning-centered coping, with the smallest effect on approach coping. Avoidance coping predicted higher ill-being and approach coping predicted higher well-being, although the latter relationship was much weaker. Meaning-centered coping predicted both ill- and well-being in different directions, as expected. In addition, psychological inflexibility positively predicted ill-being and negatively predicted well-being. Overall, the model explained 27% of the variance in avoidance coping, 17% in meaning-centered coping, 4% in approach coping, 50% in ill-being, and 63% in well-being.

Standardized total, direct, total indirect, and partial indirect effects for the tested model are shown in Table 3. Confidence intervals show that all effects are significant. The associations between psychological inflexibility and individuals' well-being and ill-being were both partially mediated by coping strategies. Specifically, psychological inflexibility predicted higher ill-being both directly and through avoidance and meaning-centered coping strategies. Mediation pathways accounted for 37.3% of the total effect of psychological inflexibility on ill-being (i.e.,

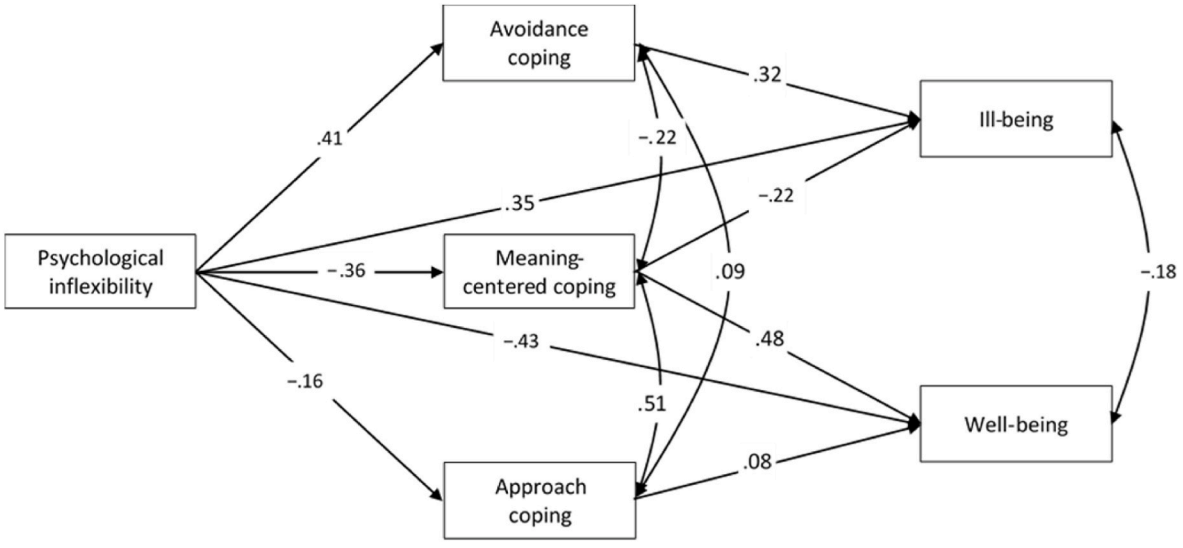

Fig. 1. Path diagram with standardized path coefficients linking psychological inflexibility with well-being and ill-being directly and through three coping styles. All coefficients are significant ($p < 0.001$). Control variables (sex and age) are not presented for brevity.

Table 3
Standardized total, direct, total indirect, and partial indirect effects of psychological inflexibility on well-being and ill-being via coping strategies.

Paths	Effect	SE	*p*	95% CI
Psychological inflexibility → ill-being				
Psychological inflexibility → ill-being (total)	.565	.021	<.001	[.522, .604]
Psychological inflexibility → ill-being (direct)	.354	.025	<.001	[.306, .402]
Psychological inflexibility → ill-being (total indirect)	.211	.016	<.001	[.180, .242]
Psychological inflexibility → AVC → ill-being	.132	.012	<.001	[.109, .157]
Psychological inflexibility → MCC → ill-being	.078	.011	<.001	[.058, .101]
Psychological inflexibility → well-being				
Psychological inflexibility → well-being (total)	−.620	.020	<.001	[−.658, −.581]
Psychological inflexibility → well-being (direct)	−.432	.021	<.001	[−.473, −.390]
Psychological inflexibility → well-being (total indirect)	−.188	.016	<.001	[−.220, −.158]
Psychological inflexibility → APC → well-being	−.014	.004	.001	[−.022, −.007]
Psychological inflexibility → MCC → well-being	−.174	.016	<.001	[−.206, −.145]

Note. Bootstrapping sample size = 2000. CI – confidence interval. AVC – avoidance coping, APC – approach coping, MCC – meaning-centered coping.

the proportion of the total indirect effect in the total effect; see Table 3). The larger proportion of the total indirect effect could be explained by the mediation pathway via avoidance coping and the smaller proportion by the mediation pathway via meaning-centered coping. Psychological inflexibility also predicted lower well-being both directly and via approach coping and meaning-centered coping. Mediation pathways accounted for 30.3% of the total effect of psychological inflexibility on well-being. The larger proportion of the total indirect effect could be explained by the mediation pathway via meaning-centered coping and the smaller proportion by the mediation pathway via adaptive coping.

7. Discussion

In this work, we investigated the mechanisms mediating the link between psychological inflexibility and psychological functioning during the novel coronavirus pandemic. We hypothesized that the use of a rigid and inflexible response style aimed at avoiding negative inner experiences would predict concurrent higher ill-being and lower well-being, both directly and by using differentially adaptive coping strategies. Particular attention was paid to meaning-centered coping, which has been previously suggested to be the most efficient coping strategy in stressful life circumstances with low control. Our results supported the hypotheses by showing that individuals with higher psychological inflexibility reported higher ill-being and lower well-being, partly due to using more avoidance, and less approach and meaning-centered coping.

Psychological inflexibility in response to the pandemic directly contributed to enhanced ill-being and decreased well-being in this stressful situation. These findings corroborate the results of numerous previous studies that linked psychological inflexibility to various indicators of mental health and mental problems, such as anxiety, depression, and stress, both in general (e.g., Hayes et al., 2006) and during the COVID-19 pandemic (e.g., Arslan & Allen, 2021; Dawson & Golijani-Moghaddam, 2020; McCracken et al., 2021; Pakenham et al., 2020). Our results showed that psychological inflexibility had a slightly stronger total and direct negative effect on well-being compared to its positive effects on ill-being, substantiating a significant role that inflexible emotional, psychological, and behavioral responses to stressful circumstances may have not only in enhancing mental health problems, but even more so in reducing positive aspects of people's psychological functioning during the pandemic (Arslan & Allen, 2021; McCracken et al., 2021). While psychological inflexibility is characterized by specific rigid and avoidant cognitive, emotional and behavioral patterns, it also refers to a lack of pursuit of personal goals and values in the presence of potentially disruptive thoughts and feelings and consequently a poorer appreciation of what the current situation or context allows (Hayes et al., 2012). These shortcomings may thwart people with high psychological inflexibility in re-evaluating the situation and their view of the society, transforming their personal experience into an opportunity for personal growth, and engaging in (social) situations likely to induce positive emotions, thus hindering their well-being and advancing ill-being.

As expected, psychological inflexibility also predicted the three coping styles, with the largest positive effect on the avoidance coping. These results are consistent with previous studies in which psychological inflexibility had the strongest associations with coping strategies typically classified as avoidant (Karekla & Panayiotou, 2011; Kashdan et al., 2006; Nielsen et al., 2016), and can be explained by a tendency of psychologically inflexible individuals to avoid negative experiences, thoughts, feelings, and situations to down-regulate their affective response (Bond et al., 2011). Our results indicated a much weaker, but still significant, negative effect of psychological inflexibility on concurrently reported approach coping, which is also consistent with previous research (Dawson & Golijani-Moghaddam, 2020; Karekla & Panayiotou, 2011; Kashdan et al., 2006; Nielsen et al., 2016), suggesting that psychological inflexibility is primarily related to higher use of avoidance coping strategies rather than lower use of approach coping strategies. Furthermore, our results showed a significant negative effect of psychological inflexibility on meaning-oriented coping, which was only slightly weaker compared to the suggested positive effect on avoidance coping. Avoiding unfavorable thoughts and feelings may limit the ability of psychologically inflexible individuals to reframe their perceptions of the pandemic, find hope and courage, and accept this aversive situation.

Coping can be considered an essential component of people's adaptation to stressful situations, predicting their psychological functioning under such circumstances. However, the adaptability of different coping strategies may depend on the context (Carver & Connor-Smith, 2010; Terry & Hynes, 1998). Our results showed that in the context of the COVID-19 pandemic, which is characterized by long duration, low levels of control, and high uncertainty, finding or making meaning may be critical for successful adaptation to stress, particularly promoting positive aspects of people's functioning, but also reducing their ill-being. This is consistent with previous studies conducted during this pandemic (Eisenbeck et al., 2021; Shamblaw et al., 2021) and with theoretical suggestions that meaning construction may be a particularly adaptive coping strategy in situations that cannot be actively managed due to low levels of personal control (e.g., Park et al., 2001). Accordingly, our results also showed that approach coping strategies that are actively directed toward eliminating threat had a much weaker association with increased well-being during the pandemic and did not predict ill-being. Changes in everyday lives brought on by the COVID-19 pandemic are largely determined by regional, national, and even global public health and political authorities. Thus, an individual cannot influence decisions regarding work, schooling of children, attending cultural events, socializing in public spaces etc. to the accustomed degree. While approach coping tends to be associated with desirable psychological outcomes, its value in the current circumstances seems to be greatly diminished. Nevertheless, the beneficial role of approach coping in the psychological functioning of individuals probably reflects the fact that even in the pandemic circumstances some aspects of individuals' lives can be actively managed (e.g., organizing supplies, finding some way of keeping in touch with important others, engaging in health behaviors) and approach response to these aspects seems to have favorable role. Avoidance coping strategies, on the other hand, appeared to undermine successful adaptation, resulting in increased ill-being. These findings are in line with those from previous studies suggesting an

unfavorable role of avoidant coping following traumatic experiences and a more favorable but weaker role of approach coping, which may be enhanced with the duration of the traumatic experience (Littleton et al., 2007). Similar results were obtained for the functionality of different coping strategies during this pandemic, with avoidance coping strategies having a greater impact on people's psychological functioning than approach coping strategies (e.g., Chwaszcz et al., 2021; Dawson & Golijani-Moghaddam, 2020; Gurvich et al., 2020; Margetić et al., 2021; Rettie & Daniels, 2020; Shamblaw et al., 2021; Zacher & Rudolph, 2021; Yang et al., 2021).

The main observation from our results is that the three coping styles had a partially mediating role in the relationship between psychological inflexibility and psychological functioning. This finding is consistent with previous work before and during this pandemic (Dawson & Golijani-Moghaddam, 2020; Karekla & Panayiotou, 2011; Rueda & Valls, 2020) and shows that psychological inflexibility is both directly and indirectly, through individuals' coping responses, related to poorer psychological functioning during the pandemic. The indirect effects accounted for approximately one-third of the total effects of psychological inflexibility on ill- and well-being, confirming previous observations that psychological inflexibility is an overarching response style that is independent of, but significantly associated with, coping strategies. Psychological inflexibility contributed to increased ill-being partially by increasing avoidance coping and, to a lesser extent, by reducing the use of meaning-centered coping, whereas it contributed to a decreased well-being partially by reducing meaning-centered coping and to a considerably lesser extent also the use of approach coping. A partial mediating role of 'traditional' coping strategies, especially avoidant ones, in the relationship between psychological inflexibility and indicators of psychological functioning has also been found in previous studies (Dawson & Golijani-Moghaddam, 2020; Rueda & Valls, 2020), while to our knowledge this is the first empirical study to reveal the mediating role of meaning-centered coping in this relationship. Theory suggests that psychological flexibility, as a generalized higher-order response style (e.g., Nielsen et al., 2016), should facilitate coping responses that are particularly adaptive in the specific context, and the opposite might be expected for psychological inflexibility. Indeed, our results suggest that psychological inflexibility in the context of the COVID-19 pandemic primarily enhanced avoidance coping and hindered meaning-centered coping, with the former having a detrimental role in individuals' psychological functioning and the latter having a protective role not only in reducing mental health problems but also in promoting positive aspects of mental health.

7.1. Research implications

The current pandemic imposed tolls not only on people's physical but also their mental health (e.g., Rajkumar, 2020; Torales et al., 2020). This calls for the identification of risk and protective factors and explorations of mechanisms through which these factors exert their effect on psychological outcomes. Especially useful would be the knowledge on mechanisms that are well responsive to interventions (Dawson & Golijani-Moghaddam, 2020). Interventions aimed at reducing psychological inflexibility (and fostering flexibility) could lead to favorable outcomes in people during these challenging times. For example, a randomized controlled trial with adults suffering from mild to moderate psychological distress found that an intervention based on acceptance and commitment therapy and mindfulness leads to significant increases not only in psychological flexibility but also in emotional, psychological, and social well-being that were still evident three months after the intervention (Fledderus et al., 2010). Moreover, such interventions might be beneficial even once the pandemic will subside as research conducted during the past pandemics suggest that psychological problems may be sustained for years to come, especially in people who were infected or are occupationally exposed to the infection roles (e.g., Chan & Huak, 2004; Lee et al., 2007; Maunder et al., 2006).

Coping skills can be learned through cognitive-behavioral or other therapeutic orientation approaches (Folkman & Moskowitz, 2004) and school-based intervention programs were also found to be effective (e.g., Hampel et al., 2008; Lang et al., 2017). Our findings suggest that viewing the pandemic as a situation that cannot be realistically eliminated by active coping or that could simply be avoided, but can be transformed into opportunity by maintaining hope, appreciation of life, and positive reframing, engagement in meaningful activities, and prosociality has beneficial associations with reduced ill-being and higher well-being. This type of coping provides a promising avenue for interventions such as those offered within the positive existential therapy, on which the Meaning-Centered Coping Questionnaire is based (Wong, 2010, 2020). Since our results suggest that people high in psychological inflexibility are less likely to use meaning-centered coping, these individuals should be identified and offered participation in the intervention.

7.2. Limitations and future directions

The present study included a relatively large and age heterogeneous sample of adults, although a self-selection method was used for recruitment resulting in an unrepresentative sample with over-represented female participants. The very low internal consistency of the self-distraction subscale of the Brief-COPE led us to exclude it from further analyses, which could lead to a different structure of the two coping components resulting from the principal component analysis, especially the avoidance component, than if all subscales were included. The AAQ-II was used as a measure of psychological inflexibility, but given recent advances in the measurement of the construct of psychological flexibility, a measure that directly taps flexibility rather than inflexibility, is context-specific, encompasses all aspects or components of flexibility, and is not confounded with neuroticism and negative affect, would be a more optimal choice in future studies (e.g., Gloster et al., 2021; Rolffs et al., 2016; Kashdan et al., 2020).

Moreover, the cross-sectional nature of the study does not allow for causal conclusions. We tested the hypothesis that individuals' psychological inflexibility as a relatively enduring disposition predicts their psychological functioning directly and indirectly by modulating coping styles applied in a certain context. However, it is possible that people's psychological functioning contributes to their choice of coping style. Longitudinal and intervention studies are needed to elucidate causal relationships between constructs under investigation. Such studies would also enable the testing of the hypothesis, that approach coping has stronger associations with favorable psychological functioning if used repeatedly over longer time as suggested by some research (Littleton et al., 2007). Moreover, longitudinal observation of individuals at shorter intervals at the onset and during the unfolding of a pandemic would also provide insight into how adaptive different strategies might be at different stages of the pandemic. For example, some avoidance strategies may also be adaptive and adopted by psychologically flexible individuals in the short term until one begins to adapt and adopt other, more approach- and/or meaning- oriented coping strategies. Future studies, possibly based on randomized controlled trials, are also needed to empirically demonstrate the efficacy of interventions promoting meaning-centered coping within the therapeutic but also prevention context. The recently developed Meaning-Centered Coping Scale (MCCS; Eisenbeck et al., 2021), employed also in the present study, may be useful for detecting possible changes in this coping style, as it appears to tap into aspects of coping that are crucial for psychological functioning in the circumstances of the COVID-19 pandemic and are not captured by 'traditional' coping strategies. Further studies are needed to investigate the differential validity of the MCCS because it includes a mixture of components and some of them are already measured by other scales.

8. Conclusions

Taken together, our results demonstrate that avoidance, approach, and meaning-centered coping played different roles in shaping the effects of psychological inflexibility on individuals' ill-being and well-being during the COVID-19 pandemic. Specifically, the psychologically inflexible response to the pandemic not only directly contributed to individuals' psychological functioning in this context, but also through increased use of avoidance coping, decreased use of meaning-centered coping, and, to a lesser extent, decreased use of approach coping. The use of avoidance coping in the context of the pandemic proved detrimental as it contributed to increased concurrent ill-being. While approach coping proved beneficial to individuals' concurrent well-being, its role was rather weak, probably reflecting the low controllability and high uncertainty of the pandemic context. Our study highlights the outstanding value of meaning-centered coping in such circumstances, as it relates not only to reduced mental problems but also to higher well-being. The results confirm that meaning-centered coping is a distinct coping strategy, showing a different pattern of associations with psychological inflexibility and psychological functioning than approach coping. These findings imply that meaning-centered coping should be studied and measured as a stand-alone strategy, rather than simply by combining measures of specific approach coping strategies, such as acceptance and positive reframing. Although our study found a moderate correlation between approach coping and meaning-centered coping, the two coping strategies independently mediated the association between psychological inflexibility and indicators of psychological functioning.

Authors' contributions

G. Zager Kocjan and T. Kavčič contributed equally as leading authors.Ethics approval: The study was approved by the Human Research Ethics Committee of the University of Ljubljana, Faculty of Arts (#186–2020).Consent to participate (include appropriate statements): Prior to beginning the survey, the participants were presented with information about the objectives of the study and asked to provide their informed consent to participate.

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