

## PAPER DETAILS

TITLE: MEMORY COMPLAINTS AND ACTIVITIES OF DAILY LIVING IN GERIATRIC  
DEPRESSION: IS THERE A DIFFERENCE BETWEEN EARLY- AND LATE-ONSET  
DEPRESSION?

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# Memory Complaints and Activities of Daily Living in Geriatric Depression: Is There A Difference between Early-and Late-Onset Depression?

## Geriatrik Depresyonda Bellek Yakınmaları ve Günlük Yaşam Aktiviteleri: Erken ve Geç Başlangıçlı Depresyon Arasında Fark Var Mıdır?

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### Abstract

**Aim:** To investigate the cognitive complaints and activities of daily living in patients with geriatric depression. Inter-group comparisons were performed by dividing geriatric depression patients into early- and late-onset subgroups.

**Materials and Methods:** Ninety-four patients with geriatric depression and 39 individuals as a control group were included. Thirty-three of the geriatric depression patients had late-onset depression, and 61 had early-onset depression. All participants completed sociodemographic data, the Mini Mental Test, the Clock-Drawing Test, the Katz Activities of Daily Living Scale, and the Subjective Memory Complaints Questionnaire. Geriatric Depression Scale-15 was used to measure the severity of patients' depression.

**Results:** Late-onset depression patients exhibited significantly poorer performance on the Clock Drawing Test than the control group. Significantly greater subjective memory complaints were determined in patients with early- and late-onset depression than in the control group. A negative relationship was found between the severity of depression and activities of daily living in patients with geriatric depression.

**Conclusion:** Geriatric depression may differ in terms of cognitive functions according to the age of onset.

**Keywords:** Geriatric depression, cognitive, functionality, elderly, memory

### Öz

**Amaç:** Bu çalışmada geriatrik depresyon hastalarının kognitif belirtileri ve işlevsellik düzeyleri araştırılacaktır. Geriatrik depresyon hastaları erken ve geç başlangıçlı depresyon alt gruplarına ayrılarak gruplar arasında karşılaştırmalar yapılacaktır.

**Gereç ve Yöntem:** Çalışmaya toplam 94 geriatrik depresyon hastası (33 geç başlangıçlı depresyon, 61 erken başlangıçlı depresyon) ve kontrol grubu olarak da 39 kişi dahil edilmiştir. Katılımcıların hepsi için sosyodemografik veri formu, Saat Çizme Testi, Katz Günlük Yaşam Aktiviteleri Ölçeği ve Öznel Bellek Yakınmaları Anketi doldurulmuştur. Geriatrik depresyon hastalarının depresyon şiddetinin ölçülmesinde Geriatrik Depresyon Ölçeği-15 kullanılmıştır.

**Bulgular:** Saat Çizme Testinde geç başlangıçlı depresyon hastaları kontrol grubuna göre daha kötü bir performans sergilemiştir. Erken başlangıçlı ve geç başlangıçlı depresyon hastalarında kontrol grubuna göre daha fazla öznel bellek yakınmalarının olduğu tespit edilmiştir. Geriatrik depresyon hastalarında depresyon şiddeti ile günlük yaşam aktiviteleri arasında negatif yönde bir ilişki bulunmuştur.

**Sonuç:** Geriatrik depresyon; başlangıç yaşına göre kognitif işlevler açısından farklılıklar gösterebilmektedir.

**Anahtar Kelimeler:** Geriatrik depresyon, bilişsel, fonksiyonellik, yaşlılık, bellek



## INTRODUCTION

The geriatric period refers to the age over 65 years. An increase in the proportion of individuals in this group compared to the general population is predicted in future years.<sup>[1]</sup> The prevalence of major depressive disorder at geriatric age has been reported at 1-5% in large sample studies. However, when subthreshold symptoms or other depressive disorders are included, this may rise to as high as 15%.<sup>[2]</sup> The frequency of depression may also vary depending on the place of residence.<sup>[3]</sup>

Geriatric depression is a term used to refer to depressive attacks seen after the age of 65. There is no difference in diagnostic criteria with depressive disorders seen at earlier ages in diagnostic classification systems. Although there is no difference between geriatric depression and depressive disorders seen at younger ages in terms of diagnostic criteria, differences may occur in symptom variation.<sup>[4]</sup> For example, geriatric depression patients have been observed to express their symptoms with somatic complaints rather than emotionally.<sup>[5]</sup> Geriatric depression is divided into two categories based on age at the time of the first attack – early-onset depression (EOD) and late-onset depression (LOD). However, there is no consensus regarding the age at which this distinction applies, and different ages may be employed in the literature, from 50 to 65. In addition to age at onset, there may also be differences between these two groups in terms of the disease's course and its clinical features.<sup>[6]</sup>

Cognitive complaints associated with both age and accompanying medical diseases may appear in the geriatric period. The relationship between cognitive complaints and depression may be a two-way one. Cognitive complaints may be identified in various ways – subjective complaints reported by the patient or relatives, and objective complaints identified by a physician through examination. Subjective and objective memory complaints in geriatric depression patients may differ. Greater subjective memory complaints but similar levels of objective memory complaints have been observed in the geriatric period compared to a control group.<sup>[7]</sup> However, subjective memory complaints have been determined in a third of the healthy elderly individuals.<sup>[8]</sup> The prevalence of subjective memory complaints rises with age, and can reach as high as 60%.<sup>[9]</sup> A relationship has been determined between subjective memory complaints and anxiety and depression levels in the geriatric population with no cognitive disease.<sup>[10]</sup> The significance of subjective memory complaints may be related to the risk of future dementia development.<sup>[11]</sup> Objective impairments may also occur in several cognitive areas in geriatric depression.<sup>[12]</sup> In a study performed using the clock drawing test, LOD patients exhibited poorer performances than EOD patients and a control group.<sup>[13]</sup>

One criterion employed in the diagnosis of depression is a decrease in functionality.<sup>[14]</sup> Activities of daily living represent one area of functionality. A two-way relationship exists between activities of daily living and geriatric depression. Activities of daily living improve following treatment in geriatric depression.

<sup>[15]</sup> However, a reduction in activities of daily living has been linked to depressive symptoms in a study group consisting of healthy elderly individuals.<sup>[16]</sup> Longitudinal observational studies have also determined a relationship between a decline in activities of daily living and the development of depressive symptoms.<sup>[17]</sup> Decreased activities of daily living in geriatric depression have been shown to be potentially linked to white matter lesions<sup>[18]</sup> and inflammation levels.<sup>[19]</sup>

The present study compared the activities of daily living and cognitive functions of individuals with geriatric depression and a control group. Patients were also divided into early and late-onset subgroups and compared in terms of these variables. Relations between the variables in the geriatric depression group were also subjected to correlation analysis. The research hypothesis was that cognitive effects and impairment of daily activities would be greater in the geriatric depression group. We also hypothesized that cognitive functions would be poorer in the LOD group compared to the EOD group.

## MATERIAL AND METHOD

The study group was selected from patients aged 65 or over admitted to the Samsun Ondokuz Mayıs University Psychiatric Clinic, Turkey, diagnosed with a major depressive disorder based on DSM 5,<sup>[14]</sup> and treated on an outpatient basis. Ninety-four patients with geriatric depression and 39 controls were included. Patients were divided into early-onset depression (age <65 at first attack) and late-onset depression (age ≥65 at first attack) groups based on age at first depressive attack. Thirty-three cases were assessed as LOD and 61 as EOD. Individuals with neurocognitive disorders (delirium or dementia), unable to complete the study scales, unable to cooperate sufficiently to complete the scales, or refusing to participate were excluded from the study. Clinical examination and a standardized Mini Mental State Examination (MMST) were used to exclude neurocognitive disorder. A score of 24 or higher on the MMST<sup>[20]</sup> was adopted as an inclusion criterion. Information concerning patients' age, sex, marital status, and psychiatric diseases was collected using a data form. Information concerning the marital status and education level were deficient for 10 patients (five from the LOD and EOD groups). The Structured Clinical Interview for DSM 5 (SCID-5) was employed to diagnose major depressive disorder. All patients diagnosed with major depressive disorder and included in the study completed the Geriatric Depression Scale (GDS-15), the Clock-Drawing Test (CDT), the Katz Activities of Daily Living Scale (KADLS), and the Subjective Memory Complaints Questionnaire (SMCQ).

Individuals aged over 65, with no cognitive disease, and agreeing to participate were included in the study. The control group was selected from individuals who applied to the psychiatry outpatient clinic for various reasons, and did not have an active psychiatric disease. The control group completed the CDT, SMCQ, and KADLS. This group also underwent clinical examination and the MMST for the assessment of cognitive disorders.

Ethical approval for the study was granted by the Ondokuz Mayıs University Clinical Research Ethical Committee (no: 2019/534). Written consent was also obtained from all participants.

### Data Collection Tools:

#### Standardized Mini Mental State Examination

The standardized MMST consists of orientation, memory, attention, language, and visual-spatial skills sections, assessed out of 30, and providing information about the individual's cognitive state. It was developed by Folstein et al.<sup>[21]</sup> The optimal cut-off values for discriminating between dementia and control groups in the Turkish-language reliability and validity study were found as 23/24.<sup>[20]</sup>

#### Geriatric Depression Scale-15

The initial GDS consisted of 30 questions. Shorter forms were later developed. The 15-question form was developed by Burke et al.<sup>[22]</sup> The scale is short, easy to apply, and completed by the participant. A cut-off point of five was determined in the Turkish-language reliability and validity study.<sup>[23]</sup>

#### Clock Drawing Test

The CDT is a simple cognitive screening test for cognitive areas such as abstract thinking, planning, and motor skills. It exhibits a high correlation with other tests measuring cognitive functions. Therefore, it has been described as a test capable of use for all cognitive functions, similarly to the MMST.<sup>[24]</sup> Different evaluation methods are available for calculating the test results. The Shulman scoring system was employed in the present study. When applied using Shulman scoring, the patient is given a circle and asked to fill in the numbers and to draw a time of 11:10. In this method, a score between 0 and 5 is awarded depending on the organization of the response.<sup>[25]</sup> Higher scores indicate better cognitive functions.

#### Katz Activities of Daily Living Scale

The KADLS consists of six questions investigating activities in the individual's daily life, such as bathing, dressing, toilet, transferring, feeding, and fecal and urinary continence. Each question is scored either 0 or 1, with total possible scores ranging from 0 to 6. Higher scores indicate a higher degree of independence. The Turkish-language reliability and validity of the scale were researched by Arık et al.<sup>[26]</sup>

#### Subjective Memory Complaints Questionnaire

The SMCQ consisting of 14 Yes/No questions was developed by Youn et al.<sup>[27]</sup> It can be used to evaluate the level of cognitive symptoms in neurocognitive disorders, and also in the assessment of cognitive complaints with depression and anxiety or various personality characteristics.<sup>[28]</sup> The reliability and validity of the Turkish-language version were investigated by Özel Kızıl et al.<sup>[29]</sup> Higher scores indicate greater complaints associated with memory.

#### Statistical Analysis

Statistical analysis was performed on SPSS 15.0 software.

Normality of distribution of the study data was assessed using the Kolmogorov-Smirnov test. The Chi-Square Test was used to evaluate relationships between categorical variables. The Kruskal-Wallis Test was applied in three-way comparisons (between the EOD, LOD, and control groups) of the non-normally distributed variables of age, CDT, SMCQ, and KADLS. The Mann-Whitney U Test with post-hoc Bonferroni correction was applied to identify the groups between which differences emerged in variables with significant differences. Relations between GDS-15, CDT, SMCQ, and KADLS scores in the geriatric depression group were evaluated using Spearman's Rank Correlation Coefficient.  $P < (0.05/3) = 0.016$  was regarded as statistically significant in the Bonferroni-corrected Mann-Whitney U Test, and  $p < 0.05$  for all other comparisons.

## RESULTS

Mean ages were  $70.4 \pm 5.3$  years in the control group and  $73.0 \pm 7.8$  and  $71.8 \pm 6.5$  in the LOD and EOD groups, respectively. Eight members of the control group, 27 of the EOD group, and 13 of the LOD group had been educated for longer than eight years. No differences were determined between the study groups in terms of age, sex, medical status, or education level (**Table 1**).

**Table 1.** Sociodemographic data of the groups and their comparison.

Variables	Patients with geriatric depression (n: 94)		Controls (n: 39)	p value
	LOD (n: 33)	EOD (n: 61)		
Age, mean( $\pm$ SS)	$73.0 \pm 7.8$	$71.8 \pm 6.5$	$70.4 \pm 5.3$	0.459
Sex, n	15 (45.5%)	20 (32.8%)	18 (46.2%)	0.309
	18 (54.5%)	41 (67.2%)	21 (53.8%)	
Marital status, n	23 (82.1%)	42 (75%)	32 (82.1%)	0.631
	5 (17.9%)	14 (25%)	7 (17.9%)	
Educational level	15 (53.6%)	29 (51.8%)	14 (35.9%)	0.231
	13 (46.4%)	27 (48.2%)	25 (64.1%)	

EOD: Early-Onset Depression, LOD: Late-Onset Depression. The marital status and education levels of five patients could not be reached in both late-onset and early-onset depression groups. n: number of participants.

Significant differences were observed between the three study groups (LOD, EOD, and control) in terms of CDT ( $\chi^2$ : 16.140,  $p$ :  $< 0.001$ ) and SMCQ ( $\chi^2$ : 19.853,  $p$ : 0.001). Post hoc analyses revealed that these derived from higher scores in the control group compared to the LOD group for CDT ( $Z$ : -3,198,  $p$ : 0.001), and to higher scores in the EOD ( $Z$ : -4,138,  $p$ :  $< 0.001$ ) and LOD ( $Z$ : -3,549,  $p$ :  $< 0.001$ ) groups compared to the control group for SMCQ. No difference was determined between the groups in terms of KADLS ( $\chi^2$ : 0.603,  $p$ : 0.740). Comparisons in GDS-15 revealed higher scores in the LOD group than the EOD group ( $Z$ : -2.632,  $p$ : 0.008) (**Table 2**).

**Table 2.** Comparison of the groups in terms of GDS-15, CDT, SMCQ, and KADLS.

Variables	Patients with geriatric depression (n: 94)		Controls (n: 39)	U/ $\chi^2$	p value
	LOD (n: 33)	EOD (n: 61)			
GDS-15	57.52	42.08		676.00	0.008
CDT	47.73	69.06	80.09	16.140	<0.001*
SMCQ	78.70	75.08	44.46	19.853	<0.001**
KADLS	63.55	68.84	67.05	0.603	0.740

The Mann-Whitney U Test with post-hoc Bonferroni correction was applied to identify the groups between which differences emerged in variables with significant differences. GDS-15: Geriatric Depression Scale, CDT: Clock-Drawing Test, SMCQ: Subjective Memory Complaints Questionnaire, KADLS: Katz Activities of Daily Living Scale. \*: Control> LOD, \*\*: EOD=LOD> Control, EOD: Early-Onset Depression, LOD: Late-Onset Depression. n: number of participants. U value is given for GDS-15 and  $\chi^2$  value for others.

The correlation analysis results between variables in patients with geriatric depression are shown in **Table 3**. This revealed a low degree of significant negative correlation between GDS-15 and KADLS scores ( $r$ : -0.450,  $p$ : <0.01.).

**Table 3.** Correlation levels of GDS-15, CDT, SMCQ, and KADLS scores in patients with geriatric depression.

VARIABLES	1	2	3
GDS-15 (1)	1.000		
CDT (2)	0.084	1.000	
SMCQ (3)	0.192	0.000	1.000
KADLS (4)	-0.450*	0.125	-0.198

Spearman Rank Correlation Coefficients are given. GDS-15: Geriatric Depression Scale, CDT: Clock-Drawing Test, SMCQ: Subjective Memory Complaints Questionnaire, KADLS: Katz Activities of Daily Living Scale. \*  $p$ <0.01.

## DISCUSSION

CDT scores were lower, and SMCQ scores were higher in the LOD group compared to the control group in the present study, while SMCQ scores were higher in the EOD group than in the control group. No significant difference was determined between the two geriatric depression subgroups, EOD and LOD, apart from greater severity of depression in the LOD group. These findings are discussed below.

Cognitive complaints frequently accompany affective symptoms in patients with geriatric depression. Variation may therefore occur between EOD and LOD patients. Cognitive functions of patients with LOD have been found to be more impaired compared to in healthy controls.<sup>[30]</sup> This impairment in cognitive functions has been shown to be at a similar level to that in patients with mild cognitive disorder.<sup>[31]</sup> Impairment in initial cognitive functions may not be reversed after treatment.<sup>[32]</sup> Şenel et al.<sup>[33]</sup> reported increased subjective memory complaints in geriatric depression compared to a control group, but observed no significant difference between the groups in terms of CDT. A study comparing a control group with EOD and LOD patients reported lower CDT scores in the LOD group than in the other two groups.<sup>[13]</sup> However, cognitive complaints predominate in the clinical manifestation of executive dysfunction syndrome, the first of the possible hypotheses in geriatric depression.<sup>[34]</sup> The difference in the CDT in the LOD group in the present study is therefore consistent with the previous literature as a finding that may indicate objective

impairment in cognitive functions. Some studies in this area have found no difference between geriatric depression, making no distinction between EOD and LOD, and control groups. LOD may therefore be regarded as a subtype of geriatric depression involving greater cognitive effects.

One of the DSM-5 diagnostic criteria for depressive disorders is difficulty in such cognitive functions as thinking and concentration. These symptoms have been reported to be expected to improve after treatment, with this manifestation being referred to as 'pseudodementia' to avoid cognitive dysfunction in dementia.<sup>[14]</sup> Higher subjective memory complaints have been observed in patients with geriatric depression compared to a control group.<sup>[7]</sup> Subjective memory complaints have been observed in more than half of geriatric depression patients in remission, with these being associated with other cognitive functions.<sup>[35]</sup> Zandi<sup>[36]</sup> determined more severe depressive symptoms in individuals with subjective memory complaints compared to those with no such complaints. One double-blind, randomized placebo-controlled study reported that subjective memory complaints responded better to a combination of escitalopram and memantine than to a combination of escitalopram and placebo.<sup>[37]</sup> A higher rate of the APO-E4 allele, known to be linked to Alzheimer's disease, was found in individuals with subjective memory complaints in a community-based study. This elevation was higher in the presence of depressive symptoms. On the other hand, in the regression analysis, it was found that depression was not a predictor of subjective memory complaints.<sup>[38]</sup> In the light of these findings, the greater subjective memory complaints in patients with geriatric depression (in both the EOD and LOD groups) as an expected result.

There may be various reasons for the fact that no difference in activities of daily living was observed between the groups in this study. One may be the fact that the case group in this study consisted of outpatients. Another reason may be the content of the scale used to evaluated activities of daily living (KADLS). This scale investigates such activities as bathing, dressing, toilet, transferring, feeding, fecal and urinary continence. Although the level of depression in the geriatric period is correlated with levels of activities of daily living,<sup>[39]</sup> impairment in these domains is expected in severe depressive disorder.<sup>[14]</sup> In geriatric depression, impairment is first expected in instrumental activities of daily living.<sup>[40]</sup> Accordingly, impairment in basic activities of daily living may not be observed in mild and moderate depressive disorders treated on an outpatient basis. However, in line with expectations, the negative correlation between the severity of depression in geriatric depression and KADLS scores is a finding compatible with the previous literature.<sup>[41]</sup>

One reason for the absence of variation between the EOD and LOD subgroups in terms of CDT, SMCQ, and KADLS may be that depressive symptoms were more severe in the LOD group. One study comparing two such groups in terms of CDT results reported greater impairment in the LOD group's CDT results. However, the mean age of the LOD group was



higher in that age, and MMST scores were lower.<sup>[13]</sup> In contrast, there was no difference in age between the two groups in the present study. One previous study reported greater cognitive effects in a LOD group.<sup>[42]</sup> CDT was employed for cognitive assessment of the patients in the present study. CDT may have been unable to account for the differences in cognitive findings between the groups.

One limitation of the present study is that only patients treated on an outpatient basis were included. The study findings cannot, therefore, be generalized to all geriatric depression patients. Our study has other limitations that it was single-centered, containing a small number of cognitive scales, some of the scales were self-report, it's cross-sectional nature, was not controlled the effects of accompanying diseases or drugs used.

## CONCLUSION

In cognitive functions evaluated by the clock drawing test, lower scores were obtained in the LOD group than the control group. Subjective memory complaints are more common in geriatric depression than controls. A negative relationship was found between the severity of depression and activities of daily living in geriatric patients with depression. However, further studies employing different tests to better evaluate cognitive functions may shed further light on this subject. In addition, using scales that evaluate more complex functions while evaluating daily living activities can give more accurate results.

## ETHICAL DECLARATIONS

**Ethics Committee Approval:** Ethical approval for the study was granted by the Ondokuz Mayıs University Clinical Research Ethical Committee (no: 2019/534)

**Informed Consent:** All patients signed the free and informed consent form.

**Referee Evaluation Process:** Externally peer-reviewed.

**Conflict of Interest Statement:** The authors have no conflicts of interest to declare.

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**Author Contributions:** All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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