Elderly Health Journal 2022; 8(1): 6-13.
Shahid Sadoughi University of Medical Sciences, Yazd, Iran
Journal Website : http://ehj.ssu.ac.ir

Original Article

Effect of Group Physical Games on Life Quality of Older Adults at Adult Daycare Centers

Maryam Hedayati [1], Shima Sum [2], Samaneh Pourhadi [*2], Seyed Reza Hosseini [2], Mahbobeh Faramarzi [2]

1. Student Research Committee, Babol University of Medical Sciences, Babol, Mazandaran, Iran
2. Social Determinants of Health Research Centre, Health Research Institute, Babol University of Medical Sciences, Babol, Mazandaran, Iran

[*] **Corresponding Author:** Social Determinants of Health Research Centre, Health Research Institute, Babol University of Medical Sciences, Babol, Mazandaran, Iran. **Tel:** +981132199592, **Email address**: Samaneh.pourhadi@gmail.com

[DOR: 20.1001.1.24236179.2022.8.1.2.4]
[DOI: 10.18502/ehj.v8i1.9949]

A B S T R A C T

Article history
Received 16 Jun 2021
Accepted 21 May 2022

Citation: Hedayati M, Sum SH, Pourhadi S, Hosseini SR, Faramarzi M. The effect of group physical games on the quality of life of the older adults at adult daycare centers. Elderly Health Journal. 2022; 8(1): 6-13.

Introduction: Physical activity is a predictor of the health outcomes of the older adults, and many approaches have been introduced for its implementation. The present study aimed to investigate the effect of group physical games on life quality (QOL) of older adults at an adult day care center.

Methods: This quasi-experimental study was conducted using pre-test and post-test. Using convenience sampling, a total of 50 senior citizens above 60 years of age from two adult daycare centers of Babol and Amol in 2017 was placed in an intervention (25) and a control (25) group, respectively. The intervention group received physical games program twice a week for 6 weeks. The SF12 questionnaire was used to assess the QOL. The statistical analysis of the variables was carried out using t-tests, Wilcoxon, and Mann-Whitney tests at a significant level ($P < 0.05$) with SPSS software.

Results: The QOL scores of the participants in the intervention group, compared to the control group have significantly improved ($p < 0.001$). The calculated difference for the quality of life of the intervention group was ($d = 4.40 \pm 2.36$) being ($d = 1.68 \pm 1.74$) and ($d = 2.72 \pm 1.51$) in the physical and mental aspects, respectively.

Conclusion: Physical exercise program (especially stationary physical game) can improve the quality of life of the older adults both physically and mentally. Therefore, such activities can be used to improve the quality of life of the older adults.

Keywords: Aged, Quality of Life, Physical Activity, Game, Adult Day Care Center

Introduction

Considering the increase in the longevity and life expectancy indices today, a more important subject comes up, namely how to spend life or in other words, the quality of life (QOL). It has been confirmed as a fact that the multitude of physiological problems occurring in old age contribute to the decrease in the QOL during this period. Therefore, considering the certain needs in advanced years, it is of crucial importance to attend to behaviors that improve health and QOL in old age, a fact that is often neglected (1).

QOL as a multifaceted concept, and assess subjective. It is the individuals themselves who judge their QOL, and aspects such as physical health, mental health, economic conditions, personal beliefs, and interactions with the environment influence this judgment (1). Health is the most important deciding factor in QOL, declining as age advances (2). Lacking health deprives the senior citizen of independence by limiting their activities. Some studies showed that senior citizens who are independent in their daily activities will have a

[DOR: 20.1001.1.24236179.2022.8.1.2.4]

[DOI: 10.18502/ehj.v8i1.9949]

better QOL (3, 4). Also, a study demonstrated that caregiving and remedial procedures for the older adults will be truly effective only when they improve their QOL (5). Thus, health improving behaviors which retain the performance and revive the independence of the individuals are among the major criteria of health and improvement in QOL. In this regard, physical movements and exercise play an important role. The aim of physical activity for the older adults is to improve mental health and combat weakness, vulnerability due to lack of exercise, biological changes arising from advanced age, chronic illnesses, and disability due to acute or chronic illnesses (6). In a study, Lee et al. observed a considerable increase in the QOL of the older adults who exercised (7). Furthermore, studies on the effect of regular and group physical activities on the older adults showed an increase in QOL and the feeling of wellbeing among the individuals who followed these activities (6, 8). Despite the mental and physical benefits of exercise and body movements, motion deficiency is very common among the older adults (9, 10). Studies conducted in Iran show that a very low percentage of the Iranian older adults take part in physical activities (11), and about 68% of the individuals above 60 years take part in no physical activities during the week (12). There are personal and social problems that hinder their motivation and participation in exercise and physical movements, and that a boost is required in motivating factors such as joy, pleasure, stronger social interactions, and health improvement to inspire the older adults to engage in such activities and follow them on a regular basis (13).

Since QOL can easily be threatened in old age, it is crucial to take their physical activities into consideration. Therefore, considering the increase in the population of the Iranian older adults, the motion deficiency among them, the existence of a relationship between physical activity and health aspects and the QOL, and considering the fact that we couldn't found any research that has been undertaken in the area of physical games, the present study conducted with the aim to examine the effect of such games in improving the QOL of the older adults.

Methods

Study design

The present study was a quasi-experimental design, in which the QOL variables in physical and mental aspects were evaluated on 50 senior citizens in the control and intervention groups using pre-test and post-test in 2018.

Setting and participants

Based on convenience sampling, 25 senior citizens from each of the two adult daycare centers in the cities of Amol and Babol in the province of Mazandaran, Iran, were selected as study samples. The Babol daycare center was chosen for the execution of the intervention program as the center had agreed with the implementation of the study design in its yard. Therefore, the intervention group from the Babol adult daycare center and the control group from the Amol adult daycare center participated in this program. The participants were independent seniors with activity of daily living (ADL) scores > 10 and Abbreviated Mental Test Scores (AMTS) > 5 aged between 60 and 85 years. Individuals who had comorbidities with medical prohibitions or intense sight and hearing impairments, and those who were not willing to participate or were absent from the study for more than two sessions, were excluded from the study. (Figure 1)

Data collection

The interventions in this study were designed and executed according to the Hayat Pouya (Playground) program (14). In this program which has been implemented in some Iranian schools since school year 2013 by the Ministry of Education, simple and feasible methods such as drawing shapes and tables and installing safe and lightweight equipment in the minimum possible space are used (as far as the existing conditions and facilities allow) to make the yard space and surroundings more fun and appealing, so that it will accommodate mental and physical activities during free time. Following the guidance of an advisory team and a sports physiology expert, the yard of the daycare center in Babol was adjusted based on the above-mentioned plan in such a way that it was suitable for the older adults. Some patterns were drawn on the walls and others on the ground, and they were then painted using warm and cheerful colors. Foam, balls, and walnuts were among the tools used in the intervention, with hula hoops used as moving targets. The selected executive games were implemented at their own allocated stations. To further adjust to the conditions, the performance of 50% of the older adults on each exercise was chosen as the criterion for successful play. Two pilot sessions were held in which the game stations were selected based on the capabilities of the senior participants and the execution methods of some of these stations were adjusted accordingly. The objectives expected of these games included boosting focus, memory, balance, interaction, and joy. The games protocol were executed in the forms of skill board games, ball throws and walnut throws for scores, and playing memorable old games. The introductory stage was held in one session at the adult daycare center, during which the participants were taught how to play the games and perform the exercises. Following that, these games and workouts were performed twice a week under the supervision of the program coach and the researcher. Eight stations had been designed and adjusted for the implementation of the intervention. At the first station namely the workout ring, the older adults, based on which zone on the ring they were standing in, would perform the workout assigned to that zone so that the rest would follow suit.

The second station was the skills board, where the participants were given scores based on which of the three areas their thrown ball hit. At the third station, scores were given for throwing the ball through the

[DOR: 20.1001.1.24236179.2022.8.1.2.4]

[DOI: 10.18502/ehj.v8i1.9949]

rolling hula hoops. The fourth station was called the motion activity station, at which the older adults would either zigzag or walk straight along the designed path based on the prompt card they had picked and the training they had received. The fifth and sixth stations reminded the older adults of their own childhood and teenage years' plays, and the seniors showed a great deal of enthusiasm about these. At the fifth station, the participants would throw walnut, aiming to make the 10-cm-diameter holes provisioned in the ground. At the sixth station, they would navigate through a diagram drawn on the ground. The move was originally done by hopping along, but owing to the older adults' physical considerations, walking was specified as the means of navigation. The seventh station was for tic-tac-toe, which was played in a group. Hitting the target areas on the wall by throwing balls was the game for the last station.

This protocol was executed in 12 sessions of 75–90 minutes each, for the participants in the intervention group. Each session consisted of three parts. First, the participants were instructed to warm up for 10–15 minutes. Then, they would execute the relevant physical moves at the stations for 45 to 60 minutes. Finally, they would stretch for 10 minutes to cool down. After the completion of the physical activities, the QOL status of the older adults' subjects was gauged again based on the introduced tools. No intervention was carried out in the control group (15).

The data were recorded in two stages for both the exercise and control groups. That is, first at the beginning of the study prior to the intervention, and then immediately after the end of the intervention, the 12-Item Short Form Survey (SF-12) were filled out for the participants.

For the purposes of data collection, the demographic information questionnaire (created by the researcher including gender, marital status, age group, education, life arrangement, and income), the ADL questionnaire, and the AMTS were filled out only in the pre-test stage and as the criterion for inclusion in the study. The ADL questionnaire is used to determine the daily physical activity status, with a validity of 0.82, a reliability of 0.76, and Cronbach's alpha above 0.75 (16). The AMTS questionnaire was used to screen the older adults in terms of cognition; Questionnaire standardization was conducted by Foroughan et al. In 2017 in Iran showed that it was reliable (α=0.90.5) and the suitable cut-off point was determined 6 using ROC curve. The sensitivity of this test at this cut-off point is 99% and its specificity is 85%, and it has the advantage of being less dependent on the participants' educational level (17).

To determine the older adults' QOL status, Short Form Survey 12-item (SF12) (18, 19) - which is the shortened version of SF36- was used pre - and post-intervention. The psychometric properties of the questionnaire had been examined by Montazeri et al. and the Cronbach's alpha has been %85 (20). The SF12 questionnaire includes 12 questions about eight aspects, grouped in two subscales namely physical and mental:

The physical subscale includes physical performance (2 questions), perception of general health (2 questions), and physical pain (2 questions).

The mental subscale includes questions about role limitation due to mental problems, energy and liveliness, mental status, and physical performance (1 question). Based on the questionnaire, the minimum and maximum scores for each QOL dimension and the total QOL are 12 and 56, respectively, where 56 is the best and 12 is the worst QOL score. In this questionnaire, questions 1, 8, 10 and 11 are scored in reverse order.

Statistical analysis

The distribution status of the data from the study was determined based on the Kolmogorov–Smirnov test. Accordingly, the independent t-test and the paired t-test were used for the variables with a normal distribution. The Mann-Whitney and Wilcoxon tests were used for nonparametric variables of the independent and dependent groups, respectively. The results were considered statistically significant below the threshold of 0.05. Accordingly, the QOL had non-normal distribution, and nonparametric tests were used. The analyses were performed using SPSS software.

Ethical consideration

This study was conducted in accordance with the Declaration of Helsinki. The study was carried out following approval from the Ethics Committee of the Babol University of Medical Sciences and obtaining written permission from the university (MUBABOL.HRI.REC.1396.24). The program has been registered at the Iranian Registry of Clinical Trials (IRCT) with the ID 26706. To observe the study ethics, in addition to obtaining the written informed consent of all participants, it was made clear to the individuals at the beginning of the program that the study results are solely for scientific research purposes and will be published in collective form and without mentioning the names of individuals. They were also told that participation in the study was entirely optional. To show appreciation to the participants in the control group, educational pamphlets on spiritual health were distributed among them and they were given two sessions of self-care training.

Statistical analysis

The distribution status of the data from the study was determined based on the Kolmogorov–Smirnov test. Accordingly, the independent t-test and the paired t-test were used for the variables with a normal distribution. The Mann-Whitney and Wilcoxon tests were used for nonparametric variables of the independent and dependent groups, respectively. The results were considered statistically significant below the threshold of 0.05. Accordingly, the QOL had non-normal distribution, and nonparametric tests were used. The analyses were performed using SPSS software.

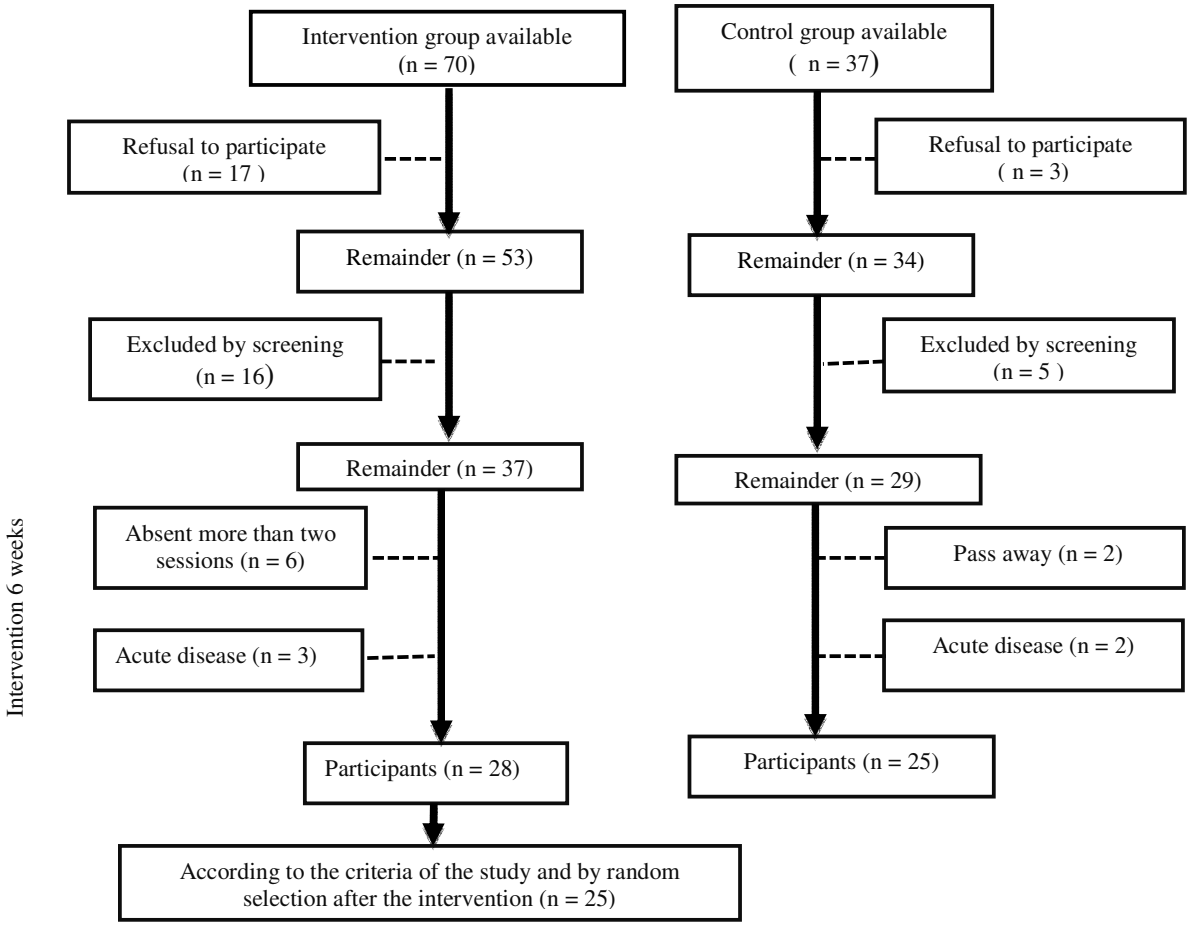

Figure 1. Flow chart of the study

Results

The mean age of the participants was 70.6 ± 7 years, with the youngest participant being 61 and the oldest 83 years old. Most of the older adults were either illiterate (26%) or had received primary education (44%). (Table 1)

The two groups of control and intervention were similar in demographic variables ($P < 0.05$).

In the investigation on the impact of games on QOL, based on the SF12 questionnaire, the findings showed that executing the intervention caused significant changes in the QOL scores in physical and mental dimensions.

Table 2 shows that after the execution of the program, the changes in the intervention group were significant and positive ($P < 0.001$), while no significant change was seen in the control group ($P = 0.84$).

Table 3 shows the changes in mental health in the intervention and the control groups before and after the intervention. The changes in the intervention group were significant and positive ($P < 0.001$), while in the control group, the observed changes were negatively significant ($P = 0.045$). The physical changes in the intervention group were significant and positive ($P < 0.001$), while in the control group, the observed changes were not significant ($P = 0.84$).

Discussion

According to the results of the present study, the hypothesis of the effect of group physical games on the QOL of the older adults has been confirmed. The mean score of QOL of the older adults in the intervention group immediately after the intervention showed an increase in mental, physical, and general dimensions, and the differences were statistically significant. Considering the fact that there had been no significant difference between the intervention and control groups before the study, the growth trend observed in the intervention group can be attributed to the effect of playing games. To elucidate the results from the findings, it can be said that these games boost human connections and interactions particularly among peers, and even playful mocking and teasing during the games further elevate such relations, contributing to a sense of competition and excitement, which in turn encourages motor activities. This is further corroborated as the seniors spoke of the stations as reminiscent of childhood games, so much so that even the older adults excluded from the intervention group for not meeting the inclusion criteria, were willing to perform the station games and used to show up at the game location to cheer their fellow seniors on. The older adults feel depressed and anxious due to a variety of reasons including feeling of loneliness, feeling of uselessness, and experience of loss, financial problems, and the inability to fill their free time.

[DOR: 20.1001.1.24236179.2022.8.1.2.4]
[DOI: 10.18502/ehj.v8i1.9949]

This feeling of anxiety and depression is connected with emotional and QOL elements (21). It seems that playing games and reminiscing the good old days bring the older adults out of the feeling of loneliness and allow them to enjoy the moment by filling their free time and enabling them to connect. In other words, such games can improve the QOL of the older adults by encouraging social interactions, and enhancing their self-confidence, cognitive performance, and independence. This suggests that designing and executing such programs for the older adults will be accompanied by their feeling of satisfaction and a positive outlook towards their life (21). The findings from the study by Mouton et al. in 2017 that had used the strategy of game play for the older adults is consistent with these results (21). Like in our study, women comprised the majority in both the intervention and control groups in Mouton's study (21). Despite the fact that Mouton's study was different from the present study in the sense that it conducted the intervention at a 24/7 care center where the older adults apparently have less abilities than those in the present study, and that the mean age of its statistical society was higher than that of this study (a 12-year difference), it still confirmed in a one-month intervention the effect of combined games on increasing movements and QOL.

Table 1. The demographic characteristics in the control and intervention subject groups

Variables		Intervention group N (%)	Control group N (%)	P*
Gender	**Male**	3(12)	1 (4)	0.297
	Female	22(88)	24 (96)	
Marital status	**Married**	15 (60)	9 (36)	0.067
	Single	3 (12)	1 (4)	
	Widow	7 (28)	15 (60)	
Age group	**60 < Age ≤ 65**	6 (24)	8(32)	0.056
	65 < Age ≤ 75	15 (60)	7 (28)	
	75 < Age ≤ 85	4(16)	10 (40)	
Education	**Illiterate**	4 (16)	9 (36)	0.068
	Elementary	10 (40)	12 (48)	
	High school and higher	11 (44)	4 (16)	
Life arrangement	**Living alone**	5 (20)	11 (44)	0.069
	Live with husband/wife or children	20 (80)	14 (56)	
Income	**Poor**	7 (28)	10 (40)	0.277
	Medium	12 (48)	13 (52)	
	Great	6 (24)	2 (8)	

*Pearson Chi-Square

Table 2.Comparison of the levels of quality of life before and after the physical games in the groups (intervention and control)

		Quality of life	Physical dimension	Mental dimension
Intervention group	**Pre intervention**	38.56 ± 6.53	17.68 ± 2.56	20.88 ± 4.58
	Post intervention	42.96 ± 6.05	19.36 ±2.36	23.60 ± 4.21
	p-value	< 0.001	< 0.001	< 0.001
	Diff	4.40 ± 2.36	1.68 ±1.74	2.72 ± 1.51
Control group	**Pre test**	34.00 ± 6.02	15.76 ± 3.64	18.24 ± 2.80
	Post test	33.48 ± 6.52	15.80 ±3.88	17.68 ± 3.06
	p-value	0.127	0.84	0.045
	Diff	-0.52 ± 1/55	0.40 ±0.97	-0.56 ± 1.32

Note: Data presented as mean ± standard deviation

Table 3. Comparison of levels of changes of quality of life, physical dimension, and mental dimension between the intervention and the control group

		Quality of life	Physical dimension	Mental dimension
Intervention group	**Diff**	4.40 ± 2.36	1.68 ± 1.74	2.72 ± 1.51
Control group	**Diff**	-0.52 ± 1.55	0.40 ± 0.97	-0.56 ± 1.32
	p-value	0.001	< 0.001	< 0.001

[DOR: 20.1001.1.24236179.2022.8.1.2.4]
[DOI: 10.18502/ehj.v8i1.9949]

[DOR: 20.1001.1.24236179.2022.8.1.2.4]

[DOI: 10.18502/ehj.v8i1.9949]

QOL is a subjective and multifaceted concept, and embodies a variety of aspects such as physical health, mental health, economic conditions, personal beliefs, and interactions with the environment (1). Among these aspects, mental and physical health is considered the most crucial in improving QOL, and an active lifestyle can play an effective role in this regard. To that end, a considerable number of studies assessed the effect of physical activity on the QOL of the older adults, the results of each of which confirmed such an effect in one way or another. Results from a study by Afshar-kohan et al. in 2015 showed that improvement in the QOL of the older adults is dependent on improvement in health, and self-care and exercise make it attainable by reviving personal independence (1). A study by Thiamwong et al. in 2013 suggested physical and mental activities as crucial components in the realization of a model for a healthy old age (22). Results from the studies by Shah et al. (23), Matlabi et al. (24), Asztalos et al. (25), and Martinsen et al. (26) confirm the findings from the present study, and relate improvement in the older adults' QOL to the effects of exercise and activities on different aspects of mental health such as a reduction in anxiety and depression. Asztalos also showed that improvement in mental health following physical activity with different intensities is observed in both sexes, and the sex variable is not an influential factor in this regard (25). Nazakatolhosaini et al. (27), Geda et al. (28), and Brach et al. (29) confirm the effect of physical activity on QOL by saying that physical activity of medium intensity increases the independence of the older adults and enhances their QOL and wellbeing by decreasing physical limitations and boosting the adoption of an active role. This is while Shamsipour et al. (30) deem only very low- and very high-intensity physical activities as ineffective, and agree with the results from the present study and the ones mentioned above that physical activities in the range from low-, medium-, and high-intensity are effective. Arriving at results agreeing with those of the present study, Tetlie et al. (31), mentioned physical training as an effective agent contributing to physical and mental health, accompanied by a feeling of wellbeing and security. Studies have shown that interventions that aim at improving QOL, generally affect both the physical and the mental aspects of QOL (32-34).

It has been observed that designing group physical games could help inspire the older adults to engage in physical activities and consequently achieve the beneficial effects of such activities since games were played in the open air of the yard at the adult daycare center, eliminating obstacles such as costs, traffic, and transport requirements. Also, easy access, pleasure of engaging in game activities, having the benefit of light and fresh air, and group interactions were helpful factors. In their study, Nadri et al. have also mentioned similar factors contributing to inspiring the older adults to become active (13).

Conclusions

Findings from this study show that the QOL of the older adults in the intervention group improved by executing physical games. Thus, performing physical activity which are targeted and based on science are feasible even with very little facilities, and is advised as a proper means of improving the health of the older adults and a fulfilling old age.

Study limitations

Inadequate number of intervention studies that focus on physical games, and the small number of the participants particularly male seniors are among the limitations in the present study, and the data obtained from this study can be used in future studies in the same field but with a larger scale. Cognitive health and the independence of the participants in this study were among the limitations which were curbed proactively by the researcher via assessment using questionnaires. So, it is advisable to make adjustments and study the effectiveness of such an intervention on the QOL of the older adults with cognitive and motor problems. Also, extending the intervention period and following up the effectiveness at longer intervals can contribute to optimal planning for achieving positive results with physical activities among the older adults. Among other limitations that need to be taken into account are the influence of the better engagement on the part of the older adults from the intervention group in filling out the post-test questionnaires due to the feeling of satisfaction from participating in the games, and the accidental deaths of two seniors from the control group daycare center.

Conflict of interest

The authors declare that there is no conflict of interest.

Acknowledgment

This study is the result of the research program from the Master's thesis approved by the Babol University of Medical Sciences. The authors would like to thank the officials of the Babol university, the daily care center of Hamrah Salamat in Babol and Javidan in Amol, and all dear older adults at these two facilities.

Authors' participation

S.P. and M.H. and Sh.S. conceived of the presented idea.

All authors contribute in research methods.

M.H. had done the intervention, with supervision of S.P and Sh.S and M.F.

S.P. and SR.H. had done data analysis.

M.H wrote the manuscript with support from S.P. and SR. H.

All authors read the manuscript and verified it.

References

1. Afsharkohan J, Koolivand S. Structured study of the quality of life in the elderly in Iran (2004-13).

[DOR: 20.1001.1.24236179.2022.8.1.2.4]

[DOI: 10.18502/ehj.v8i1.9949]

Salmand: Iranian Journal of Ageing. 2015; 10(3): 192-201. [Persian]

2. Nejati V, Ashayeri H. Health related quality of life in the elderly in Kashan. Iranian Journal of Psychiatry and Clinical Psychology. 2008; 14(1): 56-61. [Persian]

3. Wood L, Peat G, Thomas E, Hay EM, Sim J. Associations between physical examination and self-reported physical function in older community-dwelling adults with knee pain. Physical Therapy. 2008; 88(1): 33-42.

4. Ahmadi M, Noudehi M, Esmaeili M, Sadrollahi A. Comparing the quality of life between active and non-active elderly women with an emphasis on physical activity. Salmand: Iranian Journal of Ageing. 2017; 12(3): 262-75. [Persian]

5. Bigzadeh M, Parhodeh Y, Noudehi MA. Contrasting quality of life with health among active and inactive older adults of Islamabad Gharb town. World Applied Programming. 2013; 3(10): 482-7.

6. Hamidizadeh S, Ahmadi F, Aslani Y, Etemadifar S, Salehi K, Kordeyazdi R. Study effect of a group-based exercise program on the quality of life in older men and women in 2006-2007. Journal of Shahid Sadoughi University of Medical Sciences. 2008; 16(1): 181-6. [Persian]

7. Lee TW, Ko IS, Lee KJ. Health promotion behaviors and quality of life among community-dwelling elderly in Korea: A cross-sectional survey. International Journal of Nursing Studies. 2006; 43(3): 293-300.

8. King MB, Whipple RH, Gruman CA, Judge JO, Schmidt JA, Wolfson LI. The performance enhancement project: improving physical performance in older persons. Archives of Physical Medicine and Rehabilitation. 2002; 83(8): 1060-9.

9. Giuli C, Papa R, Mocchegiani E, Marcellini F. Predictors of participation in physical activity for community-dwelling elderly Italians. Archives of Gerontology and Geriatrics. 2011; 54(1): 50-4.

10. Hassanpoor Dehkordi A, Masoodi R, Naderipoor A, Poor Mir Reza Kalhori R. The effect of exercise program on the quality of life in Shahrekord elderly people. Salmand: Iranian Journal of Ageing. 2008; 2(6): 437-44. [Persian]

11. Eshaghi SR, Shahsanai A, Ardakani MM. Assessment of the physical activity of elderly population of Isfahan, Iran. Journal of Isfahan Medical School. 2011; 29(147): 939-46. [Persian]

12. Motefaker M, Sadrbafghi SM, Rafiee M, Bahadorzadeh L, Namayandeh SM, Karimi M, et al. SuicEpidemiology of physical activity: a population based study in Yazd cityide attempt and its relation to stressors and supportive systems: a study in Karaj city. Tehran University Medical Journal TUMS Publications. 2007; 65(4): 77-81. [Persian]

13. Nadri A, Safania AM, Amritash AM . Determinant of the implementation of physical activities in elderly in Tehran. Journal of Gerontology. 2016; 1(2): 66-79. [Persian]

14. Makvandi1 N, Naeimikia M, Ghasemi A. Effect of school playground activities on behavioral incompatibilities among 7-11 year-old students with intellectual disabilites. Motor Behavior. 2020; 12 (42): 37-54. [Persian]

15. Hedayati M, Sum S, Hosseini SR, Faramarzi M, Pourhadi S. Investigating the effect of physical games on the memory and attention of the elderly in adult day-care centers in Babol and Amol. Clinical Interventions in Aging. 2019; 14: 859-69.

16. Taheri Tanjani P, Azadbakht M. Psychometric properties of the Persian version of the activities of daily living scale and instrumental activities of daily living scale in elderly. Journal of Mazandaran University of Medical Sciences. 2016; 25(132): 103-12. [Persian]

17. Bakhtiyari F, Foroughan M, Fakhrzadeh H, Nazari N, Najafi B, Alizadeh M, et al. Validation of the persian version of abbreviated mental test (AMT) in elderly residents of Kahrizak Charity foundation. Iranian Journal of Diabetes and Metabolism. 2014; 13(6): 487-94. [Persian]

18. Gandek B, Ware JE, Aaronson NK, Apolone G, Bjorner JB, Brazier JE, et al. Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. Journal of Clinical Epidemiology.1998; 51(11): 1171-8.

19. Ware J, Kosinski MM, Keller S. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. Medical Care. 1996, 34(3): 220-33.

20. Montazeri A, Vahdaninia M, Mousavi SJ, Omidvari S. The Iranian version of 12-item Short Form Health Survey (SF-12): factor structure, internal consistency and construct validity. BMC Public Health. 2009; 9(1): 1-10.

21. Mouton A, Gillet N, Mouton F, Van Kann D, Bruyère O, Cloes M, et al. Effects of a giant exercising board game intervention on ambulatory physical activity among nursing home residents: a preliminary study. Clinical Interventions in Aging. 2017; 12: 847-58.

22. Thiamwong L, McManus MS, Suwanno J. Development of the Thai healthy aging model: a grounded theory study. Nursing & Health Sciences. 2013; 15(2): 256-61.

23. Shah KN, Lin FV, Yu F, McMahon JM. Activity engagement and physical function in old age sample. Archives of Gerontology and Geriatrics. 2017; 69: 55-60.

24. Matlabi H, Shaghaghi A, Amiri SH. A pilot physical activity initiative to improve mental health status amongst Iranian institutionalized older people. Health Promotion Perspectives. 2014; 4(1): 68-76.

25. Asztalos M, De Bourdeaudhuij I, Cardon G. The relationship between physical activity and mental health varies across activity intensity levels and dimensions of mental health among women and men. Public Health Nutrition. 2010; 13(8):1207-14.

26. Martinsen EW. Physical activity in the prevention and treatment of anxiety and depression. Nordic Journal of Psychiatry. 2008; 62(sup47): 25-9.

27. Nazakatolhosaini M, Mokhtari M, Esfarjani F. The effect of pilates training on improvement of motor and cognitive functions related to falling in elderly female.

Journal of Research in Rehabilitation Sciences. 2012; 8(3):489-501. [Persian]
28. Geda YE, Roberts RO, Knopman DS, Christianson TJ, Pankratz VS, Ivnik RJ, et al. Physical exercise, aging, and mild cognitive impairment: a population-based study. Archives of Neurology. 2010; 67(1): 80-6.
29. Brach JS, Simonsick EM, Kritchevsky S, Yaffe K, Newman AB. The association between physical function and lifestyle activity and exercise in the health, aging and body composition study. Journal of the American Geriatrics Society. 2004; 52(4): 502-9.
30. Shamsipour Dehkordi P, Abdolshahi M, Salehian Dehkordi M. The effect of physical activity different levels on cognitive function and quality of life in elderly people with sleep disorders. Sport Psychology Studies. 2015; 4(12): 43-58.
31. Tetlie Eik-Nes T, Eik-Nes N, Palmstierna T, Callaghan P, Nøttestad JA. The effect of exercise on psychological and physical health outcomes: preliminary results from a Norwegian Forensic Hospital. Journal of Psychosocial Nursing and Mental Health Services. 2008; 46(7): 38-43.
32. Mirbagheri N, Memarian R, Mohamadi E. Effects of regular walking programme on quality of life of elderly patients with moderate COPD. Iranian Journal of Nursing Research. 2007; 2(6-7): 19-28. [Persian]
33. Panahi R, Osmani F, Sahraei M, Ebrahimi S, Shamsinejad Gashti M, Javanmardi E. Relationship of health literacy and quality of life in adults residing in Karaj, Iran. Journal of Education and Community Health. 2018; 4(4): 9-13. [Persian]
34. Habibi A, Nikpour S, Seiedoshohadaei M, Haghani H. Quality of life and status of physical functioning among elderly people in west region of Tehran: a cross-sectional survey. Iran Journal of Nursing. 2008; 21(53):29-39.

[DOR: 20.1001.1.24236179.2022.8.1.2.4]
[DOI: 10.18502/ehj.v8i1.9949]