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ORIGINAL ARTICLE

Loneliness and Depression among Community Older Adults during the COVID-19 Pandemic: A cross-sectional study

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Abstract

Background: Social isolation has been recommended for reducing older adults' mortality and severe cases of COVID illness. That has resulted in unavoidable consequences of mental ill-health. This study aimed to examine the impact of the COVID-19 lockdown on the development of loneliness and depression and to analyse the factors associated with these conditions among community-dwelling older adults in Jordan.

Methods: A cross-sectional survey was conducted with a random sample of 456 community older adults contacted by telephone three weeks after the first pandemic lockdown in April 2020. The study instrument included the screening three-item UCLA Loneliness Scale, the Geriatric Depression Scale, and relevant medical and functional history.

Results: The mean age was 72.48 ± 6.84 years, and 50.2% were women. 41.4% were lonely, and of those 62% had a positive screen for depression. The mean UCLA score was significantly higher during the lockdown than before. Loneliness was significantly associated with being unmarried, having never worked previously, and being functionally dependent. Lonely participants were 1.65 times more likely to have depression. Likewise, a previous history of depression and cognitive impairment, multimorbidity, poor self-perceived health, and concern about contracting COVID infection were significant predictors of depression.

Conclusion: The COVID-19 pandemic has had a heavy toll on older adults' mental health, particularly those with multimorbidity, baseline functional dependence, and those with a previous history of depression and cognitive impairment. Targeting these high-risk groups is important in order to minimize loneliness, depression, and subsequent increased morbidity. Using all-inclusive language might minimize ageism and the fear of catching an infection.

INTRODUCTION

By April 2020 most of the world was facing unprecedented change in their lives due to the regulations and lockdowns imposed in the hopes of reducing the spread of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), causing the respiratory disease Coronavirus Disease 2019 (COVID-19).[1]

The first case of COVID in Jordan was confirmed on 3 March 2020.[2] It remained the only case until 15 March when subsequent cases were reported. After that, all efforts were aimed at controlling the spread of the disease by adhering to globally recommended actions, contact tracing, and using all platforms to educate the community. Eventually, a nationwide curfew was ordered on 17 March and transport between different governorates was suspended, as well as cancelling all passenger flights, as a last resort to control the spread of the

virus.[2] Strict stay-at-home measures were enforced by the government to reduce the risk of dying of the illness for older people and those with comorbidities, based on epidemiological data suggesting that the severity of COVID-19, especially its case fatality rate, rises strongly with increasing age and the presence of comorbidities.[2,3]

Despite emphasizing the importance of social isolation measures in order to contain the spread of the virus, and in light of the previous studies done during the SARS epidemic in 2002, the World Health Organization (WHO) has released a statement raising awareness about the possible impact of social isolation on psychological well-being during the pandemic.[4,5]

Further research confirms the detrimental effects of social isolation on older compared with younger adults, including the development of depression, anxiety, and loneliness, leading to serious consequences that include functional decline, disability, and even increased mortality.[4,6–8] Cognitive impairment and functional decline have also been described during periods of lockdown.[9] Cheung *et al*. reported a rise in suicide rates in the elderly during the SARS epidemic in Hong Kong.[10]

To date, several studies have investigated the psychological impact of the COVID-19 pandemic on the general population, yet only a few studies have directly examined its effects on the mental health status of older adults in the Western world[8,11–13] and in the Middle East.[14,15]

Therefore, this study aimed to examine the effects of the lockdown due to the COVID-19 pandemic on the development of loneliness and depression, and to analyse the factors associated with these outcomes, among community-dwelling older adults in Jordan, in an attempt to minimize their impact should further waves of the disease impose tight measures and lockdowns.

MATERIAL AND METHODS

Design and settings

This is a cross-sectional study of community-living older adults in Jordan. The sample was randomly selected from the telephone directory and a list of all elderly patients (60 years and older) who had visited Jordan University Hospital in the year prior to the lockdown. The hospital is a tertiary referral centre with 550 beds, serving more than half a million patients from all over the country.[16] A random sample of every fifth number in both lists was selected from all the cities in the three provinces (north, middle and south) of the kingdom to represent the estimated proportions of the population residing in these provinces (see Table 1 for more details). After the third week of the COVID-19 nationwide lockdown and extended curfew (during the period 1–10 April 2020), telephone interviews were conducted with 456 older patients who gave verbal consent to participate in the study. Participants were contacted after obtaining approval from the university's Institutional Board Review. During the phone interview, participants who had obvious cognitive impairment or severe hearing loss affecting their communication on the phone were excluded from the study.

Study instrument

The study instrument was developed by the authors incorporating the screening three-item telephone version UCLA Loneliness Scale, the short form of the Geriatric Depression Scale (GDS), and sociodemographic variables.

The UCLA Loneliness Scale

The three-item UCLA Loneliness Scale was developed specifically for use on telephone surveys and appears to measure overall loneliness quite well.[17] It measures three dimensions of loneliness: relational connectedness, social connectedness, and self-perceived isolation. The questions are: 'How often do you feel that you lack companionship?' 'How often do you feel left out?' and 'How often do you feel isolated from others?' The responses were coded as 1 (hardly ever), 2 (some of the time), and 3 (often). Participants were asked these questions twice; one set for their feelings during the lockdown and another one for their feelings in the year before the pandemic.

Geriatric Depression Scale (GDS)

The short-form, 15-item GDS represents a reliable and valid screening device for measuring depression in elderly individuals in the community and at different treatment facilities, whether they have mild to moderate dementia or physical illness.[18] An Arabic form of the 15-item GDS was validated previously, and therefore was used in the current study.[19]

Sociodemographic and additional questions

Sociodemographic questions included participants' age, marital status, place of residence, number of accompanying household members, occupation, and income. Questions about medical history, self-reported baseline functional status, and methods used to communicate with family and friends were also included. Participants were also asked about their self-perception of their health in general with the following possible answers: 'poor', 'fair', 'good', and 'excellent'. The degree of concern of the participants about contracting the COVID infection was recorded with the possible answers 'Not concerned at all', 'somewhat concerned', 'moderately concerned', and 'highly concerned'. The presence of chronic diseases was queried using self-report, or indirectly if the participant was being treated for that condition. The following chronic illnesses were included: hypertension, hypercholesterolemia, diabetes mellitus, chronic kidney disease, chronic lung disease, metastatic cancer, chronic liver disease, chronic arthritis, coronary artery disease, and heart failure. The concurrence of three or more chronic diseases is defined as multimorbidity.[20]

Validity and reliability

A pilot study was done with 77 participants after the questionnaire had been reviewed by the main author, another geriatrician, and a public health expert to ensure validity and format were adequate. Internal reliability was tested for the GDS showing a Cronbach's alpha of 0.84, which is similar to the one validated in studies, whereas the UCLA's Cronbach's alpha was acceptable at 0.64, yet similar to what is reported.[17]

Data analysis

Data were analysed using Statistical Package of Social Sciences (SPSS) version 23. Continuous variables were reported as means with standard deviations, while categorical variables were reported as percentages. Mann–Whitney and Kruskal–Wallis tests were used to study the association between sociodemographic variables in relation to the UCLA Loneliness Scale, and a post hoc Bonferroni test was used for significant results. A P-value of <0.05 was deemed significant throughout.

The Cochrane–Armitage test for trend was used to study the linear trend between the different stages of depression and the dichotomous variable of the presence of loneliness, as measured by a UCLA score of 6 to 9.

The Wilcoxon matched-pairs signed-rank test was used to test the difference in UCLA loneliness score before and during the pandemic, whereas binomial logistic regression was conducted to predict the dichotomous dependent variable (depressed or not) in lonely participants.

Standard multivariate regression analysis was performed to examine the factors predicting the continuous dependent variable, GDS score, during the pandemic lockdown. Potential factors were entered separately into univariate regression models to examine their significance and only significant variables were included in the final model. Likewise, all polychotomous variables were recorded as dummy variables before being entered into the model. The final multivariate regression model statistically significantly predicted depression through the GDS, $F(12,443) = 40.601$, $P < 0.001$, adjusted $R^2 = 0.52$.

RESULTS

The mean age for the 456 participants was 72.48 ± 6.84 years, ranging from 60 to 96. Table 1 shows the sociodemographic variables in relation to the UCLA loneliness score during the lockdown.

The majority were married, with secondary education or higher, retirees, and independent in both basic (ADLs) and instrumental activities of daily living (IADLs).

The mean UCLA loneliness score was 5.33 ± 1.672, ranging from 3 to 9. Post hoc Bonferroni tests showed that loneliness was significantly associated with being unmarried (single or divorcee) compared to being married ($P = 0.025$), having never worked before (being a housewife) compared to either having a job ($P = 0.043$) or being a retiree ($P = 0.024$). Functionally independent individuals had significantly lower UCLA loneliness mean scores compared to those who need assistance in 2 or more IADLs ($P = 0.017$), and those who need assistance in one basic ADL ($P = 0.033$). Multimorbidity and poor self-perceived health were significantly associated with loneliness, as well as with concern about contracting a COVID infection. Living alone was not associated with loneliness.

The mean UCLA score before the pandemic was 4.17 ± 1.31 (median 4.00, interquartile range 3–5). Wilcoxon matched-pairs signed-rank test determined

Table 1 Sociodemographic characteristics of the study sample in relation with the UCLA Loneliness Scale score

Variable	Number (%)	UCLA Loneliness Scale Mean ± SD	*P* value*
Age groups			0.645
60–69	172 (37.7)	5.25 ± 1.64	
70–79	204 (44.7)	5.32 ± 1.63	
80+	80 (17.5)	5.54 ± 1.85	
Marital status			0.029
Married	316 (69.3)	5.23 ± 1.61	
Widow	126 (27.6)	5.48 ± 1.77	
Other	14 (3.1)	6.43 ± 1.79	
Sex			0.013
Male	227 (49.8)	5.11 ± 1.52	
Female	229 (50.2)	5.55 ± 1.79	
Level of Education			0.074
Illiterate	54 (11.8)	5.70 ± 2.04	
Primary or high school	168 (36.8)	5.51 ± 1.76	
Secondary education	234 (51.3)	5.12 ± 1.48	
Governorate of residence			0.704
North	106 (23.2)	5.29 ± 1.79	
Central	315 (69.1)	5.37 ± 1.64	
South	35 (7.7)	5.09 ± 1.58	
Working status			0.028
Full/part time	41 (9.0)	4.95 ± 1.67	
Retired	276 (60.5)	5.22 ± 1.54	
Never worked	139 (30.5)	5.68 ± 1.86	
Smoking			0.592
Never smoked	259 (56.8)	5.38 ± 1.72	
Current smoker	96 (21.1)	5.16 ± 1.63	
Ex-smoker	101 (22.1)	5.39 ± 1.58	
Income (JOD)			0.816
Less than 500	231 (50.7)	5.29 ± 1.63	
500- Less than 1500	167 (36.6)	5.42 ± 1.77	
1500 and more	58 (12.7)	5.28 ± 1.57	
Baseline functional status			0.001
Independent	302 (66.2)	5.14 ± 1.55	
Needs assistance in 1 IADL	75 (16.4)	5.33 ± 1.59	
Needs assistance in ≥2 IADLs	36 (7.9)	6.06 ± 2.10	
Needs assistance in 1 ADL	21 (4.6)	6.24 ± 1.79	
Dependent in ≥2 ADLs	22 (4.9)	5.91 ± 2.07	
Number of households			0.804
None	22 (4.8)	5.27 ± 1.86	
1–2	214 (46.9)	5.40 ± 1.69	
3 or more	220 (48.2)	5.28 ± 1.64	
Multimorbidity			0.005
Yes	150 (32.9)	5.68 ± 1.77	
No	306 (67.1)	5.16 ± 1.60	
Concern to catch COVID			<0.001
Not at all	212 (46.5)	4.86 ± 1.47	
Somewhat concerned	139 (30.5)	5.40 ± 1.57	
Moderately concerned	69 (15.1)	6.07 ± 1.84	
Highly concerned	36 (7.9)	6.44 ± 1.78	
How do you perceive your health in general?			<0.001
Poor	20 (4.4)	6.35 ± 2.03	
Fair	75 (16.4)	6.16 ± 1.97	
Good	201(44.1)	5.18 ± 1.57	
Excellent	160 (35.1)	5.01 ± 1.41	

* *P* value of Mann Whitney and Kruskal Wallis tests is significant at <0.05.

a statistically significant median increase in the UCLA loneliness score during the pandemic lockdown compared to the loneliness score before the lockdown, $z = -12.941$, $P < 0.001$; participants were lonelier during the pandemic compared with the pre-pandemic era (Table 1).

Table 2 Distribution of depression stages according to UCLA Loneliness Scale score

GDS† Score	Total N (%)	Not Lonely (UCLA 3–5) N (%)	Lonely (UCLA 6–9) N (%)‡	*P* value*
No depression (score 0–4)	287 (62.9)	203 (76.0)	84 (44.4)	
Mild depression (score 5–8)	105 (23.0)	51 (19.1)	54 (28.6)	
Moderate depression (score 9–11)	35 (7.7)	10 (3.7)	25 (13.2)	
Severe depression (score 12–15)	29 (6.4)	3 (1.1)	26 (13.8)	
Total	456	267 (58.6)	189 (41.4)	<0.001

† GDS: Geriatric Depression Scale. ‡ Ratio of the lonely category. * *P* value of Cochrane–Armitage test is significant at <0.05.

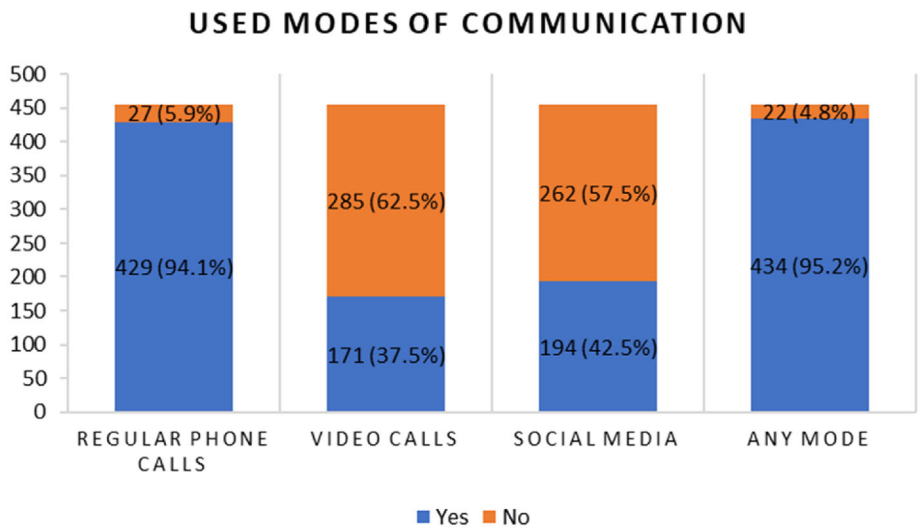

Figure 1 Modes of communication used by study participants during the lockdown.

Table 3 Multivariate Regression analysis of the factors predicting depression during the pandemic lockdown

Geriatric Depression Scale	Unstandardized Coefficients (B)	95% CI		Std. Error	Beta (ß)	*P* value*
		Lower Bound	Upper Bound			
Constant	2.142	−0.301	3.982	0.936		0.023
Level of education	−0.780	−1.232	−0.335	0.227	−0.149	0.001
Baseline function	0.355	0.082	0.628	0.139	0.110	0.011
Multimorbidity	0.848	0.290	1.407	0.284	0.111	0.003
Self-perceived health	−0.963	−1.318	−0.595	0.185	−0.221	<0.001
Concern about contracting COVID	0.943	0.680	1.205	0.134	0.249	<0.001
History of depression	1.019	0.405	1.632	0.312	0.112	0.001
History of memory decline	0.686	0.081	1.292	0.308	0.077	0.026
UCLA Loneliness Scale score	0.554	0.403	0.705	0.077	0.257	<0.001

* *P* value significant at <0.05.

The prevalence of loneliness during the lockdown, measured by a UCLA score of 6–9, was 41.4% (95% confidence interval (CI) 36.9%–46.1% ($n = 189$)) compared to 14.0% (95% CI 11.1%–17.5% ($n = 64$)) before the lockdown. The chi-square test showed a statistically significant difference between the prevalence of loneliness before versus during the lockdown ($P < 0.001$).

Table 2 shows the distribution of different stages of depression as measured by the GDS in relation with loneliness. The presence of a positive screen for depression (GDS score of 5+) was seen in 169 (37.1%, 95% CI 32.6%–41.7%) participants.

The details of the UCLA scores before and after the lockdown, as well as the GDS score in relation to the sociodemographic variables, are highlighted in Table S1 in the Supporting Information.

Of the 189 lonely participants, 105 (62%) had a positive screen for depression and 27% had moderate and severe depressive symptoms. The

Cochrane–Armitage test of trend showed that with increasing depression severity, the proportion of loneliness increases significantly. Binomial logistic regression showed that lonely participants were 1.65 (95% CI 1.45–1.89, $P < 0.001$) more likely to develop depressive symptoms.

Figure 1 shows that <5% of the study sample had no mode of known communication with their family or friends who do not live with them during the lockdown. There were no significant associations between the use of any mode of communication or the mode of communication used and the prevalence of either loneliness or depression.

Table 3 shows the regression coefficients and standard errors of the standard multivariate regression analysis of the factors predicting depression during the lockdown. Increased level of education was a negative predictor of depression, as well as the subjective feeling of good and excellent health. Functional dependence in either basic ADLs or IADLs, multimorbidity, and the presence of any history of memory decline or depressive symptoms in the past year, whether treated or not, were significant predictors of depression. The fear of contracting COVID was highly predictive of depressive symptoms, along with the presence of loneliness.

DISCUSSION

To the best of our knowledge, this is one of only a few studies shedding light on the effect of the COVID-19 pandemic on older adults' mental health in the Middle East, and it is the first study addressing the relationship between loneliness and depression during the pandemic and the factors associated with them. It showed that 41.4% of participants were lonely and 37.1% had a positive screen for depression during the lockdown. Loneliness was associated with being unmarried and not working. Functional dependency, the poor self-perceived health, multimorbidity, and concern over contracting COVID-19 infection were associated with loneliness and significantly predictive of depression.

Similar studies done during the pandemic show different rates of loneliness due to the difference in scales being used.[7] For example, lower mean scores of loneliness were found in Israel (2.28 ± 0.90 ranging from 1–5) and Austria (1.67 ± 0.58, ranging 1–4) where Shrira *et al*.[14] used the 3-item UCLA score and Heidinger *et al*.[11] used the 6- Item De Jong Gierveld loneliness scale, respectively. Similarly, a study on Polish women used the UCLA scale and found lower rates of loneliness.[21] On the other hand, comparable rates of loneliness were reported from Canada where 44.7% had loneliness some of the time or always,[12] whereas higher loneliness scores were reported in Poland and Switzerland during the times when the Federal Council called for the special protection of older adults through physical distancing, and then lessened thereafter during the pandemic.[13,22]

Following each loneliness question with a comparative question ('how do you compare these feelings now with those before the lockdown?') is believed to give a true estimate of loneliness among older adults in Jordan during the pandemic as well as in the period before, especially given the fact that a statistically significant difference was seen in the prevalence of loneliness during both periods. Likewise, a few comparative studies have corroborated our findings highlighting the important impact of the COVID-19 pandemic on people's mental health, especially among older adults.[11,13,23]

Nevertheless, a more accurate estimate would be to measure loneliness during periods of normal life and compare it with periods of lockdown to minimize recall bias. Furthermore, it is important to reassess loneliness in the period after the lockdown measures have been lifted to see if there were long-lasting effects as some studies have shown that the general state of worries was high at the beginning of the pandemic and tended to decrease steadily throughout the subsequent months,[24–26] while it has been shown that suicide rates did not go back to normal a year after the SARS epidemic in 2002.[10]

Not unexpectedly for an Arabic community in which older adults live with their families, the only sociodemographic variables associated with loneliness were being an unmarried and/or not-working female. Similar studies have highlighted these risk factors, as well.[6,8,27]

Multimorbidity was also significantly associated with loneliness and a predictive factor for depression. The literature supports this relationship suggesting that multimorbidity might lead to lower physical functioning and multiple health care visits and thus less time for social interaction, in addition to the direct consequences of loneliness and depression.[28–30]

During the lockdown, it is suggested that people with multimorbidity might be at risk of developing loneliness and depression due to the amount of unmet care needs. Nonetheless, a study done during the pandemic on older adults with multimorbidity in Hong Kong concluded that whereas older patients with multimorbidity experienced worse psychosocial health, the issues included anxiety but not depression.[8] Whatever the type of the psychological distress experienced by older adults with multimorbidity, addressing these specific issues should be a priority during lockdowns because health care demands might be compromised at a time of maximum need, which might provoke stress, anxiety, depression, or other mental health illnesses.[4,8,10]

We also found that participants with baseline functional dependency were lonelier and more likely to develop depression during the pandemic. Although it is suggested that functional decline is a result of loneliness,[6] our participants had significantly lower loneliness scores before the lockdown when their functional level was relatively unchanged. Furthermore, functional dependency is one of the major consequences of multimorbidity[30] which, in turn, might explain our findings of increased loneliness and depression among functionally dependent participants.[6] Nonetheless, due to the cross-sectional nature of our study, it is unclear if baseline functional decline was a precursor for or being triggered and/or intensified by increasing loneliness during the lockdown. Further studies are needed to examine the effects of loneliness and depression on functional status, especially if they were temporary.

Perception of own health was another factor associated with loneliness and depression where positive perceptions were associated with less loneliness and depression. This is also illustrated in the literature during the pandemic.[14,31,32] Therefore, focusing on improving older adults' perception of their aging and combating ageism are important for improving their resilience during times of stress and illness.

Interestingly, it was found that participants who had a higher level of concern about contracting the SARS-COV 2 virus were also lonelier and more likely to be depressed. A few studies concur with this finding, showing higher levels of depressive and anxiety symptoms and lower status of well-being among fearful individuals.[32–34] The overwhelming media focus on old age as a risk factor for COVID-19 morbidity and mortality has an essential role in accentuating these feelings. Consequently, adopting inclusive language when talking about the elderly and avoiding negative emphasis on risk are important in order to avoid increasing their anxiety levels about COVID-19, which could also increase their resilience.[7,15]

Regarding depression, the prevalence found during the lockdown (37.1%) was the only data available on older adults' depression during the pandemic in Jordan. These numbers are, expectedly, higher than the previously reported rate of 16.3% from the Jordan Ministry of Health report in 2019, which was done with a younger age group, relied on a self-report rather than an objective screening method, and was carried out before the pandemic.[35] Global rates of depression during the pandemic included younger mean age groups and ranged from 7.45% to 48.30%.[8,23,32] Bueno-Notivol *et al*. demonstrated a seven times higher global pooled prevalence of depression (25%) during the pandemic.[23] Similar to our findings, Wong *et al*. found a 39.8% depression rate among community-dwelling older adults using the Patient Health Questionnaire-9 (PHQ-9) administered over the telephone.[8]

It is important to keep in mind that the GDS and the PHQ-9 are screening rather than diagnostic methods for depression; patients with a positive screen need further diagnostic testing.

Notably, lonely participants were 1.65 times more likely to develop depressive symptoms, regardless of the prevalence rate of depression. This tight relationship between loneliness and depression has always been illustrated in the literature even before the pandemic and it has been questioned whether loneliness is just a proxy for depression.[6,36–38] Accordingly, lonely older adults are a high-risk group that would benefit from tailored policies to help them cope with such situations and improve their mental well-being, to help avoid depression with its dreadful consequences and hospitalizations due to COVID-19.[10,24,27]

We also found that a previous history of depression or subjective cognitive decline was a significant predictor of depressive symptoms during the pandemic. This finding is supported by Xiong *et al*.[32] who suggest that depression might be a vulnerability factor that influenced the impact of COVID-19 on older adults, hence, individuals with previous depression and memory decline, whether formally

diagnosed or subjectively declared, should be targeted for screening and possible diagnosis and treatment in cases of subsequent waves of the pandemic and associated lockdown.

CONCLUSIONS

Our study shows the detrimental impact of the COVID-19 pandemic on older adults' mental health, especially on those who have functional dependence, a poor self-perception of health, and multimorbidity. Ageism and public emphasis on older adults' risks should be avoided, and policy responses to the pandemic need to be more nuanced and non-ageist to avoid unnecessary increases in loneliness and depression in older adults and to maximize their resilience. As vaccination changes the lockdown restrictions worldwide, policy makers and population health management approaches will need to consider additional resources and alternative approaches to tackle the mental health complications that will have been caused.

STRENGTHS AND LIMITATIONS

The strengths of this study include its status as one of the first studies in the Middle East to investigate a crucial consequence of the pandemic that is generally overlooked. The timing of the interviews was chosen to ensure adequate time for the restrictions taken to have an impact on mental health, and the data were collected over the phone to ensure accuracy of the responses and minimize recall bias. The study also included older adults who do not use the Internet, which we believe makes it a more representative sample of a good proportion of community-dwelling older adults in the country and worldwide.

On the other hand, we only contacted community-living older adults and our results might not be generalizable for institutionalized older adults. Moreover, the cross-sectional design precludes establishing causality relationships.

ETHICAL CONSIDERATIONS & DISCLOSURES

This research was approved by the Deanship of Scientific Research at the University of Jordan and by the university's Institutional Review Board. It did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

The authors declare no conflict of interest for this study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

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Table S1. Sociodemographic characteristics of the study sample in relation with loneliness scales during and before the pandemic