



# An Investigation of the Relationship between Sleep and Depression and the Affecting Factors in Older Individuals

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## Abstract

**Introduction:** Sleep is a physiological need that constitutes one-third of human life and is necessary for enabling individuals' participation in daily life activities in a compatible and healthy way. Insufficient sleep or excessive sleep has been reported to be associated with many health problems such as depressive symptoms. The present study aims to examine the relationship between sleep and depression and the affecting factors in older individuals.

**Methods:** The design of this study is descriptive. The study was carried out with individuals aged 65 and over who were registered in FHCs providing primary health care services between June and October 2021. The sample size was calculated as 307 individuals using the sampling method with an unknown target population (confidence interval 95%, the margin of error 5%, and response distribution 28%). The Socio-Demographic Characteristics Form, The Geriatric Depression Scale-Short Form, and the Richard-Campbell Sleep Questionnaire were utilized as the data collection tools. The questions were sent to the older people online via telephone. SPSS statistical package program was used to analyze the data. Descriptive statistics, the Mann-Whitney U test, the Kruskal Wallis test, and Spearman Correlation analysis were performed.

**Results:** Sleep quality was found to be low in those who had pain in a way to affect sleep and who experienced stress, sorrow, or unhappiness ( $P < 0.05$ ). The Geriatric Depression Scale mean scores were significantly higher in those who did not exercise regularly, who were dependent in daily life activities, and who had pain at a level to affect sleep ( $P < 0.01$ ). A negative, statistically significant, and weak relationship was found between depression and sleep quality ( $P < 0.01$ ).

**Conclusions:** This study found a negative, statistically significant, and weak relationship between depression and sleep quality. Community health nurses are recommended to consider older individuals as privileged groups within the scope of community mental health practices, determine the factors that could cause depression and insomnia, and take active roles in the implementation of the interventions to prevent these. Interventions could include teaching older individuals coping methods and providing them with support to practice these methods, enhancing symptom management in individuals who have a chronic disease, implementing practices to reduce pain, and organizing exercise programs appropriate to older individuals' conditions.

## INTRODUCTION

Advances in science and technology and positive developments in environmental conditions have led to an increase in the length of life. The concept of healthy aging has gained importance today with the increase in

the average life expectancy. Profession groups conducting studies in the field of health have also increased their studies to determine older individuals' needs [1].

Sleep is a physiological need that constitutes one-third of human life and is necessary for enabling individuals' participation in daily life activities in a compatible and healthy way [2]. Sleep is composed of sleep continuity or efficiency, alertness/sleepiness, timing, and satisfaction/quality dimensions [3]. In older individuals, dimensions of sleep are affected due to factors such as physiological and mental changes as well as decreases in physical and cognitive functions with the aging process. They cause changes in sleep patterns such as a decrease in sleep duration, waking frequently at night, sleeping and waking up early, etc. These changes experienced in the sleep pattern cause a decrease in individuals' sleep quality [4].

It is reported that insufficient sleep or excessive sleep are associated with many health problems such as depressive symptoms, impairment in cognitive functions, physical function and movement disorder, and cardiovascular disease [5, 6].

Depression is an important community health issue that affects individuals' realizing activities related to their emotions, thoughts, impulses, and daily life activities. Depression, which is very common especially among older individuals, is a mood disorder that has severe consequences [6, 7]. Besides, the majority of older individuals were found to complain about inadequate sleep or excessive sleep conditions [8]. Prolonged depression is reported to affect the country's economy by causing an increase in health service expenses [9].

Studies on this issue indicate bidirectional relationship between depression and sleep [6, 7]. However, the mechanisms underlying the bi-directional relationship have not been fully defined or understood. Studies on the relationship between sleep quality and depression are limited in the literature Hoyos et al. found that individuals with depression had lower sleep quality [10]. Zhang et al. reported a significant and negative relationship between sleep quality and depression [11]. A study conducted by Beh-Pajoo and Soleymani also reported a statistically significant and negative relationship between sleep quality and depression [12]. Another study indicated 0.240 points increase in the depression score per point increased in the PSQI score, indicating poorer sleep quality [13]. The study conducted by Zhang et al. reported that loneliness, chronic disease, and chewing difficulty affected depression in older individuals who had low sleep quality [11]. In line with the above information, sleep is very important in maintaining health in elderly individuals.

More studies are needed for the examination of the relationship between sleep quality and depression. Therefore, the present study aims to contribute to the related literature by examining the relationship between sleep quality and depression in older individuals.

## METHODS

**Design:** The design of this study is cross-sectional

### Setting and Study Population

The study was carried out with individuals aged 65 and over who were registered in FHCs providing primary health care services in a city in eastern Turkey between June and October 2021. Older individuals who were registered in the related centers and met the research criteria were the target population of the study. The sample size was calculated as 307 individuals using the sampling method with an unknown target population (confidence interval 95%, the margin of error 5%, and response distribution 28%). The study utilized haphazard sampling methods. For the haphazard sampling method, the participants were contacted via phone through the health personnel working in the Family Health Centers (FHCs).

### Inclusion Criteria

Those who were aged 65 and over, who had online access, and who volunteered to be included in the study and those who were not bedridden and who are not diagnosed with Alzheimer's, dementia, or any psychiatric disease were included.

### Data Collection

After their written consent was obtained, data were collected from older people who agreed to participate in the study through an online questionnaire sent to the participants via telephone in line with the responses either given by them or the people who filled in the forms based on the participants' response.

### Data Collection Tools

#### Socio-Demographic Characteristics Form

The form, which was prepared by the researcher, included 16 questions collecting data about the participants' gender, age, socio-economic condition, education level, habits, current disease history, exercises, and medicine use.

#### The Geriatric Depression Scale-Short Form (GDS-15)

The GDS-Short Form was developed by Burke et al. [14]. Reliability and validity were performed by Durmaz et al. in Turkish. The scale included 15 questions that investigated the patient's emotions. The questions are answered as "yes" or "no". The cut-off point of the scale is 7 points. Cronbach's alpha was found 0.92 in the study conducted by Durmaz et al. [15]. This study found Cronbach's alpha value as 0.83.

#### The Richard-Campbell Sleep Questionnaire

The questionnaire, which was developed by Richards in 1987, is composed of six items that assess the depth of night's sleep, sleep latency, frequency of awakenings,

duration of awakenings during waking up, sleep quality, and the level of noise in the environment. Each item is assessed using VAS from 0 to 100. While scores between 0 and 25 indicate very poor sleep, those from 76 to 100 indicate very good sleep. The total score is assessed through 5 items, and the 6<sup>th</sup> item evaluating the noise level in the environment is excluded from the total score [16]. Reliability and validity of the scale for Turkish were performed by Karaman Özlü and Özer. Karaman Özlü and Özer found Cronbach's alpha value as 0.91 and the explained variance ratio as 77.290% [17]. Cronbach's alpha was found 0.66 in the present study.

### Statistical Analysis

Data were analyzed in SPSS 18 using descriptive statistics to analyze the groups by their descriptive features. Kolmogorov Smirnov test was utilized to determine whether the data set distributed normally, and as the data did not distribute normally, Mann Whitney U test was used to compare mean scores in two independent groups. Kruskal Wallis was used to compare mean scores in more than two independent groups, and Spearman correlation was used to analyze the relationship between mean scores.  $p < 0.05$  was accepted statistically significant.

### Ethical Considerations

Prior to the study, ethics committee approval was received from the Scientific Research Ethics Committee of the university (no: E.6159). Instructions containing information about the study were sent to older individuals online. The participants were asked a question to understand whether they read and understood this instruction. A question was added at the end of the instruction "do you want to participate in the study?" to which they marked "yes" or "no". The participants whose informed consent was received online in this way and agreed to participate in the study were sent the questionnaire and scale questions online. Necessary permissions were received from the authors to utilize the scales.

### RESULTS

The participants' average age was reported  $69.14 \pm 5.61$ , and the results showed that 62.2% were females, 67.8% were married, 51.5% were not literate, 92.8 % did not work, and 56.4% had income equal to expenses. Of all the older people who participated in the study, 67.1% had a chronic disease, 84% did not exercise, 78.2% carried out their daily living activities independently, 59.9% consumed caffeine-containing food close to sleeping time, 65.8% slept during the day, 80.5% woke up to urinate at night, 50.8% did not have pain at a level to affect their sleep, and 53.7% experienced stress, sorrow or unhappiness at a level to affect their sleep. In

addition, 85.3% of the participants did not use sleeping pills and 80.1% did not do anything specific for enhancing sleep, 87.9% did not live alone, and 70.4% perceived their health level as moderate. Besides, the number of medicines used by the participants regularly was found  $2.25 \pm 2.18$  on average (Table 1).

Richard-Campbell Sleep Questionnaire mean score of the participating older individuals was  $49.14 \pm 11.90$ , and their Geriatric Depression Scale mean score was  $6.43 \pm 3.85$ . When the scores obtained from the Geriatric Depression Scale were assessed categorically, it was found that 36.3% of the participants did not have depression (Table 2).

When the Richard-Campbell Sleep Questionnaire mean scores of the participating older people were analyzed by their descriptive features, the mean score was significantly lower in those who had pain at a level to affect their sleep; who experienced stress, sorrow, or unhappiness at a level to affect their sleep; and who used sleeping pills ( $P < 0.05$ ) (Table 3).

The participants' Geriatric Depression Scale mean scores were compared by their descriptive features; the scale mean score was significantly higher in those who had income less than expenses, who had a chronic disease, who did not exercise regularly, who were dependent in their daily life activities, who had pain at a level to affect their sleep, who experienced stress, sorrow, or unhappiness at a level to affect their sleep, who used sleeping pills, and who perceived their health as poor ( $P < 0.01$ ) (Table 4).

A negative, statistically significant, and weak relationship was found between depression and sleep quality ( $P < 0.01$ ) (Table 5).

### DISCUSSION

#### Main Findings of the Study and Comparison with other Studies

This study examined the relationship between sleep quality and depression and the affecting factors in older people.

When elderly individuals' Richard-Campbell Sleep Questionnaire mean scores were compared by their descriptive features, the scale mean score was significantly lower in those who had pain at a level to affect sleep and who experienced stress, sorrow, or unhappiness. Similar studies also reported that pain, by interfering with the ability to fall asleep and maintain sleep, caused sleep disorders in individuals [18, 19]; stress and sorrow had direct effects on sleep quality [20]; and sleep quality got worse as perceived stress and sorrow increased [21]. Factors such as pain, stress, sorrow or unhappiness, by interfering with the ability to fall asleep and maintain sleep, could affect individuals' sleep quality.

**Table 1.** Older Individuals' Descriptive Characteristics (N=307)

|                                                                                   | N   | %    |
|-----------------------------------------------------------------------------------|-----|------|
| <b>Gender</b>                                                                     |     |      |
| Female                                                                            | 191 | 62.2 |
| Male                                                                              | 116 | 37.8 |
| <b>Marital Status</b>                                                             |     |      |
| Single/Widow                                                                      | 99  | 32.2 |
| Married                                                                           | 208 | 67.8 |
| <b>Education Level</b>                                                            |     |      |
| Illiterate                                                                        | 158 | 51.5 |
| Primary School                                                                    | 113 | 36.8 |
| High School or University                                                         | 36  | 11.7 |
| <b>Working or not</b>                                                             |     |      |
| Working                                                                           | 22  | 7.2  |
| Not working                                                                       | 285 | 92.8 |
| <b>Income Level</b>                                                               |     |      |
| Income less than expenses                                                         | 119 | 38.8 |
| Income equal to expenses                                                          | 173 | 56.4 |
| Income more than expenses                                                         | 15  | 4.9  |
| <b>Presence of a chronic disease</b>                                              |     |      |
| Yes                                                                               | 206 | 67.1 |
| No                                                                                | 101 | 32.9 |
| <b>Doing Exercises</b>                                                            |     |      |
| Yes                                                                               | 49  | 16.0 |
| No                                                                                | 258 | 84.0 |
| <b>Dependence in daily life activities</b>                                        |     |      |
| Independent                                                                       | 240 | 78.2 |
| Dependent                                                                         | 67  | 21.8 |
| <b>Consuming caffeine-containing food close to sleeping time</b>                  |     |      |
| Yes                                                                               | 184 | 59.9 |
| No                                                                                | 123 | 40.1 |
| <b>Sleeping during the day</b>                                                    |     |      |
| Yes                                                                               | 202 | 65.8 |
| No                                                                                | 105 | 34.2 |
| <b>Waking up to urinate at night</b>                                              |     |      |
| Yes                                                                               | 247 | 80.5 |
| No                                                                                | 60  | 19.5 |
| <b>Presence of pain at a level to affect sleep</b>                                |     |      |
| Yes                                                                               | 151 | 49.2 |
| No                                                                                | 156 | 50.8 |
| <b>Presence of stress, sorrow or unhappiness at a level to affect sleep</b>       |     |      |
| Yes                                                                               | 165 | 53.7 |
| No                                                                                | 142 | 46.3 |
| <b>Use of sleeping pills</b>                                                      |     |      |
| Yes                                                                               | 45  | 14.7 |
| No                                                                                | 262 | 85.3 |
| <b>Habit of doing something apart from medicine use to enhance falling asleep</b> |     |      |
| Yes                                                                               | 61  | 19.9 |
| No                                                                                | 246 | 80.1 |
| <b>Living alone</b>                                                               |     |      |
| Living alone                                                                      | 37  | 12.1 |
| Not living alone                                                                  | 270 | 87.9 |
| <b>Perceived health condition</b>                                                 |     |      |
| Good                                                                              | 58  | 18.9 |
| Moderate                                                                          | 216 | 70.4 |
| Poor                                                                              | 33  | 10.7 |
| <b>Age</b>                                                                        |     |      |
| $\bar{X} \pm SD$                                                                  |     |      |
| 69.14 $\pm$ 5.61 (min.65 - max.98)                                                |     |      |
| <b>Number of medicines used regularly daily</b>                                   |     |      |
| 2.25 $\pm$ 2.18 (min.0 - max.12)                                                  |     |      |
| <b>Average duration of sleep daily</b>                                            |     |      |
| 7.47 $\pm$ 1.14 (min. 5 - max. 9)                                                 |     |      |

**Table 2.** Older Individuals' Scale Mean Scores and Categorical Distributions (N=307)

|                                                              | $\bar{X} \pm SD$  | Min. | Max. |
|--------------------------------------------------------------|-------------------|------|------|
| <b>Richard-Campbell Sleep Questionnaire</b>                  | 49.14 $\pm$ 11.90 | 0    | 90   |
| <b>The Geriatric Depression Scale</b>                        | 6.43 $\pm$ 3.85   | 0    | 15   |
| <b>The Geriatric Depression Scale Categorical Depression</b> | n                 |      | %    |
| <b>No Depression (0-4 points)</b>                            | 111               |      | 36.2 |
| <b>Mild depression (5-8 points)</b>                          | 96                |      | 31.3 |
| <b>Moderate-level depression (9-11 points)</b>               | 61                |      | 19.9 |
| <b>Severe depression (12-15 points)</b>                      | 39                |      | 12.7 |

**Table 3.** Comparison of Older Individuals' Sleep Scale Mean Scores according to their Descriptive Characteristics (N=307)

|                                                                                   | N   | $\bar{X} \pm SD$  | Test and Significance |
|-----------------------------------------------------------------------------------|-----|-------------------|-----------------------|
| <b>Gender</b>                                                                     |     |                   | U=10377.0, P=.352     |
| Female                                                                            | 191 | 48.76 $\pm$ 12.22 |                       |
| Male                                                                              | 116 | 49.76 $\pm$ 11.38 |                       |
| <b>Marital Status</b>                                                             |     |                   | U=9314.0, P=.176      |
| Single/Widow                                                                      | 99  | 49.86 $\pm$ 12.38 |                       |
| Married                                                                           | 208 | 48.80 $\pm$ 11.68 |                       |
| <b>Education Level</b>                                                            |     |                   | KW=4.805, P=.091      |
| Illiterate                                                                        | 158 | 48.92 $\pm$ 12.28 |                       |
| Primary School                                                                    | 113 | 47.89 $\pm$ 10.80 |                       |
| High School or University                                                         | 36  | 54.00 $\pm$ 12.60 |                       |
| <b>Working or not</b>                                                             |     |                   | U=3101.5, P=.933      |
| Working                                                                           | 22  | 49.55 $\pm$ 14.95 |                       |
| Not working                                                                       | 285 | 49.11 $\pm$ 11.67 |                       |
| <b>Income Level</b>                                                               |     |                   | KW=2.073, P=.355      |
| Income less than expenses                                                         | 119 | 48.29 $\pm$ 11.52 |                       |
| Income equal to expenses                                                          | 173 | 49.54 $\pm$ 12.13 |                       |
| Income more than expenses                                                         | 15  | 51.33 $\pm$ 12.46 |                       |
| <b>Presence of a chronic disease</b>                                              |     |                   | U=9175.0, P=.092      |
| Yes                                                                               | 206 | 47.91 $\pm$ 11.96 |                       |
| No                                                                                | 101 | 51.64 $\pm$ 11.43 |                       |
| <b>Exercising regularly</b>                                                       |     |                   | U=5747.0, P=.313      |
| Yes                                                                               | 49  | 50.65 $\pm$ 14.19 |                       |
| No                                                                                | 258 | 48.85 $\pm$ 11.43 |                       |
| <b>Dependence in daily life activities</b>                                        |     |                   | U=6807.5, P=.055      |
| Independent                                                                       | 240 | 48.74 $\pm$ 10.51 |                       |
| Dependent                                                                         | 67  | 50.57 $\pm$ 15.94 |                       |
| <b>Sleeping during the day</b>                                                    |     |                   | U=10465.5, P=.850     |
| Yes                                                                               | 202 | 49.43 $\pm$ 10.63 |                       |
| No                                                                                | 105 | 48.59 $\pm$ 14.08 |                       |
| <b>Waking up to urinate at night</b>                                              |     |                   | U=6670.5, P=.230      |
| Yes                                                                               | 247 | 49.68 $\pm$ 11.44 |                       |
| No                                                                                | 60  | 46.93 $\pm$ 13.53 |                       |
| <b>Presence of pain at a level to affect sleep</b>                                |     |                   | U=8998.5, P=.001      |
| Yes                                                                               | 151 | 46.57 $\pm$ 11.85 |                       |
| No                                                                                | 156 | 51.63 $\pm$ 11.45 |                       |
| <b>Presence of stress, sorrow or unhappiness at a level to affect sleep</b>       |     |                   | U=9841.5, P=.015      |
| Yes                                                                               | 165 | 47.41 $\pm$ 10.90 |                       |
| No                                                                                | 142 | 51.15 $\pm$ 12.72 |                       |
| <b>Use of sleeping pills</b>                                                      |     |                   | U=4397.5, P=.006      |
| Yes                                                                               | 45  | 44.22 $\pm$ 12.32 |                       |
| No                                                                                | 262 | 49.98 $\pm$ 11.65 |                       |
| <b>Habit of doing something apart from medicine use to enhance falling asleep</b> |     |                   | U=7026.0, P=.441      |
| Yes                                                                               | 61  | 49.80 $\pm$ 10.96 |                       |
| No                                                                                | 246 | 48.98 $\pm$ 12.14 |                       |
| <b>Living alone</b>                                                               |     |                   | U=4653.5, P=.499      |
| Living alone                                                                      | 37  | 47.95 $\pm$ 12.22 |                       |
| Not living alone                                                                  | 270 | 49.30 $\pm$ 11.87 |                       |
| <b>Perceived health condition</b>                                                 |     |                   | KW=5.777, P=.056      |
| Good                                                                              | 58  | 52.31 $\pm$ 11.66 |                       |
| Moderate                                                                          | 216 | 48.76 $\pm$ 11.46 |                       |
| Poor                                                                              | 33  | 46.06 $\pm$ 14.16 |                       |

**Table 4.** Comparison of Older Individuals' Depression Mean Scores according to their Descriptive Characteristics (N=307)

|                           | N   | $\bar{X} \pm SD$ | Test and Significance |
|---------------------------|-----|------------------|-----------------------|
| <b>Gender</b>             |     |                  | U=9968.5, P=.140      |
| Female                    | 191 | 6.72 $\pm$ 3.85  |                       |
| Male                      | 116 | 5.94 $\pm$ 3.81  |                       |
| <b>Marital Status</b>     |     |                  | U=9572.0, P=.318      |
| Single/Widow              | 99  | 6.86 $\pm$ 3.97  |                       |
| Married                   | 208 | 6.22 $\pm$ 3.77  |                       |
| <b>Education Level</b>    |     |                  | KW=3.794, P=.150      |
| Illiterate                | 158 | 6.84 $\pm$ 3.92  |                       |
| Primary School            | 113 | 6.19 $\pm$ 3.85  |                       |
| High School or University | 36  | 5.33 $\pm$ 3.33  |                       |
| <b>Working or not</b>     |     |                  | U=3090.5, P=.911      |



|                                                                                   |     |              |                   |
|-----------------------------------------------------------------------------------|-----|--------------|-------------------|
| Working                                                                           | 22  | 6.36 ± 3.47  |                   |
| Not working                                                                       | 285 | 6.43 ± 3.88  |                   |
| <b>Income Level</b>                                                               |     |              | KW=16.800, P=.001 |
| Income less than expenses                                                         | 119 | 7.40 ± 3.66  |                   |
| Income equal to expenses                                                          | 173 | 5.98 ± 3.92  |                   |
| Income more than expenses                                                         | 15  | 3.80 ± 2.11  |                   |
| <b>Presence of a chronic disease</b>                                              |     |              | U=7248.5, P=.001  |
| Yes                                                                               | 206 | 7.12 ± 3.90  |                   |
| No                                                                                | 101 | 5.02 ± 3.34  |                   |
| <b>Exercising regularly</b>                                                       |     |              | U=4578.5, P=.002  |
| Yes                                                                               | 49  | 4.71 ± 3.40  |                   |
| No                                                                                | 258 | 6.75 ± 3.85  |                   |
| <b>Dependence in daily life activities</b>                                        |     |              | U=6093.0, P=.002  |
| Independent                                                                       | 240 | 6.06 ± 3.79  |                   |
| Dependent                                                                         | 67  | 7.75 ± 3.79  |                   |
| <b>Sleeping during the day</b>                                                    |     |              | U=10403.0, P=.783 |
| Yes                                                                               | 202 | 6.38 ± 3.63  |                   |
| No                                                                                | 105 | 6.52 ± 4.25  |                   |
| <b>Needing to wake up to urinate at nights</b>                                    |     |              | U=6233.5, P=.056  |
| Yes                                                                               | 247 | 6.64 ± 3.84  |                   |
| No                                                                                | 60  | 5.53 ± 3.77  |                   |
| <b>Presence of pain at a level to affect sleep</b>                                |     |              | U=6073.5, P=.001  |
| Yes                                                                               | 151 | 7.99 ± 3.46  |                   |
| No                                                                                | 156 | 4.92 ± 3.60  |                   |
| <b>Presence of stress, sorrow or unhappiness at a level to affect sleep</b>       |     |              | U=6096.0, P=.001  |
| Yes                                                                               | 165 | 7.92 ± 3.77  |                   |
| No                                                                                | 142 | 4.70 ± 3.16  |                   |
| <b>Use of sleeping pills</b>                                                      |     |              | U=4478.0, P=.010  |
| Yes                                                                               | 45  | 7.69 ± 3.42  |                   |
| No                                                                                | 262 | 6.21 ± 3.88  |                   |
| <b>Habit of doing something apart from medicine use to enhance falling asleep</b> |     |              | U=7264.0, P=.699  |
| Yes                                                                               | 61  | 6.30 ± 3.78  |                   |
| No                                                                                | 246 | 6.46 ± 3.87  |                   |
| <b>Living alone</b>                                                               |     |              | U=4877.5, P=.816  |
| Living alone                                                                      | 37  | 6.51 ± 3.64  |                   |
| Not living alone                                                                  | 270 | 6.41 ± 3.88  |                   |
| <b>Perceived health condition</b>                                                 |     |              | KW=51.987, P=.001 |
| Good                                                                              | 58  | 4.24 ± 3.73  |                   |
| Moderate                                                                          | 216 | 6.40 ± 3.50  |                   |
| Poor                                                                              | 33  | 10.45 ± 3.05 |                   |

**Table 5.** Relationship between Sleep and Depression (N=307)

|                                      |      | The Geriatric Depression Scale |
|--------------------------------------|------|--------------------------------|
| Richard-Campbell Sleep Questionnaire | R, p | -.187, .001                    |

When the Richard-Campbell Sleep Questionnaire mean scores were compared by individuals' descriptive features, the mean score was significantly lower in those who used sleeping pills. The literature reported no similar findings; this finding is considered to result from the fact that individuals who had poor sleep quality preferred using sleeping pills. When older individuals' Geriatric Depression Scale mean scores were compared according to their descriptive features, the scale mean score significantly higher in those who had income less than expenses, who had a chronic disease, who did not exercise regularly, who were dependent in daily life activities, who perceived their health condition as poor, who had pain at a level to affect sleep, who experienced stress, sorrow or unhappiness, and who used sleeping pills. Studies showed that low income level had direct effects on depressive symptoms [22, 23]; older individuals who had a chronic disease had higher depression mean scores [11, 15]; older individuals who

did not exercise regularly had higher depression mean scores [15]; exercise increased self-respect and had an antidepressant effect by decreasing anxiety and stress [15]; exercise strengthened the body and finding the opportunity to communicate with other people while exercising was pleasing for older individuals [24]; depression mean scores were higher in those who were dependent in their daily life activities and who perceived their health condition as poor [15, 25]; pain affected older individuals' daily life activities and caused insomnia and severe fatigue and thus caused a correlation between pain and depression [11, 26]; older individuals who experienced stress, sorrow or unhappiness had higher depression mean scores [26]; older individuals who witnessed the death of relatives had more than seven times more at risk of experiencing depression in comparison to those who did not [27]; a positive relationship was reported between the use of sleeping pills and the severity of depression symptoms

[28]. The presence of a chronic disease, pain, physical activity restrictions, and the need for support in daily life activities could affect each other. The presence of these problems could cause individuals to perceive their health condition as poor and experience negative emotions such as stress, sorrow, hopelessness accompanied by depression.

A negative, statistically significant, and weak relationship between depression and sleep quality in the present study. This finding is parallel to the literature [10-12].

### Limitations

The limitation is that it was conducted only with the elderly who can access it online.

### CONCLUSIONS

In conclusion, this study found that the pain factor, stress, sorrow, or unhappiness affected sleep quality in older individuals; depression was affected by factors such as having income less than expenses, having a chronic disease, not exercising regularly, being dependent in daily life activities, having pain at a level to affect sleep, experiencing stress, sorrow or unhappiness at a level to affect sleep, and perceiving health condition as poor; and there was a negative, statistically significant and weak relationship between depression and sleep quality.

Within the scope of efforts for preventing depression and increasing sleep quality, mental health nurses and Community Health nurses could have some interventions to protect and improve older individuals' health through an interdisciplinary approach. For individuals who experience stress, sorrow, or unhappiness, health professionals could plan and implement psycho-education programs on coping with stress, interpersonal relationships, awareness-raising and sociability, problem-solving skills, social skills, etc. Health professionals could help older individuals with a chronic disease to attain strength to cope with life problems caused by the disease and develop coping methods. As for community health nurses, they could have interventions such as enhancing symptom management, having interventions reducing pain, and

planning exercise programs appropriate to older people for individuals who have a chronic disease.

### What are the implications of this new knowledge for nursing care with older people?

Within the scope of efforts for preventing depression and increasing sleep quality, mental health nurses and Community Health nurses could have some interventions to protect and improve older individuals' health through an interdisciplinary approach.

For individuals who experience stress, sorrow, or unhappiness, Community Health nurses could plan and implement psycho-education programs on coping with stress, interpersonal relationships, awareness-raising and sociability, problem-solving skills, social skills, etc. Community Health nurses could help older individuals with a chronic disease to attain strength to cope with life problems caused by the disease and develop coping methods.

As for community health nurses, they could have interventions such as enhancing symptom management, having interventions reducing pain, and planning exercise programs appropriate to older people for individuals who have a chronic disease.

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### ETHICAL CONSIDERATION

Ağrı İbrahim Çeçen University Scientific Research Ethics Committee Document number: (no: E.6159).

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### AUTHOR CONTRIBUTION

Authors had equal contribution to designing study, collecting data, revising the initial draft, and approving the final draft.

### CONFLICT OF INTEREST

The authors declare no conflict of interest.

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