

Does video games as a digital intervention improve depression and loneliness of elderly people?

Abstract

Introduction: Considering the increase in human life and increased disorders such as depression and loneliness, especially in the elderly, many studies have been conducted on the emergence of new and affordable technology for the treatment of mental disorders. Among the innovative technologies, in recent decades, we have seen an increase in the use of digital interventions with the nature of the game in the treatment of mental disorders.

Purpose: To review existing studies that examines the impact of video games on depression and loneliness in the elderly.

Methodology: This review study was conducted using the search engines on the google scholar, science direct, Scopus, Pubmed, Magiran, SID and Proquest databases from 2007 to January 2019. Articles that had inclusion criteria were reviewed.

Findings: Out of articles related to the subject, nine articles came up with a final review, of which three evaluated the impact of Nintendo wii's games, 5 studies on the effects of exer game and a study of the effect of virtual reality games. Five studies examined the impact of video games on depression and four studies investigated their effect on loneliness. Most of these articles have a positive effect on depression and loneliness in the elderly.

Conclusion: According to the results, video games improve depression and loneliness in the elderly. Most articles support the positive impact of these games on depression and loneliness in the elderly.

Recommendation: Considering the positive impact of video games and the increased interest of the elderly in these games, it is recommended that video games be included in the daily agenda of the elderly, and given the greater impact of it in groups, the conditions for performing these games in groups should be provided.

Keywords: game, video game, exer game, elder game, nintendo wii, depression, loneliness, elderly

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Introduction

The world's population is rapidly aging.¹ One of the psychological problems in elderly is depression that endangers the mental and physical health of the elderly. Depression significantly reduces the quality of life.² In the aging period, there are many social stressors that increase the risk of depression, one of these stresses is social isolation.³ Loneliness is an unpleasant, negative, painful and painful individual experience that creates a sense of impatience, uselessness, frustration, depression.⁴ In recent years, with the growing number of home computers, much research has been done on the emergence of new and affordable technology for the treatment of mental disorders.⁵ The results of neurological research, in addition to the therapeutic effects of digital-based interventions in depression, have a positive effect on the release of hormones such as endorphin and dopamine.⁶

Methodology

This review study was conducted using the search engines on the google scholar, science direct, Scopus, Pubmed, Magiran, SID and Proquest databases from 2007 to January 2019. It was done between articles in English and Persian. The articles include entry criteria,

video games and games in the aged population and their impact on depression and loneliness. The finalized papers were summarized, and two expert of research team reviewed the full text of the article (Table 1).

Findings

In the search, there were 139,134 articles; Repeat, irrelevant, and unrelated articles were deleted; 194 of these articles had the criteria for entering the final review. Of 185 studies were excluded due to other age groups or mismatches. Finally, nine articles were included in the review. These studies are categorized into game types, including Nintendo Wii, ExerGames, and virtual reality games. In all studies on elderly depression, the software package and its collection of games (wii) have been used. Among these studies, only one study showed that the results after the intervention were not significant, but other studies all indicated an improvement in depression after the intervention. In connection with the studies studied, the loneliness of the elderly, it should be noted that most of them used the software package and its games (wii), and only one study examined the effect of exergame on the loneliness of the elderly. All of the studies indicated improved loneliness in the elderly after the intervention.

Table 1 Summary of literature review

Author and year	Title	Aim	Design	Sample size and environment	Method	Results
1 Xu X et al. 2016	Improving Psychosocial Well-Being of Older Adults Through Exergaming	This study examined how exergaming affects older adults' social anxiousness, sociability, and loneliness	quasi-experiment	122 older adults with an average age of 75 were recruited. 89 participants completed the whole study and were included in the final analysis. Singapore	122 older adults with an average age of 75 were recruited from 10 Senior Activities Centers in Singapore. The participants were assigned to one of the three conditions: (1) playing exergames with their peers, (2) playing with an adolescent, and (3) playing alone. In each session, participants from each game type condition were asked to play three Kinect exergames, with each exergame being played for about 10 to 15 minutes. The sessions were held in three sessions a week. Social anxiousness, sociability, and loneliness Measured . The loneliness scale was completed before and after the intervention.	There was a significant change of loneliness after playing exergames. $M= 2.091, SD=0.560$ for pre-test and $M= 1.958, SD = 0.528$ for post-test), and it was statistically significant at high level, $F(1, 83)=5.570, P = 0.021, g^2= 0.063$. Furthermore, the effects of exergame play on sociability and loneliness for older adults playing with the youth were not differentiated from those playing with their peers or playing alone
2 Li J et al. ¹²	Exergames for Older Adults with Subthreshold Depression: Does Higher Playfulness Lead to Better Improvement in Depression?	Examine whether the playfulness may influence the antidepressant effect of exergames on older adults.	A randomized controlled trial	49 elderly 55 years and older. Singapore	The study was conducted on 49 elderly people over 55 years of age in Singapore. Individuals were selected from local adult activity centers and social clubs. Two exercise conditions, defined as "high playfulness" and "low playfulness," were implemented in the study. Nintendo's Wii was used as the exergame platform for both conditions. Wii Bowling and Wii Golf, were used in the high playfulness (HP) condition. Yoga and strength training, in Wii Fit console, 48 were used in low playfulness (LP) condition. Intervention sessions were conducted for one hour per week and for 6 weeks.	There was a significant change of depression after the intervention in both group. [$t(48) = 9.48, p < 0.001$],
3 Schell et al. ⁸	Social Benefits of Playing Wii Bowling for Older Adults	Determine the Social Benefits of Playing Wii Bowling	The study used a mixed-methods research approach. The research used a concurrent/triangulation design	73 elderly over 65 years old Canada	Participants were recruited from 14 independent living centers, assisted living centres, and senior recreation centers in greater Vancouver, Canada. For the experimental intervention, older adults played the digital game Wii Bowling in teams during an 8-week tournament. Those recruited to play in the tournament were organized into teams of four players (and a few team softthree players) within each participating site. Winning team received prizes loneliness scale was completed before and after the intervention.	There was a significant difference in the score of loneliness before ($M=2.21, SD= 0.53$) and after gameplay ($M \frac{1}{4} 2.05, SD = 0.54$), $t(70) = 3.52, p=.001$.

Table Continued

4	Ying-Yu Chao et al. 2014	Physical and Psychosocial Effects of Wii Fit Exergames Use in Assisted Living Residents: A Pilot Study	examine the difference in physical function, fear of falling, depression, and quality of life	quasi-experimental pre/post-test design	32 elderly over 65 years old in two 110-bed affiliated ALFs in a suburb of Buffalo in Western New York	Two ALFs were randomly assigned to either the Wii Fit group or the education group. The Wii Fit group received the SAHA intervention (Staying Active, Healthy Aging) twice a week for 4 weeks. The education group received health education material once a week. Evaluations were conducted at pre-intervention (Week 0) and post-intervention (Week 5). Interview-styled surveys included a 15-item Geriatric Depression Scale (GDS-15).	Signs of depression in posttest were significantly lower than pre-test. (p < .05)
5	Chesler et al. ¹⁴	The effects of playing Nintendo Wii on depression, sense of belonging and social support in Australian aged care residents	to investigate the mental health of aged care residents (aged 65 years or older) who are encouraged to participate in a group activity involving the Wii console.	This trial will utilize a mixed-methods, quasi-experimental trial design	Elderly from Four aged care facilities. Australia.	This trial will utilize mixed-methods, quasi-experimental trial design where an active Wii intervention will be compared to control (wait condition) utilizing aged care facility residents. The program consists of the residents playing Wii bowling in a group with up to three other residents for a period of 6 weeks, for up to 1 hour per session.	Participation in a group activity playing Wii bowling may lead to a decrease in the levels of depression experienced.
6	Rendon et al. ¹⁵	The effect of virtual reality gaming on dynamic balance in older adults	This study compared a virtual reality group (VRG) and a control group (CG).	randomized controlled intervention	Forty participants were recruited at the Air Force Village West retirement community located in Riverside, CA.	The subjects were divided into control and intervention groups. Participants alternated the exercise game sequence week-to-week during the 18-session intervention (3x/weekx 6 weeks). In the VRG group, each participant used three different balance games from the Wii Fit software package. The pre- and post-test for the CG and the VRG were administered in the same manner.	There was not a significant change of depression after the intervention in both group. Both groups scored in the 'normal' classification of depression scoring by the GDS (0-9 = normal). The median improvement for the VRG was 1.0 and for the CG was 0.0 (P = 0.112). A post hoc analysis revealed an effect size of 0.35 and the power to detect this effect was 50%.
7	Patricia et al. 2011	Effects of Playing Wii on Well-Being in the Elderly: Physical Activity, Loneliness, and Mood	Determine the Effects of Playing Wii on Well-Being in the Elderly		30 elderly at independent living residential apartments in New Haven County	Twenty-eight participants were randomly assigned to either playing a Wii game of their choice (everyone chose Wii bowling), or watching television programs of their choice for 1 hour per week for 10 weeks. In addition, resident directors recruited seven participants willing to serve as "no visit" controls. The Wii, TV Control, and No Visit Control groups completed all measures at Week 1 and Week 10.	This analysis resulted in a significant interaction, F(2, 30) = 6.24, p < .005, indicating that participants in the Wii group had lower loneliness at posttest, while the TV Control group had higher loneliness at posttest.

Table Continued

8	Rosenberg et al. ¹⁶	Exergames for Sub syndrome Depression in Older Adults	Assessing whether symptoms of depression, quality of life associated with health and cognitive function improve with performing exergames	Randomized controlled trials	19 elderly Participants were recruited through senior community centers and retirement communities in San Diego County	Their study was pilot-based and was conducted on 19 elderly people. Selected Nintendo Wii (Tennis, Bowling, Baseball, Golf and Boxing) was selected for a 12-week. Participants played the Wii Sports games in their residential facility or a senior center for three 35-minute sessions per week.	There was a significant change of depression after the intervention. ($t(21)=3.24, p=0.004$)
9	Koay Jing Li et al. 2008-2009	Nintendo Wii as an Intervention: Improving the Well-being of Elderly in Long-term Care Facilities	Investigating the Impact of Nintendo in Physical, Psychological, and Social Well-being of the Elderly		45 elderly over 60 years old Singapore	This study was conducted under the undergraduate graduate project in Singapore. Individuals were divided into three groups of 15 and placed in three different positions. Wii selective games included tennis, bowling, baseball and boxing. In the first position, people played in groups of 4. In the second position, one player could play at each turn. In the third position of the control group, they played traditional games such as memory games. Three sessions of one and a half hours each week were conducted every week for 6	The results showed a significant difference in loneliness before and after intervention. Individuals in wii group significantly decreased their loneliness compare to the intervention group. ($\beta = -.63, p < .00$)

Discussion & conclusion

The purpose of this review is to investigate the effect of video games on depression and loneliness in the elderly. The literature review has shown that these games have a positive effect on reducing depression and loneliness. Li et al.,⁷ Schell et al.,⁸ Patricia et al.,⁹ all conducted studies on the impact of video games on loneliness of the elderly. In all of these studies, the number of volunteers participating in the study was more in the female group than the male group. All of these studies have been conducted in the elderly over 60 years of age. In most studies, people were divided into three different groups and were evaluated; there is only one intervention group in Shell et al. In none of these studies, the control group was compared to the intervention group. The instrument used in all studies was UCLA. The number of intervention sessions in these studies varies from 3 to 18 sessions and the duration of the sessions varies from 30 minutes to 1 and a half hours. Given the variability in the number and timing of intervention sessions, the results of these studies all have a positive effect on loneliness of the elderly. By increasing the number of elderly people, they have become massive tech customers, including digital games.¹⁰ Individuals prefer to engage themselves with enjoyable activity and leisure. These activities may include social networks and the opportunity to play.¹¹

The impact of video games on depression in the elderly has been shown to have a positive impact on the review of the texts. Li et al.¹² Chao et al.¹³ Chesler et al.¹⁴ Rendon et al.¹⁵ and Rosenberg et al.¹⁶ all conducted studies on the effects of video games on elderly depression, although Randon And colleagues examined depression as a secondary objective along with their research goals. In most of these studies, the wii games series including bowling, tennis, golf,

boxing and baseball were used, while Chao et al. attributed the effect of Exergame to depression in the elderly. In most of these studies, the number of female participants was more than male. Most of these studies were in two group; only Rosenberg et al. were studied as a group. Among these studies, only the Chesler and Rendon study was conducted in two groups of intervention and control. The number of sessions varied from 6 to 36 sessions, indicating that the number of intervention sessions had no effect on the positive results of the studies. The duration of the sessions varies from 30 minutes to 1 hour. In all of these studies, games have been grouped. In most studies, depression decreased in elderly patients after intervention. However, in the Rendon study, there was no significant difference in depression between the two groups. Studies have shown that anxiety and depression were reduced and the quality of life associated with the health of the elderly was sought after the Exergaming.¹⁷ Video games provide many physical and mental benefits to the elderly.¹⁸

Recommendation

Considering the positive impact of video games and the increased interest of the elderly in these games, it is recommended that video games be included in the daily agenda of the elderly, and given the greater impact of it in groups, the conditions for performing these games in groups should be provided.

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None.

Conflicts of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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