

## Relationship between Activities of Daily Living, Sleep and Depression among the Aged Living at Home

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### ABSTRACT

**Objective:** This study aimed at determining the relationship between daily living activities, sleep and depression among individuals 60 years or older living at home.

**Methodology:** This descriptive and cross-sectional study was conducted with 166 patients of a family health center between December 2010 and March 2011. Data were collected via Questionnaire Form, Katz Index of Activities of Daily Living (ADL), Geriatric Depression Scale-short form (GDS\_SF), and the Pittsburgh Sleep Quality Index (PSQI).

**Results:** The participants' mean age was  $67.34 \pm 6.5$ , 78.9% had chronic diseases and 29.5% had walking problems. In words 56.8% had poor sleep, 26.5% had depressive symptoms and the majority were independent in ADL. A negative relationship was observed between ADL score and PSQI and GDS but a positive one between PSQI and GDS ( $p < 0.05$ ).

**Conclusions:** Although individuals' elderly people living at home are independent in basic ADL, they are displaying considerable depressive symptoms and having sleep problems.

**KEY WORDS:** Aged, Daily living activities, Sleep quality, Depression.

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### INTRODUCTION

Today, the average human life span and the aged population has been increasing in line with advances in technology and health care and changing dietary

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habits. The proportion of the population over 60 years of age to the total population in Turkey was 5% in 2005 and 6.1% in 2010. This rate is estimated to be 9% by 2020 and 13% by 2050.<sup>1</sup>

Chronic diseases and functional impairments may occur due to longer life expectancy. In addition, individuals may suffer from aging-related problems such as sensory, perceptual, cognitive changes and loss of physical power.<sup>2-4</sup>

Because of functional deficiencies, many elderly individuals often fail to perform basic activities of daily living and they tend to suffer from an increase in dependency status.<sup>5,6</sup> Also, chronic diseases emerging in old age and loss of various functions, organs or beloved ones can increase the tendency to depression.<sup>7-9</sup> The physical and mental diseases resulting from the advanced age, drugs used in these diseases and psycho-social changes can impair individuals' quality of sleep.<sup>4,10</sup>

This study aimed at determining the relationship between activities of daily living, sleep and depression status among individuals 60 years

of age or older living at home and to develop recommendations that may guide the creation of integrated health care services.

## METHODOLOGY

This was a cross-sectional study carried out between December 2010 and March 2011. Approval by the institution and ethics committee was obtained before commencing the study. The study initially planned to enroll all elderly individuals of 60 years of age or older who came to Mersin city Nafiz Colak Family Health Center outpatient clinic for control. Among the elderly people interviewed, 45 people refused to participate in the study for various reasons and 25 people didn't give consent either because it was not possible to contact them or because they quit during the data collection stage. As a result, the study enrolled a total of 166 elderly people registered in Nafiz Colak Family Health Center outpatient clinic.

After receiving consent from the individuals who agreed to participate in the study, data were gathered in a room in the family health center via the face to face interview technique. Data were collected using a questionnaire prepared in accordance with the review of literature, the Katz Index of Activities of Daily Living (ADL)<sup>11</sup>, Geriatric Depression Scale-Short Form (GDS\_SF)<sup>8</sup> and the Pittsburgh Sleep Quality Index (PSQI).<sup>12</sup> SPSS 11.5 and MedCalc ® software package v11.0.1 were used to assess the data.

## RESULTS

Among the elderly who participated in the study, 55.4% were female, 61.5% were secondary school graduates or above and the mean age was  $67.34 \pm 6.5$ . It was also found that 78.9% of the elderly in the study had chronic disease, 70.2% of them had hypertension, 32.8% of them had diabetes and the majority had ongoing medication due to chronic diseases. Other socio-demographic characteristics are given in Table-I and the clinical features are presented in Table-II.

**Results regarding Sleep Quality and Depression:** It was found that the participants' mean score from the GDS\_SF was  $3.96 \pm 3.48$  and 26.5% of them received scores above six (6), which is the cutoff of the GDS\_SF. On the other hand, the participants' mean score from the PSQI was  $6.88 \pm 4.22$  and 56.8% of them received scores of six (6) or above, which is the cutoff of the index (Table-III).

In the study, the statistical difference between some descriptive properties of the participants

Table-I: ADL, GDS-SF and PSQI score distributions to socio-demographic characteristics (n=166).

Variables (%)	ADL Index	GDS-SF	PSQI
	Median	Median	Median
	[%25, %75]	[%25, %75]	[%25, %75]
<b>Age</b>			
60-65 (51.2)	18[18-18]	3[1-5]	6[3-9]
66-70 (22.9)	18[18-18]	3[1-5]	7[3-11]
71-75 (13.9)	18[18-18]	4[1-10]	8[4-11]
76 or older (12.0)	18[18-18]	3[2-7.75]	5.5[4-8.75]
<b>Gender</b>			
Female (55.4)	18[18-18]	4[2-8]**	8[4.25-12]**
Male (44.6)	18[18-18]	2[1-3]	5[3-7]
<b>Educational level</b>			
Illiterate (12.7)	18[18-18]	7[3.5-10]**	11[5.5-15]**
Primary school (25.9)	18[18-18]	4[2-8]	8[5-11]
Secondary school (12.7)	18[18-18]	3[2-7.5]	6[4-8]
High school (27.7)	18[18-18]	2[1-4]	5[3-7]
University (21.1)	18[18-18]	2[1-3]	4[2-7]
<b>Marital status</b>			
Married (71.1)	18[18-18]	2[1-5]	5.5[3-8]
Single (28.9)	18[18-18]	4[2-9]**	8[5-12]**
<b>Previous job</b>			
R***Civil servant (29.5)	18[18-18]	2[1-3]	4[2-6.5]
R.Worker (20.5)	18[18-18]	3[1.75-5]	6[3-9.25]
R.Tradesman (8.4)	18[18-18]	3[1-3.5]	4[2.5-8]
Housewife (41.0)	18[18-18]	5.5[2-9.75]**	8[6-12]**
<b>Living together</b>			
Alone (15.7)	18[18-18]	5.5[3-10.25]**	9[3-13.25]**
With spouse (38.5)	18[18-18]	2[1-4]	6[4-8]
With spouse and children (26.5)	18[18-18]	2[1-5]	4.5[3-8]
With relatives (19.3)	18[18-18]	5[2-8]**	8[5.25-12]*
<b>Place of residence</b>			
Village (8.4)	18[18-18]	7.5[4-10.25]*	9.5[6.5-11.5]*
Town (11.5)	18[18-18]	3[1-8]	8[3-14]
City (75.3)	18[18-18]	3[1-5]	6[3-8]

\*The significance level at  $p < 0.01$

\*\* The significance level at  $p < 0.001$

R\*\*\* Retired

and the total score distributions of the GDS\_SF and PSQI was found to be significant (Table-I). The GDS\_SF and PSQI score means were high and the difference was statistically significant with the participants who were women, illiterate, single, housewives, and lived in village alone/with their relatives ( $p<0.05$ ). It was determined that the participants in this group had poor quality of sleep and higher levels of depression.

Total scores of the GDS\_SF and PSQI for the participants with chronic diseases, ongoing medication due to their diseases, walking, hearing and vision problems were higher than those of other participants not having this problems and that there was a statistically significant difference between the groups ( $p<0.05$ ) (Table-II). It was determined that the participants in this group had poor quality of sleep and higher levels of depression.

**Results regarding Activity of Daily Living:** The mean score received by the elderly in this study from the index of ADL was  $17.75\pm1.5$  (Table-III). The majority of the participants were independent in ADL and no statistically significant difference

Table-II: ADL, GDS-SF and PSQI score distributions to health history and physical problems (n=166).

Variables (%)	ADL Index Median	GDS-SF Median	PSQI Median
	[%25, %75]	[%25, %75]	[%25, %75]
<b>Chronic disease</b>			
Yes (78.9)	18[18-18]	3[2-7]	7[4-11]
No (21.1)	18[18-18]	2[1-3]	4[3-6]
p	0.112	0.004	<0.001
<b>Medication use</b>			
Yes (80.1)	18[18-18]	3[2-7]	7[4-11]
No (19.9)	18[18-18]	2[1-3]	4 [3-5]
p	0.216	<0.001	<0.001
<b>Vision Problem</b>			
Yes (71.1)	18[18-18]	3[2-6]	7[4-11]
No (28.9)	18[18-18]	2[1-5.75]	5[3-8]
p	0.740	0.207	0.008
<b>Hearing Problem</b>			
Yes (25.3)	18[18-18]	4.5[3-10]	7[4-11]
No (74.7)	18[18-18]	2[1-5]	6[3-8]
p	0.327	<0.001	0.148
<b>Walking Problem</b>			
Yes (29.5)	18[18-18]	4[2.5-9.5]	8[5-11]
No (70.5)	18[18-18]	2[1-5]	5[3-8]
p	<0.001	<0.001	0.007
<b>Regular Walk</b>			
Yes (71.7)	18[18-18]	2[1-5]	6[3-8]
No (28.3)	18[18-18]	4[3-8]	6[4-12]
p	0.01	0.001	0.037

was identified between their socio-demographic characteristics and the total score distributions in the ADL index ( $p>0.05$ ) (Table-I). On the other hand, the mean total scores of the ADL index for the participants not having walking problems and going for a walk regularly were higher than those of the participants having walking problems and not walking regularly and that there was a statistically significant difference between the groups ( $p<0.01$ ) (Table-II).

In the statistical analysis of the correlation of the indices with each other, a statistically significant relationship in positive direction was found between the GDS\_SF and PSQI ( $p<0.01$ ) (Table-III). Finally, it was found that the levels of depression of the aged in our study increased and their sleep quality decreased with the decreasing level of independence in ADL while the quality of sleep increased as the level of depression decreased.

## DISCUSSION

Independence in activities of daily living, sleep quality and mood of individuals are important factors affecting their quality of life. According to the results, among the participants in this study, 78.9% had chronic diseases and 70% of these diseases were hypertension and 80% of the participants had ongoing medication due to chronic diseases. The literature suggests that the incidence of chronic diseases increases with advanced age and reports a higher prevalence of hypertension among chronic diseases.<sup>1,5,6</sup>

Among the elderly in this study, 26.5% suffered from depression and 56.8% had poor quality of sleep and the majority were independent in their personal ADL. Depression and sleep quality are intertwined with each other and depression can deteriorate the quality of sleep or sleep quality disorder can lead to depression. Several studies report a relatively high prevalence rate of both sleep problems and depression in aged people in society. It is reported that sleep problems such as delay in falling asleep and frequent waking is 30-50%<sup>10,13</sup>,

Table-III: The correlation of the ADL, GDS-SF and PSQI total scores (n=166).

Properties	x±SD	ADL	GDS_SF Index	PSQI
ADL Index	$17.75\pm1.51$	1	-.142	-.094
GDS-SF	$3.96\pm3.48$	-.142	1	.472**
PSQI	$6.88\pm4.22$	-.094	.472**	1

\*\*P<0.01

symptoms of depression is 3-40%<sup>9,14,15</sup> among the aged and that these frequencies are higher with individuals living in nursing homes.<sup>4,16</sup> On the other hand, research indicates that the majority of elderly individuals living at home were independent in the basic activities of daily living.<sup>5,7,14</sup>

In our study, while no statistically significant difference was found between the identifying characteristics of the elderly and their ADL, a significant difference was found between sleep quality and depression levels ( $p < 0.05$ ). The GDS\_SF and PSQI scores of the women in the study were found to be higher than those of the men and the same scores of the housewives were higher than those of the other occupational groups in the study.<sup>3,6-8,14</sup> Women experience more physiological changes than men and menopause is known to bring about an increase in chronic diseases. However, their role as a caregiver for the elderly and children in the household continues even in their senior age. Such conditions may be considered to corrupt the quality of sleep and cause mood disorders. On the other hand, assessing the individuals in this group going to family health centers in more detail and providing them with counseling about the corresponding coping strategies is expected to improve their quality of life.

This study determined an increase in the quality of sleep and a decrease in depression with increasing level of education. Studies report a high rate of depression<sup>7,8</sup> and poor quality of sleep<sup>4,10</sup> in those with low educational level. It could be suggested that as the level of education of elderly individuals increases, they are more likely to develop strategies of coping with their problems, obtaining self-knowledge and carrying out initiatives to improve their quality of sleep and to develop personal coping strategies.

The participants who were single and lived alone/with their relatives were found to have poor sleep quality and high depression scores. The literature reports lower sleep quality<sup>10,17</sup> and higher prevalence of symptoms of depression<sup>7,8,14</sup> in this group. Having inadequate social support systems and having to deal with many problems alone can cause the individuals in this group to suffer from stress more severely. Thus, these factors can have a negative influence on their mood and quality of sleep. In order to solve the problems of the individuals in this group, family health centers should be in cooperation with national and local governments and strategies should be developed so that participation of the aged in social events and activities with other elderly individuals can be

increased (retirement villages, nursing homes, etc.). In this study, the GDS\_SF and PSQI scores were high in the participants with chronic diseases and ongoing medication. The literature reports lower sleep quality<sup>4,10,17</sup> and higher prevalence of symptoms of depression<sup>8,9,14</sup> in this group. Chronic diseases and consequent drug therapies increase in parallel with advanced age. Acute or chronic diseases, the physical deficiencies resulting from them, symptoms of these diseases and increasing use of drugs can cause individuals to suffer from frequent awakening from sleep and to have difficulty falling asleep and can corrupt their mood and sleep quality.<sup>10</sup> A counseling service to be offered to these individuals regarding the management of their present chronic disease as well as sleep hygiene and a positive mood could help them deal with the disease symptoms and problems and thus improve their quality of life.

Among the participants in this study, 71.1% of the elderly had vision problems, 25.3% had hearing problems, 29.5% had of physical problems like walking problems and 71.7% percent went for a walk on a regular basis. The high rate of those who regularly went for a walk in our study was associated with the convenience of the environment they lived in for physical activity (long fields for walk on the beach, parks suitable for exercises, quiet places away from traffic, etc.). Some studies mention fear of going out of home among the elderly and report that they spend more time in or around their homes. This situation is attributed to the fact that the environment they live in is not suitable for walking and it has heavy traffic and too much noise.<sup>3,18,19</sup> However, prospective studies that determine the factors affecting life expectancy and the factors involved report that the elderly who do more physical activity, spend their time outside home, get involved in more social interaction have longer life expectancy, higher quality of life and lower rate of developing chronic diseases.<sup>20,21</sup>

This study finally found that the participants who did not have walking problems and who went for a walk regularly had high levels of independence in activities of daily living and sleep quality but lower levels of depression. Physical activity have many positive effects in terms of physiological, psychological and social aspects. With regard to physiological aspect, it leads to muscle strength, improved sleep quality and quantity, reduction of stress and anxiety. Among its social effects are playing a more active role in society and strengthened social connections.<sup>20</sup>

## CONCLUSION

It was found that the prevalence of depression in the aged individuals in this study was 26.5% and 56.5% of them had sleep problems, while almost all of them were determined to be independent in their personal ADL. The participants who were women, housewives, had low education level and lived alone or with their relatives, were found to have higher levels of depression and poor sleep quality. One of the most important results of our study was that the majority (71.7%) went for a walk on a regular basis and that those who were physically active had high quality of sleep, low levels of depression and high levels of independence in ADL.

It could be recommended in light of these results that primary care nurses and physicians should assess the sleep quality, depression and independence in ADL of the aged living at home by means of indices and provide an appropriate counseling for the risk groups and that those individuals with inadequate physical activity should be explained the benefits of physical activity and encouraged to take up physical activity.

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## Authors Contribution:

MA and MY, research plan, data collection, manuscript writing and editing.

PO and FA data collection and data entered.

GOT, statistical analysis.