

## RESEARCH ARTICLE

# The psychological response and perception of stress during the COVID-19 pandemic in Slovenia: Three-wave repeated cross-sectional study

Ana Kozina  | Igor Peras | Manja Veldin | Tina Pivec

Educational Research Institute, Ljubljana, Slovenia

**Correspondence**

Ana Kozina, Educational Research Institute, Gerbičeva 62, Ljubljana 1000, Slovenia.

Email: [ana.kozina@pei.si](mailto:ana.kozina@pei.si)**Abstract**

In addition to COVID-19 being a health threat, its longevity and restrictions act as significant stressors and risk for mental health. In the current study, we take a look at how psychological response, both its positive aspects, for example, mental well-being and life satisfaction, and its negative aspects, for example, anxiety and COVID-19 anxiety, have changed as the pandemic has continued (first three waves in Slovenia). Additionally, we are interested in whether the psychological response is associated with the perception of stress level in waves 2 and 3 as less, equally or more stressful when compared to the stress level in wave 1 and what shapes these perceptions. An online questionnaire battery (COVID-19 stress level comparison, Warwick-Edinburgh Mental Well-being Scale; LAOM Anxiety Scale; Global Life Satisfaction scale; COVID-19 anxiety), with ANOVA and qualitative analysis of the open-ended question on reasons for perceiving wave 2 and wave 3 as more stressful when compared to wave 1, was used on a Slovene convenience adult sample (wave 1:  $N = 364$ , 83.5% female; wave 2:  $N = 987$ , 85.5% female; wave 3:  $N = 467$ , 78.5% female). The findings show (a) a significant increase in COVID-19 anxiety from wave 1 to wave 3, with a peak in wave 2, and a significant decrease in mental well-being from wave 1 to wave 3; (b) the level of anxiety, mental well-being, and life satisfaction differs significantly between individuals who perceive wave 2 and 3 as more stressful compared to individuals who perceive wave 2 and wave 3 as equally or less stressful when compared to wave 1; (c) reasons for perceiving the succeeding waves of the pandemic as more stressful compared to wave 1 are diverse, with some being reported in both succeeding waves (e.g., negative emotional response to the pandemic, negative perceptions of measures). The findings highlight the important role of stress analysis in identifying the support mechanisms for dealing with the challenges of the COVID-19 pandemic.

**KEYWORDS**

COVID-19 waves, psychological response, Slovenia, stress perception

## 1 | INTRODUCTION

The coronavirus disease (COVID-19) pandemic was and still is an intense and sudden stressor that has affected psychological functioning across the globe. The initial stress, primarily related to the health threat, was further magnified by strict rules over social and other restrictions introduced by governments around the world to stop the spread of the virus (Fancourt et al., 2020). The psychological impact (e.g., on stress levels and mental health) of the onset of the COVID-19 pandemic already has widespread empirical support (e.g., Wang et al., 2020). Given that the pandemic (and the restrictions) is still ongoing, its longevity, with the end not yet in sight, acts as an additional stressor and presents a risk for mental health (Pieh et al., 2021). In the current study, we are taking a look into how psychological response, both its positive aspects, for example, mental well-being and life satisfaction, and its negative aspects, for example, anxiety, and specifically COVID-19, have changed as the pandemic has continued (following the first three waves in Slovenia: spring 2020, autumn 2020 and spring 2021). Since stress is not simply a result of a potentially omnipresent life event that occurs to an individual but is rather a cognitively mediated emotional response to that event (Cohen et al., 1983), we are interested in whether psychological response is associated with the level of the perceived stress and what shapes these perceptions in the time of the COVID-19 pandemic.

Stress is, by definition (Boluarte-Carbajal et al., 2021), an individual's cognitive, emotional, behavioural and physiological response to a stressor. It has a negative effect on psychological response, for example, leading to more complex conditions such as anxiety, depression and post-traumatic stress (Patel et al., 2018). There are three approaches to the understanding of stress summarized in the literature, all of which can be considered in the time of COVID-19. First, the environmental approach (Clark et al., 2007) defines stress as a change, quantifying it as the number and magnitude of key life events experienced by a person in a given time period. From the environmental perspective, the COVID-19 pandemic is a significant life event that can be compared with other negative environmental contexts, such as natural disasters. Furthermore, fear of contagion has already been reported as a major stressor in unknown infectious outbreaks (Hagger et al., 2020). As mentioned above, the social restrictions, with ever more present economic difficulties (e.g., unemployment) and feeling uncertain about the future, have been proposed as an additional important stressor (Hagger et al., 2020). From this perspective, the level of perceived stress depends on how affected one is by the COVID-19 pandemic (e.g., getting infected, losing employment). Second, the psychological approach emphasizes the importance of how life events are perceived and evaluated (Cohen et al., 1983). The evaluation has two stages. The first is the primary appraisal of a stressor as threatening and, when a coping response is required, a secondary appraisal of resources to deal with the situation when it occurs. We would assume that the primary appraisal in the case of COVID-19 is similar across populations (COVID-19 being a real threat), with varieties

expected in populations more exposed to the virus (e.g., health workers). For the secondary appraisal, we would assume it depends on the quality of coping mechanisms. There are several models, such as the transactional model of stress and coping (Lazarus & Folkman, 1984), the biopsychosocial model of stress (Blascovich & Mendes, 2010), the stress optimization model (Crum et al., 2020) that all emphasize the importance of appraisals as being central for effective coping and preventing a negative effect on psychological response (Hagger et al., 2020). In the case of COVID-19, this secondary appraisal provides a possible gateway to preventing the negative effects on psychological response. The third approach to understanding stress is the biological one, defining stress in terms of the activation of responsive physiological systems (Clark et al., 2007). This approach is especially relevant when taking into consideration the longevity of the ongoing COVID-19 pandemic. Looking at all three approaches, we can see that COVID-19 resonates with all three, the environmental threat, appraisal of the stressor and biological response.

Several studies have investigated the differences in functioning in the first wave of the COVID-19 pandemic compared to the pre-COVID time. Systematic reviews about the impact of the COVID-19 pandemic on psychological response reported high levels of depression (21.94%–33.7%), anxiety (13.29%–31.9%) and stress (13.29%–29.6%) (Cénat et al., 2021; Salari et al., 2020). Furthermore, in a study based on data from 67 countries, depression levels increased by 21.62%, anxiety levels by 16.71% and stress levels by 21.8% during the COVID-19 pandemic when compared to the time before the pandemic (Ugbolue et al., 2020). Additionally, some studies have already investigated how the psychological response to COVID-19 has changed in between waves. In an Italian medical staff study, a rise in sleep and anxiety disorders and low levels of job satisfaction and happiness were reported in the second wave as a result of continual stress. The most alarming factor was the increase in cases of depression with the ongoing COVID-19 pandemic (Magnavita et al., 2021). Furthermore, in its global monitoring of mental health, the OECD (Hewlett et al., 2021) has identified an increase in mental health problems, for example, anxiety and depression, compared to the pre-COVID-19 time, with a peak at the beginning of the pandemic in wave 1 (Hewlett et al., 2021). Further on, it reported mental health improving and worsening together with the waves of COVID-19. The peaks of mental distress are closely correlated with peaks in COVID-19 deaths, and periods when pandemic control measures were most strict (Hewlett et al., 2021). As can be seen, the COVID-19 pandemic affects not only the negative aspects of psychological response, such as anxiety, but also the positive ones, such as mental well-being, life satisfaction (Rajkumar, 2020), and happiness (Meléndez et al., 2020). For instance, studies indicate that life satisfaction has been additionally jeopardized during the COVID-19 pandemic due to worries about more unstable work situations and less access to family support (Bakkeli, 2021).

When a stressor, such as the ongoing COVID-19 pandemic, is present for a longer period of time, mental health problems (e.g.,

anxiety and depression) are even more frequent. COVID-19 has become, at this point, a long-lasting event, so the stress is no longer an acute reaction in which the body responds in an adaptive way to a stressful event but is more of a chronic response, which is maintained over time and results in a higher allostatic load (Fofana et al., 2020; Guidi et al., 2021). COVID-19 is in this sense a chronic event. Allostatic load is the effect of chronic stress. More specifically, it is the cost to an individual adapting to cumulative stress, mostly associated with the regulation of physiological responses needed to accommodate changing environmental demands. It is greater for people who have undergone more stressful life experiences, as well as chronic and intense stress (McEwen & Stellar, 1993). As for the specific stressors associated with the COVID-19 pandemic, several studies have already reported the most common stressors in specific subgroups. For instance, Hamouche (2020) listed (a) perceptions of safety, threat and risk of contagion, (b) information overload and fear of the unknown, (c) quarantine and confinement, (d) stigma and social exclusion, and (e) financial loss and job insecurity in adult employed samples. These stressors are well reflected in the COVID-19 stressor types proposed by Kira et al. (2021): infection fears, lockdown, economic fears and grief. Additionally, in terms of specific populations, distance learning and social isolation were identified as important stressors in student populations (Fruehwirth et al., 2021). On the other hand, the main stressors reported by health professionals were the perceived levels of professional risk, emotional demands, the uncertainty of clinical situations, and conflict between work and family (Probst et al., 2020). Moreover, Farris et al. (2021) have also reported stressors related to COVID-19 based on a thematic analysis of responses from university students: (a) viral outbreak distress; (b) fear of virus contraction and transmission; (c) viral infection experience; (d) physical distancing distress; (e) social distancing distress; (f) academic and school-related distress; (g) financial strain and unemployment; (h) worsening of pre-existing mental health problems; and (i) social referencing that minimizes distress. From the studies mentioned, we gain insight into stressors that have been, and continue to be, experienced during the COVID-19 pandemic.

The current study adds to the research collection with the inclusion of three-time points while focussing on both negative and positive aspects of psychological response. Furthermore, it adds to the understanding of the stressors that make perceiving the succeeding waves of the pandemic (wave 2, wave 3) more stressful than for wave 1 due to the pandemic being a chronic stressor adding to the allostatic load. More specifically, we pose the following research questions:

1. Are there differences in the quality of psychological functioning (operationalized as anxiety, COVID-19 anxiety, mental well-being and life satisfaction) between the three waves? We assume psychological functioning was at its lowest (high anxiety, high COVID-19 anxiety, low mental well-being, low life satisfaction) in wave 1 and slowly improved afterwards.
2. Is there a difference in psychological functioning (operationalized as anxiety, COVID-19 anxiety, mental well-being and life

satisfaction) between individuals that perceive wave 2 and wave 3 of the pandemic as more, less or equally stressful compared to wave 1 of the pandemic? Wave 1 was used as a baseline for comparisons, due to the novelty of the virus and the unpredictability of the virus being an important initial stress, with the assumption that the level of stress would be highest in wave 1. We assume that the perception of higher stress in wave 2 and wave 3 when compared to wave 1 is associated with poorer psychological response.

3. What are the reasons for perceiving wave 2 and wave 3 of the pandemic as more stressful than wave 1? Based on the review of stressors in different populations, we assume a variety of stressors to be present in our sample, with health risks, employment risks, and fear of income loss to be stated by responders.

## 2 | METHOD

### 2.1 | Participants

In wave 1, a convenience sample of 364 Slovenian participants, mostly female (83.5%), aged 18–73 ( $M = 37.21$ ,  $SD = 12.92$ ), was obtained using the snowball method online. Most participants had completed 4 to 5 years of university studies (49.7%), were employed at the time of data collection (59.6%), worked mainly from home (49.2%), lived with other people (87.1%) and were not infected with SARS-CoV-2 (98.9%), and neither were the people close to them (95.1%). In wave 2, a convenience sample of 987 Slovenian participants, mostly female (85.5%), aged 18–82 ( $M = 43.81$ ,  $SD = 12.50$ ), was obtained using the snowball method online. Most participants had completed 4 to 5 years of university studies (55.4%), were employed at the time of data collection (81%); worked mainly at their workplace (50.4%), lived with other people (87.6%) and were not infected with SARS-CoV-2 (91.3%), and neither were the people close to them (81%). In wave 3, a convenience sample of 467 Slovenian participants, mostly female (78.5%), aged 18–83 ( $M = 43.56$ ,  $SD = 12$ ), was obtained using the snowball method online. Most participants had completed 4 to 5 years of university studies (58%), were employed at the time of data collection (84.8%), worked mainly from their workplace (53.6%), lived with other people (88.2%) and were not infected with SARS-CoV-2 (75.8%), and neither were the people close to them (54.6%).

### 2.2 | Instruments

The measurement battery consisted of questionnaires tapping psychological responses to the COVID-19 pandemic. The introduction to the questions was reformulated to cover the time of the COVID-19 pandemic. The same instruments were used for all waves.

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS; Tennant et al., 2007) was used as a measure of Mental well-being. It consists of 14 items (1 = 'never' to 5 = 'always'; originally framed as

1 = 'none of the time' to 5 = 'all of the time'), assessing the frequency of positive aspects of mental health during the COVID-19 pandemic. The reliability and validity of the instrument have been well documented (Lloyd & Devine, 2012), including on a Slovenian sample (Cilar et al., 2019). Cronbach's alpha in our study was 0.93 in wave 1, 0.93 in wave 2 and 0.94 in wave 3.

The Global Life Satisfaction scale (Andrews & Withey, 1974) measures Life satisfaction using a single item ('How satisfied are you, all in all, with your life as a whole?') on a 10-point scale (1 = 'completely dissatisfied' to 10 = 'completely satisfied'). The reliability and validity of single-item life satisfaction scales have been shown to be very similar to their multiple-item counterparts (Cheung & Lucas, 2014; Lucas & Donnellan, 2012). We used a modified scale adding a COVID-19 time frame (since the COVID-19 pandemic was announced (a) for the first time (wave 1), (b) for the second time (wave 2) and (c) for the third time (wave 3).

The LAOM Anxiety Scale (Kozina, 2012) was used to measure General anxiety and consisted of 14 items. Participants indicated the extent to which the statements were true for them during the COVID-19 pandemic (1 = 'never' to 5 = 'always'). The reliability and validity of the instrument have been well documented on Slovenian samples (Kozina, 2012), but it has only been used on students. Five items were adapted to exclude the school context. Cronbach's alpha in our study was 0.89 in wave 1, 0.91 in wave 2 and 0.92 in wave 3.

COVID-19 anxiety was used to measure specific situational anxiety during the pandemic. We created four items based on the items from the LAOM Anxiety Scale (Kozina, 2012), aiming to capture anxiety specific to the COVID-19 pandemic (e.g., 'I am worried about getting infected with COVID-19.'). Participants indicated the extent to which the statements were true for them during the COVID-19 pandemic (1 = 'never' to 5 = 'always'). The present scale was not piloted beforehand, as we aimed to capture the height of the COVID-19 pandemic in wave 1, although its validity is supported by significant correlations with other measures used in this study (e.g., a positive correlation with general anxiety,  $r = 0.38$ ,  $p < 0.01$ ; and a negative correlation with mental well-being,  $r = -0.22$ ,  $p < 0.01$  from wave 1). Cronbach's alpha in our study in waves 1, 2 and 3 was 0.85, 0.83 and 0.84, respectively.

**COVID-19 Stress Level Comparison.** For the purposes of this study, we created an item measuring a comparison of perceived stress in between the waves: 'Compared to wave 1, how stressful is the current pandemic for you?'. The participant's response options were: 1 = 'less stressful'; 2 = 'equally stressful'; 3 = 'more stressful'. Afterwards, participants elaborated on their choice by answering a subitem, 'What is the reason that your experience of stress changed or remained the same?', in an open-ended format. For the purposes of this study, only the 'more stressful' responses were analysed.

## 2.3 | Procedure

The first COVID-19 pandemic in Slovenia was declared on 12th of March 2020, while the most restrictive measures came into effect

4 days later on 16th of March. The wave 1 data collection started at the peak of the restrictive measures (three weeks after the first restrictive measures were established) during the first lockdown in Slovenia, on 8th of April 2020, and lasted for three weeks until 28th of April. Participants completed an online version of the questionnaire battery. Before starting the battery, they were informed about the purpose of the study, the methodology to be used, and their role in the study. By completing the questionnaire, they agreed to their answers being included in the research. The ongoing restrictions at the time included: closure of schools; cancelling of public transport; closing of non-essential service activities such as bars and restaurants; limiting the movement of people to the municipality of residence; and closure of country borders. The same procedure was repeated in autumn 2020 at the start of wave 2 with the second lockdown in Slovenia. The data collection lasted from 3rd of November 2020 to 16th of December that year. The ongoing restrictions at the time included: mandatory mask wearing in all public places; limited movement between 21:00 and 06:00 outside homes; freedom of movement limited to the municipality of residence; closure of schools; closing of non-essential shops and services; and a ban on all events and gatherings with six or more people. The final data collection, in wave 3, took place with the third lockdown in Slovenia, from 1st to 12th of April 2021. The ongoing restrictions at the time included: mandatory wearing of masks in public places; freedom of movement limited to statistical regions; limited movement between 22:00 and 05:00 outside homes; closure of skiing resorts; limited public transport; closing of cultural places (e.g., museums); and travel restrictions to other countries.

## 2.4 | Data analyses

For testing the differences in psychological response between the three waves and for testing the differences in psychological response between the different perceptions of stress, we used one-way ANOVA, followed by the post hoc Bonferroni test, in IBM SPSS 25 in cases where all assumptions of ANOVA were met. In cases where homogeneity of variances was not met, we used the Welch test, followed by Games-Howell post hoc tests). For qualitative insights into the data, thematic analysis (as described by Braun & Clarke, 2006) was performed in Microsoft Excel, which enabled us to identify, analyse and report patterns in the data. One author read all the answers and began coding the responses. Coded data were grouped into preliminary themes, which were reviewed by two authors. Final themes emerged upon agreement by the two authors.

## 3 | ETHICAL COMPLIANCE SECTION

All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The authors declare

they have no conflict of interest. Informed consent was obtained from all individuals included in the study.

## 4 | RESULTS

In the first research question, we were interested in the differences in the psychological response (COVID-19 anxiety, Anxiety, Mental well-being, Life satisfaction) between the three waves (see Figure 1).

COVID-19 anxiety differed significantly in the three waves of the pandemic ( $F = 4.202$ ,  $p = 0.015$ ,  $\eta^2 = 0.005$ ). Post hoc tests showed a significant difference between wave 1 and wave 2 ( $p = 0.031$ ) but not between wave 1 and wave 3 ( $p = 1.000$ ) nor wave 2 and wave 3 ( $p = 0.126$ ). The level of COVID-19 anxiety was significantly higher in autumn 2020. Significant changes, but in the opposite direction (decrease from wave 1 onwards), were detected in Mental well-being (Welch's  $F = 5.828$ ,  $p = 0.003$ ,  $\omega^2 = 0.005$ ). Although mental well-being decreased throughout the three waves, and was at its lowest in spring 2021, the post hoc test revealed that a significant change is detected between wave 1 and 3 ( $p = 0.002$ ) and between wave 1 and wave 2 ( $p = 0.049$ ) but not between wave 2 and wave 3 ( $p = 0.187$ ). The differences between the three waves were not significant in Anxiety ( $F = 0.429$ ,  $p = 0.651$ ) or in Life satisfaction ( $F = 0.422$ ,  $p = 0.656$ ).

Later on, we were interested in whether there was a difference in psychological functioning between individuals who perceived the succeeding waves (either wave 2 or wave 3) of the pandemic as more, less or equally stressful compared to wave 1 of the pandemic (Figure 2).

The level of COVID-19 anxiety differs significantly ( $F = 3.512$ ,  $p = 0.030$ ,  $\eta^2 = 0.007$ ) between individuals that perceive wave 2 as less stressful, equally stressful or more stressful when compared to wave 1. Individuals that perceive wave 2 as more stressful report higher COVID-19 anxiety when compared to individuals that perceive wave 2 as less stressful ( $p = 0.033$ ). The differences between individuals that perceive wave 2 as more stressful and those that perceive wave 2 as equally stressful are not significant ( $p = 0.143$ ). Similarly, the differences between the individuals that perceive wave 2 as less stressful and those that perceive wave 2 as equally stressful are not significant ( $p = 1.000$ ). The level of Anxiety differs significantly (Welch's  $F = 50.118$ ,  $p = 0.000$ ,  $\omega^2 = 0.001$ ) between individuals that perceive stress at wave 2 as less stressful, equally stressful or more stressful when compared to wave 1. Here, post hoc tests showed significant differences between individuals that perceive wave 2 as more stressful and those that perceive wave 2 as less stressful ( $p = 0.000$ ) and those that perceive wave 2 as equally stressful ( $p = 0.000$ ) but not between individuals that perceive wave 2 as less stressful and those that perceive wave 2 as equally stressful ( $p = 0.101$ ). The level of Mental well-being differs significantly as well ( $F = 46.812$ ,  $p = 0.000$ ;  $\eta^2 = 0.087$ ) between the three groups, with the group experiencing more stress in wave 2 having the lowest scores. The post hoc tests showed significant differences in Mental well-being between two out of the three groups, between the individuals that perceive wave 2 as more stressful and those that perceive wave 2 as less stressful ( $p = 0.000$ ) and the group that perceives wave 2 as equally stressful ( $p = 0.000$ ). The differences in Mental well-being

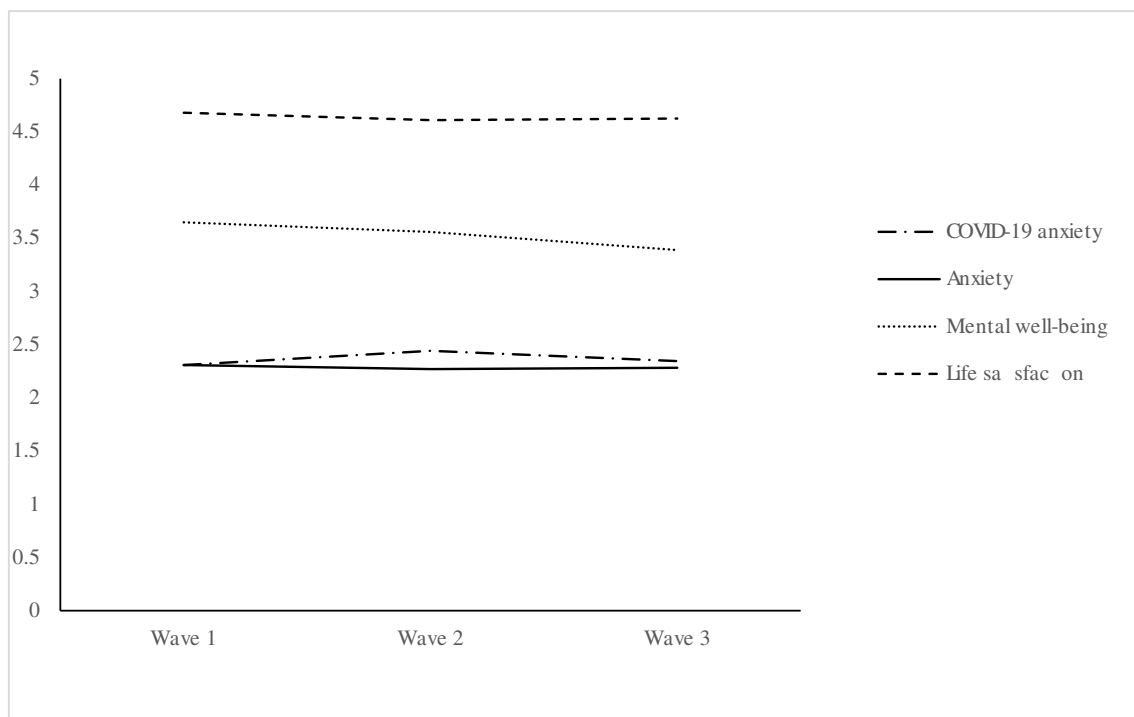
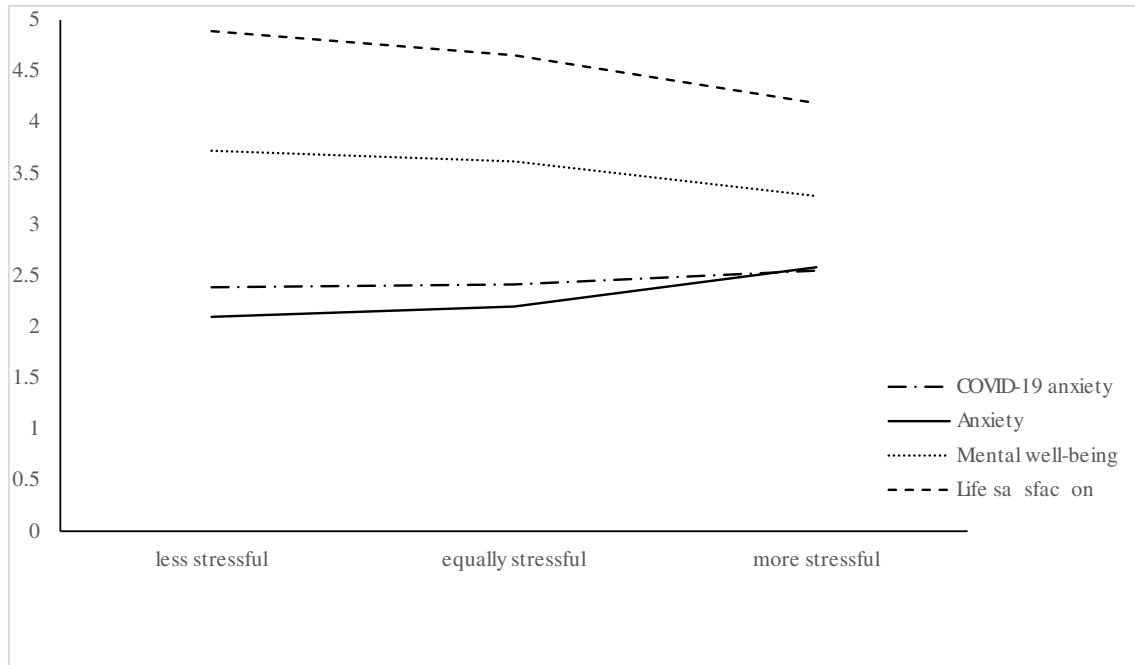


FIGURE 1 Psychological response in wave 1, wave 2 and wave 3 of COVID-19 pandemic

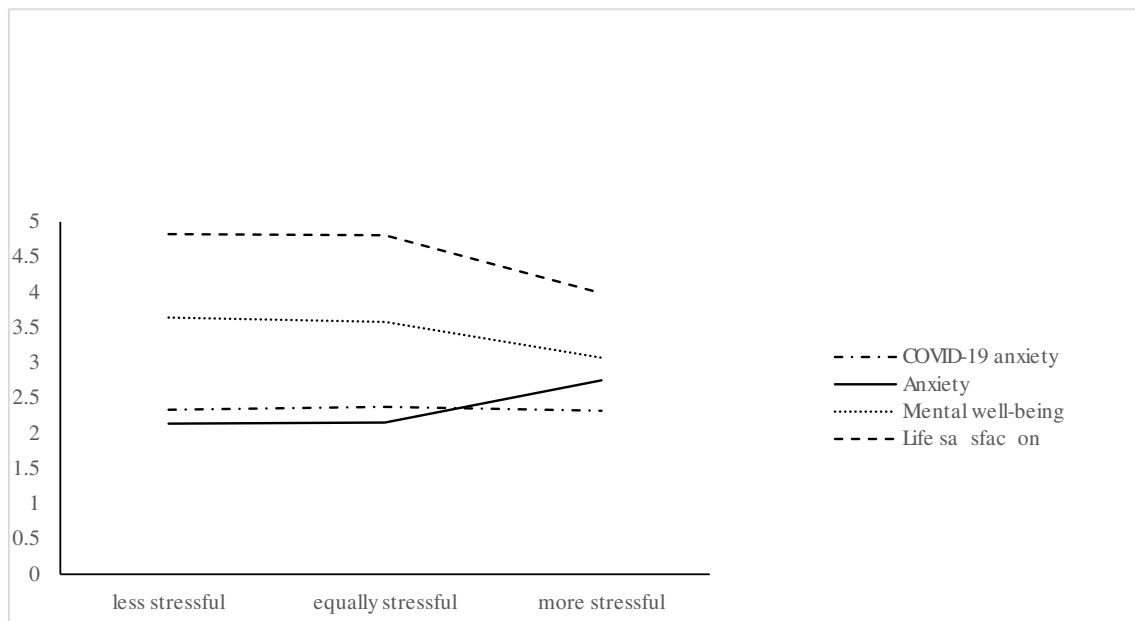
between the group that perceives wave 2 as less stressful and the group that perceives wave 2 as equally stressful are not significant ( $p = 0.074$ ). Similarly, the level of Life satisfaction differs significantly (Welch's  $F = 27.235$ ;  $p = 0.000$ ;  $\omega^2 = 0.041$ ) between individuals that reported perceived stress in wave 2 as less, equal or more stressful when compared to wave 1, with the lowest scores for people perceiving the second wave as more stressful.

In Life satisfaction, the differences are significant between all three groups ( $p < 0.05$ ).

The level of COVID-19 anxiety does not differ significantly ( $F = 0.155$ ,  $p = 0.856$ ) between individuals that perceive stress in wave 3 as less, equal or more stressful when compared to wave 1 (Figure 3). But there are significant differences in Anxiety between individuals that perceive wave 3 to be differently stressful when



**FIGURE 2** Psychological response (COVID-19 anxiety, anxiety, mental well-being, life satisfaction) when wave 2 is perceived as less ( $N = 398$ ; 40.3%), equally ( $N = 296$ ; 30.0%) or more ( $N = 293$ ; 29.7%) stressful when compared to wave 1 of the pandemic



**FIGURE 3** Psychological response (COVID-19 anxiety, anxiety, mental well-being, life satisfaction) when wave 3 is perceived as less ( $N = 201$ ; 43.0%), equally ( $N = 158$ ; 33.8%) or more ( $N = 108$ ; 23.1%) stressful when compared to wave 1 of the pandemic



compared to wave 1 ( $F = 33.98$ ,  $p = 0.000$ ,  $\eta^2 = 0.128$ ). The post hoc tests showed significant differences between the groups experiencing wave 3 as more stressful and less stressful ( $p = 0.000$ ), and between more stressful and equally stressful groups ( $p = 0.000$ ), but not between the groups experiencing wave 3 as less stressful and equally stressful ( $p = 1.000$ ). The level of Mental well-being differs significantly as well ( $F = 26.228$ ,  $p = 0.000$ ,  $\eta^2 = 0.102$ ) between individuals that perceive stress in wave 3 as less stressful, equally stressful or more stressful when compared to wave 1. The post hoc tests showed significant differences between more stressful and less stressful groups ( $p = 0.000$ ), and between more stressful and equally stressful groups ( $p = 0.000$ ), but not between less stressful and equally stressful groups ( $p = 1.000$ ). Also, the level of Life satisfaction differs significantly (Welch's  $F = 16.693$ ,  $p = 0.000$ ,  $\omega^2 = 0.017$ ) between individuals that perceived stress in wave 3 as less stressful, equally stressful or more stressful when compared to wave 1. The post hoc tests showed significant differences between more stressful and less stressful groups ( $p = 0.000$ ), and between more stressful and equally stressful groups ( $p = 0.000$ ), but not between less stressful and equally stressful groups ( $p = 0.993$ ).

Finally, we were interested in specific reasons for experiencing wave 2 and wave 3 of the pandemic as more stressful than wave 1 (Table 1). Approximately a quarter of our participants (29.69% in the second wave, 23.13% in the third wave) reported experiencing higher levels of stress in the succeeding waves than in the first one. The reasons for the perceived stress (e.g., themes from the thematic analysis) are presented in Table 1. From wave 2 data, 17 themes emerged, while 9 themes were recognized in wave 3 data.

As can be seen in Table 1, in both waves, the most common themes were Negative emotional response to the pandemic, Negative perception of measures, Pandemic duration, and Work and job demands. We present these themes in more detail below, as they have the highest variability in the responder's answers included, as well as showing an increase in the percentage of responders from wave 2 to wave 3.

The theme Negative emotional response to the pandemic summarizes participant's answers focussing on emotions of fear, uncertainty, pandemic fatigue and feelings of stress. Examples of participant's responses include: 'I am afraid of the virus'; 'I feel uncertain about the future'; 'I am fed up with all of this' and 'I think it is more stressful because the situation is familiar to us'. The theme Negative perceptions of measures refers to how participants evaluated measures aimed at restricting the spread of the virus (e.g., as limiting, illogical, constantly changing and controlling). Examples include: 'Restrictions make no sense' and 'It [stress] has increased because the restrictions are excessive and they mostly do more harm to health than the virus'. The theme Pandemic duration refers to the time period of the COVID-19 pandemic that is perceived as too long by the participants. Examples include: 'It lasts for too long' and 'Feeling that it will last and last'. The theme Work and job demands refers to different stressors faced in the work environment. Examples include: 'Stress related to troubles and task organization at work' and 'Increased demands in the workplace'.

## 5 | DISCUSSION

In the current study, we focussed on the differences in psychological response to the COVID-19 pandemic in the three waves of the COVID-19 pandemic resulting in the three lockdowns in Slovenia. More specifically, we included negative aspects (operationalized as anxiety and specific COVID-19 anxiety) as well as positive aspects of psychological response (operationalized as mental well-being and life satisfaction), how they change from wave 1 to wave 3 of the COVID-19 pandemic, and later on if they are affected by the perceived difference in stress from the first encounter. In addition, we were interested in the specific reasons for perceiving waves 2 and 3 as being more stressful than wave 1.

In the first research question, we tested the differences in positive and negative aspects of psychological response in the three waves. Our basic assumption was that psychological functioning would be at its worst at the beginning of the pandemic, due to uncertainty and an unknown threatening stressor with no coping mechanisms present at the time, and would, later on, improve in subsequent waves. The data do not support our hypothesis. The findings actually show the lowest levels of COVID-19 anxiety in wave 1 and higher levels of COVID-19 anxiety in waves 2 and 3, and the highest levels of mental well-being in wave 1 and lower levels of mental well-being in waves 2 and 3. The differences in anxiety and life satisfaction were not significant. As we can see, there were no differences in more stable constructs (e.g., anxiety, life satisfaction) but changes occurred in more situationally dependent constructs (e.g., mental well-being, COVID-19 anxiety). The factors contributing to the rise of COVID-19 anxiety and decrease in mental well-being are probably associated with the duration of the actual COVID-19 threat and allostatic load associated with ongoing constant coping and stress regulation. The psychological approach to stress emphasizes the importance of appraisal, both primary (threat) and secondary (coping) (Lazarus & Folkman, 1984). We have predicted that psychological functioning will improve in time, but we can assume that the secondary appraisal and the coping with the pandemic are not efficient. The findings are in this sense congruent with the data on the rise of difficulties in psychological functioning from Italy (Magnavita et al., 2021), as well as being aligned with the difficulties in psychological functioning reported at peaks of the COVID-19 waves (Hewlett et al., 2021).

Additional explanations can be provided with the results from our second and third research questions. The second research question focuses on the difference in psychological functioning between individuals that perceive the second and the third wave of the pandemic as more, equally or less stressful compared to the first wave of the pandemic. We have assumed that individuals that report higher stress in waves 2 and 3 than in wave 1 would report poorer psychological response. This assumption is based on the biological approach to stress that focuses on the effects of chronic stress (Fofana et al., 2020; Guidi et al., 2021). The reports of higher stress in waves 2 and 3 may be the result of the allostatic load caused by the duration of the COVID-19 pandemic. Our findings show that the

**TABLE 1** Reasons for experiencing succeeding waves as more stressful divided into common themes (including frequencies of codes within a theme, percentage of participants contributing to a theme and examples of responses)

Reasons for more perceived stress	Second wave		Third wave	
	f (%)	Response example	f (%)	Response example
Negative emotional response to the pandemic	65 <sup>a</sup> (20.1%)	'More tired and agitated'; 'fearing virus'	26 <sup>a</sup> (20.4%)	'Became anxious'; 'uncertain future'
Negative perceptions of measures	55 <sup>a</sup> (15.4%)	'We are limited'; 'illogical restrictions'	21 (19.4%)	'Disagree with closure'; 'fed up with restrictions and their changes'
Work and job demands	45 (15.4%)	'More responsibility at work'; 'working from home'	19 <sup>a</sup> (17.6%)	'Worried about coordinating work and home life'; 'pressures at work'
Pandemic duration	45 (15.4%)	'Duration of situation'; 'dragging on for so long'	29 (26.9%)	'Situation is too long'; 'length of the pandemic'
Politics related	26 <sup>a</sup> (7.5%)	'Inconsistent work by the government'; 'government policies and its actors'	6 (5.6%)	'No trust in government'; 'political decisions and disregard for expert opinions'
Worsening of epidemiological situation in the country	25 <sup>a</sup> (8.2%)	'Number of infected and number of people in hospitals'; 'more deaths due to COVID'		
Educational concerns	22 (7.5%)	'Worried about the education of children'; 'length of online schooling'	12 (11.1%)	'Fearing school closures'; 'Child's schooling'
Contact with COVID-19	20 (6.8%)	'Fell ill with COVID'; 'more infections among people I know'		
Expressing the need for an active lifestyle	17 <sup>a</sup> (5.1%)	'Wishing to travel and vacation'; 'no social gatherings'	8 <sup>a</sup> (6.5%)	'No normal life'; 'wishing to socialize'
Information about the virus and society changes	17 <sup>a</sup> (5.5%)	'More knowledge about the negative consequences of virus contraction'; 'the situation in society is worsening'		
Personal perception of virus and vaccination			8 <sup>a</sup> (6.5%)	'Pressuring with vaccination and testing'
Media reporting on COVID-19	15 <sup>a</sup> (4.8%)	'Media constantly reporting about COVID-19'; 'negative information'		
Worrying about losing income	14 <sup>a</sup> (4.4%)	'Uncertainty of income'; 'fearing for my job and survival'		
Related to season (time)	14 (4.8%)	'Winter—more possibilities of different infections'; 'Shorter days'		
Family situation	13 (4.4%)	'Can't see partner'; 'relationship has gotten worse'	7 <sup>a</sup> (5.6%)	'Father's death'; 'divorce'
Diverse personal circumstances not related to COVID-19	9 (3.1%)	'Health problems'; 'moving residence'		
State of national health services	4 <sup>a</sup> (1.0%)	'Full hospitals'; 'lack of capacity in health care'		
Conspiracy theories	1 (0.3%)	'COVID is a lie'		

Note: f, number of coded responses within the theme; %, the percentage of participants contributing to the theme.

<sup>a</sup>Multiple codes within the theme belonging to one participant.



level of anxiety differs significantly between individuals that perceive waves 2 and 3 as more stressful and those that perceive waves 2 and wave 3 as equally or less stressful. The anxiety is highest in the group that perceives wave 2 and wave 3 as more stressful. Similarly, in this group, mental well-being and life satisfaction are lower. The findings are aligned with research focussing on negative correlates of stress (e.g., Salari et al., 2020). As with general anxiety, COVID-19 anxiety also differs significantly between individuals that perceive wave 2 as more stressful and those that perceive wave 2 as equally or less stressful when compared to wave 1 stress. The differences are not significant in wave 3. We can assume that over time, the perceived stress is not significantly associated with specific situational COVID-19 anxiety (knowing more and more about the virus can be helpful in lowering COVID-19 anxiety) but to a greater extent with more stable constructs such as anxiety and life satisfaction. Although the first research question shows significant differences in time for COVID-19 anxiety (wave 1 indicating the lowest level for COVID-19 anxiety), this construct does not seem to be significantly associated with the perception of the following waves as more, equally or less stressful when compared to wave 1 stress. On the other hand, the more stable general anxiety (the changes between waves 1, 2 and 3 are not significant) is significantly associated with the perception of waves 2 and 3 as being more, equally or less stressful when compared to wave 1 stress. It seems that anxiety vulnerability reflected in high general anxiety makes individuals more perceptive to different stressors in their immediate context, which is also reflected in the lower levels of mental well-being and life satisfaction of these individuals. Our findings support the need for anxiety prevention and capacity building, regardless of the ongoing COVID-19 pandemic. These findings are aligned with the psychological approach to stress, making appraisal crucial. While COVID-19 anxiety can also be understood from the environmental approach to stress (Hagger et al., 2020), with the basic assumption that once the pandemic is over, COVID-19 anxiety will be diminished as well.

In the last research question, we focussed on the most vulnerable group, the individuals that reported experiencing increased states of stress compared to the first wave. Our findings demonstrate that roughly a quarter of participants reported perceiving the succeeding waves as more stressful, which is expected as the pandemic can affect individuals differently (Mancini, 2020). Two explanations of why the succeeding waves could be perceived as more stressful than the first one are the chronic stress occurring because of the longevity of COVID-19 and the stricter restrictions during the lockdowns occurring in these waves. First, from the chronic stress perspective, it can be argued that participants view the succeeding waves as more stressful because COVID-19 has been present in their daily lives since March 2020. Second, data from Kavčič et al. (2020) show that stress is heightened when prevention measures are most strict and lowers when restrictions ease. From this, it could be assumed that the stressors emerge when restrictions tighten up again as this presents a shift from a 'normal' life (with fewer restrictions) to a stricter restriction regime that can be associated with the stress response of individuals.

In addition to anxiety, mental well-being and life satisfaction being different in individuals that perceive waves 2 and 3 as being more

stressful than wave 1, we have also focussed in more detail on the identification of specific stressors as we aimed to identify reasons (e.g., stressors) for perceiving the following waves as more stressful than the first one. We have identified eight identical themes in the two waves (pandemic duration; negative emotional response to pandemic; family situation; negative perceptions of measures; work and job demands; educational concerns; politics related; expressing the need for an active lifestyle), and an additional nine themes in the second wave, where more participants were involved. The variability of themes is in line with previous research using thematic analysis (e.g., Farris et al., 2021). We assumed that perceiving the succeeding waves as more stressful will be explained by reasons such as perceived health risks, employment risks and fear of income loss. The results support our predictions to an extent, as we found themes that correspond to these reasons, however in the present study other reasons were more prominent in the succeeding waves (see Table 1). Consequently, even though COVID-19 presents a health threat, the main sources of stress are not related to perceived health risks. This finding is in line with previous work conducted by Zager Kocjan et al. (2020), who in a quantitative study found concerns about the current changes in life circumstances (e.g., restrictions of movement) and the long-term effects of the pandemic (e.g., financial consequences) to be more profound stressors than perceived health risks of COVID-19.

As previously mentioned, eight reasons for increased stress were found in both second- and third-wave data, suggesting that some stressors are relatively stable between the waves for people who perceive the succeeding waves as more stressful, meaning they can be monitored and targeted by interventions in order to reduce/prevent stress associated with the ongoing COVID-19 pandemic. The following is in line with practitioners' calls for informing best practices in dealing with COVID-19 related mental health interventions (Moreno et al., 2020). Furthermore, since the reasons were gained from qualitative analysis, they provide valuable insight for clinical mental health practitioners. Specifically, they can be used as a list of stressors that mental practitioners use to examine which underlying mechanisms related to the pandemic are associated with individuals seeking professional support. This is especially relevant in light of our findings that show a significant association of stress perception with anxiety on the one hand, and life satisfaction on the other. Consequentially it is especially relevant to bear in mind the specific groups that are more vulnerable to difficulties with anxiety, as well as reporting low life satisfaction; for example, Guzi et al. (2020) report that the reduction of life satisfaction due to the COVID-19 pandemic is stronger for individuals with more health-related issues and living alone.

## 5.1 | Limitations and future research

The present research adds to the understanding of psychological response and the perceiving of stress during the COVID-19 pandemic. Specifically, it has substantial implications for both research and practice as it shows psychological response to the COVID-19 pandemic at different time points, as well as demonstrating that individuals can perceive stress connected to the COVID-19 pandemic in several

different ways, which in turn is connected to their psychological response. However, the research is not without its limitations, originating from the sample selection (e.g., convenience sample, online data collection, gender ratio), cross-sectional research design (conclusions on change in time cannot be drawn, a possible overlap of individuals in the three waves) and the use of self-report measures. It is, however, the use of a combination of quantitative and qualitative data that provides a certain richness in analysing the complexities of psychological response in quickly changing immediate contexts (e.g., frequent changing of COVID-19 restrictions). Going beyond the limitations, the high relevance of our study lies in its highlighting the price of the allostatic load caused by the COVID-19 pandemic. As has been proved in several studies (e.g., Cohen et al., 2007), the prolonged exposure to stress arising from the crisis is likely to have long-term health, mental and physical effects, leading to impaired cognitive function (McEwen & Sapolsky, 1995), and also reduced productivity and absenteeism in the workplace (Kirsten, 2010). On top of that, the effects are likely to remain after the pandemic ends (Hagger et al., 2020). This is why stress interventions have a high potential to assist in stress management during the COVID-19 pandemic. Research has demonstrated that such interventions are highly translatable and have consistent short-to medium-term effects on stress (more in Hagger et al., 2020). In future research, we would suggest implementing a more thorough assessment of perceived stress, as it is a complex concept that depends on several constructs, such as self-efficacy and the perception of helplessness (Boluarte-Carbajal et al., 2021). Furthermore, since it seems that the COVID-19 situation will continue in the foreseeable future, it would be recommended to gather both quantitative and qualitative data on perceived stress during the time when restrictions are less enforced (e.g., in the summer) as this would enable researchers to understand stress responses in different situations related to COVID-19. It would be also of great interest to add demographic characteristics, such as age, gender, employment status, socio-economic status to plan more focussed prevention and intervention measures. This study is, however, the first to analyse the perception of stress in different waves of the COVID-19 pandemic.

## CONFLICT OF INTEREST

The authors have declared that they have no conflict of interest.

## DATA AVAILABILITY STATEMENT

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

## ORCID

Ana Kozina  <https://orcid.org/0000-0002-0117-6476>

## REFERENCES

- Andrews, F. M., & Withey, S. B. (1974). Developing measures of perceived life quality: Results from several national surveys. *Social Indicators Research*, 1(1), 1–26. <https://doi.org/10.1007/BF00286419>
- Bakkeli, N. Z. (2021). Health, work, and contributing factors on life satisfaction: A study in Norway before and during the COVID-19 pandemic. *SSM-Population Health*, 14, 100804. <https://doi.org/10.1016/j.ssmph.2021.100804>
- Blascovich, J., & Mendes, W. B. (2010). Social psychophysiology and embodiment. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (pp. 194–227). John Wiley & Sons, Inc. <https://doi.org/10.1002/9780470561119.socpsy001006>
- Boluarte-Carbajal, A., Navarro-Flores, A., & Villarreal-Zegarra, D. (2021). Explanatory model of perceived stress in the general population: A cross-sectional study in Peru during the COVID-19 context. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.673945>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>
- Cénat, J. M., Blais-Rochette, C., Kokou-Kpolou, C. K., Noorishad, P. G., Mukunzi, J. N., McIntee, S. E., Dalexis, R. D., Goulet, M. A., & Labelle, P. R. (2021). Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. *Psychiatry Research*, 295, 113599. <https://doi.org/10.1016/j.psychres.2020.113599>
- Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life Research*, 23, 2809–2818. <https://doi.org/10.1007/s11136-014-0726-4>
- Cilar, L., Barr, O., Štiglic, G., & Pajnikihar, M. (2019). Mental well-being among nursing students in Slovenia and Northern Ireland: A survey. *Nurse Education in Practice*, 39, 130–135. <https://doi.org/10.1016/j.nepr.2019.07.012>
- Clark, M. S., Bond, M. J., & Hecker, J. R. (2007). Environmental stress, psychological stress and allostatic load. *Psychology Health & Medicine*, 12(1), 18–30. <https://doi.org/10.1080/13548500500429338>
- Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *Journal of the American Medical Association*, 298(14), 1685–1687. <https://doi.org/10.1001/jama.298.14.1685>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385–396. <https://doi.org/10.2307/2136404>
- Crum, A. J., Jamieson, J. P., & Akinola, M. (2020). Optimizing stress: An integrated intervention for regulating stress responses. *Emotion*, 20(1), 120–125. <https://doi.org/10.1037/emo0000670>
- Fancourt, D., Steptoe, A., & Bu, F. (2020). Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: A longitudinal observational study. *The Lancet Psychiatry*, 8(2), 1–9. [https://doi.org/10.1016/S2215-0366\(20\)30482-X](https://doi.org/10.1016/S2215-0366(20)30482-X)
- Farris, S. G., Kibbey, M. M., Fedorenko, E. J., & DiBello, A. M. (2021). A qualitative study of COVID-19 distress in university students. *Emerging Adulthood*. <https://doi.org/10.1177/21676968211025128>
- Fofana, N. K., Latif, F., Sarfraz, S., Bashir, M. F., Komal, B., & Komal, B. (2020). Fear and agony of the pandemic leading to stress and mental illness: An emerging crisis in the novel coronavirus (COVID-19) outbreak. *Psychiatry Research*, 291, 113230. <https://doi.org/10.1016/j.psychres.2020.113230>
- Fruehwirth, J. C., Biswas, S., & Perreira, K. M. (2021). The Covid-19 pandemic and mental health of first-year college students: Examining the effect of Covid-19 stressors using longitudinal data. *PLoS One*, 16(3), e0247999. <https://doi.org/10.1371/journal.pone.0247999>
- Guidi, J., Lucente, M., Sonino, N., & Fava, G. A. (2021). Allostatic load and its impact on health: A systematic review. *Psychotherapy and Psychosomatics*, 90(1), 11–27. <https://doi.org/10.1159/000510696>
- Guzi, M., Pedraza, P., & Tijdens, K. (2020). *Life dissatisfaction and anxiety in COVID-19 pandemic*. Publications Office of the European Union. <https://doi.org/10.2760/755327>
- Hagger, M. S., Keech, J. J., & Hamilton, K. (2020). Managing stress during the coronavirus disease 2019 pandemic and beyond: Reappraisal

- and mindset approaches. *Stress and Health*, 36(3), 396–401. <https://doi.org/10.1002/smi.2969>
- Hamouche, S. (2020). COVID-19 and employees' mental health: Stressors, moderators and agenda for organizational actions. *Emerald Open Research*, 2, 1–15. <https://doi.org/10.35241/emeraldopenres.13550.1>
- Hewlett, E., Takino, S., Nishina, Y., & Prinz, C. (2021). *Tackling the mental health impact of the COVID-19 crisis: An integrated, whole-of-society response*. <https://www.oecd.org/coronavirus/policy-responses/tackling-the-mental-health-impact-of-the-covid-19-crisis-an-integrated-whole-of-society-response-Occafa0b/>
- Kavčič, T., Avsec, A., & Zager Kocjan, G. (2020). Od začetka do konca uradne epidemije COVID-19 v Sloveniji: Stresorji, stres in blagostanje (From the beginning to the end of the official COVID-19 epidemic in Slovenia: Stressors, stress and well-being). In Ž. Lep, & K. Hacin Beyazoglu (Eds.), *Psihologija pandemije: Posamezniki in družba v času koronske krize (The psychology of the pandemic: Individuals and society at a time of corona crisis)* (pp. 23–36). Znanstvena založba Filozofske fakultete Univerze v Ljubljani.
- Kira, I. A., Shuwiekh, H. A., Ashby, J. S., Rice, K. G., & Alhuwailah, A. (2021). Measuring COVID-19 stressors and their impact: The second-order factor model and its four first-order factors: Infection fears, economic, grief, and lockdown stressors. *Journal of Loss & Trauma*, 26(8), 1–751. <https://doi.org/10.1080/15325024.2021.1920270>
- Kirsten, W. (2010). Making the link between health and productivity at the workplace: A global perspective. *Industrial Health*, 48(3), 251–255. <https://doi.org/10.2486/indhealth.48.251>
- Kozina, A. (2012). The LAOM Multidimensional Anxiety Scale for measuring anxiety in children and adolescents: Addressing the psychometric properties of the scale. *Journal of Psychoeducational Assessment*, 30(3), 264–273. <https://doi.org/10.1177/0734282911423362>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Lloyd, K., & Devine, P. (2012). Psychometric properties of the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) in Northern Ireland. *Journal of Mental Health*, 21(3), 257–263. <https://doi.org/10.3109/09638237.2012.670883>
- Lucas, R. E., & Donnellan, M. B. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research*, 105, 323–331. <https://doi.org/10.1007/s11205-011-9783-z>
- Magnavita, N., Soave, P. M., & Antonelli, M. (2021). Prolonged stress causes depression in frontline workers facing the COVID-19 pandemic. A repeated cross-sectional study. *Preprints*. <https://doi.org/10.20944/preprints202105.0129.v1>
- Mancini, A. D. (2020). Heterogeneous mental health consequences of COVID-19: Costs and benefits. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1), S15–S16. <https://doi.org/10.1037/tra0000894>
- McEwen, B. S., & Sapolsky, R. M. (1995). Stress and cognitive function. *Current Opinion in Neurobiology*, 5(2), 205–216. [https://doi.org/10.1016/0959-4388\(95\)80028-X](https://doi.org/10.1016/0959-4388(95)80028-X)
- McEwen, B. S., & Stellar, E. (1993). Stress and the individual: Mechanisms leading to disease. *Archives of Internal Medicine*, 153(18), 2093–2101. <https://doi.org/10.1001/archinte.1993.00410180039004>
- Meléndez, J. C., Satorres, E., Reyes-Olmedo, M., Delhom, I., Real, E., & Lora, Y. (2020). Emotion recognition changes in a confinement situation due to COVID-19. *Journal of Environmental Psychology*, 72, 101518. <https://doi.org/10.1016/j.jenvp.2020.101518>
- Moreno, C., Wykes, T., Galderisi, S., Nordentoft, M., Crossley, N., Jones, N., Arango, C., Correll, C. U., Byrne, L., Carr, S., Chen, E. Y. H., Gorwood, P., Johnson, S., Kärkkäinen, H., Krystal, J. H., Lee, J., Lieberman, J., López-Jaramillo, C., Männikkö, M., ... Arango, C. (2020). How mental health care should change as a consequence of the COVID-19 pandemic. *The Lancet Psychiatry*, 7(9), 813–824. [https://doi.org/10.1016/S2215-0366\(20\)30307-2](https://doi.org/10.1016/S2215-0366(20)30307-2)
- Patel, V., Saxena, S., Lund, C., Thornicroft, G., Baingana, F., Bolton, P., Chisholm, D., Collins, P. Y., Cooper, J. L., Eaton, J., Herrman, H., Herzallah, M. M., Huang, Y., Jordans, M. J. D., Kleinman, A., Medina-Mora, M. E., Morgan, E., Niaz, U., Omigbodun, O. J., ... Unützer, J. (2018). The Lancet Commission on global mental health and sustainable development. *The Lancet*, 392(10157), 1553–1598. [https://doi.org/10.1016/S0140-6736\(18\)31612-X](https://doi.org/10.1016/S0140-6736(18)31612-X)
- Pieh, C., Budimir, S., Humer, E., & Probst, T. (2021). Comparing mental health during the COVID-19 lockdown and 6 months after the lockdown in Austria: A longitudinal study. *Frontiers in Psychiatry*, 12, 1–8. <https://doi.org/10.3389/fpsy.2021.625973>
- Probst, T. M., Lee, H. J., & Bazzoli, A. (2020). Economic stressors and the enactment of CDC-recommended COVID-19 prevention behaviors: The impact of state-level context. *Journal of Applied Psychology*, 105(12), 1397–1407. <https://doi.org/10.1037/apl0000797>
- Rajkumar, R. P. (2020). Ayurveda and COVID-19: Where psychoneuro-immunology and the meaning response meet. *Brain, Behavior, and Immunity*, 87, 8–9. <https://doi.org/10.1016/j.bbi.2020.04.056>
- Salari, N., Hosseini-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., Rasoulpoor, S., & Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Globalization and Health*, 16, 57. <https://doi.org/10.1186/s12992-020-00589-w>
- Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J., & Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS): Development and UK validation. *Health and Quality of Life Outcomes*, 5, 1–13. <https://doi.org/10.1186/1477-7525-5-63>
- Ugbole, U. C., Duclos, M., Urzeala, C., Berthon, M., Kulik, K., Bota, A., Thivel, D., Bagheri, R., Gu, Y., Baker, J. S., Andant, N., Pereira, B., Rouffiac, K., Clinchamps, M., & Dutheil, F. (2020). An assessment of the novel COVISTRESS Questionnaire: COVID-19 impact on physical activity, sedentary action and psychological emotion. *Journal of Clinical Medicine*, 9(10), 3352. <https://doi.org/10.3390/jcm9103352>
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, 17(5), 1729. <https://doi.org/10.3390/ijerph17051729>
- Zager Kocjan, G., Kavčič, T., & Avsec, A. (2020). Kaj nam je povzročalo stres in slabšalo blagostanje med epidemijo COVID-19 (What caused us stress and worsened our well-being during the COVID-19 epidemic). In Ž. Lep & K. Hacin Beyazoglu (Eds.), *Psihologija pandemije: Posamezniki in družba v času koronske krize (The psychology of the pandemic: Individuals and society at a time of corona crisis)* (pp. 117–128). Znanstvena Založba Filozofske Fakultete Univerze v Ljubljani.

**How to cite this article:** Kozina, A., Peras, I., Veldin, M., & Pivec, T. (2022). The psychological response and perception of stress during the COVID-19 pandemic in Slovenia: Three-wave repeated cross-sectional study. *Stress and Health*, 1–11. <https://doi.org/10.1002/smi.3147>