RESEARCH

AN INVESTIGATION OF FACTORS RELATED TO SUBJECTIVE MEMORY COMPLAINTS OF OLDER ADULTS DURING THE COVID-19 PANDEMIC

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Abstract

Introduction: The purpose of this research was to determine the individual factors that predict the subjective memory complaints of older adults during the Covid-19 pandemic.

Materials and Method: The sample of the study consisted of 356 older adults aged between 60 and 88 years ($\bar{x}$= 67.03, SD = 5.72). Subjective Memory Complaints Questionnaire, Geriatric Depression Scale-Short Form, The Scale of Loneliness for the Elderly, Quality of Life Scale in Older People, and Socio-Demographic Information Form were administered to the participants. In order to examine the relationships among the variables, correlation analysis was performed. In addition, a hierarchical regression analysis was conducted to determine the variables predicting subjective memory complaints.

Results: The subjective memory complaints of this age group were found to be positively related to depression and loneliness levels, while they were discovered to be negatively associated with quality of life. The results of hierarchical regression analysis indicated that each of the variables of gender, perceived socioeconomic status, loneliness, quality of life, and depression included in the analysis at different steps were a significant predictors of subjective memory complaints.

Conclusion: Our results showed that there is a need for interventions that will expand social support networks, improve quality of life, and reduce depression levels in order to prevent subjective memory complaints of elderly individuals during the Covid-19 pandemic.

Keywords: COVID-19; Aging; Memory; Loneliness; Quality of Life; Depression

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INTRODUCTION

In many societies, the proportion of the elderly population is growing, and those in this age group often complain that their memory is declining. Change in memory function is a common cognitive problem that affects the lives of older adults in many ways (1). Recently, subjective memory complaints-the forgetfulness complaints of individuals in daily life-have increased (2). While this condition is often characterized by normal performance on neuropsychological tests that evaluate objective cognitive functions and forgetfulness, its presence can also be a predictor of various neurological disorders, such as mild cognitive impairment (MCI) and dementia (3). Studies have shown that the rate of diagnosis with dementia within three years of individuals with subjective memory complaints is 11.7% (4). In addition, for individuals who complain about their memory, the risk of developing dementia is twice as high as those who have no such complaints (5).

Subjective memory complaints in older adults are affected by various factors. First, they can differ according to several socio-demographic characteristics. Many studies have concluded that women have more memory complaints than men (3, 6). In terms of age, memory complaints in adults increase with time as older people experience more memory complaints compared to younger individuals (6). In addition, the presence and frequency of memory complaints is affected by education level. Many studies have found a relationship between subjective memory complaints and education level, in particular that memory complaints increase as education level decreases (3, 6). Although it has been shown that subjective memory complaints in older adults are affected by education level, there are conflicting results in studies on socioeconomic conditions. Despite studies in the literature stating that a low socioeconomic level is a factor that increases subjective memory complaints (7), there are also studies stating that none of the socioeconomic conditions in different developmental periods predicts such memory complaints (8).

In addition to socio-demographic factors, some psychological factors that affect subjective memory complaints in old age are also very important. In the literature, previous studies indicated that there is a relationship between the loneliness levels of the elderly and their subjective memory complaints, and that loneliness is a predictor of subjective memory complaints (9). Furthermore, subjective memory complaints are known to be affected by quality of life, and some studies have shown that there is a negative relationship between subjective memory complaints of the elderly and quality of life, including happiness and well-being (6). It is also noteworthy that the most common predictor of subjective memory complaints is depressive symptoms. Thus, it has been reported that depression predicts subjective memory complaints and depressive symptoms increase subjective memory complaints in older adults (8). Moreover, depressive symptoms have been found to be more strongly correlated with subjective memory complaints than with objective memory performance (10).

The World Health Organization (WHO) has declared a pandemic as a result of a new form of coronavirus that arose in China at the end of 2019 and has since spread around the world. It is well recognized that elderly individuals are at higher risk for Covid-19. Additionally, Covid-19 and the precautions against it have the potential to cause physical, cognitive, psychological, and social problems in older people (11). Although the studies conducted during the Covid-19 period mostly focused on the emotional state and general well-being of the elderly due to Covid-19 and its restrictions, there were limited studies evaluating the possible effects on cognitive functions. For example, in a study conducted during the Covid-19 period, 54% of healthy elderly people stated that they had memory complaints, while 37.5% stated

that memory complaints increased during the curfew period (12). In some studies, being a woman, having a low education level, and living in quarantine were found to be risk factors for cognitive decline (13, 14). Also, a review highlighted that precautions such as social isolation, physical distancing, and curfews during Covid-19 have caused the elderly to be isolated, and the resulting loneliness increased the risk of cognitive dysfunction in this age group (15). Moreover, it has also been shown that the complaints of the elderly about cognitive errors are associated with subjective well-being (16). Some studies conducted during the Covid-19 period have found a relationship between increased subjective memory complaints and depression (12). In particular, one study determined that the reported changes in cognitive functioning were especially related to depression, and it also stated that depression may be a frailty factor that heightens the negative effect of the Covid-19 period on older adults (16).

In conclusion, various factors, such as loneliness, poor quality of life, depression, and some sociodemographic characteristics, are associated with the subjective memory complaints of older adults. However, to our knowledge, there is no study that has simultaneously evaluated the effects of the above-mentioned variables on the subjective memory complaints of the elderly during the Covid-19 pandemic. Since memory function has important consequences, especially for the elderly, this research filled the gap by studying cognitive functionality. In particular, the aim of this study was to determine the factors that predict the subjective memory complaints of elderly individuals during the Covid-19 pandemic.

MATERIALS AND METHODS

Sample

A total of 356 elderly people living in 35 different provinces in Turkey participated in this study. Their ages ranged from 60-88 ($\bar{x}$ = 67.03, SD = 5.72); 56.7% (n = 202) were female and 43.3% (n = 154) were male. Detailed demographic characteristics of the sample are given in Table 1.

Table 1. Socio-demographic characteristics of the older adults (N = 356)

Variables	Frequency	%
Education Level		
Literate / Primary School	124	34.8
Secondary / High School	103	28.9
College and Above	129	36.2
Perceived SES		
Low	97	27.2
Middle	202	56.7
High	57	16.0
Marital Status		
Married	253	71.1
Single	9	2.5
Divorced/Separated	26	7.3
Widow/Widower	68	19.1
Employment Status		
Yes	59	16.6
No	297	83.4
Chronic Disease		
Yes	210	59.0
No	146	41.0
Covid-19 Diagnosis		
Yes	28	7.9
No	328	92.1
Cohabitant		
Unaccompanied	60	16.9
With spouse only	170	47.8
With spouse and family	78	21.9
With family only	42	11.8
Other (e.g., with a relative)	6	1.6

Measures

Socio-Demographic Information Form: This form was prepared by the researchers and includes questions about the sociodemographic

characteristics of the participants, including gender, marital status, educational status, employment status, perceived socioeconomic status (SES), and chronic diseases.

Subjective Memory Complaints Questionnaire (SMCQ): This scale was developed by Youn et al. (17) to evaluate individuals' subjective memory complaints. The Turkish adaptation study of the scale was conducted by Özel-Kızıl et al. (18) in participants with MCI and in healthy elderly people. The first four questions of the questionnaire, which consists of 14 questions, evaluate general memory, and the remaining 10 questions evaluate daily memory function. "Yes" answers = 1 point, while "no" answers = 0 points. Higher scores on the scale indicate that the person has more subjective memory complaints. The cut-off point for the diagnosis of MCI was 4.5 and above (80% sensitivity and 66% specificity). In the adaptation study, the Cronbach's alpha internal consistency coefficient was found to be 0.83. In the present study, this value was found to be 0.84.

Geriatric Depression Scale-Short Form (GDS-SF): The 15-question Geriatric Depression Scale-Short Form was developed by Burke et al. (19). The validity and reliability study of the Geriatric Depression Scale-Short Form in Turkey was conducted by Durmaz et al. (20). "Yes" answers to straight items = 1 point, and "no" answers to straight items = 0 points, while "no" answers to reverse items = 1 point, and "yes" answers to reverse items = 0 points. Higher scores indicate a higher level of depression. In addition, analyses based on the DSM-V criteria indicate that when the cut-off score of the scale is 5 and above, depression can be diagnosed with 92% sensitivity and 91% specificity. The Cronbach's alpha internal consistency coefficient of the scale was found to be 0.92. In this study, Cronbach's alpha was calculated as 0.86.

Loneliness Scale for Elderly (LSE): This scale was developed by Jong-Gierveld and Kamphuis (21) to determine loneliness levels in the elderly. Akgül and Yeşilyaprak (22) adapted the scale to Turkish. The scale has a total of 11 items divided into two sub-dimensions: six negative items measure emotional loneliness and five positive items measure social loneliness. Responders respond on a 3-point Likert-type scale, where 0 = yes, 1 = maybe, and 2 = no. The total score for the two dimensions constitutes the overall loneliness score. The lowest possible score is 0, and the highest possible score is 22. High scores indicate a high level of loneliness. Cronbach's alpha was found to be 0.85 in the adaptation study and 0.79 in this study.

Quality of Life Scale in Older People (CASP-19): This scale was developed by Hyde et al. (23) to assess the quality of life of older people and was translated into Turkish by Türkoğlu and Adıbelli (24). In the adaptation study, six items with low factor loads were removed from the scale, and as a result, the number of questions was reduced to 13. While the original scale had four subscales, namely "control," "autonomy," "pleasure," and "self-realization," the adaptation study determined that the scale consisted of two factors: "perception of autonomy and satisfaction" and "obstacle perception." High scores obtained from the scale evaluated with a 4-point Likert-type (1 = never to 4 = always) indicate that the quality of life of the responder is high. The Cronbach's alpha of the adapted scale was 0.91. In the current study, this value was determined to be 0.90.

Procedure

The participants were recruited using convenience and snowball sampling methods. General information about the study was given to the participants via informed consent forms. Data from older adults who agreed to voluntarily participate in this study were collected online via Google Forms. The elderly individuals reached were informed that they could first fill out the online questionnaire themselves, and if they could not fill it out, they could get help from their relatives to read the questions and record their answers. Data were collected between December 2020 and February

2021. The respondents spent approximately 30 to 40 minutes completing the scales.

Data Analysis

Since the data were obtained online, there was no missing data in the dataset. However, 37 of the 393 elderly people reached were excluded from the dataset based on the exclusion criteria (e.g., having a major psychiatric or neurological disorder); therefore, data from 356 participants were analyzed. To evaluate whether the sample showed a normal distribution, the skewness and kurtosis values of the variables were checked, and since these values were acceptable, parametric tests were used in the analysis. First, a correlation analysis was performed to examine the relationships between the variables. Then, hierarchical regression analysis was conducted to determine the variables that predicted subjective memory complaints. All data analyses were performed using SPSS 22.00.

Ethical Issues

Permission to conduct the study was obtained from the Ufuk University Social and Human Sciences Scientific Research and Publication Ethics Committee (decision no. 2020/101 dated December 24, 2020).

RESULTS

Descriptive Statistics

Descriptive statistics regarding the research variables are given in Table 2.

Intercorrelations Among Variables

Relationships between variables were examined with Pearson Product-Moment Correlation Analysis. The results of the correlation analysis showed that there were significant relationships between the research variables. Subjective memory complaints of the elderly were found to be positively related to depression ($r = .43$, $p<.001$) and loneliness levels ($r = .30$, $p<.001$), while they were found to be negatively related to quality of life ($r = -.37$, $p<.001$). In other words, as the loneliness and depression levels of the elderly increased, subjective memory complaints also increased. However, as the quality of life of the elderly increased, subjective memory

Table 2. Mean, standard deviation, kurtosis, and skewness values of the scale scores (N= 356)

Scale Scores	Min.	Max.	Mean	SD	Skewness	Kurtosis
SMCQ total score	.00	14.00	3.63	3.28	.91	.12
LSE total score	.00	22.00	7.62	4.37	.66	.04
CASP-19 total score	1.00	39.00	22.88	8.82	-.14	-.69
GDS-SF total score	.00	15.00	4.73	3.89	.80	-.43

Table 3. Intercorrelations among the SMCQ, LSE, CASP-19, and GDS-SF total scores (N = 356)

Scale Scores	SMCQ total score	LSE total score	CASP-19 total score	GDS-SF total score
SMCQ total score	1			
LSE total score	**.30*****	1		
CASP-19 total score	**-.37*****	**-.48*****	1	
GDS-SF total score	**.43*****	**.57*****	**-.60*****	1

Note: $^{***}p<.001$

complaints decreased. Correlation analysis results are presented in Table 3.

Variables Predicting Subjective Memory Complaints

The predictors of subjective memory complaints were investigated using a four-step hierarchical regression analysis. In the first step, gender, age, perceived SES, and Covid-19 diagnosis were included as control variables. In the second step, the loneliness variable was entered into the model, while the quality of life variable was added in the third step. The depression variable was entered in the last step. The overall contribution of the variables entered in all four steps was significant ($F(4, 356) = 5.97$, $p<.001$; $F(5, 356) = 10.56$, $p<.001$; $F(6, 356) = 13.04$, $p<.001$; $F(7, 356) = 14.85$, $p<.001$, respectively). Hierarchical regression analysis results are presented in Table 4.

According to the analysis results, at the first step, gender (β: -.13, $p<.05$) and perceived SES (β: -.18, $p<.01$) were found to be significant predictors of subjective memory complaints. Results showed that men's subjective memory complaints were lower than women's. In addition, there was an increase in subjective memory complaints of the elderly who perceived their socioeconomic level to be low. It was observed that the variables in the first step explained 6% of the variance in subjective memory complaints. Further, it was determined that the loneliness variable added to the model in the second step, which provided significant contribution (7%) to the variance, positively predicted the subjective memory complaints of the elderly (β: .27, $p<.001$). Moreover, it was found that the quality of life variable (β: -.27, $p<.001$) added to the model at the third step negatively predicted subjective memory complaints of the elderly. This variable also provided significant contribution (5%) to the variance. It was found that the depression variable added at the last step (β: .30, $p<.001$) positively predicted the subjective memory complaints of the elderly. The depression variable explained approximately 5% of the variance in the dependent variable, and the total variance explained with this variable increased to 23%.

DISCUSSION

The aim of this study was to determine the individual factors that predict subjective memory complaints of older adults during the Covid-19 pandemic. To the best of our knowledge, this is the first study in Turkey to simultaneously examine the effects of the variables of loneliness, quality of life, and depression on subjective memory complaints of the elderly. Considering that subjective memory complaints are both related to objective memory performance and predict MCI and dementia (3, 4, 5), it is important to determine the variables that predict subjective memory complaints. This study is important in terms of guiding interventions that can be made in order to protect the cognitive functionality of elderly individuals at risk from the Covid-19 pandemic and the precautions taken for it. Moreover, this research may provide implications for social politicians on the protection of the cognitive health of elderly individuals.

As a result of this study, it was determined that each of the variables of gender, perceived SES, loneliness, quality of life, and depression were significant predictors of subjective memory complaints. First, it was found that men had fewer subjective memory complaints than did women. This result is consistent with many studies in the literature showing that women experience more memory complaints (3, 6). In addition, it was concluded that the elderly who perceived their SES to be low had more subjective memory complaints. Although this result is compatible with studies that show low socioeconomic level is a factor that increases subjective memory complaints (7), it seems to contradict other studies that show

Table 4. Results of hierarchical regression analysis (N = 356)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	R	R^2
	B	SE	Beta				
Step 1						.25	.06
Gender	-.85	.34	-.13	-2.50	.013		
Age	.04	.03	.07	1.27	.204		
Perceived SES	-.93	.27	-.18	-3.47	.001		
Covid-19 diagnosis	-.43	.64	-.04	-.67	.501		
Step 2						.36	.13
Gender	-.81	.33	-.12	-2.45	.015		
Age	.03	.03	.05	1.00	.317		
Perceived SES	-.65	.26	-.13	-2.48	.014		
Covid-19 diagnosis	-.31	.62	-.03	-.51	.612		
LSE total score	.20	.04	.27	5.21	.000		
Step 3						.43	.18
Gender	-.64	.32	-.10	-1.99	.047		
Age	.01	.03	.02	.31	.758		
Perceived SES	-.58	.26	-.11	-2.26	.025		
Covid-19 diagnosis	-.06	.60	-.01	-.10	.919		
LSE total score	.11	.04	.14	2.60	.010		
CASP-19 total score	-.10	.02	-.27	-4.71	.000		
Step 4						.48	.23
Gender	-.55	.31	-.08	-1.74	.082		
Age	.02	.03	.03	.68	.496		
Perceived SES	-.53	.25	-.11	-2.15	.032		
Covid-19 diagnosis	-.01	.58	.01	-.01	.996		
LSE total score	.03	.04	.04	.65	.514		
CASP-19 total score	-.05	.02	-.14	-2.31	.022		
GDS-SF total score	.25	.05	.30	4.60	.000		

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socioeconomic conditions do not predict subjective memory complaints (8). However, this result may be due to the fact that individuals with low SES experience economic difficulties in participating in various activities that protect against cognitive impairment (25).

In the current study, the variables of loneliness, quality of life, and depression, as well as some sociodemographic variables, were found to be significant predictors of subjective memory complaints. As a matter of fact, the results obtained from this study seem to be consistent with other studies in the literature reporting that an increase in loneliness (14) and depression symptoms (12) and a decrease in quality of life or well-being (16) increase subjective memory complaints. The fact that the restrictions applied during the Covid-19 pandemic caused more social isolation in the older adult group increased the concerns about the cognitive health of this population (16). In addition, loneliness can reduce cognitive resources and attention processes that require effort by causing the individual to be hypersensitive to external threats. Therefore, this decrease in attention processes may result in forgetfulness (9). Indeed, previous research (9, 15) has already highlighted that loneliness can accelerate cognitive decline and increase the risk of dementia. On the other hand, quality of life can be an important factor when faced with difficulties. A recent study suggested that quality of life may be affected by resilience, which is defined as "a successful adaptation process in response to threatening, stressful or traumatic negative experiences or the ability to bounce back from difficult life situations" (26). This result can be evaluated in this context, as the Covid-19 pandemic is also a period of extraordinary difficulties. Since it is already known that there is a negative relationship between quality of life and subjective memory complaints (6), it is an expected result that low quality of life during the Covid-19 period predicts subjective memory complaints.

Another important finding obtained from this study is that even when other demographic and psychological variables are controlled, the depression variable predicts subjective memory complaints at the last step of the regression analysis. It is frequently seen in the literature that the strongest predictors of subjective memory complaints are psychological well-being and depressive symptoms (12). Other studies show that memory disorders in geriatric depression may be due to hippocampal atrophy and the increase in vascular risk factors related to the lifestyle of a person with depression. In addition, the literature emphasizes that this is a predictor of cognitive impairment that may develop later (27). Studies have also shown that there was a significant increase in depressive symptomatology during the current Covid-19 period compared to pre-pandemic (14), and that depression is strongly associated with the reported decreases in cognitive functions (16). Isolation, caused by breaking away from social ties in daily routine and collective interactions in traditional rituals, as well as the transition to a long sedentary lifestyle at home, can cause stress in the elderly. Therefore, based on these findings in the literature, it is possible to say that depression, which is already associated with memory complaints in the pre-pandemic, has had a significant effect on subjective memory complaints of the elderly during the Covid-19 period, when stress, social isolation and difficulties have increased. In addition, because depression is also associated with loneliness and quality of life variables, and other variables predict subjective memory complaints, this result was not surprising.

In conclusion, practices such as social interaction, which increase the quality of life and reduce loneliness and depression levels in the elderly, are very important in reducing the risk of subjective cognitive decline, especially since these interactions have been limited during the Covid-19 pandemic. However, this study has some limitations,

the first of which is that it relied on online sampling. Because it is assumed that certain demographic characteristics, such as age, education level, and economic level of the participants, may affect their use of information and communication technology, a potential limitation arises in that the sample may have consisted of only individuals with the ability to use information and communication technology or to receive support in its use. Therefore, the generalizability of the research results is limited to a sample of older adults who can complete an online questionnaire. Future studies that work with participants from different age groups (for example, middle-aged adults), or clinical populations with both online and non-online methods, would contribute more to the literature. The second limitation of the study is that participants self-reported the data. Considering the common stereotypes about the memories of the elderly in our country (1), participants may have given socially desirable answers. In addition, the possibility that the participants received support from their relatives while completing the questionnaire may have caused them to give socially desirable answers to the questions. Hence, future studies should evaluate the objective memory performances as well as the subjective memory complaints of elderly individuals. Another limitation of this study is that the exclusion criteria were obtained based on self-report due to the fact that a medical examination could not be conducted to evaluate general cognitive functions, nor could neuropsychological testing be performed. It is not clear whether the participants included only elderly individuals with subjective memory complaints or also elderly individuals with MCI and early-stage Alzheimer's dementia. Therefore, the results should be interpreted with caution. Moreover, given the cross-sectional nature of our study, it is also unclear whether loneliness, quality of life, and depression were precursors or were present prior to the Covid-19 era. For this reason, longitudinal studies should be considered. Finally, in terms of recommendations for future studies, it is believed that measuring the symptoms and processes experienced by elderly individuals who have had Covid-19 both during and after the pandemic period will contribute to the literature by demonstrating the effect of Covid-19 on subjective memory complaints.

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