

Health Anxiety, Perceived Stress, and Coping Styles in the Shadow of the COVID-19

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Abstract

Background In the case of people who carry an increased number of anxiety traits due to their maladaptive coping strategies, psychosocial stressors may further increase the level of perceived stress they experience. In our research study, we aimed to examine perceived stress and health anxiety levels as well as coping styles among students at one of the higher education institutions in Hungary, in the midst of the COVID-19 pandemic.

Methods A cross-sectional study was conducted using an online-based survey at the University of Debrecen, during the official lockdown in Hungary when dormitories were closed, and teaching was conducted using online platforms. Our questionnaire solicited information using three international scales, namely, the Perceived Stress Scale (PSS), the Ways of Coping Questionnaire (WCQ), and the Short Health Anxiety Inventory (SHA-I).

Results A total of 1320 students have participated in our study, of whom 6 responses were excluded due to incompleteness. Among the remaining 1314 participants, 948 (72.1%) and 366 (27.9%) were Hungarian and international students, respectively. Female students predominated the overall sample with 939 participants (71.5%). In general, there was a statistically significant positive relationship between perceived stress and health anxiety. Health anxiety and perceived stress levels were significantly higher among international students compared to the Hungarian ones. Also, the elevation in perceived stress was significantly greater among students who mostly used emotion-focused coping strategies, both in the Hungarian and in the international student samples. Besides, a higher proportion of international students used emotion-focused coping methods compared to Hungarian students. Concerning health anxiety, female students (Hungarian and international) had significantly higher levels of health anxiety compared to males. Moreover, female students had significantly higher levels of perceived stress compared to males in the international group, however, there was no significant difference in perceived stress between males and females in the Hungarian group.

Conclusion People's elevated perceived stress levels during major life events can be further deepened by disengagement from home by using inadequate coping methods. By following and adhering to international recommendations that primarily convey problem-focused strategies, people's emotional-focus strategies and the associated higher levels of perceived stress may be mitigated.

1. Introduction

On March 4, 2020, the first cases of the coronavirus disease were announced in Hungary. One week later, the World Health Organization (WHO) declared COVID-19 as a global pandemic [1]. The Hungarian government ordered a ban on outdoor public events with more than 500 people and indoor events with more than 100 participants to reduce contact between people [2]. On March 27, the government imposed a nationwide lockdown for two weeks effective from March 28, to mitigate the spread of the pandemic. Except for food stores, drug stores, pharmacies, and petrol stations, all other shops and educational institutions remained closed. On April 16, a week-long extension was further announced [3].

The COVID-19 pandemic with its high morbidity and mortality has already afflicted the psychological and physical wellbeing of humans worldwide [4–9]. During major life changes, people may have to deal with more stress. Stress can negatively affect the population's well-being or function when they construe the situation as stressful and they cannot handle the environmental stimuli [10]. Health anxiety is one of the most common types of anxiety. It occurs -to a certain degree- in almost everyone's life and can be rather deleterious when it is excessive. Health anxiety is alarming when someone's life is affected in more aspects or when it interferes with daily life by making people misinterpret somatic sensations, leading them to think that they have an underlying condition [11].

Illness anxiety disorder is described as a preoccupation with acquiring or having a serious illness. Somatic symptoms are not present or if they are, then only mild in intensity. The preoccupation is disproportionate or excessive if there is a high risk of developing a medical condition (e.g., family history) or the patient has another medical condition. Excessive health-related behaviors can be observed (e.g., checking body for signs of illness) and individuals can show maladaptive avoidance as well by avoiding hospitals and doctor appointments [12].

Health anxiety is indeed an important topic as both its increase and decrease can progress to problems [11]. Looking at health anxiety as a wide spectrum, it can be high or low [13]. While people with a higher degree of worry and checking behaviors may cause some burden on healthcare facilities by visiting them too many times (e.g., frequent unnecessary visits), other individuals may not

seek medical help at healthcare units in order to avoid catching up infections for instance. A lower degree of health anxiety can lead to low compliance with imposed regulations made to control a pandemic [14].

The COVID-19 pandemic as a major event in almost everyone's life has posed a great impact on the population's perceived stress level. Several studies about the relation between coping and response to epidemics in recent and previous outbreaks found higher perceived stress levels among people. Being a woman, low income, and living with other people related to higher stress levels. Protective factors like being emotionally more stable, having self-control, adaptive coping mechanisms, and internal locus of control were also addressed. The findings indicated that the COVID-19 crisis is perceived as a stressful event. The perceived stress was higher amongst people than it was in situations with no emergency. According to the Perceived Stress Scale (PSS) mean values, nervousness, stress, and the loss of control of one's life are the factors that are most connected to perceived stress levels which leads to the suggestion that unpredictability and uncontrollability take an important part in perceived stress during a crisis. Certain coping styles (e.g., having a positive attitude) were associated with less psychological distress experiences but avoidance strategies were more likely to cause higher levels of stress [15–18].

According to Lazarus (1999), individuals differ in their perception of stress if the stress response is viewed as the interaction between the environment and humans [19]. An Individual can experience two kinds of evaluation processes, one to appraise the external stressors and personal stake, and the other one to appraise personal resources that can be used to cope with stressors [19, 20]. If there is an imbalance between these two evaluation processes, then stress occurs, because the personal resources are not enough to cope with the stressor's demands [20]. Perceived stress can be also affected by personality traits.

A recent study in Hunan province in China found that the most effective factor in coping with stress among medical staff was the knowledge of their family's well-being [21]. Although there have been several studies about the mental health of hospital workers during the COVID-19 pandemic or other epidemics (e.g., SARS, MERS) [22–25], only a few studies from recent literature assessed the general population's coping mechanisms. According to Gerhold (2020) [26], older people perceived lower risk of COVID-19 than younger people. Also, women have expressed more worries about the disease than men did. Coping strategies were highly problem-focused and most of the participants reported that they listen to professionals' advice and tried to remain calm [26]. In the same study, most responders perceived the COVID-19 pandemic as a global catastrophe that will severely affect a lot of people. On the other hand, they perceived the pandemic as a controllable risk that can be reduced. Dealing with macrosocial stressors takes faith in politics and in those people, who work with COVID-19 on the frontline.

According to the Centers for Disease Control and Prevention (CDC) recommendation, the ways to cope with stress in this current crisis of COVID-19 is to take breaks from watching, reading, or listening to news stories, including social media, as hearing about the pandemic repeatedly can be upsetting [27]. Taking care of the body, taking deep breaths, stretching, and meditating, eating healthy, regularly exercising, getting plenty of sleep, and avoiding alcohol and drugs can also reduce stress [27].

In our present study, we aimed at assessing levels of health anxiety, perceived stress, and coping style among university students, amid the COVID-19 crisis and lockdown in Hungary. We hypothesized the following: (i) Students who use problem-focused coping styles are more resilient to psychosocial stressors than those who use emotion-focused ways to cope with stress, (ii) Emotion-focused strategies would be more frequently used by women than men. And (iii) we assumed that the results would be independent of the country of origin (Hungarian vs International).

2. Methods And Materials

2.1 Study Design and Setting.

This study utilized a cross-sectional design, using online self-administered questionnaires that were created and designed in Google Forms® (A web-based survey tool). Data collection was carried out in the period April 30, 2020, and May 15, 2020, which represent the most stressful period of the COVID-19 pandemic in Hungary when the official curfew/lockdown was declared along with the closure of university dormitories and shifting to online remote teaching. The study was conducted at the University of Debrecen, which is one of the largest higher education institutions in Hungary. The University is located in the city of Debrecen, the second-largest city in Hungary. Debrecen city is considered the educational and cultural hub of Eastern Hungary. As of October 2019, around 28,593 students were enrolled in various study programs at the University of Debrecen, of whom, 6,297 were international students [28]. The university offers various degree courses in both Hungarian and English languages.

2.2 Study Participants and Sampling

The target population of our study was students at the University of Debrecen. Students were approached through social media platforms (e.g., Facebook®) and the official student administration system at the University of Debrecen (Neptun). The invitation link to our study survey was sent to students on the web-based platforms described earlier. By using the Neptun system, we theoretically assumed that our survey questionnaire has reached all students at the University. The students who were interested and willing to participate in the study could fill out our questionnaire anonymously during the determined study period; thus, employing a convenience sampling approach. All students at the University of Debrecen whose age 18 years or older had the eligibility to participate in our study.

2.3 Study Instruments

In our present study, the survey has solicited information about the sociodemographic profile of participants including age, gender, study program (health-related vs non-health related), whether the student stayed in Hungary or traveled abroad since the outbreak (especially for international students). Our survey has also adopted three international scales to collect data about health anxiety, coping styles, and perceived stress during the pandemic crisis. As the language of instruction for international students at the University of Debrecen is English, and English fluency is one of the criteria for international students' admission at the University of Debrecen, the international students were asked to fill out the English version of the survey and scales. On the other hand, the Hungarian students were asked to fill out the Hungarian version of the survey and validated Hungarian scales. Also, we have provided contact information for psychological support when needed. Students who felt that they needed some help and psychological counseling could use the contact information of our peer supporters. Four International students have used this opportunity and were referred to a higher level of care. The original scales and their validated Hungarian versions are described in the following sections.

2.3.1 Perceived Stress Scale (PSS)

The Perceived Stress Scale (PSS) was designed to measure the level of stress in the general population who have at least completed a junior high school [29]. The original 10-item PSS asks about stressful situations that people noticed or experienced in the previous month. It consists of 10 statements with responses on a 5-point Likert scale (from 0 to 4). In the 10-item PSS, four positive items are reversely scored. [29]. The PSS has satisfactory psychometric properties with a Cronbach's alpha of 0.78, and this English version was used for international students in our study.

For the Hungarian students, we used the Hungarian version of the PSS, which has 14 statements that are evaluated on a 5-point Likert scale (0–4) to mark how typical a particular behavior was for a respondent in the last month [30]. The Hungarian version of the PSS was psychometrically validated in 2006. In the validation study, the Hungarian 14-item PSS has shown good internal consistency with a Cronbach's alpha of 0.88 [30].

2.3.2 Ways of Coping Questionnaire (WCQ)

The second scale we used was the 26-item Ways of Coping Questionnaire (WCQ) which was developed by Sørli and Sexton [31]. The 26-item WCQ distinguished five different factors, Wishful thinking (hoped for a miracle, day-dreamed for a better time), Goal-oriented (tried to analyze the problem, concentrated what to do), Seeking support (talked to someone, got professional help), Thinking it over (drew on past experiences, realized other solutions), and Avoidance (refused to think about it, minimized seriousness of it). For the original WCQ scale, Cronbach's alpha values for the factors ranged from 0.74 to 0.81 [31]. For the Hungarian students, we used the Hungarian 16-item version of WCQ, which was validated in 2008 [32]. In the Hungarian WCQ, four dimensions were identified, which were cognitive restructuring/adaptation (every cloud has a silver lining), stress reduction (eating, drinking, smoking), problem analysis (I tried to analyze the problem), and helplessness/passive coping (I prayed; used drugs) [32]. The Cronbach's alpha values for the Hungarian WCQ's dimensions were in the range of 0.30–0.74 [32].

2.3.3. Short Health Anxiety Inventory (SHAI)

The Short Health Anxiety Inventory (SHAI) is an 18-item questionnaire that estimates how a person is concerned about health [33]. One of four possible statements (scored from 0 to 3) must be chosen. The SHAI consists of two subscales: 14-item health anxiety at the beginning of the test and 4-item negative consequences if the illness occurs. Alberts et al. (2013) [34] found the mean SHAI value to be 12.41 (± 6.81) in a non-clinical sample. The original 18-item SHAI has Cronbach's alpha values in the range of 0.74–0.96 [34]. For the Hungarian students, the Hungarian version of the SHAI was used. The Hungarian version of SHAI was validated in 2011 on a

domestic sample [35]. In the validation study, it was found that the SHA1 mean score in a non-clinical sample (university students) was 33.02 points (± 6.28) and the Cronbach's alpha of the test was 0.83 [35].

2.4 Data Analyses

Data were extracted from Google Forms® as an Excel sheet for quality check and coding then we used SPSS® (v.25) and RStudio statistical software packages to analyze the data. Descriptive and summary statistics were presented as appropriate. To assess the difference between groups/categories of anxiety, stress, and coping preferences, we used the non-parametric Kruskal-Wallis test, since the variables did not have a normal distribution and for post hoc tests, we used the Mann-Whitney test. Also, we used Spearman's rank correlation to assess the relationship between health anxiety and perceived stress within the international group and the Hungarian group. Comparison between International and Hungarian groups and different genders in terms of health anxiety and perceived stress levels were also conducted using the Mann-Whitney test.

2.5 Ethical Considerations

Ethical permission was obtained from the Hungarian Ethical Review Committee for Research in Psychology (Reference number: 2020-45). All methods were carried out in accordance with the institutional guidelines and conforming to ethical standards of the declaration of Helsinki. All participants were informed about the study and written informed consent was obtained before completing the survey. There were no rewards/incentives for completing the survey.

3. Results

3.1 Sociodemographic characteristics of respondents

A total of 1320 students have responded to our survey. Six responses (four Hungarian and two international) were eliminated due to incompleteness and this has left 1314 valid responses to be included in our analysis. Out of 1314, the Hungarian sample consisted of 948 participants, of whom 719 were females and 229 were males, while, the international sample included 366 students, of whom, 146 were males and 220 were females. Based on university admission statistics mentioned in the study setting, the response rate in our study was estimated to be 3.67% and 5.84% among Hungarian and international students, respectively. The mean age (\pm SD) among Hungarian students was 24.99 years (± 8.07) and for the international students was 22.68 years (± 3.87). Most of the Hungarian students were enrolled in non-health related programs ($n = 690$, 52.5%), while most of the international students were enrolled in health-related programs ($n = 232$, 17.7%). Table 1 demonstrates the sociodemographic profile of participants (Hungarian vs International)

Table 1
Sociodemographic characteristics of participants ($n = 1314$)

Variables	Hungarian ($n = 948$)	International ($n = 366$)
Gender		
Female	719 (75.84%)	220 (60.11%)
Male	229 (24.16%)	146 (39.89%)
Age (mean \pm SD)	24.99 (± 8.07)	22.68 (± 3.87)
Faculty/Study Program		
Health-related	258 (27.22%)	232 (63.39%)
Non health-related	690 (72.78%)	134 (36.61%)
Stayed in Hungary during the pandemic	948 (100%)	344 (93.99%)

3.2 Perceived Stress, Anxiety, and Coping Styles

For greater clarity of statistical analysis and interpretation, we created preferences regarding coping mechanisms. That is, we made the categories based on which coping strategy factor (in the international sample) or dimension (in the Hungarian sample) the given person reached the highest scores, so it can be said that it is the person's preferred coping strategy. The four preferences for international students were goal-oriented, thinking it over, wishful thinking, and avoidance. The four preferences for Hungarian students were cognitive restructuring, problem analysis, stress reduction, and passive coping. In both listings, the first two belong to *problem-focused coping* and the last two belong to *emotional-focused coping*.

The 26-item WCQ [31] contains a seeking support subscale which is missing from the Hungarian 16-item WCQ [32]; therefore, the seeking support subscale was excluded from our analysis. Moreover, because the PSS contained a different number of items in English and Hungarian versions (10 items vs 14 items), we looked at the average score of the answers so that we could compare international and domestic students.

In the evaluation of SHAI, the scores on the two questionnaires are different. For the sake of comparability between the two samples, the international points were corrected to the Hungarian, adding plus one to the value of each answer. This may be the reason why we obtained higher results compared to international standards. See Table 2 and Table 3 for the detailed results.

Table 2
Perceived Stress and Health Anxiety depending on different coping preferences and gender among international students

Coping Preferences	Perceived Stress (PSS)		Health Anxiety (SHAI)	
	Mean	SD	Mean*	SD
Goal oriented	1.83	0.74	32.38	7.79
Thinking it over	2.21	0.78	35.83	7.62
Wishful thinking	2.73	0.70	37.73	7.65
Avoidance	2.23	0.86	32.91	6.52
Male	2.21	0.86	34.46	8.09
Female	2.52	0.78	36.11	7.75
Total	2.36	0.83	35.45	7.92
*Corrected SHAI values				

Table 3
Perceived Stress and Health Anxiety depending on different coping preferences and gender among Hungarian students

Coping Preferences	Perceived Stress (PSS)		Health Anxiety (SHAI)	
	Mean	SD	Mean	SD
Cognitive restructuring	1.73	0.74	32.43	6.76
Problem analysis	2.34	0.78	35.54	7.15
Stress reduction	2.79	0.64	38.36	8.06
Passive coping	2.59	0.66	37.41	8.56
Female	2.18	0.83	35.05	7.39
Male	2.06	0.84	33.40	7.63
Total	2.15	0.83	34.65	7.48

Concerning coping styles, the two most used coping mechanisms (most of the students rated the statement the highest on the Likert scale) for international students were *“Wished the situation would go away or somehow be finished”* and *“Had fantasies or wishes about how things might turn out”*. Both fell into the “wishful thinking” preference. For Hungarian students, the two most used coping mechanisms were *“I tried to analyze the problem to understand better”* (problem analysis) and *“I thought every cloud has a silver lining, I tried to perceive things cheerfully”* (cognitive restructuring). The least used coping methods (most students assigned to the statement a minimum Likert value) for international students were *“I got professional help”* and *“Talked to someone who could do something concrete about the problem”*. Both belong to the “seeking support” factor. The least used coping strategies among Hungarians were *“I tried to take sedatives or medications”* (passive coping) and *“I put everything on one sheet, I took something very risky”* (stress reduction). Table 4 shows a comparison of different coping preferences among international and Hungarian students.

Table 4
Dominances of Coping Preferences among international and Hungarian students.

Coping Preferences	Female	Male
International	<i>n</i> = 220	<i>n</i> = 146
Goal oriented ^P	55 (25.00%)	46 (31.51%)
Thinking it over ^P	23 (10.45%)	19 (13.01%)
Wishful thinking ^e	115 (52.27%)	64 (43.84%)
Avoidance ^e	27 (12.27%)	17 (11.64%)
Hungarian	<i>n</i> = 719	<i>n</i> = 229
Cognitive restructuring ^P	309 (42.98%)	99 (43.23%)
Problem analysis ^P	279 (38.80%)	93 (40.61%)
Stress reduction ^e	95 (13.21%)	27 (11.35%)
Passive coping ^e	36 (5.01%)	10 (4.37%)
^P – Problem-focused coping preference		
^e – Emotion-focused coping preference		

To test the difference between the preferences, we used the non-parametric Kruskal-Wallis test, since the variables did not have a normal distribution. For post hoc tests, we used Mann-Whitney tests with lowered significance levels ($p = 0,0083$). Among Hungarian students, there were significant differences between the groups in stress ($\chi^2(3) = 212.01$; $p < 0.001$) and health anxiety ($\chi^2(3) = 80.32$; $p < 0.001$). In the post hoc tests, there were significant differences everywhere ($p < 0.001$) except between stress reduction and passive coping ($p = 0.089$) and between problem analysis and passive coping ($p = 0.034$). Considering the health anxiety, the results were very similar. There were significant differences between all groups ($p < 0.001$), except between stress reduction and passive coping ($p = 0.347$) and between problem analysis and passive coping ($p = 0.205$). See Fig. 1 and Fig. 2 for the Hungarian students.

In the international sample, the results were similar. According to the Kruskal-Wallis test, there were significant differences in stress ($\chi^2(3) = 81.21$; $p < 0.001$) and health anxiety ($\chi^2(3) = 42.96$; $p < 0.001$) between the coping preference groups. The post hoc tests showed that there were differences between the perceived stress level the coping preference groups everywhere ($p \leq 0.003$) except between goal-oriented and avoidance ($p = 0.010$) and between avoidance and thinking it over ($p = 0.752$). Concerning health anxiety, there were significant differences between wishful thinking and goal-oriented ($p < 0.001$), between wishful thinking and thinking it over ($p < 0.001$), and between goal-oriented and avoidance ($p = 0.006$). There were no significant differences between wishful thinking and avoidance ($p = 0.090$), between goal-oriented and thinking it over ($p = 0.528$), and between avoidance and thinking it over ($p = 0.054$). See Fig. 3 and Fig. 4.

3.3 Comparisons between the Hungarian and International Students.

We compared health anxiety and perceived stress levels of the Hungarian and international students' groups using the Mann-Whitney test. In the case of health anxiety, the results showed that there were significant differences between the two groups ($W = 160331$; $p = 0.033$) and international students' levels were higher. Also, there was a significant difference in the perceived stress level between the two groups ($W = 149414$; $p < 0.001$), and the international students have increased stress levels compared to the Hungarian ones.

3.4 Comparisons between Genders within 'Nations'

Firstly, we compared the international men's and women's health anxiety and stress levels using the Mann-Whitney test. The results showed that the international women's health anxiety ($W = 14097$; $p = 0.047$) and perceived stress ($W = 11880$; $p < 0.001$) levels were both significantly higher than international men's values. However, in the Hungarian sample, women's health anxiety was significantly higher than men's ($W = 69643$; $p < 0.001$), but there was no significant difference in perceived stress levels among between Hungarian women and men ($W = 75644.5$; $p = 0.064$).

3.5 Relationship between Health Anxiety and Perceived Stress

We correlated the general health anxiety and perceived stress using Spearman's rank correlation. There was a significant moderate positive relationship between the two variables ($P < 0.001$; $\rho = 0.441$). Within the Hungarian students, there was a significant correlation between health anxiety and perceived stress ($P < 0.001$; $\rho = 0.433$), similarly among international students as well ($p < 0.001$; $\rho = 0.448$).

4. Discussion

In our study, we found that individuals who were characterized by a preference for emotion-focused coping mechanisms reported significantly higher perceived stress than those who were characterized by a preference for problem-focused coping mechanisms. This difference can be found along with the preference of emotion and problem-focused coping styles not only for perceived stress but also for health anxiety. These correlations can be found in both the Hungarian and international samples. Thus, our first hypothesis has been confirmed by our findings.

In light of our results, we can say that 64.54% of international female students and 55.48% of males have chosen some form of emotion-focused coping preference. Among Hungarian students, only 18.22% of women and 15.72% of men used primarily some form of emotion-focused coping style to overcome their problems. With this, our results support our second hypothesis, as more women used emotion-focused coping preferences than men did. However, our third hypothesis was refuted by two reasons. Firstly, it can be noticed that international students have explicitly more often used some form of emotion-focused coping preference to tackle their obstacles than domestic students did. This remains a very sharp discrepancy even though we did not consider the seeking support preference in their WCQ. Secondly, among the Hungarian students, we found no significant differences between the genders according to the perceived stress.

Based on the cognitive-behavioral model of health anxiety, emotion-regulating strategies can regulate the physiological, cognitive, and behavioral consequences of a fear response to some degree, even when the person encounters the conditioned stimulus again. In the long run, regular use of these dysfunctional emotion control strategies may manifest as functional impairment, which may be associated with anxiety disorders. A detailed study that examined health anxiety in the view of the cognitive-behavioral model found that, regardless of the effect of depression, there are significant and consistent correlations between certain dimensions of health anxiety and dysfunctional coping and emotional regulation strategies [36].

Similar to our current study, other studies have found that trait health anxiety was positively correlated with maladaptive emotion regulation and negatively with adaptive emotion regulation [37], and in the case of state anxiety that emotion-focused coping strategies proved to be less effective in reducing stress, while active coping leads to a sense of subjective well-being [14, 23, 38–40]

SHAI values were found to be high in other studies during the pandemic, and the SHAI results of the international students in our study were found to be even slightly higher compared to those studies [37, 41]. Besides, anxiety values for women were found to be higher than for men in several studies [37, 41–43]. This was similar to what we found among the international students but not among the Hungarian ones. We can speculate that the ability to contact someone, the closeness of family and beloved ones,

familiarity with the living environment, and maybe less online search about the coronavirus News could be factors counting towards that finding among Hungarian students. As our results showed, among Hungarian students, roughly the same proportion of women used problem-focused coping strategies as men did.

Our findings suggest that those who are forced to face danger away from their home and friends in a relatively alien environment may tend to use coping mechanisms other than the adequate ones, which in turn can lead to increased levels of perceived stress. Furthermore, our results seem to support the knowledge that deep-rooted trait anxiety is difficult to change because it is closely related to certain coping mechanisms that are mostly personality traits. State anxiety, which has risen significantly above the average level in the current pandemic, can be most effectively influenced by the well-formulated recommendations and advice of major international health organizations (e.g. physical activity; proper sleep; healthy eating; avoiding alcohol; meditation; caring for others; relationships maintenance, and instead of checking the Internet for information on the virus regularly rather using trusted sites at limited times, etc.) since they formulate adequate ways of coping [1, 27]. Furthermore, as our results show, there may be additional positive effects, if these recommendations would be published in different languages or languages that are widely spoken by many people. Thus, those living far away from their homeland could also be helped by using these recommendations. If one can delve into these, adhere to them, we can also expect to be able to use cognitive behavioral therapy techniques, some of which are also available online in these difficult times, so possibly, through a lot of practice, can further improve their anxiety state. Also, if someone does not feel safe, fear prevails, there are plenty of helplines where they can get in touch with professionals and this applies both internationally and at the University of Debrecen in Hungary.

Naturally, our study had certain limitations that should be acknowledged and considered. Firstly, the temporality of events could not be assessed as we employed a cross-sectional study design, that is, we did not have information on the previous conditions of the participants which means that it is possible that some of these conditions existed in the past, while others de facto occurred with COVID-19 crisis. Secondly, because the survey questionnaires were completed by those who felt interested and involved, i.e., a convenience sampling technique was used, this impairs the representativeness and generalizability of the results. Thirdly, each questionnaire was a self-report test, which can also modify the results, as participants judge themselves through a subjective filter, so our results are not truly objective. And lastly, we had to make minor changes to the used scales in the different languages for comparability.

5. Conclusion

The COVID-19 pandemic crisis has imposed a significant burden on the physical and psychological wellbeing of humans. Crises like the current pandemic can trigger unprecedented responses among individuals to adapt or cope with the situation. People's elevated perceived stress levels during major life events can be further deepened by disengagement from home by using inadequate coping methods. By following and adhering to international recommendations that primarily convey problem-focused strategies, people's emotional-focus strategies and the associated higher levels of perceived stress may be mitigated.

Abbreviations

CDC: Centers for Disease Control and Prevention; COVID-19: Coronavirus Disease 2019; PSS: Perceived Stress Scale; SHAI: Short Health Anxiety Inventory; MERS: Middle East Respiratory Syndrome; SARS: Severe Acute Respiratory Syndrome; WCQ: Ways of Coping Questionnaire; WHO: World Health Organization

Declarations

Ethics approval and consent to participate:

Ethical permission was obtained from the Hungarian Ethical Review Committee for Research in Psychology (Reference number: 2020-45). All methods were carried out in accordance with the institutional guidelines and conforming to ethical standards of the declaration of Helsinki. All participants were informed about the study and written informed consent was obtained before completing the survey.

Consent for publication:

Not Applicable

Availability of data and materials:

The datasets generated and/or analysed during the current study are not publicly available due to compliance with institutional guidelines but they are available from the corresponding author (LRK) on a reasonable request.

Competing interests:

The authors declare that they have no competing interests

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Authors' contributions:

All authors SG, ASN, MSA, SH, DO, VR, ABA, and LRK have worked on the study design, text writing, revising, and editing of the manuscript. DO, SG, and VR have done data management and extraction, data analysis. Drafting and interpretation of the manuscript were made in close collaboration by all authors (SG, ASN, MSA, SH, DO, VR, ABA, and LRK). All authors have read and approved the submitted version of the manuscript.

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Figures

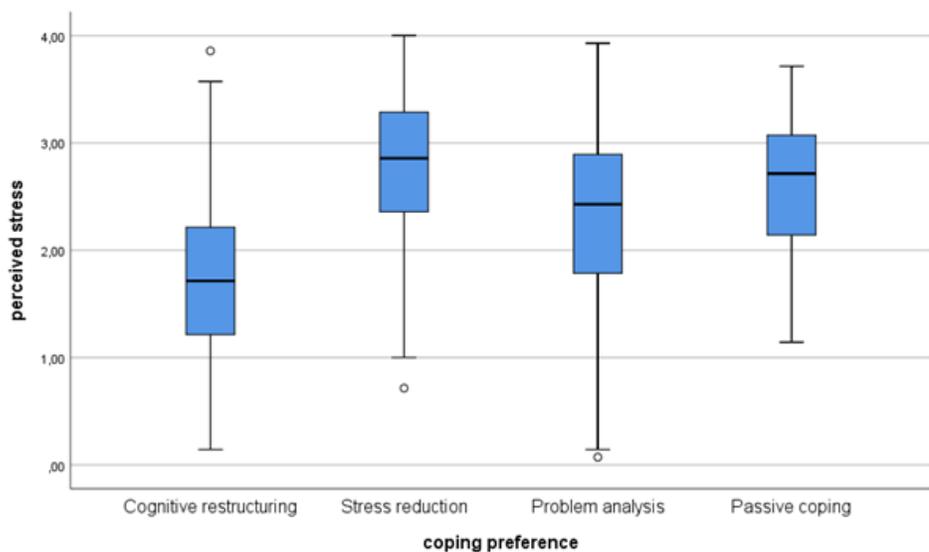


Figure 1

Perceived Stress differences between coping preference groups in the Hungarian sample

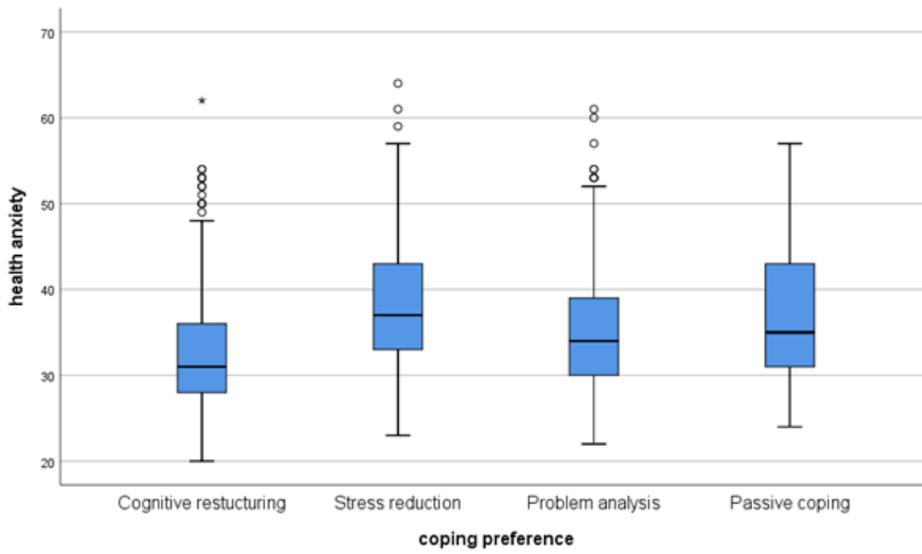


Figure 2

Health Anxiety differences between Coping Preference groups in the Hungarian sample

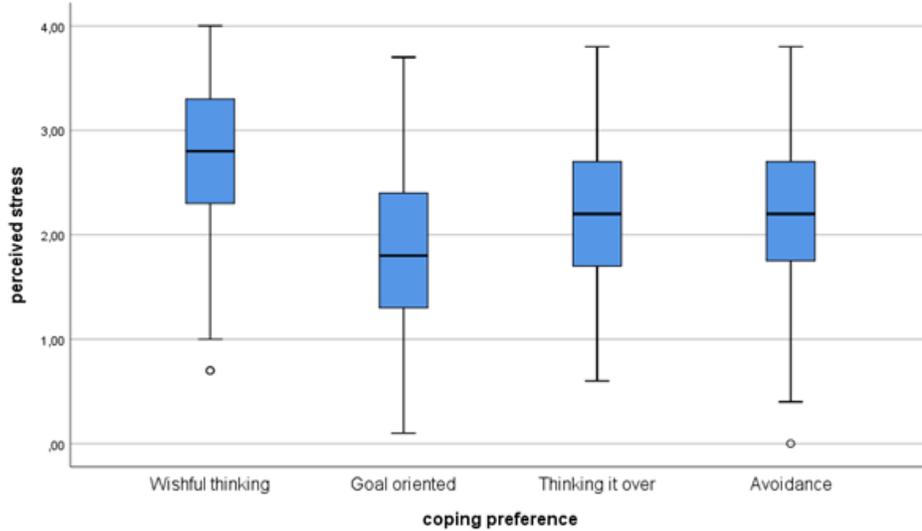


Figure 3

Perceived Stress differences between coping preference groups in the international sample.

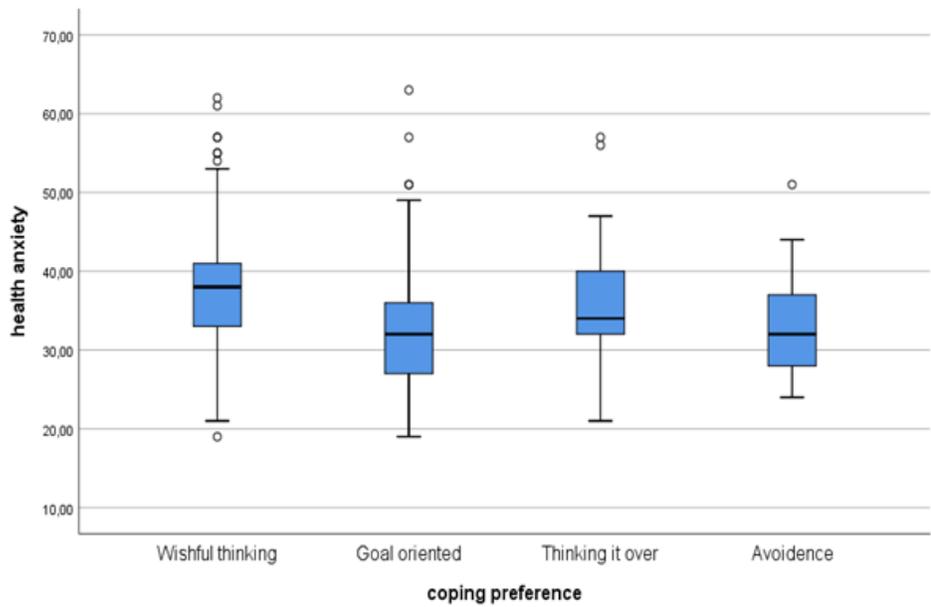


Figure 4

Health Anxiety differences between Coping Preference groups in the international sample

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