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Social loneliness and perceived stress among middle-aged and older adults during the COVID-19 pandemic

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Abstract
Older age has been considered a risk factor for physical and mental health during the COVID-19 pandemic, yet many middle-aged and older adults showed resilience. This cross-sectional study aimed to examine the protective factors against social loneliness and perceived stress among Turkish middle-aged and older adults. The data were collected from 464 adults aged 55 and above when the curfew restrictions were still in place. Hierarchical regression analyses revealed that resilience, life satisfaction, self-esteem, satisfaction with social support and internet use negatively predicted both social loneliness and stress. The extent of curfew measures, which were more restrictive for the elderly, did not predict social loneliness and stress. The participants living alone showed higher social loneliness and those with chronic disease reported more stress. Results highlight the significant role of protective factors in enhancing well-being and coping in old age under highly stressful situations such as the pandemic.

Keywords COVID-19 · Social loneliness · Perceived stress · Resilience · Older adults

Introduction

The global pandemic of coronavirus disease 2019 (COVID-19) had a significant impact on individuals and communities, resulting in adverse physical and mental health outcomes. To prevent the spread of the virus, physical distancing measures were implemented in Turkey as were in several countries (Haug et al., 2020). Starting from March 2020, Turkey imposed curfew restrictions for older adults aged 65 and over (Turkish Ministry of Interior, 2020), which were later extended to all citizens and lifted in July 2021 (Turkish Ministry of Interior, 2021). However, more rigorous curfew restrictions with longer duration applied to older adults. Considering the vulnerability of older adults due to high risks of physical complications (Shahid et al., 2020) and limited access to social support systems, the curfew can be expected to have negatively affected the well-being of older adults along with other pandemic-related stressors.

Older age has been a risk factor for both poor physical health (Shahid et al., 2020) and mental health outcomes (Briguglio et al., 2020) during the pandemic. Loneliness (Müller et al., 2021) and stress (Nimrod, 2020) have been common among the elderly. In particular, the history of chronic disease has been shown to be related to increased stress (Ozamiz-Etxebarria et al., 2020) due to high risk of infection and mortality. Therefore, older adults with chronic diseases were more likely to avoid in-person interaction (Heid et al., 2021) and report high levels of loneliness (Elran-Barak & Mozeikov, 2020). Additionally, recent studies have repeatedly demonstrated that living alone during stay-in measures was positively associated with loneliness (Macdonald & Hülür, 2021; van Tilburg et al., 2020) among older adults.

Despite reports of adverse psychological effects of the pandemic on the elderly, older adults have also coped well with pandemic-related stressors. A series of individual and social attributes have been identified as protective factors against negative psychological outcomes of the pandemic. For instance, higher resilience is emphasized as an important

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factor associated with less loneliness (Müller et al., 2021) and stress (Flesia et al., 2020). Additionally, self-esteem has been shown to be negatively related to loneliness (Tian, 2016; Zhao et al., 2017) and had a buffering effect against loneliness (Rossi et al., 2020). Those with higher self-esteem might have been more likely to try to maintain social relationships, seek social support (Park et al., 2020), and cope better with stressors such as limited social interactions (Carver et al., 1989).

Life satisfaction of different age groups (Cheng et al., 2020) has been reported to have declined during the pandemic due to physical distancing measures and fear of getting infected. Previous studies have demonstrated that higher life-satisfaction in middle and old adulthood is associated with less loneliness (Szcześniak et al., 2020) and stress (Hamarat et al., 2001). Based on previous research, higher life satisfaction might be expected to act as a protective factor against social loneliness and stress. Besides, in middle and old adulthood, social support is an important factor that contributes to well-being (Yeung & Fung, 2007). Older adults reported less loneliness if they perceived that social support was available (Macdonald & Hülür, 2021) throughout the pandemic. Similarly, social support has been shown to be negatively associated with both loneliness and pandemic-related stress, and a significant mediating factor between these two variables (Minahan et al., 2021). During lockdowns and curfews, online platforms have played a key role in receiving social support (Radwan et al., 2021) and socializing (Kotwal et al., 2021) for the elderly. As a result, internet use might have helped older adults to cope with loneliness (Hajek & König, 2021) and stress (Nimrod, 2020).

Identifying personal and social resources, which contribute to well-being of the elderly, is critical for development of more effective psychosocial programs and psychological interventions that enhance coping and resilience (Rodrigues et al., 2022; Shapira et al., 2021). Thus, the purpose of this study is to further examine how protective factors (resilience, life satisfaction and self-esteem), pandemic-related variables (satisfaction with social support, internet use, living arrangement and extent of curfew measures), chronic disease are associated with social loneliness and perceived stress among Turkish middle-aged and older adults in the early months of the pandemic. Rather than emotional loneliness, we focus on social loneliness, which refers to lack of broader social networks and social integration (Weiss, 1973). We hypothesized that protective factors, pandemic-related factors, shorter and less strict curfew measures would negatively predict social loneliness and perceived stress. We also expected that compared to middle-aged adults, older adults would report higher social loneliness as a result of more restrictive curfew measures and more perceived stress due to higher health risks.

Method

Participants and procedure

The research group consisted of a convenience sample of 464 Turkish middle-aged and older adults. The middle-aged and older adults at the age of 55 and over were included in the study and no inclusion criteria other than age were specified. 52.6% of the participants were female and the mean age was 64.74 ($SD = 6.49$). The majority of the participants were university graduates (75.7%), married (78.0%) and retired (or retired but employed) (79.1%), living with their spouses (or with their spouses and children) (78.0%) and had children (90.5%). 47.4% of the participants had chronic diseases and the mean income satisfaction was 2.11. The sample characteristics are detailed in Table 1.

The data were collected in May and June 2020, while the curfew restrictions for all Turkish citizens were still in effect. This study employed cross-sectional and correlational design, and used convenience sampling technique to collect data. Participants were recruited via social media platforms. The middle-aged and older adults took part voluntarily in the study. Prior to data collection, participants gave electronic informed consent and permission for the data to be used for scientific purposes. Completing online questionnaires lasted approximately 30 minutes. The system only allowed fully completed questionnaires to be submitted, so there was no missing data.

Measures

Social loneliness was assessed by the social loneliness subscale of the 11-item "de Jong Loneliness Scale" (de Jong Gierveld & Kamphuis, 1985; de Jong Gierveld & Van Tilburg, 1999) which consists of five positively worded items with three response categories ("no", "more or less" and "yes"). Negative and neutral responses were counted to compute a total score of social loneliness ranging from 0 to 5. Higher scores indicate greater social loneliness. The scale was translated to Turkish by Akgül and Yeşilyaprak (2015). Cronbach's alpha was .87 in the current study.

The level of *perceived stress* during the pandemic was measured by the 10-item version of the Perceived Stress Scale (PSS-10) developed by Cohen et al. (1983). Participants were asked to indicate how often they felt the way described in the scale items in the last month on a 5-point response scale (0 = "never" to 4 = "very often"). The scale was adapted to Turkish by Eskin et al. (2013). In the present study, Cronbach's alpha was .90.

The role of three protective factors, namely resilience, self-esteem and life satisfaction in prediction of social

Table 1 Sample Characteristics and Descriptive Statistics (N = 464)

Variables	*n* (%)
Gender	
Male	220 (47.41)
Female	244 (52.59)
Age group	
55–64 years	202 (43.53)
≥ 65 years	262 (56.47)
Education	
Secondary school graduate	32 (6.90)
High school graduate	81 (17.46)
Bachelor's degree	263 (56.68)
Postgraduate degree	88 (18.97)
Marital status	
Single	22 (4.74)
Married	362 (78.02)
Divorced	47 (10.13)
Widowed	33 (7.11)
Having children	
Yes	420 (90.52)
No	44 (9.48)
Employment status	
Retired	297 (64.01)
Retired but employed	70 (15.09)
Employed	55 (11.85)
Unemployed	42 (9.05)
Living arrangement	
Alone	102 (21.98)
With spouse	237 (51.08)
With spouse and children	125 (26.94)
Chronic disease	
Having chronic disease	220 (47.41)
Not having chronic disease	244 (52.59)

loneliness and perceived stress, were examined. *Resilience* was measured with the "Brief Resilience Scale (BRS)" (Smith et al., 2008), a 6-item self-report instrument with items ranked on a 5-point scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The scale was translated to Turkish by Doğan (2015). Cronbach's alpha in the current study was .80.

One of the most widely used scales measuring *self-esteem*, the "Rosenberg Self-Esteem Scale" (Rosenberg, 1965), which was adapted to Turkish by Çuhadaroğlu (1986), was used to assess self-esteem. The 10-item scale comprises five positive and five negative feelings about the self, rated on a 4-point Likert-type scale ranging from 1 ("strongly disagree") to 4 ("strongly agree"). In the present study, Cronbach's alpha was .84.

Satisfaction with life was measured by the "Satisfaction with Life Scale" (Diener et al., 1985) consisting of five positively formulated items. The participants were asked to rate each of the statements on a scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The scale was translated to Turkish by Dağlı and Baysal (2016). In the current study, Cronbach's alpha was .87.

The extent of curfew measures, living arrangement, satisfaction with social support and internet use were determined as pandemic-related factors. The participants aged 65 and over were subject to more restrictive curfew measures, so the restrictive curfew variable was created based on two age groups (being over 65 or not) and was dummy coded (no = 0, yes = 1). The participants were asked with whom they were living during the pandemic. Dummy variables were created for each living arrangement category, with living alone as the reference category.

Participants were asked to rate their *satisfaction with the social support* they received from family or friends during the pandemic on a three-point Likert-type scale (from 1 = "I didn't get any social support" to 3 = "Adequate"). Responses to two questions related to family or friends were summed to create a total score of satisfaction with social support. *Internet use* during the pandemic was measured with two questions: "During the COVID-19 pandemic, did you do video chat with your family and friends?" and "During the COVID-19 pandemic, did you do your daily tasks (e.g., shopping, banking) online?". A total score calculated by summing the responses to these questions was used as an indicator of internet use during the pandemic.

Socio-demographic variables included gender, age, education, income satisfaction and chronic disease. Education was coded as binary (less than university degree = 0, university degree or above = 1) for analysis. Income satisfaction was assessed by asking the participants the extent to which their income met their needs (from 1 = "not satisfied" to 3 = "very satisfied"). Having chronic disease was determined with a yes/no question. Age is not included in the regression analyses since age differences are examined by assessing the role of the restrictive curfew variable in predicting outcome variables. The participants were also asked to report their marital status, employment status, and whether they had children.

Data analysis

Analyses were performed using the Statistical Package for the Social Sciences (SPSS) software version 23. First, descriptive statistics were obtained for each variable (Table 1). Then, Pearson correlation analyses were conducted to explore the associations between continuous study variables (Table 2). In addition, to determine the relationships between continuous variables and dichotomous

Table 2 Means, Standard Deviations, and Pearson Correlations Among Study Variables (N = 464)

Variables	*M*	*SD*	1	2	3	4	5	6	7	8
1. Age	64.74	6.49	–							
2. Income satisfaction	2.11	0.82	.12*	–						
3. Internet use	1.61	0.58	−.24***	.01	–					
4. Social support	4.09	1.33	.20	.13**	.22***	–				
5. Resilience	20.70	5.05	−.01	.09	.12*	.13**	–			
6. Self-esteem	32.68	4.19	−.09*	.10*	.24***	.19***	.43***	–		
7. Life satisfaction	17.46	4.32	.12**	.30***	.07	.17***	.21***	.41***	–	
8. Social loneliness	1.84	1.93	.05	−.15**	−.21***	−.35***	−.26***	−.33***	−.38**	–
9. Perceived stress	19.75	8.32	.14**	−.13**	−.26***	−.17***	−.47***	−.35***	−.29**	.43**

M = Mean; *SD* = Standard Deviation

*$p < .05$

**$p < .01$

***$p < .001$

variables point-biserial correlation analyses are computed. Two hierarchical multiple regression analyses, using the forced entry method, were then conducted separately to examine the effects of socio-demographic variables, pandemic-related and protective factors with social loneliness and perceived stress as predicted variables (Tables 3 and 4). The categorical variables were dummy coded in the analyses. Socio-demographic variables were entered as control variables in Step 1. Pandemic-related factors were added in Step 2 and protective factors were entered in Step 3.

Preliminary analyses showed that there were no violations of assumptions of normality, linearity and homoscedasticity. These assumptions were tested graphically. In addition, normality was assessed by examining skewness and kurtosis

Table 3 Hierarchical Multiple Regression Analysis for Variables Predicting Social Loneliness (N = 464)

Predictor	Step 1			Step 2			Step 3		
	B	SE B	*β*	B	SE B	*β*	B	SE B	*β*
Constant	2.92	.43		5.63	.60		8.77	.75	
Gender	.54	.18	.14**	.44	.18	.11*	.40	.17	.10*
Education	−.39	.21	−.09	−.13	.20	−.03	.11	.19	.02
Income satisfaction	−.31	.11	−.13**	−.24	.10	−.10*	−.04	.10	−.02
Chronic disease				.23	.17	.06	.04	.16	.01
Restrictive curfew				.04	.18	.01	.12	.17	.03
Living arrangement									
Living w/ spouse (v Alone)				−.66	.22	−.17**	−.45	.21	−.12*
Living w/ spouse and children (v Alone)				−.76	.25	−.17**	−.47	.24	−.11*
Social support				−.45	.07	−.31***	−.36	.06	−.25***
Internet use				−.42	.15	−.13**	−.28	.14	−.08*
Resilience							−.05	.02	−.13**
Self-esteem							−.06	.02	−.13**
Life satisfaction							−.10	.02	−.23***
Adj. R^2	.04			.16			.27		
ΔR^2	.04***			.14***			.11***		

Adj. R^2 = Adjusted R^2. Gender (coded as female = 0, male = 1); education (coded as less than university degree = 0, university degree or above = 1); chronic disease (coded as no = 0, yes = 1); restrictive curfew (subject to more restrictive curfew; coded as no = 0, yes = 1)

*$p < .05$

**$p < .01$

***$p < .001$

Table 4 Hierarchical Multiple Regression Analysis for Variables Predicting Perceived Stress (N = 464)

Predictor	Step 1			Step 2			Step 3		
	B	SE B	β	B	SE B	β	B	SE B	β
Constant	37.82	1.84		43.04	2.62		64.23	3.08	
Gender	−.50	.77	−.03	−1.11	.78	−.07	−.63	.69	−.04
Education	−2.94	.90	−.15**	−1.79	.87	−.09*	−.40	.77	−.02
Income satisfaction	−1.25	.47	−.12**	−1.32	.45	−.13**	−.53	.41	−.05
Chronic disease				2.70	.73	.16***	1.84	.65	.11**
Restrictive curfew				1.01	.80	.06	.99	.70	.06
Living arrangement									
Living w/ spouse (v Alone)				−1.47	.95	−.09	−1.52	.85	−.09
Living w/ spouse and children (v Alone)				−1.56	1.09	−.08	−.57	.97	−.03
Social support				−.77	.29	−.12**	−.30	.25	−.05
Internet use				−2.90	.66	−.20***	−1.95	.59	−.14**
Resilience							−.55	.07	−.33***
Self-esteem							−.46	.09	−.23***
Life satisfaction							−.17	.09	−.09*
Adj. R^2	.04			.13			.34		
ΔR^2	.04***			.10***			.22***		

Adj. R^2 = Adjusted R^2. Gender (coded as female = 0, male = 1); education (coded as less than university degree = 0, university degree or above = 1); chronic disease (coded as no = 0, yes = 1); restrictive curfew (subject to more restrictive curfew; coded as no = 0, yes = 1)

*$p < .05$

**$p < .01$

***$p < .001$

statistics. The values of skewness and kurtosis ranged from −1.19 to .54 and from −1.28 to .43, respectively, which were in acceptable range (Kline, 2011). The correlations among study variables were below .70 (Tabachnick & Fidell, 2007), suggesting that the assumption of multicollinearity is not violated. In addition, tolerance values and variance inflation factor (VIF) values for the study variables ranged between 0.53 and 0.99, and between 1.01 and 1.88, respectively. These values were within acceptable limits (Hair et al., 2011), thus they did not indicate multicollinearity.

Results

Pearson correlation analyses showed that social loneliness and perceived stress negatively correlated with predictor variables (Table 2). Correlation coefficients of these relationships varied for social loneliness and perceived stress, respectively from −.15 to −.38, and −.13 to −.47. Point-biserial correlation analyses demonstrated that social loneliness was only significantly correlated with gender ($r = .13$, $p = .004$) whereas there was a significant association of perceived stress with education ($r = -.16$, $p < .001$) and chronic disease ($r = .17$, $p < .001$). As expected, a high correlation ($r = .85$, $p < .001$) was found between age and the restrictive curfew variable. Overall, point-biserial correlation coefficients for the relationships between study variables, except the association between age and the restrictive curfew variable, ranged between −.20 and .16.

The first hierarchical multiple regression was conducted to examine the relative contribution of the pandemic-related and protective factors in the prediction of social loneliness while controlling for socio-demographic variables. In the first step, gender and income satisfaction were significant predictors. This model only explained 4% of the variance in social loneliness, $F(3,460) = 7.15$, $p < .001$. The results showed that men felt more socially lonely than women, and income satisfaction was negatively related to social loneliness. Education was not significantly associated with social loneliness.

After controlling for socio-demographic variables, the pandemic-related factors entered on Step 2 accounted for a significant 14% increase in predictive value of the model ($R^2 = .18$, $F(9,454) = 11.11$, $p < .001$). In this model, satisfaction with social support and internet use were significantly and negatively related to social loneliness. The participants living with spouse or with spouse and children reported less social loneliness than the participants living alone. Having chronic disease and being subject to more restrictive curfew did not significantly contribute to the model. In the third

model, all protective factors made significant negative contributions, indicating that older adults with higher resilience, self-esteem and life-satisfaction reported less social loneliness. Overall, this model explained an additional 11% of the variance in social loneliness ($R^2 = .29$, $F(12,451) = 15.45$, $p < .001$).

The second hierarchical multiple regression analysis regressed perceived stress on socio-demographic variables, pandemic-related and protective factors. The first model in the hierarchical regression analysis showed that, except gender, all socio-demographic variables were significantly associated with perceived stress. The model as a whole only accounted for 4% of the variance in perceived stress ($F(3,460) = 6.76$, $p < .001$). Increase in educational level and income satisfaction was related to lower levels of perceived stress.

Entry of pandemic-related factors accounted for an additional 10% of the variance in perceived stress beyond that explained by the control variables ($R^2 = .14$, $F(9,454) = 8.54$, $p < .001$). Having chronic disease was significantly associated with increased perceived stress whereas higher satisfaction with social support and more internet use was related to lower stress levels. Being subject to more restrictive curfew and living arrangement did not make significant contributions to the model. Finally, the model of perceived stress with protective factors was statistically significant, explaining an additional 22% of the variance in perceived stress ($R^2 = .36$, $F(12,451) = 21.16$, $p < .001$) above and beyond the pandemic-related factors. As in the previous hierarchical regression analysis, resilience, self-esteem and life satisfaction negatively predicted perceived stress.

Discussion

This study examined the role of the protective and pandemic-related variables in predicting social loneliness and perceived stress in a sample of Turkish adults aged 55 and above during the COVID pandemic. Overall, the hierarchical regression analyses revealed that resilience, life satisfaction, self-esteem, satisfaction with social support and internet use negatively predicted both social loneliness and stress after controlling for socio-demographic variables.

In recent studies, resilience has been shown to be negatively related to loneliness (Müller et al., 2021) and stress (Flesia et al., 2020) brought about by the pandemic. Supporting these findings, we found that the middle-aged and older adults, who could more positively adapt to changing circumstances due to the pandemic (Lind et al., 2021) and recover from the pandemic-related adversities (Windle et al., 2010), reported less social loneliness and stress. Some pandemic-related factors explored in this study, such as social support (Van Kessel, 2013), living with others and better physical health (Hardy et al., 2004) might have contributed to this relationship. Due to the cumulative life experience of the middle-aged and older adults in dealing with many stressors, they might have been more likely to avoid pandemic-related stressors (Pearman et al., 2021) and effectively mobilize personal and social resources effectively to cope with stress.

In line with previous studies reporting a positive relationship between self-esteem and well-being (e.g., Rossi et al., 2020; Tian, 2016), higher self-esteem was found to be associated with less social loneliness and perceived stress. The middle-aged and older adults with a positive appraisal of the self might have been more likely to engage in behaviors that reduce stress (Conn et al., 1992) and to use more positive coping strategies (Carver et al., 1989) such as seeking social support (Park et al., 2020). Considering the positive correlation between satisfaction with social support and self-esteem found in the current study and in previous studies (e.g., Goodwin et al., 2004), it can be argued that social support received during the pandemic has bolstered self-esteem (Krause, 1987). Thus, higher self-esteem might have enhanced positive coping (Zhao et al., 2017) and promoted well-being (Tian, 2016). On the contrary, low self-esteem might have resulted in more negative perception of the pandemic and a decrease in social connectedness during the pandemic (Nitschke et al., 2021).

Consistent with our expectations, life satisfaction negatively predicted social loneliness and perceived stress. In studies examining the relationship among these variables, life satisfaction has been analyzed either as a predictor or as an outcome variable, yet it is concluded that life satisfaction is adversely associated with loneliness (Szcześniak et al., 2020) and stress (Hamarat et al., 2001) in middle and late adulthood. In the current study, life satisfaction was identified as the strongest predictor of social loneliness. This finding points to the important effect of life satisfaction on mental health of older adults, especially under highly stressful conditions.

Among the pandemic-related variables, satisfaction with social support and internet use were the only variables, which significantly contributed to both regression models. Social support has been demonstrated to be a protective factor against loneliness (Macdonald & Hülür, 2021) and negatively related to pandemic-related stress (Minahan et al., 2021). Similarly, in the current study, higher satisfaction with social support system was found to be associated with less social loneliness and perceived stress. Social support might have acted as a buffer against adverse psychological outcomes (Cohen & Wills, 1985). In Turkish culture, characterized by close family ties and knit social networks (Sunar & Fişek, 2005), having supportive and close networks is valued. Therefore, it can be argued that Turkish adults needed and expected to receive emotional and social support from

family and friends during a highly stressful event such as the pandemic.

In line with our expectations, internet use was found to be negatively associated with social loneliness and perceived stress. Internet use seems to have enabled middle-aged and older adults to maintain social relationships (Gonçalves et al., 2020), socialize (Kotwal et al., 2021) and receive social support (Radwan et al., 2021) during the pandemic. Increased online social interactions might have partially compensated for face-to-face social contacts (Dahlberg, 2021). Doing daily tasks online have eliminated the risk of infection, and thus probably reduced the stress associated with carrying out daily chores outside the home. In addition, middle-aged and older adults might have used the internet as a means of coping with loneliness (Hajek & König, 2021) and stress (Nimrod, 2020), and online interactions might have also motivated them to use more proactive coping strategies (Moore & March, 2020). These results further highlight the positive impact of internet use on mental health of the elderly, especially when in-person interactions are limited or not possible.

It is well established that older adults, especially those with preexisting health conditions have been vulnerable during the pandemic, as indicated by high rates of severe complications and mortality (Shahid et al., 2020). History of chronic illness has been shown to be associated with higher levels of stress (Ozamiz-Etxebarria et al., 2020). Similarly, in this study the participants with chronic disease, comprising almost half of the research group, reported more perceived stress than the adults with no underlying health condition. On the other hand, having chronic disease was not found to be a significant predictor of social loneliness. In the pre-pandemic period (Richard et al., 2017) and during the pandemic (Elran-Barak & Mozeikov, 2020), higher loneliness has been shown to be related to poor health condition. For instance, in a study with Swiss older adults, having a higher number of health conditions was found to be associated with higher loneliness (Macdonald & Hülür, 2021). Though the middle-aged and older adults with the history of chronic illness have probably isolated themselves (Heid et al., 2021), the participants of the current study seem to have stayed in touch with their family friends, via phone calls, video calls and short visits, received social support that has led to decrease in social loneliness. No difference in social loneliness scores between chronic disease groups also suggests that both groups have minimized social interactions due to high health risks independent of having chronic disease.

The middle-aged and older adults living alone during the curfew reported higher levels of social loneliness compared to their peers living with other family members. These findings support recent studies (e.g., Macdonald & Hülür, 2021; van Tilburg et al., 2020) on loneliness among older adults during the pandemic. Contrary to our expectations, there was no significant difference in perceived stress scores among living arrangement groups. Though living alone has been identified as a risk factor for poor mental health outcomes (e.g., García-Portilla et al., 2021), living with other family members has also been demonstrated to be associated with negative psychological outcomes among older adults. For instance, in a study conducted with Italian adults, living with other family members during the lockdown was found to be related to higher levels of perceived stress (Flesia et al., 2020). Living with other family members might have led to more concern for loved ones and stronger fear of infection. Yet, adults living alone might have not experienced these negative emotions as strongly. In addition, having more experience with being alone might have resulted in a decreased sensitivity to stressful situations (Losada-Baltar et al., 2021).

Contrary to our expectations, we found no difference in social loneliness and perceived stress scores with regard to the extent of the curfew restrictions. Older adults aged 65 and over had been subject to more restrictive measures than the curfew imposed on middle-aged adults. Yet, during the data collection, curfew restrictions were in place in Turkey for all Turkish citizens, albeit differences in the extent of restrictions based on age. Therefore, middle-aged adults might have had similar experiences with older adults. Besides, given that 42% of the middle-aged adults reported to have chronic disease, they might have also limited physical social interactions and felt increased stress due to risk of infection. Since age was the main criteria to form the groups to assess the effect of the curfew restrictions, the results can be explained by age differences. There is a growing body of literature (e.g., Bruine de Bruin, 2021; Losada-Baltar et al., 2021) suggesting that older adults had less psychological problems than younger and middle-aged adults during the pandemic. The older adults might have used adaptive (Fuller & Huseth-Zosel, 2021) or proactive (Pearman et al., 2021) coping strategies more than middle-aged adults and coped well with pandemic-related stressors due to more experience with stressful life events (Lind et al., 2021).

Limitations

This study had several limitations. First, this was a cross-sectional and correlational study, therefore it was not possible to draw a conclusion regarding the causal direction of the relationship between the study variables and to determine the change in social loneliness and perceived stress over time. Second, since the data was collected with an online survey, the middle-aged and older adults without internet access or with lower digital literacy were underrepresented. Yet, administering an online survey was the only possible way to collect data due to the outbreak and the resulting

curfew. Third, the research group consisted of only Turkish middle-aged and older adults, the majority of whom were educated and retired. These characteristics of the research group limit the generalizability of the findings to middle-aged and older adults with different socio-demographic characteristics. Finally, only one type of loneliness (social loneliness) was measured in this study, but assessing other aspects of loneliness might contribute to better understanding of the relationship between loneliness and study variables.

Conclusion

Findings of this study demonstrated that resilience, self-esteem and life-satisfaction have contributed to coping with social loneliness and perceived stress during COVID-19 pandemic. Therefore, it is important for preventive social work and psychosocial practices to focus on these protective factors and support development of skills that enhance resilience in older adults. In addition, findings highlight the significant role of social support in coping during the pandemic. Accordingly, the middle-aged and older adults reported less social loneliness and perceived stress if they had used the internet to socialize and do chores during the pandemic. Considering the positive effect of internet use on well-being, we suggest that online platforms should be integrated into mental health practice, especially during disasters.

This study also contributes to research and practice by examining the effects of curfew measures. The results did not indicate a significant effect of more restrictive curfew measures on well-being. However, it is important to monitor and examine long-term psychological effects of the pandemic and the curfew. The findings reflect the heterogeneity of the elderly in terms of level of vulnerability. Especially, history of chronic disease or living alone has been associated with poor psychological outcomes. In this regard, it is critical to develop social work and psychological interventions that focus on older adults' strengths and needs specific to the pandemic as well as risk factors.

Author contributions All authors contributed to the study conception, design, material preparation and data collection. Data analysis was performed and the first draft of the manuscript was written by Petek Akman Özdemir. Hacer Nermin Çelen supervised the study. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors declare no conflict of interest.

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Consent to participate Electronic consent was obtained from all participants.

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