Ageing & Society (2024), **44**, 1–16
doi:10.1017/S0144686X21001938

ARTICLE

Fear of COVID-19 and quality of life: the mediating role of loneliness among older Turkish adults

Melih Altay[1]* and Azime Arisoy[2]

[1]Ambassade de Turquie, Conakry, Guinea and [2]Social Services and Consulting Department, Mehmet Akif Ersoy University, Burdur, Turkey
*Corresponding author. Email: maltay35@gmail.com

(Accepted 8 December 2021; first published online 9 March 2022)

Abstract

The novel coronavirus (COVID-19) outbreak has affected living standards around the world, and pandemic anxiety has changed social habits. In this context, this paper investigates the relationship between fear of COVID-19 and quality of life, and assesses the mediating effect of loneliness on this relationship among a sample of older adults in Turkey. The study considers data from approximately 400 people, all of whom completed the CASP-19 Quality of Life Scale in Older People, the Loneliness Scale for the Elderly and the Fear of COVID-19 Scale. Confirmatory factor analyses were performed to confirm a one-factor structure for each instrument. Subsequently, mediation analysis, correcting for age as a continuous covariate, was performed to assess the nature of the relationship between fear and quality of life, and the extent to which that relationship is mediated by loneliness. Our study showed that there is a negative and direct relationship between loneliness and quality of life. Another important finding of our research is that fear of COVID-19 has a significant effect on loneliness. Finally, loneliness mediates the relation between fear of COVID-19 and quality of life. This finding strongly suggests that fear of COVID-19 influences quality of life via loneliness. This result is noteworthy, as we could not find any similar finding in the literature.

Keywords: older adults; coronavirus; COVID-19; fear of COVID-19; loneliness; quality of life

Introduction

During the COVID-19 pandemic, many people have spent their time alone at home and have engaged in fewer social interactions, which can have a negative impact on physical and mental health (World Health Organization (WHO), 2021*a*). Since older individuals with chronic diseases are the group most affected by COVID-19 (Liu *et al.*, 2020), social isolation of older populations has become mandatory during the COVID-19 pandemic (Fletcher, 2021). Such social isolation may increase feelings of loneliness (Çam *et al.*, 2018) while reducing social activities and quality of life in older age (Gouveia *et al.*, 2017). Scientific studies on this subject

are important in guiding social work actors in planning and implementing psychosocial services for older individuals. In this context, COVID-19 anxiety may affect feelings of loneliness and quality of life among individuals aged 60 years and older.

Studies to date have generally focused on the relationship between loneliness and quality of life (Weiner *et al.*, 2010; Vuletić and Stapić, 2013; Gerino *et al.*, 2017; Szabo *et al.*, 2019), while the role of fear of COVID-19 in this relation has not been examined. Moreover, prior research on these variables has largely focused on Western cultural contexts, although the criteria predicting older people's quality of life vary from society to society (Siedner, 2019). The adverse effects of loneliness may also vary depending on cultural characteristics. For example, Beller and Wagner (2020) found that the effect of loneliness on health was stronger in collectivist countries than in individualist countries and suggested focusing on the effects of loneliness outside Western contexts. According to Hofstede's (2001) global study, Turkey's cultural classification differs from that of Western countries, as Turkey is a collectivist culture (Paşa *et al.*, 2001; Kabasakal and Bodur, 2007). In sum, additional research needs to be conducted in non-Western societies such as Turkey.

COVID-19 should also be taken into consideration as a new area of focus, as the pandemic's effects on older communities have been felt deeply. For example, certain restrictions and measures have been implemented as a result of the pandemic that have isolated people from their environments. These policies may have especially affected sense of loneliness and quality of life among older people. Extending previous work, this study investigates the relationship between fear of COVID-19 and quality of life among Turkish individuals aged 60 years and older, and tests the mediating effect of loneliness in this relationship. First, we review the literature on older adults, fear of COVID-19, sense of loneliness and quality of life. Next, we examine data obtained from older people living in Burdur Province, Turkey. Finally, our findings are summarised and discussed in comparison with other research.

Literature review

Fear of COVID-19

As COVID-19 has spread across the world (Liu *et al.*, 2020), health officials and governments have warned that older people face a greater risk of serious and potentially fatal diseases associated with COVID-19. The risk of death from COVID-19 for people in their sixties is 3.6 per cent, a figure that increases for those in their seventies, eighties and older (Brooke and Jackson, 2020). Because the disease may be more severe and lead to an increased mortality rate among older people (Dhama *et al.*, 2020; Yanez *et al.*, 2020), older adults may experience heightened fear of COVID-19.

In light of this, social isolation policies have been implemented for the older population globally. Such policies may include a number of measures, such as avoiding social contact with family members and friends, and maintaining physical distance from other people (Brooke and Jackson, 2020). In response to COVID-19, the Ministry of the Interior in Turkey issued a circular imposing age-based

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

lockdowns and certain other restrictions on citizens aged 65 years and older as well as individuals with chronic conditions (Republic of Turkey Ministry of Interior, 2020).

The pandemic brought not only the risk of death but also psychological pressure, anxiety and fear (Duan and Zhu, 2020; Duman, 2020; Lin, 2020; Xiao, 2020). Fear refers to an individual's normal subconscious responses – both physical and mental – to the possible harms associated with a given threat (Pappas *et al.*, 2009). Infection has unique characteristics that explain the disproportionate degree of fear it incurs. The rapidity of the spread of COVID-19, the high rate of contraction of disease and morbidity, and psychosocial difficulties such as stigma, discrimination and loss of relatives to the disease could be expected to lead to widespread fear of COVID-19 (Pappas *et al.*, 2009). The dramatic shift towards social distancing measures has posed significant challenges related to the health and wellbeing of older adults in the community, especially among those who are fragile, are very old or have multiple chronic diseases (Steinman *et al.*, 2020).

Loneliness

Social relationships are an integral part of human wellbeing (Gerst-Emerson and Jayawardhana, 2015). Loneliness, lack of a mutual relationship with others, is experienced as a complex and subjective emotion that represents the gap between desired and actual social engagement (Victor *et al.*, 2005). Loneliness negatively affects older individuals' lives, and increased loneliness among older people due to social isolation is a growing problem (Akbaş *et al.*, 2020). According to a WHO report, approximately 15 per cent of adults aged 60 years and older experience mental health problems, which are associated with social isolation, loss of independence, loneliness and psychological distress (WHO, 2017). In light of this, the health and wellbeing consequences of social isolation and loneliness in older age have increasingly been monitored (Courtin and Knapp, 2017).

In parallel with ageing, individuals' social living spaces are shrinking (Willis *et al.*, 2022). It is more difficult for older people to adapt to situations involving rapid changes in social structure, causing them to experience a sense of loneliness in response to social isolation more intensely than younger groups (Akbaş *et al.*, 2020). Factors that cause an intense sense of loneliness among older individuals include sensory losses, physical limitations, the death of a spouse or friend, retirement, a change in roles, separation from home, chronic diseases, sociocultural conditions, economic difficulties, lack of social support systems and dependence on others (Akbaş *et al.*, 2020).

Considering loneliness as a deficiency of social relationships (Koehn *et al.*, 2022), the decrease in older people's face-to-face interactions with their friends and family during the COVID-19 pandemic is an important factor in their increased feelings of loneliness (Pandya, 2020). In addition, social isolation among older adults is a known 'serious public health concern' due to the associated increased risks of cardiovascular, autoimmune, neurocognitive and mental health problems (Gerst-Emerson and Jayawardhana, 2015; Armitage and Nellums, 2020: 256). Social disconnection is also known to place older individuals at greater risk of depression and anxiety (Armitage and Nellums, 2020).

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Older people who are attempting to cope with health problems and have difficulty meeting their daily personal needs are worried about their futures. They may feel excluded due to social isolation during the COVID-19 pandemic and may experience an intense sense of loneliness (Gencer, 2019, 2020). Many studies have found that feelings of loneliness are associated with poor health outcomes, such as high blood pressure, cardiovascular disease, cognitive and functional decline, and depression (Knox and Uvnäs-Moberg, 1998; Cacioppo *et al.*, 2006; Hawkley *et al.*, 2010; James *et al.*, 2011; Perissinotto *et al.*, 2012, cited in Zhang *et al.*, 2018; Theeke and Mallow, 2013).

Quality of life

As individuals live longer lives, health-enhancing behaviours become more important, especially with regard to quality of life (Lee *et al.*, 2006). Older adults' lives involve not only health and dysfunction but also wellbeing and social exchanges (Lee *et al.*, 2020). Quality of life refers to a person's state of wellbeing in a general sense, which includes being enthusiastic and happy (Eser, 2006; Altay *et al.*, 2016). In the context of culture and value systems, the WHO defines quality of life as an individual's goals, expectations, standards and concerns regarding the perception of the position in that person's life (WHO, 2021*b*). 'Quality of life' became a frequently used term with the rapid development of the understanding of the welfare state after the Second World War (Musschenga, 1997). The goals of social policy are expressed in terms such as 'prosperity', 'happiness' and 'quality of life', and with an intent to raise the quality of social life as much as possible. Social policies have thus played an important role in the development of quality of life in the field of health (Musschenga, 1997).

Many factors affect quality of life, including financial situation, physical wellbeing, hobbies, participation in social life, relations with family and friends, psychological state and emotional state (Birtane *et al.*, 2000; Altuğ *et al.*, 2009). Quality of life means different things in different periods of life and for different individuals. The criteria for determining quality of life may also vary with age. Culture, age, marital status, gender, economic status, leisure activities, educational attainment, chronic diseases, physical disabilities, social security, family relations and nursing home resident status are important variables affecting quality of life (Ercan Şahin, 2015). Receiving support for psychosocial needs also shows positive results with regard to perceived loneliness, quality of life and attitudes among older people (Esmaeilzadeh and Oz, 2020). According to the needs satisfaction approach, quality of life varies according to the number of satisfied needs, which can be either biological or social (Wiggins *et al.*, 2004). Danış (2009) explains that satisfaction with physical, spiritual and mental health and the state of enjoyment of life play a role in improving quality of life.

Relations among variables and hypotheses

The closeness of relationships with other individuals decreases among older people with increased health risks (Griffin *et al.*, 2020). Parlapani *et al.* (2020) found that, during the COVID-19 pandemic, older adults exhibited moderate to severe (84.5%) anxiety symptoms, moderate to severe depressive symptoms (81.6%) and sleep

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

disturbances (37.9%). They also found that older women experienced greater fear of COVID-19, had more severe depressive symptoms and sleep disturbances, and exhibited greater intolerance to uncertainty, and those individuals living alone had greater feelings of loneliness than other participants in the study. Simon *et al.* (2014) found that older adults who had experienced adverse health changes in the previous year were more likely to experience a sense of loneliness. Grossman *et al.* (2021) found that loneliness related to COVID-19 was associated with more sleep problems. Those with psychiatric diagnoses were more affected by loneliness during the implementation of social isolation measures to prevent the spread of COVID-19 (Hoffart *et al.*, 2020).

- Hypothesis 1: Fear of COVID-19 among older adults is positively related to their sense of loneliness.

Since the isolation measures undertaken to counteract the spread of the pandemic have led to some problems related to the wellbeing and health of older adults (Korkmaz, 2019; Bozkurt *et al.*, 2020; Steinman *et al.*, 2020), fear of COVID-19 may affect their quality of life. Dymecka *et al.* (2022) found a significant association between life satisfaction and fear of COVID-19. According to Alyami *et al.* (2021), fear of COVID-19 indirectly affects quality of life. Maslakçı *et al.* (2021) also identified close associations between these two variables. People's ways of life may change depending on isolation measures, and living apart from relatives and friends may lead to declines in quality of life.

- Hypothesis 2: Fear of COVID-19 is negatively related to older people's quality of life.

Quality of life is fed by emotional support (Doran *et al.*, 2019). However, loneliness in older age may damage wellness and quality of life. For example, Morris (2020) proposed that reducing loneliness could mitigate the risk of depression. VanderWeele *et al.* (2012) identified mutual effects between loneliness and subjective wellbeing. Ekwall *et al.* (2005) found that loneliness was the most important factor predicting low quality of life among older people, and Çam *et al.* (2018) revealed that feelings of loneliness were more intense among older adults with insufficient social interaction (*i.e.* interactions in which psychosocial support, social bonds or emotional attachment could not be achieved). They emphasised that these individuals' mental health and quality of life were negatively affected. The quality of life of older people living in nursing homes has been found to be significantly worse than that of those living at home (Göktaş, 2006). A negative relationship has also been found between quality of life and loneliness (Weiner *et al.*, 2010; Vuletić and Stapić, 2013; Faruk *et al.*, 2019; Korkmaz, 2019; Szabo *et al.*, 2019). In other words, loneliness may decrease quality of life (Gerino *et al.*, 2017; Faruk *et al.*, 2019). In light of this, we propose the following relationship between loneliness and quality of life among those aged 60 years and older:

- Hypothesis 3: The sense of loneliness experienced by older individuals is negatively related to their quality of life.

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

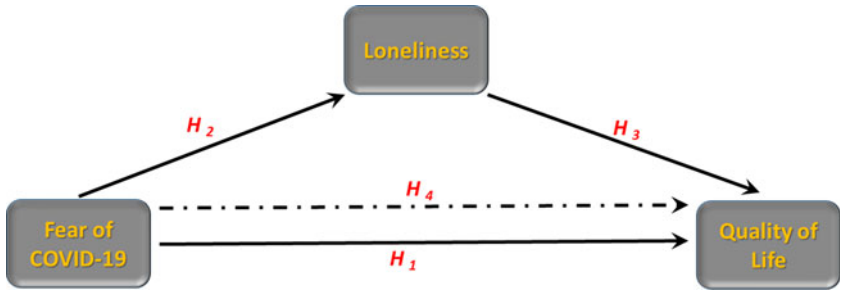

Figure 1. Research model and hypotheses.
Notes: H_1: Hypothesis 1. H_2: Hypothesis 2. H_3: Hypothesis 3. H_4: Hypothesis 4. The mediating effect is shown in dash lines.

The absence of social associations with friends and parents may lead to feelings of loneliness (Weiner et al., 2010). Moreover, fear of COVID-19 and social isolation measures may cause individuals to feel lonely (Hoffart *et al.*, 2020; Grossman *et al.*, 2021) and contribute to lower quality of life (Alyami *et al.*, 2021; Maslakçı *et al.*, 2021). Considering that loneliness is a predictor of quality of life (Weiner *et al.*, 2010; Vuletić and Stapić, 2013; Faruk *et al.*, 2019; Korkmaz, 2019; Szabo *et al.*, 2019), it may mediate the negative association between fear of COVID-19 and quality of life. Although there is little evidence of this mediation effect in the existing literature, we propose the following role of loneliness in the relationship between fear of COVID-19 and quality of life:

- Hypothesis 4: Loneliness mediates the relationship between fear of COVID-19 and quality of life among older adults.

Method

Research model

The research model prepared based on the hypotheses is shown in Figure 1. Data obtained from individuals aged 60 years and older were entered into a database and coded for subsequent analysis. Confirmatory factor analyses were conducted using AMOS. Cronbach's alpha reliability coefficients, correlations and multiple regressions were calculated using SPSS. The principles outlined by Baron and Kenny (1986) were used as a reference framework when assessing the potential mediating role of loneliness. Sobel tests and Hayes's (2017) PROCESS bootstrapping macro for SPSS were used to confirm the mediation effect.

Sample

The sample in this research included older individuals living in Turkey. Individuals from the Burdur city centre and surrounding villages were selected using simple random sampling. A total of 267,092 people live in Burdur, 56,296 (21%) of whom are older adults (Table 1). Of the 540 surveys we distributed in February 2021, 397 were returned. Since outliers, which can be referred to as deviants (Aggarwal, 2017), can dramatically affect the inference results (Woolrich, 2008),

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Table 1. Distribution of the older population in Burdur by gender

	Male		Female			
Age	Rural	Urban	Rural	Urban	Total	Percentage
60–64	3,167	4,457	3,490	4,726	15,840	5.85
65–69	2,672	3,552	3,327	3,681	13,232	4.89
70–74	2,228	2,267	3,013	2,750	10,258	3.79
75–79	1,544	1,410	2,297	1,847	7,098	2.62
80–84	1,170	975	1,638	1,425	5,208	1.92
85–90	800	553	1,175	914	3,442	1.27
>90	209	186	407	416	1,218	0.45
Total	11,790	13,400	12,334	15,759	56,296	21

Source: TÜİK/MEDAS (2020).

outlier analysis was conducted. As a result of the analysis, ten responses were excluded from the dataset. Participants' average age was 69.5 years. Of the total sample, 46 per cent were female and 54 per cent were male; 40 per cent had graduated from primary or secondary school, 14 per cent from high school and 31 per cent from university, 7 per cent had a postgraduate education and the remaining 8 per cent were literate.

Measures

Quality of Life Scale in Older People (CASP-19)

The 19-item CASP-19, developed by Hyde *et al.* (2003) to measure quality of life among older people, was used to determine participants' levels of quality of life (*see* the Appendix). Answers are provided on a four-point Likert scale ranging from 0 ('never') to 3 ('always') (Hyde *et al.*, 2003). Sample items include 'My age prevents me from doing the things I would like to', 'My health stops me from doing the things I want to do' and 'I feel that the future looks good for me'. The Turkish translation of the scale was created by Türkoğlu and Adıbelli (2014). Confirmatory factor analysis was performed to test the CASP-19's sampling suitability and structural validity. Results showed that the values of goodness-of-fit indices were good in the analysis using a single-factor model (χ^2/degrees of freedom (df) = 4.58, Goodness-of-Fit Index (GFI) = 0.91, Incremental Fix Index (IFI) = 0.95, Comparative Fit Index (CFI) = 0.95, Root Mean Square Error of Approximation (RMSEA) = 0.09). Factor loadings of items ranged from 0.57 to 0.91. Cronbach's alpha must be at least 0.70 for a scale to be considered reliable (Fields, 2002; Neuman, 2007); the CASP-19's reliability coefficient was high ($\alpha = 0.96$).

Fear of COVID-19 Scale (FCV-19S)

The seven-item FCV-19S developed by Ahorsu *et al.* (2020) was used to measure fear of COVID-19. Answers are provided on a five-point Likert scale ranging

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Table 2. Means, standard deviations (SD) and correlations

Variable	Mean	SD	1	2	3	4
1. Age	69.54	6.78	–			
2. Quality of life	1.61	0.87	−0.67**	(0.96)		
3. Fear of COVID-19	3.32	0.90	0.30**	−0.40**	(0.88)	
4. Loneliness	0.95	0.65	0.54**	−0.81**	0.47**	(0.93)

Note: Alpha reliability coefficients are shown in parentheses.
Significance level: ** $p \leqslant 0.01$.

from 1 ('strongly disagree') to 5 ('strongly agree'). Sample items include 'It makes me uncomfortable to think about coronavirus-19', 'I am afraid of losing my life because of coronavirus-19' and 'I cannot sleep because I'm worrying about getting coronavirus-19' (*see* the Appendix). The FCV-19S was translated into Turkish by Bakioğlu *et al.* (2020) and has high reliability ($\alpha = 0.88$). Confirmatory factor analysis indicated that the FCV-19S's goodness-of-fit indices were good ($\chi^2/df = 2.31$, GFI = 0.98, IFI = 0.99, CFI = 0.99, RMSEA = 0.06). Factor loadings of items ranged from 0.44 to 0.81. As a result of the reliability analysis, it was determined that the reliability coefficient of the scale was high ($\alpha = 0.88$).

Loneliness Scale for the Elderly (LSE)

The 11-item LSE developed by De Jong Gierveld and Kamphuis (1985) and adapted by Van Tilburg and De Jong Gierveld (1999) was used to measure participants' perceived feelings of loneliness (*see* the Appendix). Sample items include 'I experience a general sense of emptiness', 'I miss the pleasure of the company of others' and 'I miss having people around'. Akgül and Yeşilyaprak (2015) translated the LSE into Turkish and found that it had high reliability ($\alpha = 0.85$). Confirmatory factor analysis indicated that the LSE's goodness-of-fit indices fit the single-factor structure ($\chi^2/sd = 3.08$, GFI = 0.94, IFI = 0.97, CFI = 0.97, RMSEA = 0.07). Factor loadings of items ranged from 0.47 to 0.90. The scale had high reliability ($\alpha = 0.93$).

Findings

Because data must fit the normal distribution for parametric analysis tests (Yazıcıoğlu and Erdoğan, 2004), analysis of normal distribution was performed and indicated that the data were normally distributed. Pearson's correlations were calculated to determine the relations among variables (Table 2). To assess the mediating role of loneliness in the relationship between fear of COVID-19 and quality of life, we followed Baron and Kenny's (1986) procedure and used Sobel tests. According to this method, three conditions must be met to test the mediating effect of a variable. First, the independent variable should be significantly related to the mediator variable. Second, the independent variable should be related to the dependent variable. Third, the mediator should be included in the model. In this last stage, the mediating variables should be related to the dependent variables

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Table 3. Mediating role of loneliness in the relationship between fear of COVID-19 and quality of life

Model	Dependent variable	β	*t*	*R*	R^2	*F*
Test 1 (Hypothesis 1):				0.73	0.53	142.11***
Age	Quality of life	−0.59	−15.77***			
Fear of COVID-19		−0.23	−6.10***			
Test 2 (Hypothesis 2):				0.67	0.45	102.35***
Age	Loneliness	0.41	10.25***			
Fear of COVID-19		0.35	8.69***			
Test 3 (Hypothesis 3):				0.86	0.73	340.72***
Age	Quality of life	−0.34	−10.63***			
Loneliness		−0.61	−18.52***			
Test 4 (Hypothesis 4):				0.86	0.73	255.10***
Age	Quality of life	−0.34	−10.59***			
Fear of COVID-19		−0.02	−0.51			
Loneliness		−0.60	−16.67***			
Sobel test (*z*)		−7.83***				

Significance level: *** $p < 0.001$.

with the independent variables included in the equation. If the independent variables have no significant beta weights in the final stage, a full mediation effect is indicated. After these tests, we used bootstrapping to obtain a more robust *p*-value (Caron, 2019). The analyses controlled for age as a possible covariate here for clarity.

Regression analysis was conducted to test the hypotheses (Table 3). The beta weights for fear of COVID-19 and perceived quality of life were negative and significant ($\beta = -0.23$, $p < 0.001$). The beta weights for fear of COVID-19 and loneliness were also significant ($\beta = 0.35$, $p < 0.001$). In addition, loneliness was negatively and significantly related to quality of life ($\beta = -0.61$, $p < 0.001$). The R^2 values (Table 3) indicate that sense of loneliness explained 73 per cent of the variance in quality of life, a relatively high proportion in the statistical model. Thus, the first three hypotheses are supported.

In the final step, fear of COVID-19 and the interaction of loneliness on quality of life were tested together. While the negative beta weight for the interaction between fear of COVID-19 and quality of life was not significant ($\beta = -0.02$, $p > 0.05$), the interaction between loneliness and quality of life was significant ($\beta = -0.60$, $p < 0.001$). In other words, when loneliness was added to the model as a mediator variable, the regression coefficient for fear of COVID-19 – which has a significant effect on quality of life ($p < 0.001$) – was reduced from −0.23 to −0.02, and the association lost its significance ($p > 0.05$). The predictor variables together explained 73 per cent of the variance in quality of life. Thus, we conclude that loneliness fully mediates the relation between fear of COVID-19 and quality of life. Sobel's

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

test also showed that loneliness plays a mediating role in the relation between fear of COVID-19 and quality of life ($z = -7.83$, $p < 0.001$).

Since the bootstrapping method is free from statistical distribution assumptions (Caron, 2019) and has more powerful statistical properties than the Sobel test with regard to indirect effect detection (Hayes, 2009), we also employed this method, using bias-corrected confidence intervals (CIs) (MacKinnon *et al.*, 2004). The 95 per cent CI of the indirect effects was obtained using 5,000 bootstrap resamples (Caron, 2019). Results indicated that fear of COVID-19 was negatively associated with quality of life ($B = -0.39$, $t(386) = -8.47$, $p < 0.001$) and positively related to loneliness ($B = 0.34$, $t(386) = 10.36$, $p < 0.001$). Finally, the mediator variable (*i.e.* loneliness) was negatively related to quality of life ($B = -0.79$, $p < 0.001$). When controlling for loneliness, the direct effect of fear of COVID-19 on quality of life became non-significant ($B = -0.02$, $t(386) = -0.74$, $p < 0.001$). Thus, it was confirmed that loneliness mediates the relationship between fear of COVID-19 and quality of life ($B = -0.37$; CI = −0.44 to −0.30). Hypothesis 4 is therefore supported.

Discussion

In this study, older adults' fear of COVID-19, loneliness and quality of life were examined by collecting data from participants aged 60 years and older. Hypotheses regarding the relationship among fear of COVID-19, quality of life and loneliness were examined empirically. First, confirmatory factor analyses were performed to detect the factorial structure for each instrument. Subsequently, mediation analysis (controlling for age as a continuous covariate) was performed to assess the nature of the relationship between fear and quality of life and the extent to which that relationship is mediated by loneliness. Following Baron and Kenny's (1986) procedure and using Sobel tests, we used bootstrapping to obtain a more robust *p*-value (Caron, 2019).

We found a negative and direct relationship between loneliness and quality of life. Loneliness explained roughly 76 per cent of the variance in quality of life. This finding shows an overwhelming association that is consistent with other studies in the literature. As Ekwall *et al.* (2005) and Çam *et al.* (2018) have pointed out, loneliness affects quality of life. Although living alone does not necessarily equate to loneliness, people who live alone may have felt loneliness more intensely during the pandemic because of social isolation and limited social activities. In turn, older people's quality of life may have fallen over time as a result of living alone (Gouveia *et al.*, 2017). Likewise, quality of life decreases among older people if their feelings of loneliness are high (Gerino *et al.*, 2017; Faruk *et al.*, 2019). Thus, loneliness is an important factor in older people's quality of life. We also found the effect of loneliness on quality of life to be higher in our sample than in some other studies conducted in individualist societies (Weiner *et al.*, 2010; Szabo *et al.*, 2019). As Beller and Wagner (2020) have proposed, this result may show that collectivist communities assign more importance to loneliness than their individualist counterparts. Thus, feelings of loneliness may reduce older adults' quality of life much more in collectivist cultures than in Western cultures.

Another important finding of our research is that fear of COVID-19 has a significant effect on loneliness. Specifically, as fear of COVID-19 increases, loneliness

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

also increases. We believe that this result is valuable in that it has not previously been recorded in the literature. Since older adults are more strongly affected by COVID-19 (Griffin *et al.*, 2020; Parlapani *et al.*, 2020), they may be especially pushed to isolate themselves. We also found that fear of COVID-19 has a negative effect on quality of life, which likewise appears to be the first such finding in the literature. Given that the pandemic has affected the wellbeing of older people (Steinman *et al.*, 2020) and that fear of COVID-19 has an indirect effect on quality of life (Alyami, 2021), this conclusion is in line with other findings. Fear of COVID-19 leads individuals to isolate themselves and live apart from their relatives and friends, depriving them of physical and psychological support and interactions. This, in turn, may lead to a decrease in their quality of life.

Finally, loneliness mediates the relation between fear of COVID-19 and quality of life. This result is noteworthy, as we could not find any similar finding in the literature. This finding strongly suggests that fear of COVID-19 influences quality of life via loneliness. In other words, older people with high levels of fear of COVID-19 are at increased risk of experiencing high levels of loneliness, resulting in low quality of life. While fear of COVID and social isolation measures promote feelings of loneliness (Hoffart *et al.*, 2020; Grossman *et al.*, 2021) and indirectly affect quality of life (Alyami *et al.*, 2021), loneliness leads to a decline in the quality of older adults' lives (Weiner *et al.*, 2010; Vuletić and Stapić, 2013; Faruk *et al.*, 2019; Korkmaz, 2019; Szabo *et al.*, 2019). Hence, fear of COVID-19 indirectly affects quality of life through loneliness. In line with the literature (Simon *et al.*, 2014; Dymecka *et al.*, 2022), this result seems to indicate that people who are more afraid of a pandemic are not only exposed to a sense of loneliness but also experience a lower quality of life. This impact on quality of life can be ameliorated to some extent by having social and official support.

Limitations and recommendations for future research

Our research only examined fear of COVID-19, loneliness and quality of life. The inclusion of other variables that might impact quality of life would expand the scope of this research. In the model we created, only the mediating role of loneliness was tested and determined. We recommend examining the role of this variable as a moderator in similar models. Moreover, the scales used in this research measure individuals' self-perceptions. Therefore, factors such as common method variance and social desirability bias should be taken into account when analysing our data. Finally, we used simple methods to test our hypotheses, which poses limitations: specifically, treating the responses as continuous rather than ordinal and directly using the loneliness score as a mediator, rather than using a complete ordinal structural equation model. Considering the novelty of this research, this may still be acceptable, but further analysis using different methods or statistical programs would deepen our results.

Conclusion and implications

Urgent action is needed to alleviate the problems that have arisen due to social isolation and fear of COVID-19. It is recommended that psychosocial support services should be strengthened in order to reduce fear of COVID-19. Since older people

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

experience this feeling deeply as a result of their social isolation, the negative effects of loneliness within this population should be reduced using innovative solutions. In addition, public fear of COVID-19 should be addressed by increasing health literacy. To this end, a social support line could be established to provide a sense of belonging, and online support could be provided using new technologies.

Financial support. This research was not supported by any funding body or financial sponsors.

Conflict of interest. The authors declare no conflicts of interest.

Ethical standards. Ethical approval was received from the Mehmet Akif University Non-Interventional Clinical Research Ethics Committee (reference GO 2021/80). All participants indicated their consent to participate in the study prior to answering the questionnaire. All participants were fully anonymised.

References

Aggarwal CC (2017) An introduction to outlier analysis. In *Outlier Analysis*. Cham, Switzerland: Springer, pp. 1–34.

Ahorsu DK, Lin C-Y, Imani V, Saffari M, Griffiths MD and Pakpour AH (2020) The fear of COVID-19 scale: development and initial validation. *International Journal of Mental Health and Addiction* **18**, 1–8.

Akbaş E, Taşdemir Yiğitoğlu G and Çunkuş N (2020) Social isolation and loneliness in elderly. *International Journal of Society Researches* **15**, 4540–4562.

Akgül H and Yeşilyaprak B (2015) Adaption of loneliness scale for elderly into Turkish culture: validity and reliability study. *Elderly Issues Research Journal* **8**, 34–45.

Altay B, Çavuşoğlu F and Çal A (2016) The factors affecting the perception of elderly patients towards health, quality of life and health-related quality of life. *TAF Preventive Medicine Bulletin* **15**, 181–189.

Altuğ F, Yağcı N, Kitiş A, Büker N and Cavlak U (2009) Analyzing factors affecting the quality of life in elderly at home. *Elderly Issues Research Journal* **2**, 48–60.

Alyami M, de Albuquerque JV, Krägeloh CU, Alyami H and Henning MA (2021) Effects of fear of COVID-19 on mental well-being and quality of life among Saudi adults: a path analysis. *Saudi Journal of Medicine & Medical Sciences* **9**, 24–30.

Armitage R and Nellums LB (2020) COVID-19 and the consequences of isolating the elderly. *The Lancet Public Health* **5**, 256.

Bakioğlu F, Korkmaz O and Ercan H (2020) Fear of COVID-19 and positivity: mediating role of intolerance of uncertainty, depression, anxiety, and stress. *International Journal of Mental Health and Addiction* **18**, 1–14.

Baron RM and Kenny DA (1986) The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* **51**, 1173–1182.

Beller J and Wagner A (2020) Loneliness and health: the moderating effect of cross-cultural individualism/collectivism. *Journal of Aging and Health* **32**, 1516–1527.

Birtane M, Tuna H, Ekuklu G, Uzunca K, Akçi C and Kokino S (2000) The evaluation of factors effecting quality of life in the residents of Edirne elderly instution. *Turkish Journal of Geriatrics* **3**, 141–145.

Bozkurt Y, Zeybek Z and Aşkın R (2020) Covid-19 pandemic: psychological effects and therapeutic interventions. *Journal of Istanbul Ticaret University* **19**, 304–318.

Brooke J and Jackson D (2020) Older people and COVID-19: isolation, risk and ageism. *Journal of Clinical Nursing* **29**, 2044–2046.

Cacioppo JT, Hughes ME, Waite LJ, Hawkley LC and Thisted RA (2006) Loneliness as a specific risk factor for depressive symptoms: cross-sectional and longitudinal analyses. *Psychology and Aging* **21**, 140–151.

Çam C, Atay E and Işıklı B (2018) Loneliness and quality of life in elderly. *Turkish World Implementation and Research Center Public Health Journal* **3**, 49–67.

Caron PO (2019) A comparison of the type I error rates of three assessment methods for indirect effects. *Journal of Statistical Computation and Simulation* **89**, 1343–1356.

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Courtin E and Knapp M (2017) Social isolation, loneliness and health in old age: a scoping review. *Health and Social Care in the Community* **25**, 799–812.

Danış NZ (2009) *Quality of Life and Factors Affecting Quality of Life of the Elderly People Living in Institutions: A Survey in the Ankara Sample* (PhD dissertation). Hacettepe Üniversity, Ankara.

De Jong Gierveld J and Kamphuis FH (1985) The development of a Rasch-type loneliness-scale. *Applied Psychological Measurement* **9**, 289–299.

Dhama K, Kumar Patel S, Kumar R, Rana J, Iqbal Yatoo M, Kumar A, Tiwari R, Dhama J, Natesan S, Singh R and Harapan H (2020) Geriatric population during the COVID-19 pandemic: problems, considerations, exigencies, and beyond. *Frontiers in Public Health* **8**, 562.

Doran P, Burden S and Shryane N (2019) Older people living well beyond cancer: the relationship between emotional support and quality of life. *Journal of Aging and Health* **31**, 1850–1871.

Duan L and Zhu G (2020) Psychological interventions for people affected by the COVID-19 epidemic. *The Lancet Psychiatry* **7**, 300–302.

Duman N (2020) COVID-19 fear and intolerance to uncertainty in university students. *Journal of Social Science* **4**, 426–437.

Dymecka J, Gerymski R and Machnik-Czerwik A (2022) How does stress affect our life satisfaction during the COVID-19 pandemic? Moderated mediation analysis of sense of coherence and fear of coronavirus. *Psychology, Health & Medicine* **27**, 280–288.

Ekwall AK, Sivberg B and Hallberg IR (2005) Loneliness as a predictor of quality of life among older caregivers. *Journal of Advanced Nursing* **49**, 23–32.

Ercan Şahin N (2015) *The Effect of Applied Reminiscence Therapy on the Quality of Life of Older Adults in Living Nursing Homes* (PhD thesis). Hacettepe University, Health Science Institute, Ankara.

Eser E (2006) Conceptual foundations and measurement of health-related quality of life. *Sağlıkta Birikim Dergisi* **1**, 1–5.

Esmaeilzadeh S and Oz F (2020) Effect of psychosocial care model applied in an 'elderly day care center' on loneliness, depression, quality of life, and elderly attitude. *Nigerian Journal of Clinical Practice* **23**, 189–197.

Faruk AY, Akkaya D and Başıbüyük GÖ (2019) The effect of life quality on loneliness: example of Antalya 60+ Tazelenme University. *Cumhuriyet University Faculty of Letters Journal of Social Sciences* **43**, 193–210.

Fields DL (2002) *Taking the Measure of Work: A Guide to Validated Scales for Organizational Research and Diagnosis*. Thousand Oaks, CA: Sage.

Fletcher JR (2021) Chronological quarantine and ageism: COVID-19 and gerontology's relationship with age categorisation. *Ageing & Society* **41**, 479–492.

Gencer N (2019) Ritualization as alternative approach to the spiritual dimension of palliative care: a concept analysis. *Dini Araştırmalar* **22**, 489–502.

Gencer N (2020) Being elderly in covid-19 process: evaluations on curfew for 65-year-old and over citizens and spiritual social work. *Turkish Journal of Social Work Research* **4**, 35–42.

Gerino E, Rollè L, Sechi C and Brustia P (2017) Loneliness, resilience, mental health, and quality of life in old age: a structural equation model. *Frontiers in Psychology* **8**, 2003.

Gerst-Emerson K and Jayawardhana J (2015) Loneliness as a public health issue: the impact of loneliness on health care utilization among older adults. *American Journal of Public Health* **105**, 1013–1019.

Göktaş K (2006) *Comparison of Elderly People Staying in Nursing Homes and Elderly People Living at Home in Terms of Sleep, Quality of Life, Functionality* (PhD thesis). Necmettin Erbakan University, Konya, Turkey.

Gouveia ÉRQ, Gouveia BR, Ihle A, Kliegel M, Maia JA, Badia SB and Freitas DL (2017) Correlates of health-related quality of life in young-old and old-old community-dwelling older adults. *Quality of Life Research* **26**, 1561–1569.

Griffin SC, Williams AB, Mladen SN, Perrin PB, Dzierzewski JM and Rybarczyk BD (2020) Reciprocal effects between loneliness and sleep disturbance in older Americans. *Journal of Aging and Health* **32**, 1156–1164.

Grossman ES, Hoffman YS, Palgi Y and Shrira A (2021) COVID-19 related loneliness and sleep problems in older adults: worries and resilience as potential moderators. *Personality and Individual Differences* **168**, 1–5.

Hawkley LC, Thisted RA, Masi CM and Cacioppo JT (2010) Loneliness predicts increased blood pressure: 5-year cross-lagged analyses in middle-aged and older adults. *Psychology and Aging* **25**, 132–141.

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Hayes AF (2009) Beyond Baron and Kenny: statistical mediation analysis in the new millennium. *Communication Monographs* **76**, 408–420.

Hayes AF (2017) *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach*. New York, NY: Guilford Press.

Hoffart A, Johnson SU and Ebrahimi OV (2020) Loneliness and social distancing during the COVID-19 pandemic: risk factors and associations with psychopathology. *Frontiers in Psychiatry* **11**, 1297.

Hofstede G (2001) *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*. Thousand Oaks, CA: Sage.

Hyde M, Wiggins RD, Higgs P and Blane DB (2003) A measure of quality of life in early old age: the theory, development and properties of a need's satisfaction model (CASP-19). *Aging & Mental Health* **7**, 186–194.

James BD, Wilson RS, Barnes LL and Bennett DA (2011) Late-life social activity and cognitive decline in old age. *Journal of the International Neuropsychological Society* **17**, 998–1005.

Kabasakal H and Bodur M (2007) Leadership and culture in Turkey: a multifaceted phenomenon. In Chhokar JS, Brodbeck F and House R (eds)., *Culture and Leadership Across the World*: The GLOBE book of in-depth studies of 25 societies . Psychology Press, pp. 835–874. Mahwah, NJ: LEA Publishers.

Knox SS and Uvnäs-Moberg K (1998) Social isolation and cardiovascular disease: an atherosclerotic pathway? *Psychoneuroendocrinology* **23**, 877–890.

Koehn S, Ferrer I and Brotman S (2022) Between loneliness and belonging: narratives of social isolation among immigrant older adults in Canada. *Ageing & Society* **42**, 1117–1137.

Korkmaz T (2019) *The Research of Loneliness Perception and the Quality of Life of the Elder People Who Live in Retirement Homes Based on Some Criteria* (Master's thesis). Maltepe University, Graduate School of Social Sciences, Istanbul.

Lee TW, Ko IS and Lee KJ (2006) Health promotion behaviors and quality of life among community-dwelling elderly in Korea: a cross-sectional survey. *International Journal of Nursing Studies* **43**, 293–300.

Lee HJ, Small BJ and Haley WE (2020) Health and well-being in the year before death: the association with quality of life and care at the end-of-life. *Journal of Aging and Health* **32**, 1475–1485.

Lin C-Y (2020) Social reaction toward the 2019 novel coronavirus (COVID-19). *Social Health and Behavior* **3**, 1–2.

Liu K, Chen Y, Lin R and Kunyuan H (2020) Clinical features of COVID-19 in elderly patients: a comparison with young and middle-aged patients. *Journal of Infection* **80**, 14–18.

MacKinnon DP, Lockwood CM and Williams J (2004) Confidence limits for the indirect effect: distribution of the product and resampling methods. *Multivariate Behavioral Research* **39**, 99–128.

Maslakçı A, Sürücü L and Sesen H (2021) Fear of COVID-19 and work–quality of life among nurses: the mediating role of psychological well-being. *Management Science Letters* **11**, 1985–1990.

Morris ZA (2020) Loneliness as a predictor of work disability onset among nondisabled, working older adults in 14 countries. *Journal of Aging and Health* **32**, 554–563.

Musschenga AW (1997) The relation between concepts of quality of life, health and happiness. *Journal of Medicine and Philosophy* **22**, 11–28.

Neuman WL (2007) *Basics of Social Research*. Boston, MA: Pearson/Allyn and Bacon.

Pandya P (2020) Effect on mental health issues during the COVID-19 pandemic. *British Journal of General Practice* **70**, 382–382.

Pappas G, Kiriaze IJ, Giannakis P and Falagas ME (2009) Psychosocial consequences of infectious diseases. *Clinical Microbiology and Infection* **15**, 743–747.

Parlapani E, Holeva V, Nikopoulou VA, Sereslis K, Athanasiadou M, Godosidis A, Stephanou T and Diakogiannis I (2020) Intolerance of uncertainty and loneliness in older adults during the COVID-19 pandemic. *Frontiers in Psychiatry* **11**, 842.

Paşa FS, Kabasakal H and Bodur M (2001) Society, organizations, and leadership in Turkey. *Applied Psychology* **50**, 559–589.

Perissinotto CM, Stijacic Cenzer I and Covinsky KE (2012) Loneliness in older persons. *Archives of Internal Medicine* **172**, 1078–1083.

Republic of Turkey Ministry of Interior (2020) *65 Yaş ve Üstü ile Kronik Rahatsızlığı Olanlara Sokağa Çıkma Yasağı Genelgesi*. Available at https://www.icisleri.gov.tr/65-yas-ve-ustu-ile-kronik-rahatsizligi-olanlara-sokaga-cikma-yasagi-genelgesi.

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Siedner MJ (2019) Aging, health, and quality of life for older people living with HIV in Sub-Saharan Africa: a review and proposed conceptual framework. *Journal of Aging and Health* **31**, 109–138.

Simon MA, Chang ES, Zhang M, Ruan J and Dong X (2014) The prevalence of loneliness among US Chinese older adults. *Journal of Aging and Health* **26**, 1172–1188.

Steinman MA, Perry L and Perissinotto CM (2020) Meeting the care needs of older adults isolated at home during the COVID-19 pandemic. *JAMA International Medicine* **180**, 819–820.

Szabo A, Allen J, Alpass F and Stephens C (2019) Loneliness, socio-economic status and quality of life in old age: the moderating role of housing tenure. *Ageing & Society* **39**, 998–1021.

Theeke LA and Mallow J (2013) Loneliness and quality of life in chronically ill rural older adults: findings from a pilot study. *American Journal of Nursing* **113**, 28–38.

TÜİK/MEDAS (2020) *Merkezi dağıtım sistemi*. Available at https://biruni.tuik.gov.tr/medas/?kn=95&locale=tr.

Türkoğlu N and Adıbelli D (2014) Adaptation of Quality of Life Scale in Older People (CASP-19) to Turkish society. *Akad Geriatri* **6**, 98–105.

VanderWeele TJ, Hawkley LC and Cacioppo JT (2012) On the reciprocal association between loneliness and subjective well-being. *American Journal of Epidemiology* **176**, 777–784.

Van Tilburg TG and De Jong Gierveld J (1999) Cesuurbepaling van de enzaamheidsschaal [Reference standards for the loneliness scale]. *Tijdschrift voor Gerontologie en Geriatrie* **30**, 158–163.

Victor CR, Scambler SJ, Bowling A and Bond J (2005) The prevalence of, and risk factors for, loneliness in later life: a survey of older people in Great Britain. *Ageing & Society* **25**, 357–375.

Vuletić G and Stapić M (2013) Quality of life and loneliness among elderly people. *Klinička Psihologija* **6**, 45–61.

Weiner A, Roe D, Mashiach-Eizenberg M, Baloush-Kleinman V, Maoz H and Yanos PT (2010) Housing model for persons with serious mental illness moderates the relation between loneliness and quality of life. *Community Mental Health Journal* **46**, 389–397.

Wiggins RD, Higgs PF, Hyde M and Blane DB (2004) Quality of life in the third age: key predictors of the CASP-19 measure. *Ageing & Society* **24**, 693–708.

Willis P, Vickery A and Jessiman T (2022) Loneliness, social dislocation and invisibility experienced by older men who are single or living alone: accounting for differences across sexual identity and social context. *Ageing & Society* **42**, 409–431.

Woolrich M (2008) Robust group analysis using outlier inference. *Neuroimage* **41**, 286–301.

World Health Organization (WHO) (2017) *Mental Health of Older Adults*. Geneva: WHO. Available at https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults.

World Health Organization (WHO) (2021*a*) *#Healthy at Home*. Geneva: WHO. Available at https://www.who.int/campaigns/connecting-the-world-to-combat-coronavirus/healthyathome?gclid=Cj0KCQiA3Y-ABhCnARIsAKYDH7t7ldzlxso_K7TV-HC-bIeVIcFEy-uTEgB6JPEhI5Hb9-x0kAhyLD4aAogyEALw_wcB.

World Health Organization (WHO) (2021*b*) *WHOQOL: Measuring Quality of Life*. Geneva: WHO. Available at https://www.who.int/toolkits/whoqol#:~:text=The%20WHOQOL%20is%20a%20quality,would%20be%20applicable%20cross%2Dculturally.

Xiao C (2020) A novel approach of consultation on 2019 novel coronavirus (COVID-19)-related psychological and mental problems: structured letter therapy. *Psychiatry Investigation* **17**, 175–176.

Yanez ND, Weiss NS, Romand JA and Treggiari MM (2020) COVID-19 mortality risk for older men and women. *BMC Public Health* **20**, 1742.

Yazıcıoğlu Y and Erdoğan S (2004) *SPSS Applied Scientific Research Methods*. Ankara: Detay Publishing.

Zhang J, Xu L, Li J, Sun L, Ding G, Qian W, Jing Z, Zihang Yu and Xie S (2018) Loneliness and health service utilization among the rural elderly in Shandong, China: a cross-sectional study. *International Journal of Environmental Research and Public Health* **15**, 1468.

https://doi.org/10.1017/S0144686X21001938 Published online by Cambridge University Press

Appendix

Quality of Life Scale in Older People (CASP-19)

1. My age prevents me from doing the things I would like to.
2. I feel that what happens to me is out of my control.
3. I feel free to plan for the future.
4. I feel left out of things.
5. I can do the things that I want to do.
6. Family responsibilities prevent me from doing what I want to do.
7. I feel that I can please myself what I can do.
8. My health stops me from doing the things I want to do.
9. Shortage of money stops me from doing the things that I want to do.
10. I look forward to each day.
11. I feel that my life has meaning.
12. I enjoy the things that I do.
13. I enjoy being in the company of others.
14. On balance, I look back on my life with a sense of happiness.
15. I feel full of energy these days.
16. I choose to do things that I have never done before.
17. I feel satisfied with the way my life has turned out.
18. I feel that life is full of opportunities.
19. I feel that the future looks good for me.

The Fear of COVID-19 Scale (FCV-19S)

1. I am most afraid of coronavirus-19.
2. It makes me uncomfortable to think about coronavirus-19.
3. My hands become clammy when I think about coronavirus-19.
4. I am afraid of losing my life because of coronavirus-19.
5. When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.
6. I cannot sleep because I'm worrying about getting coronavirus-19.
7. My heart races or palpitates when I think about getting coronavirus-19.

Loneliness Scale for the Elderly (LSE)

1. There is always someone I can talk to about my day-to-day problems.
2. I miss having a really close friend.
3. I experience a general sense of emptiness.
4. There are plenty of people I can lean on when I have problems.
5. I miss the pleasure of the company of others.
6. I find my circle of friends and acquaintances too limited.
7. There are many people I can trust completely.
8. There are enough people I feel close to.
9. I miss having people around.
10. I often feel rejected.
11. I can call on my friends whenever I need them.

Cite this article: Altay M, Arisoy A (2024). Fear of COVID-19 and quality of life: the mediating role of loneliness among older Turkish adults. *Ageing & Society* **44**, 1–16. https://doi.org/10.1017/S0144686X21001938