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# Loneliness, socio-demographics, and self-rated health outcomes among the high-risk 50+ population in the Czech Republic: COVID-19 early outbreak responses

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## ABSTRACT



Loneliness in late life can act as a trigger of negative feelings, reduce well-being, and cause significant health problems. Yet, we have a limited understanding of older adults' lived experiences of loneliness, especially during pandemics. Based on the Survey of Health, Ageing, and Retirement in Europe (SHARE) conducted in the Czech Republic ( $n = 2,631$ ), we found that depression, nervousness, gender, trouble with sleep, and physical health condition before COVID-19 were significantly associated with loneliness. These determinants should be taken into account when planning further supportive fieldwork to optimize the functioning of the aging population during the pandemic and beyond.


## KEYWORDS

COVID-19; loneliness; mental health; natural and human made disasters; older adults

## Introduction

The coronavirus disease (COVID-19) that broke out in December 2019 in Wuhan, China, represents an unprecedented global public health crisis (United Nations, 2020, World Health Organization WHO, 2020). In the Czech Republic, the first case of COVID-19 was identified on March 01, 2020, followed by 35 deaths during the first three weeks of the pandemic (Ministry of Health of the Czech Republic, 2022). Many governments, including the Czech Republic, therefore declared State of Emergency; with lockdown and social distancing safety measures as primary strategies for reducing the uncontrolled spread of infection and preventing serious coronavirus illnesses or death, especially among the high-risk adult population (Garnier-Crussard et al. 2020 Ministry of the Interior of the Czech Republic, 2020; US CDC, 2020). However, due to the worsening of COVID-19 situation in the Czech Republic, lockdown and social distancing restrictive measures were repeatedly extended by the Government between March 12, 2020, and December 25, 2021 (The Government of the Czech Republic, 2021).

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Considering the unpredictable nature of the disease, sudden changes in social activities during early outbreaks of the COVID-19 pandemic may have produced significant mental health consequences among the general population (Choi et al., 2022, World Health Organization WHO, 2020). The heightened risk of loneliness in connection with COVID-19 has therefore been recognized as a mental health research priority across the continents. In China, for example, Bao et al. (2021) found that implementation of social distancing and quarantine measures has contributed toward an increase in feelings of loneliness among 24.2% of adult respondents. Consistently, Xu et al. (2021) showed a higher prevalence of loneliness (38.7%) among adult populations experiencing strict social distancing measures. In line with prior findings, Vietnamese evidence suggests higher rates of loneliness among adults experiencing quarantine measures (Gan et al., 2021).

Similar evidence has been found in Europe, with a Norwegian study indicating that social distancing measures during the early stage of the pandemic were associated with more loneliness in 30% of adults (Hoffart et al., 2020). Similarly, van Tilburg et al. (2021) found increasing rates of social and emotional loneliness among the Dutch adult population experiencing worries COVID-19 during strict lockdown measures. These findings are in line with those by Bu et al. (2020a), showing that lockdowns and stay-at-home orders due to the outbreak of the COVID-19 pandemic may have led to a higher prevalence of loneliness (37%) among the general British population.

The results presented above correlate with the North American experience. Specifically, Killgore et al. (2020) indicate that the third week of shelter-in-place guidelines contributed toward higher rates of loneliness among 43% of U.S. study participants. A study by Fuller et al. (2022) confirmed that loneliness may have increased among 54% of adults due to social isolation and feelings of loss resulting from the early stages of the COVID-19 pandemic. Finally, McGinty et al. (2020) found a higher prevalence of feelings of loneliness, as 13.8% of U.S. adults reported that they “always” or “often” felt lonely during early pandemic lockdowns.

Despite the wide evidence indicating that COVID-19 safety measures based on limited contact with others in society may trigger negative mental outcomes in the general population, there is a noticeable gap in understanding about this phenomenon in the unique context of a pandemic. More recently, very little attention has been devoted specifically to the high-risk older adult (50+) population, which is generally more vulnerable to social isolation (e.g. Coyle & Dugan, 2012, Dahlberg, 2021, Dahlberg et al., 2022, Li et al., 2022). Additionally, stay-at-home and quarantine orders related to COVID-19 erect additional barriers in their social ties (see Berg-Weger & Morley, 2020, Clair et al., 2021, Seifert, 2021, Smith et al., 2020), which could potentially contribute to their feelings of loneliness (Adams et al., 2021, American Psychological Association APA, 2020,

Miller, 2020). Mental health changes represented by loneliness in vulnerable adult populations should therefore be considered by gerontologists during social isolation efforts intended to combat the pandemic, since loneliness is likely to be an important aspect of aging (Hughes et al., 2004). This issue seems to be relevant and urgent in the Czech Republic; with 1,947,408 (42.4%) of positive cases and 42,419 (99.2%) of deaths in the 50+ population as of August 23, 2023, the country is considered to be one of the most significantly affected countries in the world, per capita (see Ministry of Health of the Czech Republic, 2022, World Health Organization (WHO), 2021).

However, to our knowledge, no studies to date have investigated the impact of COVID-19 lockdowns on mental health, particularly on feelings of loneliness, in the Czech older adult population highly affected by the pandemic. To address this gap, as well as to expand the European research evidence related to COVID-19, the current study takes advantage of the representative SHARE Corona data set collected in the Czech Republic during the initial stages of the outbreak in 2020 to focus on the living situations of those 50 years of age and older under COVID-19. The main research aim is to explore key factors affecting loneliness in the older adult (50+) population during the early peak of the COVID-19 emergency. Firstly, the following research questions were put forth: is there a relationship between the presence of loneliness, socio-demographic variables, and physical and mental health outcomes? What are the main determinants of the likelihood that participants would report having experienced loneliness during the initial stages of the COVID-19 outbreak? Secondly, we aimed to determine a typology of the high-risk 50+ population according to these significant determinants based on cross-sectional usage of the SHARE Corona dataset for the Czech Republic.

## **Materials and method**

### ***Study sample and data collection***

The Survey of Health, Ageing and Retirement in Europe (SHARE; Börsch-Supan, 2020) was used in the presented research. SHARE is a cross-national panel database of micro data on the health, socio-economic status, and social and family networks of about 140,000 individuals aged 50 or older, administered since 2004 with the aim of understanding the aging process in European countries and Israel (Börsch-Supan et al., 2013, Scherpenzeel et al., 2020). The main purpose is to turn the challenges of aging into opportunities and provide valid and reliable data for evidence-based policies (MEA, 2020). To do so, SHARE uses a common generic questionnaire translated into national languages with ex-post harmonization of internationally highly diverse variables. The general SHARE questionnaire covers basic socio-demographic (i.e.

gender, age, economic status, and housing), physical and mental health outcomes, and health behavior variables.

The ex-ante harmonization approach, which means that not only the questionnaire design but also fieldwork procedures are standardized across countries, was chosen by SHARE for scientific reasons, as it minimizes those artifacts in cross-national comparisons that are created by a country-specific survey design (Schuller et al., 2021). National operations are coordinated by university-based groups of researchers in all participating countries; however, interviewing is subcontracted to survey agencies, which have the expertise, staff, and logistics available to conduct large-scale operations like SHARE with a high stability of the contracted survey over time in most countries.

The fieldwork began largely synchronously across most participating countries between the end of October and the beginning of November 2019 (see Supplementary Figure S1). SHARE was hit by the COVID-19 outbreak in March 2020, leaving half of the Wave 8.0.0 face-to-face-interviewing (CAPI) data collection incomplete. A response to the quick spread of the virus across Europe was the inclusion of a special “SHARE Corona” survey covering the same topics as the regular SHARE questionnaire, but considerably shortened and targeted to the COVID-19 living situation of people who are 50 years and older and completed initial SHARE data collection. Ongoing interviews among all its panel respondents were instituted by the Computer Assisted personal communication (CATI) data collection (MEA, 2020). On this basis, data collection was achieved with a largely synchronous schedule across participating countries that allows cross-country comparisons of effects of seminal events (see Supplementary Figure S2).

Regarding the fieldwork design, SHARE COVID-19 data were collected from June 8 to August 6, 2020. A public COVID-19 lockdown was implemented in the Czech Republic between March 16 and May 17, 2020. A national COVID-19 crisis quarantine was simultaneously carried out, with a transition of school learning to an online environment, the closure of borders and local services except daily necessities, take-away, and deliveries, the implementation of safety measures avoiding aggregation, and the compulsory usage of individual protection equipment, excepting children under two years old.

The retention rate that SHARE uses instead of response rate is based on the participation patterns of individuals who have been successfully interviewed. After several waves, the longitudinal samples are divided into four subsamples distinguishing between respondents' participation in the previous wave or another wave; their residence in a household where at least one household member participated in the previous wave; and missing or new partners who have not participated in SHARE before. Based on these definitions, individual-level retention rate is continuously tracked, as well as information about how SHARE got back those respondents who had already dropped out of the study

(for more information on the development of the panel sample over time, see Bergmann et al., 2022).

The data are available to registered users free of charge through the SHARE Research Data Center and are typically utilized by the scientific community for longitudinal, cross-sectional, and comparative as well as single-country studies (for more details on such publications, see <https://share-eric.eu/publications>).

### ***Operationalization of the dependent variable***

In our paper, we focus on loneliness functioning as a dependent variable among the high-risk 50+ population in the Czech Republic. Loneliness in was measured by the question “How much of the time do you feel lonely?” with responses on a 3-point Likert scale, where 1 = “often,” 2 = “some of the time,” and 3 = “hardly ever or never.” For this analysis, this score was recoded as “lonely” (former level 1–2) and “not lonely” (former level 3).

### ***Operationalization of the independent variables***

From a theoretical and empirical background, basic socio-demographic variables including the gender and age of respondents in years and in an age category of mostly working (50–70 years), retirees (71–79 years), and the elderly (80+ years), can influence reported feelings of loneliness. The work-related question of employment or self-employment, including working for a family business at the time of the COVID-19 outbreak, was labeled “Employment status.” Economic status was measured by respondents’ ability to make ends meet. Housing was measured by whether respondents lived in their usual home or temporarily moved elsewhere due to the pandemic. Respondents were also asked, with a single “yes/no” item, if they had ever left their homes since the COVID-19 outbreak.

Self-rated physical health before the COVID-19 outbreak was assessed on a 5-point Likert scale consisting of 1 (“excellent”), 2 (“very good”), 3 (“good”), 4 (“fair”), and 5 (“poor”). Scores were recoded into a 3-category variable with the levels “very good” (formerly 1–2), “good” (3), and “poor” (4–5). For the purpose of a binary analysis, 0 (“good or poor”) and 1 (“very good”) coding was used. The second question related to health status asked: “If you compare your health now and before the outbreak of Coronavirus, would you say your health has improved, worsened, or stayed about the same? (1 = improved, 2 = worsened, 3 = about the same).” The score was recoded into a variable with three levels (1 = improved, 2 = same, and 3 = worsened), compared to before the outbreak and into a binary item (0 = about the same or worsened, and 1 = improved).

Further mental health variables, including questions about whether the participants felt nervous, anxious, or on edge in the last month (labeled

“Nervous”) and if they experienced trouble with sleep or recent changes in their sleep patterns (labeled “Trouble sleeping”), were measured using binary items recoded as 0 = “no” and 1 = “yes.” The same coding was used for a question asking “In the last month, have you been sad or depressed?” (meaning miserable, in low spirits, or “blue,” and labeled “Depressed”).

### **Analysis**

The analysis proceeds in interrelated steps and begins with a univariate description of the 50+ population sample (percentages, means, and standard deviations) divided by reported loneliness (“lonely” vs. “not lonely”). Chi-square tests for the independence of differences in socio-demographic characteristics, physical and mental health outcomes, and reported loneliness were performed. Assumptions about these statistics of the random sample, independent observations, and at least 80% of cells that have an expected frequency of more than five, were not violated. Multivariate outliers were assessed by the Mahalanobis distance measure, indicating the presence of no outliers.

To analyze the association of individual characteristics and feelings of loneliness during the COVID-19 outbreak, bivariate correlations were carried out, followed by a separate binary logistic regression analysis. Finally, we performed a cluster analysis to identify subgroups of participants based on observed patterns of significant predictors for reported loneliness arising from the previous stage. The K-means algorithm was applied, and the final clusters were further described using socio-demographic, physical, and mental health characteristics. All analyses were carried out using IBM SPSS v 27.

### **Results**

In a research sample of Czech adults aged 50 and older, 1,617 (61.5%) were women and 995 (37.8%) were men, with ages ranging from 50 to 98 years ( $M = 72.9$ ,  $SD = 7.7$ ). 38.9% of the adults were in the age group of mostly working participants (up to 70 years), 40.8% were young retirees (between 71 and 79 years), and 19.5% were elderly (80+ years). The included participants were mostly unemployed (80.8%) and lived in their usual home (97%), with 11.1% of participants not leaving their homes since the outbreak of the pandemic. Considering their household’s financial situation, more than half of the participants (64.8%) reported problems making ends meet since the pandemic began.

Out of 2,631 participants, almost every third person ( $n = 723$ , 28%) reported feelings of loneliness. Results also indicated that most of the selected socio-demographic variables and variables measuring physical and mental health before and after COVID-19 outbreak were significantly associated with feelings of loneliness. More specifically, gender, age, economic status, and leaving

home since the COVID-19 outbreak had a significant effect of on the presence of loneliness. For example, women (33.6%) and the elderly (34.3%) were more likely to report feelings of loneliness. In contrast, there was no significant difference found in relation to participants' economic status and housing. Further, participants with trouble sleeping (58.8%) and worsened health after the COVID-19 outbreak (45.4%) had higher scores on loneliness compared to participants whose health remained about the same or even improved after the outbreak. Interestingly, there were no significant results regarding nervousness and depression. Since the influence of the presented variables is often considered only descriptively, it is questionable whether the findings

**Table 1.** Univariate description of the 50+ population sample divided by reported loneliness.

Variables	Category	Total (n = 2,631)	Lonely (n = 723)	Not lonely (n = 1,869)	p
<i>Socio-demographic</i>					
Age	Years	M (SD) 72.9 (7.7)	M (SD) 73.9 (7.9)	M (SD) 72.6 (7.6)	+++
		n (%)	n (%)	n (%)	p
Age groups	50-70 years	1,023 (38.9)	259 (25.3)	760 (74.3)	***
	71-79 years	1,073 (40.8)	287 (26.7)	779 (72.6)	
	80+ years	513 (19.5)	176 (34.3)	330 (64.3)	
Gender	Women	1,617 (61.5)	542 (33.6)	1,062 (65.7)	***
	Men	995 (37.8)	181 (18.2)	807 (81.1)	
Employment status	Employed	477 (18.1)	120 (25.2)	357 (74.8)	
	Unemployed	2,126 (80.8)	602 (28.3)	1,509 (71.7)	
Economic status	Not getting by	1,706 (64.8)	535 (31.4)	1,163 (68.2)	***
	Getting by	173 (6.6)	82 (47.4)	91 (52.6)	
Housing	Usual home	2,552 (97.0)	712 (27.9)	1,823 (71.4)	
	Not at home	58 (2.2)	11 (19)	46 (79)	
Left home	Yes	2,301 (87.5)	620 (26.9)	1,681 (73.1)	*
	No	291 (11.1)	103 (35.4)	188 (64.6)	
<i>Physical and mental health</i>					
<i>Before COVID-19 outbreak</i>					
Physical health	Very good	586 (22.3)	100 (17.1)	486 (82.9)	***
	Good	1,365 (51.9)	393 (28.8)	972 (71.2)	
	Poor	636 (24.2)	229 (36.0)	407 (64.0)	
Nervous	Yes	553 (21.0)	281 (50.8)	272 (49.2)	***
	No	2,028 (77.1)	437 (21.5)	1,591 (78.5)	
Depressed	Yes	542 (20.6)	317 (58.5)	225 (41.5)	***
	No	2,041 (77.6)	402 (19.7)	1,639 (80.3)	
Trouble sleeping	Yes	752 (28.6)	307 (40.8)	445 (59.2)	***
	No	1,839 (69.9)	416 (22.6)	1,423 (77.4)	
<i>After COVID-19 outbreak</i>					
Physical health	Worsened	218 (8.3)	99 (45.4)	119 (54.6)	***
	About the same	2,280 (86.7)	597 (26.2)	1,683 (73.8)	
	Improved	93 (3.5)	27 (29)	66 (71)	
Nervous	More so	363 (13.8)	191 (52.6)	172 (47.4)	
	About the same	178 (6.8)	84 (47.2)	94 (52.8)	
	Less so	12 (0.5)	6 (50)	6 (50)	
Depressed	More so	264 (10.0)	161 (61)	103 (39)	
	About the same	263 (10.0)	149 (56.7)	114 (43.3)	
	Less so	13 (0.5)	5 (38.5)	8 (61.5)	
Trouble sleeping	More so	148 (5.6)	87 (58.8)	61 (41.2)	***
	About the same	585 (22.2)	207 (35.4)	378 (64.6)	
	Less so	16 (0.6)	8 (50)	8 (50)	

+++ $p < .001$  for independent-samples t-test of age mean scores divided by reported loneliness ("Lonely" vs. "Not lonely"); NS = not significant, \* $p < .05$ , and \*\*\* $p < .001$  for chi-square test for independence of differences in demographics characteristics divided by reported loneliness ("Lonely" vs. "Not lonely").



remain valid in the multivariate analysis presented below. Descriptive statistics divided by reported loneliness are given in Table 1.

The research questions underlying the following analysis connect findings about which factors influence loneliness and the strength of their interrelation. Therefore, bivariate correlations of significant variables detected from the previous descriptive phase were associated with loneliness (see Table 2). Correlations ranged from medium to small ( $r = 0.35$  to  $0.08$ ,  $p < .01$ ), which suggests the possibility of connecting related variables into one regression model. Overall, older women who felt nervous, depressed, had trouble sleeping before and since the COVID-19 outbreak, self-rated their physical health before the COVID-19 outbreak as rather good or poor, and did not leave their home but were able to get by financially since the outbreak were more likely to report loneliness.

The impact of significant associations with the likelihood of loneliness in the high-risk 50+ population was further investigated in the logistic regression (see Table 3). More specifically, using the Enter method, we uploaded socio-demographic variables (gender and age), mental health status (depression, nervousness, and trouble sleeping), physical health condition before and since the COVID-19 outbreak, and a variable measuring participants' COVID-19 infection symptoms within a binary logistic regression. We aimed to search for

**Table 2.** Bivariate correlation of loneliness with study variables.

Socio-demographic			Physical and mental health						
			Before the outbreak				Since the outbreak		
Gender	Age	Economics	Left Home	Physical health	Nervous	Depressed	Trouble sleeping	Physical health	Trouble sleeping
0.17**	0.08**	0.10**	-0.06**	-0.13**	0.27**	0.35**	0.18**	0.01	0.08

$p < .01$ .

**Table 3.** Logistic regression of reported loneliness.

Predictor variable	B	SE	Wald	Df	p	Exp(B)	95% CI for Exp(B)	
							Lower	Upper
<i>Socio-demographic</i>								
Gender (Ref. group women)	0.487	0.129	14.263	1	.000	1.627	1.264	2.094
Age category (Ref. 50-70 yrs)			8.029	2	.018			
71-79 yrs	0.011	0.125	0.008	1	.930	1.011	0.792	1.291
80+ yrs	0.388	0.152	6.482	1	.011	1.474	1.093	1.986
Economic status	0.245	0.181	1.829	1	.176	1.278	0.896	1.824
Left home	0.125	0.178	0.496	1	.481	1.133	0.800	1.605
<i>Physical and mental health before COVID-19 outbreak</i>								
Physical health (Ref. very good)			13.341	2	.001			
Good	0.528	0.148	12.745	1	.000	1.695	1.269	2.265
Poor	0.511	0.172	8.815	1	.003	1.668	1.190	2.338
Nervous	0.514	0.140	13.515	1	.000	1.671	1.271	2.198
Depressed	1.285	0.138	86.501	1	.000	3.615	2.757	4.739
Trouble sleeping	0.385	0.118	10.693	1	.001	1.470	1.167	1.852
Constant	-2.296	0.252	83.109	1	.000	0.101		

SE = standard error; df = degrees of freedom; CI = confidence interval.

a minimum of predictors that would best explain the maximum range of reported feelings of loneliness.

Our model reached statistical significance  $\chi^2(10, N = 2,631) = 305.97, p = .001$ ; Cox and Snell  $R^2 = 0.15$  and Nagelkerke  $R^2 = 0.21$ , explaining between 15% and 21% of the variability in the set of variables. Improvement of the correctly classified cases within the model is from 67% to 73.5%. Out of the eight independent variables in the equation, only five made a unique statistically significant contribution to the model (see Table 3).

The strongest significant predictor of loneliness is an experience with depression, giving an odds ratio of 3.615. This result shows that participants who felt depressed were almost four times more likely to report the presence of loneliness than a person who did not feel depressed, while controlling for all other predictors in the model. The next significant predictor was self-rated health status before the COVID-19 outbreak. Those participants who felt poor or good before the pandemic outbreak were more likely to report loneliness compared those who felt that their general health condition was very good before the coronavirus. Moreover, the model predicted that those participants who felt nervous or had trouble sleeping were more likely to be lonely. Another essential predictor that increased reported feelings of loneliness in the high-risk 50+ population was gender; women were predicted to report the presence of loneliness more often relative to men.

Following series of cluster analyses helped to segment data and highlight assumptions made about the likely relationships within the data. The two clusters were identified based on significant variables identified in the regression analysis, i.e. gender and self-rated physical health status before the COVID-19 outbreak and mental health (i.e. trouble sleeping, nervousness, depression, and loneliness). The final cluster solution using descriptive statistics is presented in Table 4. The empirically grounded typology of the high-risk 50+ population shows the presence of two subgroups in the dataset, including 980 (38%) of participants with higher negative physical and mental outcomes; that is covered mostly by women with higher perceptions of loneliness,

**Table 4.** Descriptive statistics of the two-cluster solution.

Cluster	n (%)	Socio-demographics		Physical and mental health before the outbreak (%)				
		Age <i>M (SD)</i>	Gender (%) male/female	Physical health good or poor/ very good	Lonely no/ yes	Nervous no/yes	Depressed no/yes	Trouble sleeping no/yes
I: Higher negative physical and mental outcomes	980 (38)	74.62 (7.94)	33/67	100/0	51/49	57/43	55/45	52/48
II: Lower negative physical and mental outcomes	1,590 (62)	71.82 (7.29)	42/58	63/37	85/15	92/8	94/6	83/17

*M(SD)* = mean (standard deviation).

depression, recent trouble with sleep, and nervousness in the last month, and with good or poor physical health before the COVID-19 outbreak. In contrast, a second subgroup of participants (1,590, 62%) represented subgroup with lower negative physical and mental outcomes and was mostly covered by Czech older adults with lower perceptions of loneliness, depression, recent trouble with sleep, and nervousness in the last month, and with mainly good or poor self-rated physical health before the COVID-19 outbreak.

## Discussion

People around the world have been exposed to extreme psychological stress coming from the COVID-19 pandemic, causing serious long-term impacts including reduced health, well-being, and cognitive decline or late-life infirmity. A handful of studies have found that older adults are at higher risk for developing such complications due to COVID-19 (García-Portilla et al., 2021, Nikolich-Zugich et al., 2020, Remuzzi & Remuzzi, 2020). In particular, the first ad-hoc surveys have shown that COVID-19 lockdown periods may significantly contribute to increased loneliness among older adults (Losada-Baltar et al., 2021, Sandu et al., 2021). Therefore, understanding potential risk factors causing loneliness during the initial stages of COVID-19 pandemic in the 50+ population is especially important for social services, particularly for gerontologists.

With prior results showing that older adults in central European nations, including the Czech Republic, appeared to be the loneliest among Europeans when controlling for socio-economic variables (Lee, 2020, Shiovitz-Ezra, 2015, Webb & Chen, 2022), it seems relevant to examine loneliness among Czech older adults experiencing lockdown and social distancing safety measures during the COVID-19 pandemic within the country where the pandemic had been the most severe. Based on our findings, almost every third person (28%) experienced the elderly's feelings of loneliness. This finding contradicts results from Lee (2020), which demonstrated that only 5% of a representative sample of Czech older adults aged 65+ drawn from SHARE Wave 6.0 reported they often felt loneliness, and exceeds the European average of 7% of adults who experience frequent loneliness (the European Commission's Science and Knowledge, 2018). A possible explanation for this increase could be the rapid spread of COVID-19 across European countries, as many prior studies have found COVID-19 lockdowns or social distancing safety measures were contributing factors toward higher rates of loneliness among older adult populations. This is evidenced, for example, by a survey in the Netherlands (Van Tilburg et al., 2021) which showed an increase in loneliness among the older adult population, compared to the 2019 pre-pandemic situation. Similarly, Bu et al. (2020b) showed that compared to the 2017–2019 period, the prevalence of reported loneliness among the British adult population increased from 37%

to 51% in March and May 2020. Similarly, Ausín et al. (2021) confirmed a hypothetical increase in feelings of loneliness among the adult Spanish population ( $n = 1,041$ ) two and five weeks after the declaration of a state of emergency and stay-at-home order. Following these findings, it is clear that the pandemic's effects on loneliness among the European high-risk 50+ population deserves further research attention using longitudinal research or comparative studies (see Østertun Geirdal et al. 2021, Pan et al., 2021, Sakib et al., 2021) to provide targeted mental health support and interventions for this vulnerable population (e.g. Bolton, 2012, European Commission, 2018, Tilvis et al., 2011).

Our results further indicated that the presence of depression acted as the strongest significant predictor of loneliness, suggesting a synergistic effect (Cacioppo et al., 2006). Participants who felt depressed were almost four times more likely to report the presence of loneliness. Likewise, people who self-reported a good or poor physical health status before the COVID-19 outbreak were more likely to report loneliness compared those who felt that their health was very good before the outbreak (Hacihasanoglu et al., 2012, Pengpid & Peltzer, 2021). Older adults who experienced loneliness also appeared to be more sensitive to other mental issues, including nervousness and sleep-related problems (Tesen et al., 2022, Werner et al. 2021). Further findings correspond well to both the previous psychological (e.g., Beal, 2006, Heylen, 2010, Pinquart & Sörensen, 2001, Vozikaki et al., 2018) and the more recent COVID-19 literature (see Bartoszek et al., 2020, Parlapani et al., 2020), which consistently show that out of socio-demographic characteristics, being a woman can serve as a risk factor for loneliness.

We also add to the current literature by distinguishing two individual groups of participants. Higher negative physical and mental outcomes were reported by 38% of participants represented mostly by women with higher perceptions of loneliness, depression, recent trouble with sleep, and nervousness in the last month, along with self-rated good or poor physical health before the COVID-19 outbreak. Similarly, Vloo et al. (2021), using longitudinal data from the Netherlands, highlighted that the pandemic had different mental health impacts on men and women, with women experiencing more depression. Psychological variables associated with depression at the beginning, middle, and end of forced COVID-19 confinement were also studied by Fenollar-Cortés et al. (2021). The results showed that although women had significantly higher scores than men in almost all mental health measures at the beginning of confinement, the gender differences quickly vanished away over time.

The presented findings fit well with the conceptual perspectives of aging science (Wahl & Gerstorf, 2018), showing that context shapes human aging and not all adults experience the same psychological stresses the same way (Pearman et al., 2021). Therefore, the identified risk factors

for physical and mental functioning might have a very subjective effect on each individual. How and why contexts shape human aging by preventing or limiting the formation of stressors, feelings of depression, nervousness, and inability to sleep well in older adults is especially important during this tense time of global pandemic, in which the moment-to-moment context can play a critical role in health outcomes and successful aging (Hughes & Tournon, 2021). In this respect, those professionals who work with seniors, such as social workers and care-givers, should help these older adults, an at-risk group for loneliness (e.g., feeling depressed, nervous, anxious, or on edge), to experience positive and supportive social interactions during residential or ambulant interventions. In this context, gerontology scholars have recognized individual reminiscence (Chiang et al., 2010, Dammeyer, 2004), peer support-group concepts (Theurer et al. 2014), person-centered care approaches (Chu et al., 2020, Hoffman et al., 2020, Li et al., 2022), and animal-assisted therapy (Olsen et al., 2016, Schuurmans et al., 2016) to be effective interventions for improving social isolation and loneliness among high-risk 50+ populations during the COVID-19 pandemic.

Our study has several limitations, which should be acknowledged. Firstly, included measures of physical and mental health during the first phase of the COVID-19 pandemic were self-reported single-item measures. Although building research on cross-sectional analysis using representative samples has many benefits, in contrast, it did not allow researchers to employ more sophisticated clinical applications or internally consistent scales, like the UCLA loneliness scale (Hughes et al., 2004), in order to make diagnoses. Therefore, the measured variables indicate a possible state of a person's health, rather than a diagnosed health condition, representing subjective isolation rather than an objective feeling of being left out or isolated. In addition, the secondary data analysis that we performed focused on available variables. It did not address levels of loneliness, changes in loneliness over time, or the extent of social and emotional support related to such constructs; nor did it capture other kinds of mental disorders that may have been present during the pandemic and influenced reported loneliness. For instance, the variable measuring COVID-19 stay-at-home and quarantine orders (at quarantine centers or at home) could shed more light on older adults' social isolation due to COVID-19, which has been shown to be highly associated with loneliness.

The negative consequences associated with the COVID-19 pandemic may vary across more affected regions within the country. Therefore, variables connecting participants to their locality could serve as a reasonable representation of context-related outcomes. Another notable weakness related to the SHARE COVID-19 questionnaire itself is the survey reference period, which in its Wave 8.0 data collection captures a relatively short time in the COVID-19 crisis and its effect on humanity.

Thus, subsequent embedment of longitudinal design with further research outcomes into existing knowledge is certainly warranted. Moreover, given the long-term continuing impact of this pandemic, understanding and supporting field programs for older adults in terms of eliminating the negative impacts of loneliness might be fruitful.

Despite these limitations, this study is, to our knowledge, the first to explore loneliness in a national representative sample of Czech older adults during the early peak of the COVID-19 pandemic. Moreover, these presented results are not solely based on the (albeit important) descriptive statistics but their influence has been further measured with multivariate analysis to see if they remain valid or whether they persist under interaction with other factors. This study, aimed at high-risk groups of older adults, highlights physical and mental health condition along with gender as critical factors in facing the impact of the pandemic. As a response, strategies for older adults, gerontologists, social workers, care-givers, and healthcare providers should monitor not only the physical health of patients, but also sources of social isolation, life satisfaction, physical distancing, proactive coping, and subjective psychological sources of well-being that cause altered states of loneliness. In conclusion, more comprehensive exploration of relevant factors that might affect the presence of loneliness will broaden the scope of how aging can be productively researched in the future.

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## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Ethical approval

The CTL institution in cooperation with SHARE-ERIC took responsibility for the implementation of the survey. Participation in the SHARE interview was voluntary, and all information was kept confidential. The conversation was not recorded and all participants received a data-protection statement. Individual researchers were not provided with contact details of the respondents.

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