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The effect of recreational games on happiness, life satisfaction, loneliness, and somatisation in elderly individuals: a non-randomized controlled trial

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Abstract

Background Participation in recreational activities supports continuity of activity and psychological well-being in old age. Games are one of these recreational activities. This study aims to measure the influence of recreational games on somatisation, loneliness, happiness and life satisfaction among elderly individuals.

Methods This non-randomized quasi-experimental study involved 80 individuals from two nursing homes, allocated to intervention (n = 40) and control (n = 40) groups. Participants, aged 65 or older, met cognitive eligibility criteria based on the Standardized Mini-Mental State Examination. The intervention group selected 4 games (hot-and-cold, word challenge, bingo, matching pairs) from a set of 15 and played twice weekly for two months in smaller groups. The control group maintained their usual leisure activities. Data were collected using the Oxford Happiness Questionnaire Short Form, Satisfaction with Life Scale, De Jong Gierveld Loneliness Scale, and Symptom Checklist-90-Revised Somatization Subscale at baseline, 1 week, and 1 month post-intervention.

Results The intervention group (IG) showed significant improvements compared to the control group (CG). Happiness ($\eta^2 = 0.93$) and life satisfaction ($\eta^2 = 0.92$) increased significantly in the IG (p < 0.0001), with higher scores than the CG in both the post-test ($r \approx -0.246$ to -0.212, p < 0.05) and follow-up ($r \approx -0.273$ to -0.309, p < 0.01). Loneliness, including emotional and social loneliness, decreased significantly in the IG ($\eta^2 = 0.94$, p < 0.0001), with greater reductions than the CG in the post-test and follow-up ($r \approx -0.503$ to -0.593, p < 0.0001). Somatization did not change significantly within the IG but showed a reduction compared to the CG in the post-test and follow-up ($r \approx -0.226$ to -0.280, p < 0.05).

This study derived from the Nursing Doctoral Thesis of Marmara University. This study was presented as an oral presentation at the 2^{nd} International 3^{rd} National Public Health Nursing Congress.

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Conclusions Recreational games may give psychological benefits to older adults. Yet, results of the study need to be interpreted with caution and need to be replicated.

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Keywords Elderly, Game, Happiness, Life satisfaction, Loneliness, Somatisation

Background

As per the United Nations population projections, the percentage of individuals aged 65 and older in the global population is expected to increase from 10% in 2022 to 16% by the year 2050. In response to this demographic shift, the United Nations emphasizes the importance of aging countries establishing long-term sustainable care institutions and taking measures to ensure the adaptation of the elderly to these institutions [1]. A similar population trend to that observed worldwide is also evident in Turkey. The aging population and changes in the social family structure have led to an increased interest in nursing homes in the country. The number of elderly individuals receiving care in nursing homes in Turkey was 4,952 in 2002, and this figure rose to 14,428 by 2023 [2].

The transition to the institutional structure of a nursing home becomes a challenging and stressful life event for elderly individuals who are trying to adapt to the physical, cognitive, and psychological changes that come with aging [3]. For elderly individuals who move away from their familiar environment and try to adapt to the rules of the nursing home, changes in routines and establishing new social relationships can be highly challenging during this period [4]. It is noted that psychological problems such as loneliness, social isolation, depression, and somatization, which often emerge with aging, are more prevalent among individuals living in nursing homes [3, 5]. These psychological problems are associated with long-term negative effects on physical and emotional health, including depression [6], a decline in quality of life [7], self-harm [8], stroke, and cardiovascular diseases [9]. However, it is often stated that in such institutions, care is predominantly treatment-oriented and focused on physiological needs, while the psychological needs of elderly individuals are frequently overlooked [10].

With the increasing importance of aging within society, there arises an urgent necessity for diverse interventions aimed at facilitating the effective and efficient adaptation of elderly individuals to changes in their living environments and the associated challenges of aging [11]. Numerous studies on demographic aging emphasize the need to increase practices aimed at protecting and enhancing the health of elderly individuals, particularly in nursing homes [12, 13]. Because many studies have reported that individuals living in nursing homes mostly spend time sitting or doing passive activities without environmental interaction [14–16]. Studies report that elderly people usually spend their leisure time watching television [14, 15, 17], reading books [14], chatting [14, 15], walking [14, 15], doing handicrafts [14, 15] and playing games [14].

Recreational activities are stated to play a significant role in promoting social participation and maintaining social roles [18-20]. There are many studies in the literature proving the positive psychological effects of social participation in the elderly [21-25]. However, very few studies have been found examining the effects of game, one of the most important activities that support social participation, on elderly individuals [26-32]. Trizinski and Higgins (2001) found that individuals who engaged in physical games experienced increased attention and feelings of relaxation, while those who played symbolic games reported an enhancement in self-knowledge and self-expression [29]. In Yarnal's study (2011), elderly individuals who dedicate time to playing games exhibit psychological traits such as optimism, happiness, cheerfulness, entertainment, positivity, comfort, and enthusiasm [31]. However, in addition to the positive effects, there are studies that highlight the risks of games (such as card games, bingo, etc.) turning into gambling behaviors, particularly in older adults [33].

Notwithstanding the lack of studies addressing the influence of gaming activities on the elderly demographic, the current research inadequately addresses the requirements of Turkey's swiftly expanding ageing populace. Hence, the present study aims to investigate the impact of participating in recreational games on life satisfaction, happiness, loneliness and somatisationfundamental factors influencing the physical and mental well-being of older adults.

The hypothesis, that "Recreational games affect the happiness, life satisfaction, loneliness, and somatisation of the elderly," has been rigorously tested, and the data gathered through this hypothesis have been thoroughly discussed.

Methods

Study design

This study employed a nonrandomized experimental design featuring pretest-posttest control and intervention

groups. The study was conducted across two distinct nursing homes to prevent potential influence between individuals in the control and intervention groups, rendering randomization unattainable. To ensure methodological transparency, adherence to the Transparent Reporting of Evaluations with Nonrandomized Designs Statement checklist was observed throughout the study's reporting process [34].

Study sample

The research was conducted from April to August 2018 within two nursing homes in Tkiye. Inclusion criteria comprised individuals meeting the following conditions: (1) aged 65 years and above and residing in the designurated nursing homes during the study duration; (2) expressing willingness to participate in the research; (3) attaining a score of 23 or higher (for individuals with five or more years of formal education) or 19 or higher (for those with fewer than five years of formal education) on the Standardized Mini-Mental State Examination for Educated and Uneducated Individuals (SMMSE); and (4) displaying openness to communication.

Sample size analysis, executed utilizing the G Power 3.0.10 software, determined the requisite number of participants for both the intervention and control groups. Given a type I error rate of 0.05, a type II error rate of 0.70, and an effect size of 0.5, it was established that a minimum of 39 participants were needed for each group. Considering the potential occurrence of missing data during the study, 40 participants meeting the inclusion criteria were applied to participants in both groups. The power of the study with this sample size is 0.71. Before the study initiation, written informed consent, personally signed by all participants, was obtained.

Measurements

The Standardized Mini-Mental State Examination for Educated and Uneducated Individuals (SMMSE) was utilized to ascertain the eligibility of older individuals for participation in the study. Data were collected utilizing a Personal Information Form, the Oxford Happiness Questionnaire Short Form (OHQ-S), the Satisfaction with Life Scale (SWLS), the De Jong Gierveld Loneliness Scale (DJGLS), and the Symptom Check-List Somatisation Subscale (SCL-90-R). Since it will be applied to elderly individuals, short forms of the scales, if any, were used.

Standardized mini-mental state examination for educated and uneducated individuals (SMMSE)

SMMSE, originally devised by Folstein, Folstein, and McHugh for cognitive performance evaluation, underwent adaptation to the Turkish language by Gungen et al. (2002) [35]. Comprising eleven items with a total score of 30, the test's results are influenced by both education level and age [36]. For educated participants (with 5 years or more of education), a score of 22 or lower suggests cognitive dysfunction, while a score of 23 or higher suggests satisfactory cognitive function. For those who are uneducated (with less than 5 years of education), a score of 18 or lower suggests cognitive impairment, while a score of 19 or higher suggests adequate cognitive functioning [37].

Personal information form

The survey instrument, informed by existing literature [30, 38], was developed by the researcher. It comprises 13 inquiries concerning participants' sociodemographic attributes, encompassing parameters such as age, gender, and length of residency within the institution.

Oxford happiness questionnaire short form (OHQ-S)

OHQ-S, created by Hills and Argyle, comprises a 29-item scale utilizing a 6-point Likert-type scoring system [39]. Its abbreviated version, containing 7 items, was translated into Turkish in 2011 [40]. The highest score that can be obtained from the scale is 174 and the lowest score is 29. An increase in the score means an increase in the level of happiness [39]. In this study, the Cronbach's alpha was found 0.76.

Satisfaction with life scale (SWLS)

SWLS, developed by Diener et al. (1985), evaluates life satisfaction and consists of a 7-point Likert scale with unidimensional structure comprising 5 items [41]. The Cronbach's alpha of the scale was 0.88 and the test-retest reliability coefficient was 0.97. High scores indicate high life satisfaction [42]. In the present study, the Cronbach's alpha was determined to be 0.93.

De Jong Gierveld loneliness scale (DJGLS)

DJGLS, crafted by Gierveld and Kamphuis (1985) to gauge the degree of loneliness among older individuals, underwent linguistic adaptation to Turkish in 2015 [43]. The scale's Cronbach alpha was 0.85. Comprising 11 items and 2 subscales, the scale encompasses six negative items evaluating emotional loneliness and 5 positive items appraising social loneliness. The scale's minimum and maximum scores are 0 and 22, respectively [44]. In the present research, the Cronbach alpha was determined to be 0.85.

Symptom check-list somatisation subscale (SCL-90-R)

SCL-90-R, originally developed by Derogatis, Lipman, and Covi (1973) [45] and subsequently adapted to the Turkish language by Kılıc (1991). The scale consists of nine subcategories and is a 4-point Likert type. The reliability coefficient for the somatisation subcategory was

found to be 0.82 [46]. In the present research, the Cronbach's alpha was determined to be 0.96.

Game selection

After an extensive literature review, the researcher identified 15 games. These games were introduced to participants in the intervention group, enabling them to make informed selections subsequent to receiving instructions [28, 29, 47]. In the process of game selection, priority was accorded to games that are easily comprehensible and playable by individuals aged 65 and above, characterized by simplicity and entertainment value while avoiding the induction of competition among participants.

Application of pre-tests

OHQ-S, DJGLS, SWLS, and SCL-90-R scales were administered to a total of 80 individuals in both nursing homes who met the study inclusion criteria. The application of pretests lasted approximately 30–35 min. Participants filled out the forms on their own, with the researcher providing assistance only when needed to help them understand the concepts in the scales correctly.

Interventions

All the residents of the nursing homes where the study took place were informed about the research. Afterwards, the researcher provided the informed consent form, highlighting the voluntary nature of participation and the option to withdraw from the study at any stage. One nursing home was allocated as the intervention group to minimize potential interaction between the groups, while the other was designated as the control group. The lottery method was used when deciding whether the nursing homes would be in the intervention or control group. The SMMSE was administered by the researcher to individuals who expressed interest in participating. All individuals who voluntarily agreed to participate (n = 80) met the required criteria in the SMMSE. The intervention group participated in recreational play, while the control group continued their routine leisure activities in the nursing home.

Selection of the games to be included in the application

After pre-tests, 40 individuals in the intervention group were introduced to 15 games during two sessions. Researchers conducted these sessions and provided participants with instructions and rules for the games. Then, they were asked to rate the games from 1 to 10. In this form, the elderly individuals evaluated the games by determining the minimum "1" and maximum "10" points according to their interest and willingness to play. Thus, it was ensured that individuals freely choose the games they want to play. As a result, bingo, matching pairs, word challenge and hot-cold games, which received the highest scores from the participants, were selected to be played.

Preparing the playground and organizing the groups

For the elderly to play games, a sunny room with a large sliding door on the ground floor of the institution, opening to the garden, was chosen. There are single and double armchairs and a table for the elderly to use. Five groups of eight participants were formed for the games. The researcher planned these groups according to the elderly individuals' available hours, considering their wishes. Therefore, although the number of groups remained constant, the individuals in the group changed because the available hours of the individuals could change. Thus, providing flexibility to the elderly individuals in terms of group changes ensured that the participants did not feel pressured and were not limited in terms of time. This situation supported the participants' compliance with the program and time. When one group completed the games, 15-20 min breaks were given for that group to leave the room and for the other group to gather and prepare for the games.

Playing games

Participants in the intervention group engaged in bingo, matching pairs, word challenges, and hot-and-cold games, organized into groups of eight individuals. They adhered to the game instructions and participated in sessions twice a week for a duration of 2 months, totaling 16 sessions. The groups were formed by the requests of the participants, considering their available time. In each session, all individuals in the group played all four games, so one individual played 64 games in a total of 16 sessions. Sessions are planned to last 45 min.

Application of posttests

Data collection tools were filled out again by the participants at two consecutive intervals; 1 week (post-test) and 1 month (follow-up test) after the end of the game (Fig. 1).

Data analysis

The data analysis was performed using IBM SPSS Statistics Version 22.0. To evaluate the normal distribution of variables, Kolmogorov-Smirnov test was conducted. When variables did not adhere to a normal distribution, discrepancies between groups were investigated utilizing the Mann-Whitney U test. Moreover, multiple dependent variables that did not follow a normal distribution were analyzed using Friedman's two-way ANOVA. In cases of significant differences, multiple comparison tests were utilized to determine variations among variables. The results were interpreted with a significance level of



Fig. 1 Research process diagram

p < 0.05. Eta-squared (h2) and Cohen's r were calculated and used to indicate the effect size.

Ethical considerations

For the implementation of the study, verbal authorization was secured from the directors of two nursing homes, while written consent was acquired from the Istanbul Provincial Directorate of Family, Labor, and Social Policies. Ethical committee approval (Approval Date/Number: 05.03.2018 / 93) was acquired from the Ethics Committee of Marmara University Institute of Health Sciences. As a prerequisite, all participants were required to provide informed, written consent. They were also made aware of their right to withdraw from the study at any point. Permission to use and adapt the scales was obtained via electronic correspondence from the original authors.

Results

Descriptive characteristics and homogeneity of intervention and control groups

The demographic characteristics of the intervention and control groups were examined, and it was observed that the groups had a homogeneous distribution (Table 1). The difference in gender distribution was not significant ($\chi^2 = 0.83$, p = 0.367). While the ratio of women and men in the intervention group was equal (50% each), the proportion of men (62.5%) in the control group was higher than that of women (37.5%). There was no significant difference in the mean age between the groups (IG: 73.28 ± 6.00; CG: 71.75 ± 5.96; z = 0.061, p = 0.237). Similarly, there was no significant difference in the duration of stay in the institution (IG: 44.48 ± 30.50 months; CG: 57.70 ± 32.80 months; z = -1.8, p = 0.118) (Table 1).

Within and between group comparisons

Table 2 presents the within-group comparisons of the OHQ, SWLS, SCL-90-R, DJGLS, and its subscales for the intervention (IG) and control (CG) groups.

In the IG, a significant increase in happiness levels was observed between the pre-test, post-test, and follow-up test periods (X = 24.7, p = 0.0001, $\eta^2 = 0.93$). Pairwise comparison results showed significant differences between the pre-test and follow-up test (p = 0.0001), as well as between the post-test and follow-up test (p = 0.0001).

Satisfaction with life scores in the IG also showed a significant increase between the pre-test, post-test, and follow-up test periods (X = 24.3, p = 0.0001, $\eta^2 = 0.92$). Pairwise comparisons revealed significant differences between the pre-test and post-test (p = 0.002), as well as between the pre-test and follow-up test (p = 0.0001).

No significant difference in somatisation levels was observed in the IG (X = 1.4, p = 0.478, $\eta^2 = 0.41$). However, in the CG, significant differences were found between the pre-test and post-test (p = 0.016), as well as between the pre-test and follow-up test (p = 0.018) (X = 10.4, p = 0.005, $\eta^2 = 0.84$).

Loneliness levels in the IG significantly decreased across the pre-test, post-test, and follow-up test periods (X = 30.4, p = 0.0001, $\eta^2 = 0.94$). Pairwise comparisons showed significant differences between the pre-test and post-test (p = 0.0001), pre-test and follow-up test (p = 0.0001), and post-test and follow-up test (p = 0.021). In contrast, the CG showed an increase in loneliness levels, with significant differences between the pre-test and post-test (p = 0.023), as well as between the pre-test and follow-up test (p = 0.008) (X = 6.6, p = 0.037, $\eta^2 =$ 0.77). Emotional loneliness levels in the IG significantly decreased (X = 28.5, p = 0.0001, $\eta^2 = 0.93$). Pairwise comparisons revealed significant differences between the pre-test and post-test (p = 0.0001), pre-test and followup test (p=0.0001), and post-test and follow-up test (p=0.022). Social loneliness levels in the IG also significantly decreased across the pre-test, post-test, and follow-up test periods (X = 7.2, p = 0.026, $\eta^2 = 0.78$). Pairwise comparisons showed significant differences between the pre-test and post-test (p = 0.015), as well as between the pre-test and follow-up test (p = 0.027). In the CG, social loneliness levels increased, with significant differences between the pre-test and post-test (p = 0.0001), as well as between the pre-test and follow-up test (p=0.0001) $(X = 18.3, p = 0.001, \eta^2 = 0.90)$ (Table 2).

Table 3 presents the between-group comparisons of the OHQ, SWLS, SCL-90-R, DJGLS, and its subscales for the intervention (IG) and control (CG) groups.

The happiness levels of the IG showed significant increases in the post-test (Z = -2.2, p = 0.027, $r \approx -0.246$) and more differences in the follow-up test (Z = -2.44, p = 0.014, $r \approx -0.273$) compared to the CG. Satisfaction with life in the IG also showed significant increases in the post-test (Z = -1.9, p = 0.049, $r \approx -0.212$) and followup test (Z = -2.76, p = 0.006, $r \approx -0.309$) compared to the CG. Somatisation levels in the IG significantly decreased in the post-test (Z = -2.02, p = 0.043, $r \approx -0.226$) and follow-up test (Z = -2.5, p = 0.012, $r \approx -0.280$). Loneliness levels in the IG significantly decreased in the post-test $(Z = -4.5, p < 0.0001, r \approx -0.503)$ and follow-up test (Z = -5.3, p < 0.0001, $r \approx -0.593$). Emotional loneliness also significantly decreased in the IG in the post-test (Z = -3.6, p < 0.0001, $r \approx -0.402$) and follow-up test (Z = -4.3, p < 0.0001, $r \approx -0.481$). Social loneliness in the IG also

Table 1 Descriptive characteristics and homogeneity of intervention and control groups (n = 80)

Demographic characteristics	Intervention group (n = 40)	Control group (n = 40)	Total (n = 80)	Test Statistics	
	Mean \pm SD or $n(\%)$	Mean ± SD or n(%)	Mean ± SD or n(%)		
Gender					
Female	20 (50)	15 (37.5)	35 (43.8)	= 0.83	p=0.367
Male	20 (50)	25 (62.5)	45 (56.3)		
Age (years)	73.28±6.00	71.75 ± 5.96	72,51±5,99	z=0.061	p=0.237
Duration of stay in the institution (months)	44.48 ± 30.50	57.70±32.80	51.09±32.16	z = -1.8	p=-1.18

= Chi-square test; z= Mann-Whitney U test

Questionnaires	Groups	Time	Median (IQR)	X*/p	η2	Binary Comparisons (X _{kw **} /p)
Oxford Happiness Ques-	IG (n=40)	Pre-test	24.0 (22.0-24.8)			Follow up-Pre Test (p=0.0001)
tionnaire (OHQ)		Post-test (After 1 week)	24.0 (22.0–26.0)	24.7/0.0001	0.93	Follow up-Post Test (p=0.0001)
		Follow-up test (After 1 month)	24.50			Post-Pre Test ($p = 0.648$)
			(23.0–26.0)			
	CG (n=40)	Pre-test	23.0 (22.0–24.0)			
		Post-test (After 1 week)	23.0 (21.3–24.0)	0.971/0.615	0.33	-
		Follow-up test (After 1 month)	23.0 (22.0–25.0)			
Satisfaction with Life Scale (SWLS)	IG (n=40)	Pre-test	14.0 (11.0–17.0)			Pre-Post Test (<i>p</i> = 0.002)
		Post-test (After 1 week)	15.0 (11.3–18.0)	24.3/0.0001	0.92	Pre-Follow up Test (p=0.0001)
		Follow-up test (After 1 month)	16.0 (12.0–18.0)			Post-Follow up Test ($p = 0.348$)
	CG (n=40)	Pre-test	13.0 (9.3–17.8)			
		Post-test (After 1 week)	12.50 (9.0–16.0)	1.5/0.464	0.43	-
		Follow-up test (After 1 month)	12.50 (9.0–15.0)			
Somatisation Subscale	IG (n=40)	Pre-test	0.25 (0.08–0.50)			
		Post-test (After 1 week)	0.25 (0.08-0.48)	1.4/0.478	0.41	-
		Follow-up test (After 1 month)	0.21 (0-0.48)			
	CG(n = 40)	Pre-test	0.29 (0.08–0.50)			Pre-Post Test (p=0.016)
		Post-test (After 1 week)	0.41 (0.16-0.64)	10.4/0.005	0.84	Pre-Follow up Test (p=0.018)
		Follow-up test (After 1 month)	0.41 (0.16-0.58)			Post-Follow up Test ($p = 0.869$)
De Jong Gierveld Loneli- ness Scale (DJGLS) (Total)	IG (n=40)	Pre-test	6.50 (5.0–9.0)			Pre-Post Test (<i>p</i> = 0.0001)
		Post-test (After 1 week)	5.0 (3.0–7.0)	30.4/0.0001	0.94	Pre-Follow up Test (p=0.0001)
		Follow-up test (After 1 month)	4.0 (3.0-7.0)			Post-Follow up Test (p=0.021)
	CG(n = 40)	Pre-test	8.50 (7.0–10.0)			Pre-Post Test (p=0.023)
	()	Post-test (After 1 week)	9.50 (6.25–12.75)	6.6/0.037	0.77	Pre-Follow up Test ($p = 0.008$)
		Follow-up test (After 1 month)	10.0 (6.25-13.0)			Post-Follow up Test (p=0.451)
Emotional Loneliness Subscale	IG (n=40)	Pre-test	4.0 (3.25–5.75)			Pre-Post Test (<i>p</i> = 0.0001)
		Post-test (After 1 week)	3.0 (2.0-4.75)	28.5/0.0001	0.93	Pre-Follow up Test (p=0.0001)
		Follow-up test (After 1 month)	3.0 (2.0-4.0)			Post-Follow up Test (p=0.022)
	CG(n = 40)	Pre-test	5.0 (4.0-6.0)			
	. ,	Post-test (After 1 week)	5.0 (4.0-6.0)	2.1/0.335	0.51	-
		Follow-up test (After 1 month)	5.0 (3.0-6.0)			
Social Loneliness Subscale	G(n=40)	Pre-test	2.0 (1.0-4.0)			Pre-Post Test (p=0.015)
		Post-test (After 1 week)	1.50 (0-3.75)	7.2/0.026	0.78	Pre-Follow up Test (p=0.027)
		Follow-up test (After 1 month)	1.0 (0-3.75)			Post-Follow up Test ($p = 0.108$)
	CG(n=40)	Pre-test	3.0 (2.25-4.0)			Pre-Post Test (<i>p</i> = 0.0001)
	- (-)	Post-test (After 1 week)	4.50 (3.0-7.75)	18.3/0.001	0.90	Pre-Follow up Test (p=0.0001)
		Follow-up test (After 1 month)	5.0 (2.0–7.0)			Post-Follow up Test ($p = 0.212$)

Table 2 Within-group comparisons of OHQ, SWLS, SCL-90-R, DJGLS and subscales scores

IG: Intervention Group; CG: Control Group; IQR: Interquartile range; n2: Effect size Eta-squared; (*): Friedman's test; (**): Kruskal Wallis test

showed significant reductions, with the post-test (Z = -4.13, p < 0.0001, $r \approx -0.462$) and follow-up test (Z = -4.5, p < 0.0001, $r \approx -0.503$) showing significantly lower scores compared to the CG (Table 3).

Discussion

This study aimed to assess the impact of recreational games on psychological aspects among elderly individuals residing in nursing homes.

In this study, elderly individuals preferred games that do not involve much physical activity such as bingo, word challenge, hot-and-cold and matching pairs, similar to those in the literature [26]. In the study of Hoppes et al. (2000), the elderly also preferred games that do not involve much physical activity among the eleven games, such as dominoes, bingos and checkers [26]. This choice of elderly individuals may be affected by factors such as musculoskeletal problems, balance problems and general feeling of fatigue that occur with old age [48].

This study has shown that recreational games increase the level of happiness in elderly individuals and positively affect their mood in a short time. It was observed that

Table 3 Between-group comparisons of OHQ, SWLS, SCL-90-R, DJGLS and subscales scores

Questionnaires	Groups	Time	Mean Rank	Z* /p	Cohen's r
Oxford Happiness Questionnaire	IG (n=40)	Pre-test	43.24	-1.06 / 0.285	-
	CG (n=40)	Pre-test	37.76		
	IG (n=40)	Post-test (After 1 week)	46.20	-2.2 / 0.027	$r \approx -0.246$
	CG (n=40)	Post-test (After 1 week)	34.80		
	IG (n=40)	Follow-up test (After 1 month)	46.81	-2.44 / 0.014	$r \approx -0.273$
	CG (n=40)	Follow-up test (After 1 month)	34.19		
Satisfaction with Life Scale	IG (n=40)	Pre-test	41.99	-0.575 / 0.566	-
	CG (n=40)	Pre-test	39.01		
	IG (n=40)	Post-test (After 1 week)	45.45	-1.9 / 0.049	$r \approx -0.212$
	CG (n=40)	Post-test (After 1 week)	35.46		
	IG (n=40)	Follow-up test (After 1 month)	47.65	-2.76 / 0.006	$r \approx -0.309$
	CG (n=40)	Follow-up test (After 1 month)	33.35		
Somatisation Subscale	IG (n=40)	Pre-test	38.04	-0.955/ 0.339	-
	CG (n=40)	Pre-test	42.96		
	IG (n=40)	Post-test (After 1 week)	35.29	-2.02/ 0.043	$r \approx -0.226$
	CG (n=40)	Post-test (After 1 week)	45.71		
	IG (n=40)	Follow-up test (After 1 month)	34.00	-2.5 / 0.012	$r \approx -0.280$
	CG (n=40)	Follow-up test (After 1 month)	47.00		
De Jong Gierveld Loneliness Scale (Total)	IG (n=40)	Pre-test	35.16	-2.06 / 0.059	-
	CG (n=40)	Pre-test	45.84		
	IG (n=40)	Post-test (After 1 week)	28.61	-4.5 / 0.0001	$r \approx -0.503$
	CG (n=40)	Post-test (After 1 week)	52.39		
	IG (n=40)	Follow-up test (After 1 month)	26.73	-5.3 / 0.0001	$r \approx -0.593$
	CG (n=40)	Follow-up test (After 1 month)	54.28		
Emotional Loneliness Subscale	IG (n=40)	Pre-test	36.68	-1.49/0.135	-
	CG (n=40)	Pre-test	44.33		
	IG (n=40)	Post-test (After 1 week)	31.05	-3.6 / 0.0001	$r \approx -0.402$
	IG (n=40)	Post-test (After 1 week)	49.95		
	CG (n=40)	Follow-up test (After 1 month)	29.43	-4.3 / 0.0001	$r \approx -0.481$
	IG (n=40)	Follow-up test (After 1 month)	51.58		
Social Loneliness Subscale	CG (n=40)	Pre-test	36.16	-1.6 / 0.09	-
	IG (n=40)	Pre-test	44.84		
	CG (n=40)	Post-test (After 1 week)	29.85	-4.13 / 0.0001	$r \approx -0.462$
	IG (n=40)	Post-test (After 1 week)	51.15		
	CG (n=40)	Follow-up test (After 1 month)	28.89	-4.5 / 0.0001	$r \approx -0.503$
	IG (n=40)	Follow-up test (After 1 month)	52.11		

IG: Intervention Group; CG: Control Group; (*): Mann Whitney U Test

there was a high effect size in the change in happiness levels between groups. This can be said that recreational games can have a positive effect on happiness levels and this change is not only statistically but also clinically significant. Similarly, studies show that leisure activities increase the happiness levels of elderly individuals in nursing homes [48–51]. Watkins et al. (2017) discovered that the happiness levels of elderly individuals residing in nursing homes rose following exposure to organized activities. They proposed that the systematic arrangement of such activities within nursing homes represents an effective approach to enhancing the happiness of elderly residents [49]. Michele et al. (2019), argue that the emotions felt during activities that enable elderly people to communicate with their environment are related to happiness [48]. The reason for this may be that similar to other group activities, games are also effective in increasing the level of happiness of older individuals by improving their ability to cope with psychological problems, socialize, and communicate with others more easily.

This study established that recreational games have a beneficial effect on the life satisfaction of older adults. In addition, an increase in life satisfaction was observed in the intervention group, similar to happiness. This effect size may indicate that games have a strong effect on increasing life satisfaction in elderly individuals and that this change is clinically important. Consistent with this research, existing studies demonstrate that various leisure activities correlate with heightened life satisfaction, among elderly populations [51–53]. Tse et al. (2010),

assert that the perception of play significantly impacts life satisfaction among older individuals [53]. Play activities can encourage elderly individuals who have lost their productivity, do not want to participate in leisure activities, do not have a sense of belonging to their environment and cannot adapt to society, to take more active roles, develop their psychosocial skills and socialize. Thus, their satisfaction with life can increase [15].

In the study, the between-group comparison revealed that somatization levels in the intervention group significantly decreased compared to the control group. These findings suggest that participation in recreational games may have a mild to moderate positive effect on somatic complaints. In another study, Babacan Gumus et al. (2012), reported that active, healthy ageing and independent living individuals have lower somatisation levels. Recreational games can support psychological well-being, contributing to the reduction of stress and anxiety, which may indirectly lead to a decrease in somatic complaints [54]. However, the lack of a significant decrease within the intervention group and the low effect size in the between-group comparison may be attributed to the complex and individualized nature of somatization, as well as the influence of chronic illnesses and various biological and environmental factors commonly affecting older adults. This may have occurred due to the potential risks associated with continuous participation in activities, such as social anxiety and fatigue, in older adults. Additionally, in long-term game interventions, the games may lead to gambling behaviors in older adults, which could affect somatization outcomes. To better understand these effects, studies with longer follow-up tests should be planned.

Communication with family and friends decreases in old age, causing elderly individuals to feel stranger to both their relatives and society [17]. Elderly individuals living in nursing homes have decreased social relations and increased feelings of abandonment and worthlessness, increasing their sense of loneliness and making their adaptation difficult [55]. This study determined that recreational games positively affected the level of loneliness in intervention group. The reduction in loneliness levels in the intervention group was observed to have a high effect size, and this change was determined to be clinically significant. Similarly, large effect sizes were also identified in the levels of emotional and social loneliness in intervention group. In a similar vein, a comparative study assessed the loneliness levels of elderly individuals engaged in gaming versus those who watched television, revealing that individuals who participated in games exhibited lower levels of loneliness compared to their television-watching counterparts [27, 32]. Trizinski and Higgins (2001), received positive feedback from the participants as a result of the game activities they carried out 1 day a week for 10 weeks with a group of people aged between 50 and 95 years. The participants stated that they liked playing games and had an opportunity to meet other individuals. The researchers observed positive changes in the participants' health functions, attitudes and communication skills, which continued even after one year. The study found that the levels of loneliness in elderly individuals continued to decrease one month after the end of the game activities, and the long-term effect was similar with the Trizinski and Higgins's study (2001) [29]. The decreased loneliness of elderly individuals may be because they have maintained their friendships while playing games, and those who participated in game activities could communicate more easily and effectively.

Limitations

This study has several limitations. First, it was conducted in only two nursing homes with a relatively small sample size, which limits the generalizability of the findings. Second, randomization was not implemented during the formation of groups to avoid potential interactions between individuals in the control and intervention groups, increasing the risk of bias. Although demographic similarities were observed between the groups, double-blinded randomization could have minimized potential bias. Third, the long-term effects of recreational games beyond one month were not evaluated in this study. Considering the potential changes in the cognitive levels of nursing home residents, the effects of the intervention over a period longer than one month were not measured. Finally, selection bias may have occurred, as individuals who agreed to participate in the study were likely to be more motivated. In the study, it was aimed to actively involve the participants in the process and shape the implementation based on their preferences by applying four games of their own choice. However, the lack of examination of the effects of other games can be considered a limitation of the study. Despite these limitations, the study makes a significant contribution by pioneering a game intervention approach for elderly individuals, a subject that has not been previously addressed.

Practical implications

This study highlights the potential benefits of recreational game interventions in nursing homes for enhancing the psychological well-being and social interactions of elderly individuals. In the study, allowing participants to choose games based on their preferences as part of the initial phase of the intervention demonstrates the importance of tailoring interventions to the individual needs of nursing home residents, which may increase participation and satisfaction. To effectively utilize recreational games, it may be beneficial to adapt the types, durations, and difficulty levels of games to the physical and cognitive capacities of the individuals. This approach could help mitigate potential negative emotional effects. For instance, avoiding overly competitive or challenging games might promote more enjoyable experiences and foster social interaction. Additionally, the findings suggest that nursing home staff and caregivers could incorporate similar game-based activities into daily routines to promote cognitive stimulation and social interaction. If nursing home staff pay attention to the emotional and physical states of elderly individuals while guiding the games, this may help minimize negative effects. This approach can also serve as a pilot application for the development of other personalized recreational programs and games for elderly populations in different settings. Future research may use the findings of this study as a model for designing games for elderly individuals in nursing homes and may provide guidance to nursing homes interested in non-pharmacological interventions.

Conclusion and recommendations

The results of the study examining the effects of recreational games on elderly individuals living in nursing homes suggest that the games selected by the participants may have the potential to produce positive effects on happiness, life satisfaction, somatization, and loneliness levels. However, the limitations of the current study make it difficult to conclude that the observed changes were solely attributable to the games. To reduce bias and enhance generalizability, future research on this topic should consider using larger sample sizes and incorporating blinding techniques. Additionally, comparing the outcomes of elderly individuals in nursing homes across different games with the results of this study could provide more comprehensive insights. Furthermore, a feedback phase could be included, allowing participants to express their emotions and reflections after engaging in the games. It is also important to note that the Hawthorne effect might lead participants to give more favourable responses simply due to their awareness of being part of a research study. Therefore, future studies should incorporate long-term follow-ups to minimize the impact of the Hawthorne effect. This would help in understanding the sustainable, long-term effects of the intervention, beyond any positive changes that may have resulted from the research process itself.

Abbreviations

SMME	Standardized Mini-Mental State Examination for Educated and Uneducated Individuals
OHQ-S	Oxford Happiness Questionnaire Short Form
SWLS	Satisfaction with Life Scale
DJGLS	The De Jong Gierveld Loneliness Scale
SCL-90-R	Symptom Check-List Somatisation Subscale
IG	Intervention Group
CG	Control group

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Author contributions

MÇ and HK designed the study. MÇ collected the data and prepared the original text. MÇ analyzed the data. MÇ interpreted the data and prepared the draft manuscript. HK contributed to critical revision of the manuscript. All authors read and approved the final manuscript.

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Data availability

The data sets used and/or analyzed during the current study are available from the corresponding authors on reasonable request.

Declarations

Ethics approval and consent to participate

For the implementation of the study, verbal authorization was secured from the directors of two nursing homes, while written consent was acquired from the Istanbul Provincial Directorate of Family, Labor, and Social Policies. Ethical committee approval (Approval Date/Number: 05.03.2018 / 93) was acquired from the Ethics Committee of Marmara University Institute of Health Sciences. As a prerequisite, all participants were required to provide informed, written consent.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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