Predictors of Anxiety, Stress, and Concern of COVID-19 Infection in Older Adults During the First and the Second Waves of the COVID-19 Pandemic in Slovakia

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Abstract

Objectives: This cross-sectional online study examined the role of socio-demographic and psychological characteristics in predicting anxiety, stress, and concern of coronavirus (COVID-19) infection in older adults during the first and second waves of the COVID-19 pandemic in Slovakia. Methods: Six hundred and seven older adults (Sample 1) and 156 older adults (Sample 2) participated in the study during the first and second waves of the COVID-19 pandemic, respectively. The older adults completed a battery of validated instruments for anxiety, stress, concern of COVID-19 infection (outcome variables), satisfaction with health, perceived danger of COVID-19, loneliness, intolerance of uncertainty (IU), optimism, powerlessness, and coping self-efficacy (predictor variables). The data were analyzed using multiple linear regression. Results: The older adults in both samples experienced moderate levels of anxiety, stress, and concern of COVID-19 infection. The greatest amount of variability in anxiety and stress was explained by powerlessness, IU, optimism, and coping self-efficacy. Concern of COVID-19 infection was best predicted by the perceived danger of COVID-19. Conclusion: The findings contribute to the existing knowledge about the mental health of older adults during the COVID-19 pandemic and highlight the role of the psychological predictors of anxiety, stress, and concern of COVID-19 infection during both waves.

Introduction

During the coronavirus (COVID-19) pandemic, the risk of severe infection as well as the negative consequences in both physical and mental health has been stressed for older adults in particular (Centers for Disease Control and Prevention CDC, 2020). In order to eliminate the spread of COVID-19, restrictions and preventive measures have been imposed by governments with an emphasis on home isolation and social distancing. As a result, older adults have reported increased feelings of loneliness during the pandemic (Teater et al., 2020; Wong et al., 2020). Psychological research carried out on the population of older adults during the pandemic has been predominantly focused on mental health, quality of life, and its relationship to loneliness (Bergman et al., 2020;

Bidzan-Bluma et al., 2020; Carriedo et al., 2020; García-Portilla et al., 2020; Grossman et al., 2021; Parlapani et al., 2020; Robb et al., 2020; Shrira et al., 2020). Indeed, loneliness, social isolation, and health concerns have all been found to be positively correlated with emotional distress, anxiety, depression, and sleep disorders in older adults at this time (Bergman et al., 2020; García-Portilla et al., 2020;

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Grossman et al., 2021; Parlapani et al., 2020; Robb et al., 2020; Shrira et al., 2020).

However, an increase in the negative emotional experience during the COVID-19 pandemic may not have only been related to the strict imposed measures. Rather, the emotional distress during the pandemic may have resulted from the ambiguity, uncertainty, and threat, which are generally associated with novel situations (Durodié, 2020; Taha et al., 2014). Indeed, intolerance of uncertainty (IU), that is, the inability to tolerate uncertainty in life (Carleton et al., 2007) was found to be related to high levels of anxiety in research done by Taha et al. (2014) during the swine flu (H1N1 flu) pandemic.

The ability to cope with stressful events, such as the COVID-19 pandemic, is a topic of relevance (Durodié, 2020). Coping self-efficacy (the perceived ability to cope with stressful events) has been found to be related to posttraumatic distress (Benight & Harper, 2002; Benight et al., 1999; Cieslak et al., 2008). In addition, perceived control over stressful situations (low perceived control—powerlessness vs. high perceived control), locus of control (internal vs. external), and coping strategies have been found to be associated with anxiety, depression, and health-related quality of life (Bjørkløf et al., 2013; Helvik et al., 2016; Jordan et al., 2021). In particular, external locus of control is related to poorer health-related quality of life (Helvik et al., 2016), while coping flexibility and forward-focused coping predicted low levels of depression and anxiety (Jordan et al., 2021). Research has also shown that expectations of positive future outcomes (optimism) can decrease the negative emotional experience (Anzaldi & Shifren, 2019; Fischer et al., 2018; Scheier et al., 1994). Jovančević and Milićević (2020) reported that optimistic expectations about the future were associated with low levels of fear during the COVID-19 pandemic.

However, little is known about the role of psychological characteristics in predicting the negative emotional experience of older adults during COVID-19. The aim of the present study is to fill this gap in the research knowledge by analyzing the predictors of anxiety, stress, and concern of COVID-19 infection in older adults in Slovakia during the first and second waves of the COVID-19 pandemic. With regard to the theoretical and empirical background, the current study offers a more complex insight into the predictors of mental health of older adults during the COVID-19 pandemic by focusing on the role of socio-demographic characteristics, satisfaction with health, perceived danger of COVID-19, loneliness, IU, optimism, powerlessness, and coping self-efficacy.

Methods

Procedure

This cross-sectional online study is part of a large-scale study carried out in Slovakia with the aim of exploring the perceptions, emotional experience, and behavior of people during the COVID-19 pandemic. The whole study included

participants aged 15–93 years (Bavoľár et al., 2021). The current study provides insight into the psychological determinants of perception and emotional experience in older adults during the first and second waves of the COVID-19 pandemic in Slovakia. It was approved by the Ethical Committee of Pavol Jozef Šafárik University in Košice.

The data were collected at two time periods. The first round of data collection was conducted from March 31, 2020 to May 2, 2020. This was during the first wave of the pandemic after the first restrictions and preventive measures were introduced by the government. The second round of data collection started on October 21, 2020 during the second wave of the COVID-19 pandemic after a state of emergency was declared by the Slovak government (1st October) and the COVID-19 restrictions were tightened (October 15). This continued until the start of the night-time curfew on December 19, 2020.

Both purposive and snowball sampling methods were used to select the research samples in the two periods of data collection. The data were collected online due to the restrictions and measures during the first and the second waves of the COVID-19 pandemic. The participants were recruited via e-mails and social networks. Their participation was voluntary and anonymous. The participants were provided with informed content before completing the survey.

In order to participate in the online survey, the participants had to be retired or 62 years and older. The former criterion was set because retired people were considered to be at a higher risk of the negative effects of the COVID-19 pandemic due to forced isolation as a result of the measures (Public Health Authority of the Slovak Republic, 2020). In terms of age, older adults aged over 65 were at increased risk of severe COVID-19 infection (CDC, 2020; Public Health Authority of the Slovak Republic, 2020). For the purposes of the current study, the age limit was lowered to 62 years, since it was a retirement age in Slovakia in 2020 (Social Insurance Agency in Slovakia, 2020).

Participants

During the first wave, 655 older adults participated in the online study (Sample 1). However, 48 did not complete the whole survey. As a result, the final Sample 1 size included 607 participants who lived in their own households; 71% were female, and their age ranged from 61 to 93 years ($M = 68.97$, $SD = 4.76$). The majority of the participants in Sample 1 were fully retired (84%), married (61%), and lived with a spouse (55%).

During the second wave of the COVID-19 pandemic, 156 older adults participated and completed the online survey without any missing data (Sample 2). In Sample 2, all participants lived in their own households, 80% were female, and their age ranged from 60 to 81 years ($M = 67.75$, $SD = 4.09$). The majority of participants in Sample 2 were fully retired (85%), married (55%), and lived with a spouse (53%).

Fifty-three out of the 156 older adults (34%) were the participants of Sample 1 although it was not possible to pair the data from the first and second period of data collection. As it was only the first round of data collection which was initially intended, the participants in Sample 1 were not asked to provide a code to match the data. However, as the second wave continued in Autumn 2020 and the situation in Slovakia was getting worse compared to the first wave, a second round of data collection was initiated. Its aim was also to obtain data about the perceptions, emotional experience, and behaviors of older adults during the second wave of the COVID-19 pandemic. The participants in Sample 2 were recruited independently of Sample 1. However, in the questionnaire, they were asked to answer if they had taken part in the first round of data collection in Spring 2020, and 53 out of 156 (34%) answered that they had. Among the 53 older adults who had taken part in both rounds of data collection, 77% were female, and aged between 62 and 75 ($M = 67.40$; $SD = 3.48$). The majority were fully retired (81%), married (60%), and lived with a spouse (50%).

The socio-demographic characteristics of the participants in Sample 1 and 2 are shown in Table 1. Independent sample t-tests and χ^2 tests were used to compare the socio-demographic characteristics of the participants in both samples. There were significant differences found in both gender ($\chi^2 = 5.57$, $p = 0.018$) and age (t = 2.94, $p = 0.003$). In the second survey, more women than men participated, and the mean age of the participants was lower. No significant differences were found between the samples according to marital status ($\chi^2 = 2.77$, $p = 0.428$), employment status ($\chi^2 = 0.07$, $p = 0.780$), or household composition ($\chi^2 = 2.47$, $p = 0.480$).

Instruments

First, the participants in both samples completed a socio-demographic questionnaire which included age, gender, marital status (married, divorced, widowed, and single), employment status (fully retired or retired and working), and household composition (living alone, with a spouse, with a spouse and children, and with children and family). They rated their satisfaction with their health on a six-point scale (*"To what extent are you satisfied with your current health?"* 1 = very dissatisfied; 6 = very satisfied). The participants in Sample 2 answered an extra question: *"Did you take part in the first round of this research in spring (April 2020)?" (1 = yes; 2 = no)*.

Second, the participants in both samples completed Slovak adaptations of the scales measuring anxiety, perceived stress, IU, and optimism:

The State-Trait Anxiety Inventory, State version (Spielberger et al., 1983; Slovak adaptation Müllner et al., 1980) was used to assess the level of anxiety during the first and the second waves of the pandemic. A 4-point scale was used to indicate the frequency of positive and negative feelings about the COVID-19 situation (1 = almost never; 4 = almost always; 20

items). In this study, the Cronbach α estimates of the scale were 0.928 (Sample 1) and 0.936 (Sample 2).

The Perceived stress scale, short form (PSS-4; Cohen et al., 1983; Slovak adaptation Ráczová et al., 2018) was used to assess the level of stress during the first and the second waves of the COVID-19 pandemic. A 5-point scale was used to indicate the frequency of stress-related feelings and thoughts in the last week (1 = never; 5 = always). In this research, the internal consistency estimates of the scale (Cronbach α) were 0.767 (Sample 1) and 0.814 (Sample 2).

The Intolerance of Uncertainty Scale—Short Form (Carleton et al., 2007; Slovak adaptation Bavoľár, 2019) was used to assess the level of IU. The participants answered the 12 items on a 5-point scale (1 = not at all characteristic of me; 5 = entirely characteristic of me). In this research, the Cronbach α estimates of the scale were 0.845 (Sample 1) and 0.846 (Sample 2).

The Life Orientation Test—Revised (LOT-R; Scheier et al., 1994; Slovak adaptation Köverová & Ferjenčík, 2013) was used to assess the level of dispositional optimism (generalized expectancies of good vs. bad outcomes). A 5-point scale (1 = strongly disagree; 5 = strongly agree) was used to indicate the level of agreement with the six items focused on positive/ negative future expectancies. In this research study, the reliability estimates of the scale (Cronbach α) were 0.665 (Sample 1) and 0.679 (Sample 2).

The participants were also asked to answer the authors' questions relating to their perceptions, emotional experience, and behavior during COVID-19. For the purpose of this paper, 5 out of the 18 questions were analyzed and focused on the level of participants' concern of COVID-19 infection: *"To what extent are you concerned that you will be infected with COVID-19?"* (1 = not at all concerned; 6 = very much concerned); perceived danger of COVID-19 for oneself: *"How dangerous do you think COVID-19 is for you personally?"* (1 = not at all dangerous; 6 = very dangerous); coping self-efficacy: *"I am sure that I can deal with the COVID-19 pandemic situation."* (1 = not at all; 6 = absolutely); powerlessness: *"How often have you felt powerless in the last week?"* (1 = never; 6 = always), and loneliness, that is, a subjective feeling of being isolated (Wu, 2020): *"In the last week, I have felt isolated from others."* (1 = never; 6 = always).

The questions about concern of COVID-19 infection and perceived danger of COVID-19 were formulated by the authors for the purposes of the current study based on the theoretical background. The questions on powerlessness and coping self-efficacy were formulated based on the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) while the loneliness question was taken from the revised version of the UCLA Loneliness Scale (Russell, 1996). This approach has previously been used in social science research in older adults during the COVID-19 pandemic (Bidzan-Bluma et al., 2020; Robb et al., 2020). As such, clear and easily understandable single questions can be used if it is impossible to include the whole scales (Bidzan-Bluma et al., 2020; Bhattacherjee, 2012).

In the current research, single questions were preferred to whole scales given the possible decline in health and cognitive functioning in older adults. This can affect their ability to understand and answer questions properly or to participate in time-consuming surveys (Quinn, 2010). The mean time for completing the survey for the current study was 30 minutes in Sample 1 and 23 minutes in Sample 2.

Statistical Analyses

For the purpose of the analyses, anxiety, stress, and concern of COVID-19 infection were the outcome variables. The predictor variables included the socio-demographic characteristics (gender, age, and household composition), satisfaction with health, perceived danger of COVID-19, loneliness, IU, optimism, coping self-efficacy, and powerlessness. The socio-demographic characteristics were controlled in the analyses because gender and age differences were identified between Samples 1 and 2 (see Participants section). Although no significant differences between the two samples were found in household composition, it was added as a control variable (living alone—not living alone) based on previous research findings indicating a relationship between social isolation and the mental health of older adults (Robb et al., 2020).

A sample size calculator (Soper, 2021) revealed that in a multiple regression model with 10 predictor variables, 118 participants would be the minimum required sample size to observe an anticipated medium effect size (0.15) at the desired statistical power level of 0.8. The number of participants in both research samples was thus sufficient for the analyses.

Before running the regression analyses, extreme values were excluded, resulting in 592 participants in Sample 1 and 150 participants in Sample 2. There was no multicollinearity identified between the predictor variables; VIF ranged from 1.08 to 1.47 (Sample 1) and from 1.09 to 1.52 (Sample 2).

IBM SPSS Statistics 25 and Jamovi 1.6.15 were used to analyze the data. A multiple linear regression (Enter method) was used to identify the significant predictors of anxiety (Model 1), stress (Model 2), and concern of COVID-19 infection (Model 3) in older adults during the first and second waves of the COVID-19 pandemic.

Ten predictor variables were entered into each of the three regression models in five steps in order to determine the relative contribution of the predictor variables in explaining the dependent variables: sociodemographic characteristics— gender, age, and household composition (living alone, not living alone) in step 1; satisfaction with health in step 2; perceived danger of COVID-19 in step 3; loneliness in step 4; and IU, optimism, powerlessness, and coping self-efficacy in step 5. The three regression models were tested separately for Sample 1 and Sample 2.

Results

Descriptive Characteristics of the Tested Variables

Table 2 presents the means and standard deviations of the outcome and predictor variables in both samples and significance of the differences in the variables between Samples 1 and 2. Older adults in both samples reported moderate levels of anxiety, stress, and concern of COVID-19 infection (Table 2). No significant differences in the outcome and

Table 1. Characteristics of the Participants in Samples 1 and 2. Figures are number (% of Non-Missing Values) Unless Otherwise Stated.

	Sample 1 (*n* = 607)	Sample 2 (*n* = 156)
Age		
Mean (standard deviation)	68.97 (4.76)	67.75 (4.09)
Minimum–maximum	61–93	60–81
Gender		
Male	178 (29%)	31 (20%)
Female	429 (71%)	125 (80%)
Employment status		
Fully retired	512 (84%)	133 (85%)
Retired and working	95 (16%)	23 (15%)
Marital status		
Single	44 (7%)	16 (10%)
Married	367 (61%)	86 (55%)
Divorced	87 (14%)	21 (14%)
Widowed	109 (18%)	33 (21%)
Household composition		
Living alone	186 (30%)	55 (35%)
Living with a spouse	332 (55%)	83 (53%)
Living with children and family	65 (11%)	15 (10%)
Living with a spouse and children	24 (4%)	3 (2%)

predictor variables were found between the two samples (Table 2).

Predictors of Anxiety, Stress, and Concern of COVID-19 Infection

The results of the regression analyses are presented in Tables 3–5. After Bonferroni correction, the predictor variables were interpreted as significant at $p \leq 0.005$.

In both samples, the demographic characteristics (step 1) were insignificant in explaining anxiety, stress, and concern of COVID-19 infection. However, after adding the predictor variables in steps 2–5, the regression models became significant ($p < 0.001$). In Samples 1 and 2, the variables added in step 5 accounted for the greatest amount of variability in anxiety ($\Delta R^2 = 0.31$ and $\Delta R^2 = 0.25$, respectively) and stress ($\Delta R^2 = 0.33$ and $\Delta R^2 = 0.30$, respectively), whereas adding perceived danger of COVID-19 in step 3 accounted for the greatest amount of variability in concern of COVID-19 infection ($\Delta R^2 = 0.39$ and $\Delta R^2 = 0.32$, respectively).

In Sample 1, all 10 predictor variables explained a significant proportion of the variance in anxiety ($R^2 = 0.51$, F (10, 581) = 93.7, $p < 0.001$), stress ($R^2 = 0.49$, F (10, 581) = 96.9, $p < 0.001$), and concern of COVID-19 infection ($R^2 = 0.49$, F (10, 581) = 16.76, $p < 0.001$). Anxiety was significantly predicted by high levels of powerlessness, low optimism, low coping self-efficacy, high IU, low satisfaction with health, and high loneliness (Table 3). Stress was significantly predicted by high powerlessness, low coping self-efficacy, low optimism, and low satisfaction with health (Table 4). The level of concern of COVID-19 infection was significantly predicted by high perceived danger of COVID-19 for oneself, high powerlessness, and high IU (Table 5).

In Sample 2, all predictor variables together explained a significant amount of the variance in anxiety ($R^2 = 0.50$, F (10, 139) = 14.26, $p < 0.001$), stress ($R^2 = 0.54$, F (10, 139) = 16.53, $p < 0.001$), and concern of COVID-19 infection ($R^2 = 0.47$, F (10, 139) = 12.78, $p < 0.001$). The significant predictors of anxiety were high powerlessness and high IU while satisfaction with health and optimism approached the level of significance which indicates that low satisfaction with health and low optimism were related to high anxiety (Table 3). The significant predictors of stress were high powerlessness, low coping self-efficacy, and high IU (Table 4). High concern of COVID-19 infection was significantly predicted by high perceived danger of COVID-19 for oneself (Table 5).

Discussion

This study aimed to identify the significant predictors in negative emotional experience (anxiety, stress, and concern of COVID-19 infection) among older adults during the first and the second waves of the COVID-19 pandemic in Slovakia. The population of older adults is one of those at increased risk of severe COVID-19 infection (CDC, 2020). Since the outbreak of the COVID-19 pandemic, the number of research focuses on the mental health of older adults is increasing. However, these studies have mostly looked at the first wave of the pandemic (Ahorsu et al., 2020; Bergman et al., 2020; Bidzan-Bluma et al., 2020; Carriedo et al., 2020; García-Portilla et al., 2020; Grossman et al., 2021; Jordan et al., 2021; Parlapani et al., 2020; Robb et al., 2020; Shrira et al., 2020; Tyler et al., 2021). The present research contributes to the existing knowledge about the mental health of older adults during the COVID-19 pandemic by analyzing the role of socio-demographic and psychological characteristics in predicting levels of anxiety, stress, and concern of COVID-19 infection during both the first and the second waves of the pandemic.

However, the design of the study did not allow the longitudinal comparison of the data given that only 8% of the participants from the first study participated again in the second study. It was not possible to match the data across the samples due to the reasons described in the Method

Table 2. The Comparison of Samples 1 and 2 in the Outcome and Predictor Variables.

		Sample 1 (n = 607)		Sample 2 (n = 156)		t	p
		M	SD	M	SD		
Outcome variables	Anxiety	1.97	0.47	1.98	0.47	−0.221	0.825
	Stress	2.11	0.63	2.17	0.66	−1.191	0.234
	Concern of COVID-19 infection	3.23	1.32	3.19	1.29	0.339	0.735
Predictor variables	Satisfaction with health	4.15	1.19	4.18	1.15	−0.322	0.747
	Perceived danger of COVID-19 for oneself	3.94	1.48	3.95	1.51	−0.095	0.924
	Loneliness	3.18	1.52	3.07	1.57	0.866	0.387
	Intolerance of uncertainty	2.87	0.67	2.95	0.64	−1.344	0.179
	Optimism	3.62	0.61	3.55	0.60	1.238	0.216
	Powerlessness	2.23	1.25	2.41	1.22	−1.527	0.127
	Coping self-efficacy	4.86	1.06	4.92	1.17	−0.579	0.563

Note. M = mean; SD = standard deviation.

(Participants section). Thus, the data were interpreted separately for each research sample. In both samples, powerlessness, optimism, IU, and satisfaction with health were found to be significant predictors of anxiety; powerlessness and coping self-efficacy were related to stress while the perceived danger of COVID-19 for oneself was the strongest predictor of concern of COVID-19 infection. Although the current research was a part of a broader Slovak study involving a general adult sample as well as an older adult sample (Bavoľár et al., 2021), the results presented in this paper cannot be fully compared with the general adult sample as some variables were measured with different instruments. However, the current findings can be compared with similar research studies conducted on a cohort of older adults in different countries during the COVID-19 pandemic (Ahorsu et al., 2020; Bergman et al., 2020; Bidzan-Bluma et al., 2020; Carriedo et al., 2020; García-Portilla et al.,

2020; Grossman et al., 2021; Han et al., 2021; Jordan et al., 2021; Parlapani et al., 2020; Reppas-Rindlisbacher et al., 2021; Robb et al., 2020; Shrira et al., 2020; Tyler et al., 2021; Zhou et al., 2021).

In Slovakia, the novel type of virus, high death rate among older adults in other countries, strict preventive measures (first wave), tightening of measures, increasing numbers of cases and deaths in Slovakia, and pessimistic prognoses of the situation despite the strict measures (second wave) could have contributed to the perceived ambiguity, uncertainty, or threat in many people, including older adults. As a result, anxiety, stress, or health concerns could have increased (Boswell et al., 2013; Durodié, 2020). The present study has shown that concern of COVID-19 infection was best predicted by the perceived danger of COVID-19 for oneself in both samples. This finding is not surprising considering older adults are most at risk of developing a severe COVID-19 infection

Table 3. Predictors of Anxiety in Samples 1 and 2.

Predictors (Sample 1)	B	SE	95% CI LL	95% CI UL	β	t	p
Step 1 (R^2 = 0.012, p = 0.061)							
Gender	0.082	0.031	0.019	0.144	0.081	2.579	0.010
Age	−0.001	0.002	−0.007	0.003	−0.019	−0.656	0.512
Household composition	0.049	0.030	−0.010	0.109	0.049	1.617	0.106
Step 2 (ΔR^2 = 0.111, p < 0.001)							
Satisfaction with health	−0.053	0.011	−0.076	−0.030	−0.139	−4.517	<0.001
Step 3 (ΔR^2 = 0.024, p < 0.001)							
Perceived danger of COVID-19	−0.011	0.009	−0.031	0.007	−0.037	−1.194	.233
Step 4 (ΔR^2 = 0.052, p < 0.001)							
Loneliness	0.027	0.009	0.008	0.046	0.090	2.889	0.004
Step 5 (ΔR^2 = 0.313, p < 0.001)							
Intolerance of uncertainty	0.109	0.023	0.063	0.156	0.152	4.642	<0.001
Optimism	−0.177	0.026	−0.229	−0.125	−0.235	−6.705	<0.001
Coping self-efficacy	−0.087	0.014	−0.117	−0.058	−0.202	−5.903	<0.001
Powerlessness	0.111	0.013	0.085	0.137	0.293	8.509	<0.001
Predictors (Sample 2)							
Step 1 (R^2 = 0.003, p = 0.922)							
Gender	0.013	0.072	−0.129	0.156	0.011	0.182	0.856
Age	−0.006	0.007	−0.021	0.008	−0.059	−0.882	0.379
Household composition	0.017	0.064	−0.110	0.145	0.017	0.272	0.786
Step 2 (ΔR^2 = 0.156, p < 0.001)							
Satisfaction with health	−0.073	0.026	−0.126	−0.021	−0.183	−2.783	0.006
Step 3 (ΔR^2 = 0.007, p = 0.255)							
Perceived danger of COVID-19	−0.004	0.020	−0.044	0.035	−0.013	−0.211	0.833
Step 4 (ΔR^2 = 0.086, p < 0.001)							
Loneliness	0.003	0.022	−0.040	0.047	0.010	0.141	0.888
Step 5 (ΔR^2 = 0.252, p < 0.001)							
Intolerance of uncertainty	0.156	0.051	0.054	0.258	0.207	3.033	0.003
Optimism	−0.147	0.055	−0.256	−0.038	−0.189	−2.677	0.008
Coping self-efficacy	−0.058	0.027	−0.112	−0.004	−0.146	−2.145	0.034
Powerlessness	0.149	0.028	0.093	0.206	0.384	5.234	<0.001

Note. A multiple linear regression (Enter method) was used; B = unstandardized regression coefficient; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; β = standardized regression coefficient.

(CDC, 2020). Anxiety and stress during the COVID-19 pandemic in older adults were best explained by the group of psychological predictors (powerlessness, coping self-efficacy, optimism, and IU), with powerlessness being the strongest predictor. Low perceived control was also found to be related to increased anxiety in the study done by Taha et al. (2014) during the H1N1 pandemic, and can thus be an important factor in the context of mental health in novel, uncertain, and/or ambiguous situations. However, optimism and low IU predicted low levels of anxiety and stress in older adults. The ability to tolerate uncertainty in life (Carleton et al., 2007) and generalized expectancies of good outcomes (Scheier et al., 1994) as dispositional traits can thus be considered protective personality factors of mental health in this age group.

In this study, low satisfaction with health was related to anxiety during the COVID-19 pandemic in both samples. Similar results have also been reported by Bergman et al. (2020) who found that health-related concerns had increased anxiety symptoms in older adults during the COVID-19 pandemic. In general, diseases in older age are an important factor which contributes to anxiety (Stubbs et al., 2016; Yohannes et al., 2006). During the pandemic, this relationship can become more relevant since COVID-19 can have severe health consequences especially in this age group (CDC, 2020).

There is also consistent research evidence that social isolation and loneliness in old age are related to a deterioration in physical and mental health (Blazer, 2020; Grenade & Boldy, 2008; Holt-Lunstad et al., 2010; Newman & Zainal, 2020;

Table 4. Predictors of Stress in Samples 1 and 2.

Predictors (Sample 1)	B	SE	95% CI LL	95% CI UL	β	t	p
Step 1 (R^2 = 0.002, p = 0.759)							
Gender	0.015	0.042	−0.067	0.098	0.011	0.367	0.714
Age	−0.005	0.003	−0.012	0.002	−0.040	−1.309	0.191
Household composition	0.060	0.040	−0.019	0.139	0.045	1.475	0.141
Step 2 (ΔR^2 = 0.094, p < 0.001)							
Satisfaction with health	−0.056	0.015	−0.087	−0.025	−0.112	−3.582	<0.001
Step 3 (ΔR^2 = 0.016, p < 0.001)							
Perceived danger of COVID-19	−0.021	0.013	−0.047	0.003	−0.053	−1.663	0.097
Step 4 (ΔR^2 = 0.043, p < 0.001)							
Loneliness	0.028	0.012	0.003	0.053	0.070	2.214	0.027
Step 5 (ΔR^2 = 0.337, p < 0.001)							
Intolerance of uncertainty	0.054	0.031	−0.007	0.116	0.057	1.716	0.087
Optimism	−0.223	0.035	−0.293	−0.154	−0.226	−6.327	<0.001
Coping self-efficacy	−0.135	0.019	−0.174	−0.096	−0.238	−6.831	<0.001
Powerlessness	0.176	0.017	0.142	0.210	0.354	10.089	<0.001
Predictors (Sample 2)							
Step 1 (R^2 = 0.009, p = 0.716)							
Gender	−0.022	0.089	−0.199	0.154	−0.015	−0.251	0.802
Age	−0.009	0.009	−0.028	0.008	−0.068	−1.060	0.291
Household composition	−0.025	0.079	−0.183	0.132	−0.020	−0.318	0.751
Step 2 (ΔR^2 = 0.140, p < 0.001)							
Satisfaction with health	−0.081	0.032	−0.146	−0.016	−0.157	−2.479	0.014
Step 3 (ΔR^2 = 0.006, p = 0.295)							
Perceived danger of COVID-19	−0.007	0.024	−0.056	0.042	−0.018	−0.294	0.769
Step 4 (ΔR^2 = 0.085, p < 0.001)							
Loneliness	−0.013	0.027	−0.068	0.040	−0.035	−0.497	0.620
Step 5 (ΔR^2 = 0.301, p < 0.001)							
Intolerance of uncertainty	0.192	0.063	0.066	0.318	0.197	3.011	0.003
Optimism	−0.125	0.068	−0.260	0.008	−0.125	−1.846	0.067
Coping self-efficacy	−0.105	0.033	−0.172	−0.038	−0.204	−3.126	0.002
Powerlessness	0.236	0.035	0.166	0.306	0.472	6.692	<0.001

Note. A multiple linear regression (Enter method) was used; B = unstandardized regression coefficient; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; β = standardized regression coefficient.

Taylor et al., 2018; Victor & Bowling, 2012; Wu, 2020). In the current study, loneliness was only related to anxiety in older adults during the first wave of the COVID-19 pandemic while social isolation (operationalized as a dummy variable—living alone/not living alone) was insignificant in predicting anxiety, stress, and concern of COVID-19 infection. The subjective feeling of being lonely thus seems to be more important in relation to anxiety in older age than living alone.

The results of the current study have also revealed some differences in the predictors of anxiety, stress, and concern of COVID-19 infection between Samples 1 and 2. In addition to the previously discussed results, optimism and coping self-efficacy were stronger predictors of anxiety and stress in Sample 1 (during the first wave of the COVID-19 pandemic), while satisfaction with health, IU, and powerlessness were

stronger predictors of anxiety and stress in Sample 2 (during the second wave of the COVID-19 pandemic). However, in terms of concern of COVID-19 infection, IU and powerlessness were only significant predictors in Sample 1. The differences in predictors between Samples 1 and 2 could be related to the changes in prognosis of the situation during the first and the second waves of the pandemic. During the first wave, the situation was unknown and ambiguous while the future was uncertain and threatening. In addition, measures and restrictions led to the social isolation of older adults and could have reduced their coping resources. As a result, low optimism (generalized expectancies of bad future outcomes) and low coping self-efficacy better predicted increased anxiety and stress of older adults during the first wave.

However, the second wave of the COVID-19 pandemic continued in the autumn and got worse despite the measures.

Table 5. Predictors of Concern of COVID-19 Infection in Samples 1 and 2.

Predictors (Sample 1)	B	SE	95% CI LL	95% CI UL	β	t	p
Step 1 (R^2 = .010, p = .101)							
Gender	0.109	0.092	−0.072	0.290	0.038	1.184	0.237
Age	−0.016	0.008	−0.032	0.000	−0.058	−1.907	0.057
Household composition	0.003	0.088	−0.169	0.177	0.001	0.043	0.965
Step 2 (ΔR^2 = .024, p < 0.001)							
Satisfaction with health	0.042	0.034	−0.025	0.109	0.038	1.390	0.221
Step 3 (ΔR^2 = .390, p < 0.001)							
Perceived danger of COVID-19	0.489	0.028	0.433	0.545	0.553	17.147	<0.001
Step 4 (ΔR^2 = .008, p = 0.003)							
Loneliness	0.019	0.027	−0.034	0.074	0.022	0.715	0.474
Step 5 (ΔR^2 = .058, p < 0.001)							
Intolerance of uncertainty	0.215	0.068	0.080	0.350	0.105	3.127	0.002
Optimism	−0.171	0.076	−0.322	−0.020	−0.080	−2.235	0.026
Coping self-efficacy	−0.025	0.043	−0.109	0.059	−0.020	−0.578	0.563
Powerlessness	0.180	0.038	0.105	0.255	0.166	4.170	<0.001
Predictors (Sample 2)							
Step 1 (R^2 = 0.051, p = 0.053)							
Gender	−0.040	0.205	−0.447	0.366	−0.012	−0.197	0.844
Age	0.008	0.021	−0.034	0.050	0.026	0.381	0.704
Household composition	0.083	0.184	−0.280	0.447	0.030	0.455	0.650
Step 2 (ΔR^2 = 0.018, p = 0.093)							
Satisfaction with health	0.058	0.075	−0.090	0.208	0.052	0.777	0.438
Step 3 (ΔR^2 = 0.322, p < 0.001)							
Perceived danger of COVID-19	0.455	0.057	0.342	0.569	0.529	7.920	<0.001
Step 4 (ΔR^2 = 0.011, p = 0.100)							
Loneliness	0.012	0.063	−0.112	0.137	0.014	0.197	0.844
Step 5 (ΔR^2 = 0.075, p < 0.001)							
Intolerance of uncertainty	0.363	0.147	0.072	0.654	0.173	2.470	0.015
Optimism	−0.259	0.157	−0.570	0.051	−0.119	−1.652	0.101
Coping self-efficacy	−0.137	0.077	−0.290	0.016	−0.123	−1.768	0.079
Powerlessness	0.053	0.081	−0.107	0.214	0.049	0.659	0.511

Note. A multiple linear regression (Enter method) was used; B = unstandardized regression coefficient; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; β = standardized regression coefficient.

The poor effectiveness of the restrictions in Slovakia could have supported feelings of powerlessness during the second wave of the pandemic, and its long duration could have increased uncertainty about the future. In addition, older adults were at the highest risk of severe COVID-19 infection. Thus, older adults could have believed that sooner or later they would be infected with COVID-19 and suffer from the severe course of the disease. As a result, powerlessness, IU, and low satisfaction with health were found to be stronger predictors of anxiety and stress of older adults during the second wave of the COVID-19 pandemic.

In terms of concern of COVID-19 infection, powerlessness and IU were significant predictors only during the first wave of the pandemic. As previously mentioned, the best predictor of concern of COVID-19 infection during both waves was perceived danger of COVID-19 for oneself. Whereas perceived danger of COVID-19 remained the strongest predictor of concern of COVID-19 infection during the first and the second waves, powerlessness and IU did not. This could indicate that although older adults perceived the COVID-19 infection as dangerous during both waves, they adapted to the situation over time. As a result, powerlessness and IU were no longer significant predictors of concern of COVID-19 infection during the second wave. This could be explained by older adults realizing that they could do something to protect themselves against COVID-19 as well as the growing information about COVID-19 which could have helped to decrease uncertainty regarding the whole situation.

Despite the novel findings, there are some limitations to the research. First, the sample was not representative of the whole population of older adults. The research was conducted on a sample of older adults living in their own households while those in social service facilities did not participate. Indeed, their perceptions, emotions, and behavior during the COVID-19 pandemic could have been different. However, data collection in social service facilities was not possible due to strict measures. Second, due to the self-report measures, the participants could have provided socially desirable answers. In addition, the online collection of data could have increased the likelihood that some questions were misunderstood. However, the participants could have contacted the researchers via e-mail or provided their feedback on the survey at the end of the online form. If participants reported problems with understanding the questions and thus did not complete the whole survey, their responses were excluded from analyses. Another limitation is that the research was conducted online, and thus participants were predominantly older adults with internet access and better online skills. It is also possible that older adults could have asked their relatives for help with completing the survey online which could have had an effect on their answers. Last but not least, the size of Sample 2 was smaller in comparison to Sample 1, yet sufficient for the analyses. This reduction in the number of participants during the second wave of the COVID-19 pandemic could have been the result of fatigue of (not

only) older adults from the long-lasting situation and subsequent disinterest in completing an online survey in the second round of data collection. The online method of data collection could also have led to a reduced number of older adults in Sample 2 due to the researchers' low control over the number of participants when disseminating the surveys via e-mails and social networks.

It is also important to point to the practical implications of the current study. Older adults who have experienced negative psychological effects of the COVID-19 pandemic could benefit from targeted, evidence-based effective psychological and social support, including methods of cognitive behavioral therapy focused on alleviation of fear and anxiety (Frost et al., 2020; Hall et al., 2016), stress reduction techniques, such as mindfulness, meditation, and relaxation (Geiger et al., 2016; Klainin-Yobas et al., 2015), interventions for reducing loneliness and social isolation during the pandemic (Lozupone et al., 2020; O'Rourke et al., 2018), as well as techniques for increasing resilience, confidence in one's own ability to cope with difficult situations, and training in effective coping strategies (Almazan et al., 2019; Chen, 2020).

Conclusion

To the best of our knowledge, this has been the first study done on the psychological predictors of mental health in older adults during the first and the second waves of the COVID-19 pandemic. The findings highlight the role of personality characteristics (powerlessness, coping self-efficacy, optimism, and IU) in predicting the levels of anxiety and stress, and the role of perceived danger of COVID-19 for oneself in predicting concern of COVID-19 infection in older adults during the first and the second waves of the pandemic. Future research should replicate the study on a sample of older adults living in social service facilities as well.

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