ORIGINAL ARTICLE

# IMPACT OF RECREATIONAL ACTIVITIES ON DEPRESSION AND EMERGENCY ROOM VISITS IN OLDER ADULTS LIVING ALONE

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Nurcan YÜKSEKKAYA[1]
Tahsin Barış DEĞER[2]

## Abstract

**Introduction:** This study aimed to determine the impact of recreational activities on the frequency of emergency room visits and depression levels of individuals aged ≥65 years living alone.

**Materials and Method:** This cross-sectional study included 192 older adults living alone who were admitted to a state hospital emergency room between June and September 2022. The mean age was 76.23 ± 7.24 years. The Older Adults Promotion and Recreational Activities Determination Form and Geriatric Depression Scale Short Form were used. The chi-square test, nonparametric comparison tests, sequential logistic regression, and correlation analysis were used to analyse the data.

**Results:** The mean Geriatric Depression Scale Short-Form score was 7.51 ± 4.47. The factors affecting depression were the duration of loneliness, interaction with family members and friends, physical activity, smartphone use, gardening, attending courses, trips, knitting, going on a picnic, walking, cycling, and making a cake. Wanting to engage in sports but not being able to was a significant factor for depression in the regression analysis. The number of medications used, number of children, smartphone use, and cancer status affected the frequency of emergency room visits. As the level of depression increased, the frequency of emergency room visits also increased.

**Conclusion:** Therefore, social policies that reduce depression and emergency department visits were recommended.

***Keywords:*** Aged; Loneliness; Depression; Emergencies; Recreation.

CORRESPONDANCE

Tahsin Barış DEĞER
Phone : +90 5423233854
e-mail : drbarisdeger@gmail.com

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[1] Çankırı Karatekin University, Institute of Health Sciences, Department of Public Health Nursing, Çankırı, Turkey

[2] Çankırı Karatekin University, Faculty of Health Sciences, Department of Gerontology, Çankırı, Turkey

## INTRODUCTION

As individuals age, their risk of dependence and psychological challenges increases. Retirement, children leaving home, loss of spouses and friends, and the isolating effects of urban life contribute to loneliness (1). Psychosocial distress, social isolation, and loneliness along with the effects of ageing, can induce physiological changes that heighten the risk of depression and exacerbate it in vulnerable older adults (2).

Older adults often experience an increase in leisure time. Recreation is an enjoyable social activity practised during free time to renew oneself. Recreational activities, which create a feeling of satisfaction in people when realised, include hobbies and pursuits that support individuals psychologically (3). Regular recreational activities contribute to recovery from chronic diseases, coping with stress, and depression prevention in older adults, and include exercise, trips, cycling, music, cinema, meeting with friends, attending social events, walking, gardening, photography, swimming, and handicrafts (4, 5). People who participate in sports clubs and organise recreational activities have better mental health and are more resistant to the stress of modern life (6).

With advances in age, the physical activity performed by the older adults decreases, which triggers many diseases, such as diabetes, osteoporosis, cardiovascular diseases, and depression (7). The symptoms of these disorders increase the number of visits to health institutions. One reason for the increase in emergency room visits is individuals' fear and uncertainty regarding their condition. Parallel to the increase in the elderly population, the number of older adults applying for emergency services has also increased (8).

The term recreation is a concept that covers many activities. Studies conducted on some of these activities have been previously reported. The effects of social relationships, leisure activities, and health status on depression in lonely older adults have also been examined (2). The relationships between loneliness, depression, and social networks in older individuals (9); between loneliness, depression, and quality of life (10); and between physical activity and depression (11) were examined. Within the scope of the term 'recreation', there are studies on visiting the national forest recreation area in Taiwan (12) and recreational experience preferences in Sweden (13). However, none of these studies covered all recreational activities in the lives of lonely older adults or the effects of these activities on depression and emergency room visits. To the best of our knowledge, this study is the first to focus on such topics in the literature and is based on the following questions.

What is the level of depression among older adults living alone? Which recreational activities affect depression levels?

What recreational activities affect the frequency of emergency room visits among older adults living alone?

What are the recommendations for older adults to reduce their depression level and frequency of emergency room visits?

The current study aimed to investigate the effect of recreational activities on the lives of older adults living alone who visited the emergency room of a state hospital, their level of depression, and frequency of emergency room visits.

## MATERIALS AND METHOD

### Setting and Sampling

This cross-sectional study was conducted in the Çankırı province of Türkiye. The study sample comprised 192 patients who visited the Emergency Room of the Çankırı State Hospital and satisfied the inclusion criteria. The study utilised both convenience (since older adults who visited the emergency department were included) and

purposive (because older individuals who lived alone were included) sampling methods. Before starting the study, G-Power 3.1.9.4 software was used for power analysis. Within the scope of the Mann–Whitney U test, which was applied in a previous study using the Geriatric Depression Scale Short Form (GDS-15), the effect value was approximately d = 0.783 (14). Using this effect value and a 5% margin of error ($p < 0.05$), the power value was calculated as 0.951 (95.1%) when working with 76 observations.

A repeat power analysis was applied to determine the statistical power of the study after study. Within the scope of the Kruskal–Wallis test applied to the GDS-15 score variable in the current study, the effect value was approximately d = 0.280, with a 5% margin of error, and the power value was calculated as 0.942 (94.2%) when working with 192 observations (Figure 1).

The inclusion criteria were as follows: age ≥65 years, living alone, history of admission to the emergency room, voluntarily accepting participation in the study, having a stable health status, and having no problems in mental functions.

The exclusion criteria were age <65 years and a psychiatric or neurological medical diagnosis preventing communication, dementia, and cerebrovascular disease.

### Data collection tools

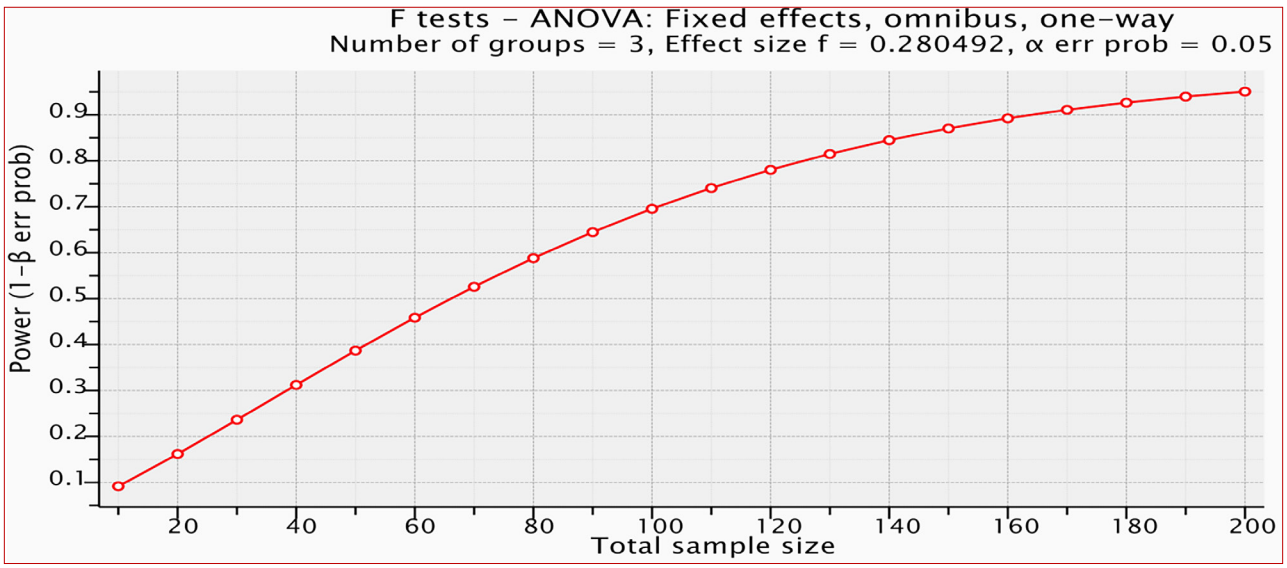
**Older Adults Promotion and Recreational Activities Determination Form:** This form utilised the literature to determine the participants sociodemographic data and recreational activities (5).

**GDS-15:** This form identified depression in the older population. The cut-off score is 5, and a score of >5 indicates a risk of depression, with 0–4 indicating no risk of depression, 5–8 indicating mild depression, 9–11 indicating moderate depression, and ≥12 indicating severe risk of depression. The 15-question scale was tested for validity and reliability regarding suitability for Turkish older people in Türkiye (15).

### Data collection process

This study was explained to the individuals who visited the Emergency Room whose condition was stable, and questionnaires were administered

**Figure 1.** Post-study power analysis



personally and face-to-face after obtaining their signed consent forms between June and September 2022. The first author was a nurse working in the emergency department of a hospital. The data collection process was conducted in the green area, which includes individuals who do not require urgent intervention and can wait; in the yellow area, which includes patients who are not in a life-threatening position and whose treatment can be delayed; and in the Emergency Room observation rooms. Data were collected when the participant was alone to avoid restricting their free will.

### Ethics

Approval was obtained from the University Ethics Committee (meeting no. 25, Decision Date: 21.04.2022) and Government Provincial Health Directorate (Number: E-64943697-799, Date: 03.06.2022) before starting the study. This study was conducted in accordance with the Declaration of Helsinki and other international ethical guidelines. Informed consent was obtained from all the participants.

### Statistics

The data in this study were evaluated using the International Business Machines Statistical Package for the Social Sciences 24 (IBM SPSS). Frequency analysis and chi-square tests were performed. The data distribution normality was verified using the Shapiro–Wilk and Kolmogorov–Smirnov tests to select the appropriate statistical tests. Accordingly, either the Mann–Whitney U (between two groups) and Kruskal–Wallis (more than two groups) tests were used for group comparisons depending on the number of groups. Sequential logistic regression, binary logistic regression, and correlation analyses were performed.

## RESULTS

The mean age of the participants was 76.23 ± 7.24 years (range: 65–91); 59.38% were female, and 22.92% were illiterate.

### Depression levels

The mean GDS-15 participant scale score was 7.51 ± 4.47, and the median was 7 (range: 0–15).

The mild-to-moderate-to-severe depression risk ratios of the participants are shown in Table 1.

### Recreation and depression

A chi-square association test was performed on recreational activities that may have affected participants' depression levels. Statistically significant independent variables were analysed using the GDS-15 score as the dependent variable and analysing their median values. Owing to the high number of variables in this study, significant variables affecting the level of depression are shown in Table 2. For instance, participants aged 65–74 years had a significantly lower risk of depression than those aged ≥85 years ($p<0.001$; Table 2). No significant differences were found according to sex or educational status (not shown in Table 2).

**Table 1.** Depression risk levels of the participants according to their GDS-15 scores

| n (%) | | | | |
|---|---|---|---|---|
| **No Depression (<5 points)** | **Mild Depression (5–8 points)** | **Moderate Depression (9–11 points)** | **Severe Depression (>11 points)** | **Total** |
| 58 (30.2 %) | 55 (28.6 %) | 35 (18.2 %) | 44 (22.9 %) | 192 (100 %) |
| | 134 (69.8 %) | | | |

**Table 2.** Comparison of participants' GDS-15 score medians according to recreational activity variables

| Variable | Group | n | Median | p | D.C. (English) |
|---|---|---|---|---|---|
| Age groups | 65–74 (1) | 78 | 6 | **<0.001**** | **3>1** |
| | 75–84 (2) | 82 | 8 | | |
| | 85+ (3) | 32 | 11 | | |
| Duration of living alone | Less than 1 year (1) | 26 | 4.00 | **0.039**** | **3>1<br>4>1<br>5>1** |
| | 1–5 years (2) | 70 | 8.00 | | |
| | 5–10 years (3) | 38 | 7.00 | | |
| | 10–15 years (4) | 38 | 9.00 | | |
| | 15 years and over (5) | 20 | 8.00 | | |
| Using a smartphone | Yes | 111 | 6.00 | **<0.001*** | |
| | No | 81 | 10.00 | | |
| Interested in music, singing | Yes | 53 | 4.00 | **<0.001*** | |
| | No | 139 | 9.00 | | |
| Going for regular walks | No | 131 | 9.00 | **<0.001*** | |
| | Yes | 61 | 4.00 | | |
| Exercising | Yes | 126 | 5.50 | **<0.001*** | |
| | No | 66 | 11.00 | | |
| Cycling | No | 175 | 8.00 | **<0.001*** | |
| | Yes | 17 | 3.00 | | |
| Gardening | Yes | 69 | 5.00 | **<0.001*** | |
| | No | 123 | 8.00 | | |
| Volunteer work | Yes | 25 | 3.00 | **<0.001*** | |
| | No | 167 | 8.00 | | |
| Doing activities with family members | Yes | 99 | 5.00 | **<0.001*** | |
| | No | 91 | 10.00 | | |
| Activity with family members (don't go on a picnic) | No | 108 | 9.00 | **<0.001*** | |
| | Yes | 84 | 6.00 | | |
| Frequency of contact with friends | Once a week (1) | 67 | 6.00 | **<0.001**** | **3>1** |
| | Once a month (2) | 28 | 6.50 | | **5>1** |
| | Several times a year (3) | 17 | 9.00 | | **3>4** |
| | Every day (4) | 43 | 5.00 | | **5>4** |
| | Never to meet (5) | 37 | 12.00 | | **5>2** |
| Participation in outing events (concert, exhibition, theatre) | No | 161 | 8.00 | **<0.001*** | |
| | Yes | 31 | 3.00 | | |
| Participation in outing events (wedding, entertainment) | No | 119 | 9.00 | **<0.001*** | |
| | Yes | 73 | 5.00 | | |
| Participation in outing events (sightseeing tours) | No | 148 | 8.00 | **<0.001*** | |
| | Yes | 44 | 3.00 | | |
| Participation in outing events (hobby courses) | No | 158 | 8.00 | **<0.001*** | |
| | Yes | 34 | 4.00 | | |
| Home activities (making cakes, pies) | No | 136 | 8.00 | **0.017*** | |
| | Yes | 56 | 6.00 | | |
| Home activities (knitting) | No | 123 | 8.00 | **0.032*** | |
| | Yes | 69 | 7.00 | | |
| Home activities (playing chess, checkers) | No | 182 | 8.00 | **<0.001*** | |
| | Yes | 10 | 1.00 | | |
| Is there an activity that you want to do but can't? | Yes | 56 | 6.00 | **0.012*** | |
| | No | 136 | 8.00 | | |

* Mann Whitney U Test; ** Kruskal Wallis Test; D.C., Dual Comparison; p<0.05, Statistically significant; Only significant variables were included in the table and insignificant variables were not included

In addition, logistic regression analysis was applied to variables with significant relationships. Accordingly, participants who answered 'yes' for the variable 'sports activities', from the activities that the participants wished but could not do, were utilised as the reference group. However, the depression level of the participants who answered 'no' was significantly higher (Odds Rate = 353.817; p = 0.004). That is, the depression levels of the participants who wished but could not participate in sports were higher than that of those who wished to participate and could.

### Recreation and frequency of emergency room visits

A chi-square test was conducted on the recreational activity variables that may be related to the frequency of emergency room visits in the last 6 months, and the statistically significant variables are summarised in Table 3.

Logistic regression analysis was also applied to the eight significant variables (Table 3). The frequency of emergency department visits in the last 6 months was a 5-level dependent, including

**Table 3.** Recreational activity variables associated with frequency of emergency room visits

| Variable | Chi-Square Value | p-value |
|---|---|---|
| Amount of drugs used daily | 39.963 | <0.001[a] |
| Existence of children | 35.844 | 0.01[a] |
| Using a phone | 25.069 | 0.01[a] |
| Presence of chronic disease | 15.086 | 0.01[b] |
| Hypertension | 9.691 | 0.04[a] |
| Cancer | 9.686 | 0.04[a] |
| Exercising on an apparatus | 9.621 | 0.02[a] |
| Surfing on the Internet | 18.686 | <0.001[a] |

a: Pearson Chi-Square test, b: Fisher exact test

**Table 4.** Results of the sequential logistic regression analysis

| Variables | | β | Standard error | Wald | p | OR |
|---|---|---|---|---|---|---|
| Number of drug uses | No medication | -1.417 | 1.417 | 1.000 | 0.317 | 0.242 |
| | 1–3 | -0.772 | 0.465 | 2.762 | 0.097 | 0.462 |
| | 3–5 | -0.947 | 0.442 | 4.585 | **0.032** | 0.388 |
| | >5 | | Reference | | | |
| Number of children | None | -1.038 | 0.839 | 1.532 | 0.216 | 0.354 |
| | 1 | -1.612 | 0.608 | 7.037 | **0.008** | 0.199 |
| | 2 | -1.364 | 0.543 | 6.312 | **0.012** | 0.256 |
| | 3 | -0.254 | 0.557 | 0.209 | 0.648 | 0.775 |
| | 4 | -0.322 | 0.568 | 0.321 | 0.571 | 0.725 |
| | ≥5 | | Reference | | | |
| Smartphone usage | Yes | -1.672 | 0.441 | 14.372 | **0.000** | 0.188 |
| | No | | Reference | | | |
| Cancer | No | -2.278 | 0.944 | 5.828 | **0.016** | 0.102 |
| | Yes | | Reference | | | |

OR: Odds ratio, β: regression coefficient, p: probability value

1, 2, 3, 4, and ≥5 visits in the last 6 months. In the analyses, a sequential logistic regression model was employed because of the structure of the dependent variable.

A sequential logistic regression model was constructed using a logit link function. The assumption of parallel curves, which is a sequential logistic model assumption, was satisfied, and the model's compliance tests yielded statistically significant results. The factors affecting the frequency of emergency room visits are presented in Table 4.

### Relationship between depression and frequency of emergency room visits

When the relationship between the frequency of emergency department visits in the last 6 months and GDS-15 scores was analysed using Spearman's rho correlation coefficient, a low positive correlation was observed between the variables (n = 192; r = 0.180; p = 0.013).

## DISCUSSION

In a study conducted in Nigeria, the likelihood of depression was higher in lonely retirees than in non-lonely retirees, and the prevalence of depression in lonely retirees was 52% (16). In a study conducted among older individuals in India, depression rates in lonely older individuals were higher than those in non-lonely older individuals (17). Herein, the prevalence of overall depression risk was 69.8%, whereas that of moderate-to-severe depression risk was 41%. To prevent the risk of depression, determining which recreational activities are meaningful in the lives of lonely older adults at high risk of depression is crucial.

In a study conducted in Tokyo, loneliness and weak social networks triggered depression; however, the effect of weak social networks was more dominant. Weak social networks are a social risk factor for mental health, even among non-lonely older adults (18). Another study comprising 3535 older adults in Spain, the significant risk factor for risk of depression for lonely older individuals was weak social networks (9). Therefore, more social support from family and friends is necessary, especially in old age (19). This study revealed that engaging in various recreational activities that provide social interaction has a positive effect on depression levels among older adults living alone. Activities such as meeting friends, using smartphones, engaging in family activities, volunteering, going on picnics, and participating in outdoor activities were identified as important factors that supported the mental health of older adults.

In Greece, depression levels increased in lonely older adults as their physical activity declined (11). Thus, a significant relationship has been observed between physical activity and depression variables (20). In another study, a significant decrease was found in depression levels in older individuals who underwent exercise (21). Likewise, another study found that older adults who played music had lower levels of depression (22). Herein, recreational activities such as walking, exercising, cycling, gardening, and playing music were factors that influenced depression levels.

One study found a significant relationship between depression and emergency room use (23). Similarly, in the current study, a weak positive correlation was found between the frequency of emergency room visits in the last 6 months and GDS-15 score. This relationship suggests that emergency health needs may indirectly affect mental health in older adults. Individuals who frequently visit the emergency department are likely to experience increased stress and anxiety owing to health problems, which may affect their depression scores.

Our study findings emphasise the importance of social support, interaction opportunities, and potential therapeutic effects of recreational activities for older individuals living alone. These results also provide a foundation for the identification of

meaningful recreational activities and development of intervention strategies along with evidence-based data for health policies and social service programs.

## LIMITATIONS

The results of this study cannot be generalised for a larger population, as this study was conducted on older individuals admitted to the emergency department of a state hospital in a province and due to the presence of cultural differences. Thus, further multicentre studies that include different societies are warranted.

## CONCLUSION

Advanced age, duration of loneliness, interaction with family members, meeting friends, physical exercise, walking, cycling, smartphone use, going on picnics with family members, making cakes and pastries at home, knitting, going to concerts and movies, going on excursions, attending courses, and gardening are all depression associated factors. Additionally, the desire of an older adult wanted to engage in sports is a significant predictor of depression in regression analysis. The number of medications received, number of children, smartphone use, and cancer status were factors that affected the frequency of emergency room visits. The frequency of emergency room visits proportionally increased with the level of depression.

### Policy recommendations

The recreational activities identified in this study should be increased to protect the health of older adults. Local governments should open active living centres for older individuals to engage in social and artistic activities to allow them to access and form extensive social networks. Additionally, 'Will you be my grandson' or 'Will you be my grandfather or grandmother' projects that bring young and old individuals together can be planned. '3rd age universities', which have recently become prevalent worldwide, should be expanded, as this project, which is conducted within universities and accepts only older adults, allows older adults to participate in healthy living classes, knitting, and exercise. Finally, cafeterias could be established in neighbourhoods and branded as 'coffee houses for older adults.' Thus, older adults are encouraged to interact socially with others.

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