

ORIGINAL ARTICLE

Effect of Health Promotion Interventions in Active Aging in the Elderly: A Randomized Controlled Trial

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ABSTRACT

Background: Active aging has been the paradigm of the old-age lifestyle. Integrated aging care interventions in health centers primarily focus on diseases such as diabetes, hypertension, depression, and cardiovascular diseases, and there is no program or training regarding active aging. This study was carried out from September to December 2021 to determine the effectiveness of an intervention program to promote active aging in the elderly referred to Mashhad health centers.

Methods: This randomized controlled clinical trial was conducted on 60 elderly individuals without disabling diseases and cognitive impairment who presented to the Daneshamooz health center in Mashhad in 2021. Through a simple block allocation scheme, those who met the inclusion criteria were randomly divided into the intervention and control groups. The intervention group received the health promotion program during 6 sessions (one session per week) about nutrition, physical activity, responsibility, stress management, communications, and spiritual aspects. The data were gathered using the active aging questionnaire and analyzed using the SPSS software version 25; independent and paired t-test, Wilcoxon, and Mann-Whitney U tests were utilized. P value < 0.05 was considered statistically significant.

Results: The results of this study demonstrated that after the intervention, the total active aging score in the intervention group increased significantly (68.5 ± 3 to 85 ± 8.25) ($P < 0.001$) and there was a significant difference between the control and intervention groups (68 ± 3.25 to 85 ± 8.25) ($P < 0.001$).

Conclusion: According to the results, training based on a health-enhancement approach can effectively promote active aging in the elderly. Therefore, more attention should be paid to strategic planning for active aging in health centers.

Trial Registration Number: IRCT20210308050639N1

Keywords: Community health centers, Geriatrics, Healthy aging, Health promotion

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INTRODUCTION

Approximately 50% of hospital admissions, 70% of hospital services, 90% of hospice beds, and 85% of chronic disease beds are dedicated to the elderly.¹ By 2050, 21.5% of the world population will have been elderly. Approximately 9% of the Iranian population are in advanced ages of life, which will rise to 28% in 2050.^{2,3} Without proper strategic planning, the increase in the number and proportion of the elderly in different societies will be a great challenge for the health systems. In this regard, health promotion programs aim to reduce hardships and complications associated with aging, and one such program is active aging.⁴ The World Health Organization (WHO) defines active aging as “the process of promoting health, social security, and social contribution of the elderly to promote their quality of life”.⁵ The active aging process was introduced, developed, and globally expanded in the 90s by European countries in collaboration with the WHO to respond to the health and social welfare financial challenges. European countries were confronted with this program which has different behavioral, environmental, social, economic, and health dimensions and depends on different factors such as the education and income of the elderly individual.^{6,7} According to the WHO, living arrangements, including social support, social wealth, and background factors (age, gender, marital status, employment status, educational background, income, and the size of the family) are considered influential in active aging.⁸ Physical activity, nutrition, and cognitive function are the main influential factors in active aging.⁹ Some studies have shown the role of proper nutrition, physical activity, and community capacities in promoting active aging.^{10,11} A study in 14 European countries showed that active aging played an influential role in promoting the well-being of the elderly, so it should be encouraged through public and social policies.¹² Most aging studies have focused on lifestyle and health-promoting behaviors, successful aging, and the quality of life,¹³⁻¹⁵ while in the active aging field, the

focus of most studies has been on the macro-level social and economic policy-making, and there has been little research at an individual level.^{11,16,17} Promoting a healthy life is important from not only a population-health perspective, but also an individual viewpoint, as active aging is not an arbitrary concept.¹² A personal view is essential in active aging, and all individuals are responsible for their aging process. Capacity building in aging does not merely depend on sociopolitical efforts. It also depends on the decisions made at the individual levels, and national initiatives implemented for the elderly are an integrated set of care.^{12,18} However, as the first-level prevention centers, health centers are critical as supportive and rehabilitative environments. Health centers are people’s first level of contact in all health systems. Therefore, their services should be comprehensive, inclusive and available, and of high-quality.⁸ One strategy for realizing active aging is promoting healthy behavior.¹⁹ The advanced ages are associated with impaired motility, increased prevalence of chronic diseases, feeling of loneliness, depression, and poverty. These factors can discourage healthy behavior. Health-promoting behavior (nutrition, physical activity, stress management, communication, spiritual growth, and responsibility) can also lead to lifestyle improvement.²⁰ Such behavior is the most important and influential factor in maintaining and promoting the elderly health.¹³ In developed countries, the promotion of social dimensions of preventive measures and lifestyle change is considered as the main drivers of the promotion of quality of life, reducing the risk of losing physical independence. The genuine amalgamation of social support and health care at the social level is influential in promoting health and implementing preventive measures.²¹ On the other hand, active aging can be considered a lifestyle in the advanced ages and can address other dimensions of the elderly health beyond disease prevention.²² Active aging is a general strategy for maintaining physical and spiritual health.⁷ Some of the six dimensions of health-promoting behavior, such as physical activity, communication,

health responsibility, and spiritual health, are influential in active aging by determining such factors as physical-functional activity, social contacts, social institutional participation, and agent attitude. In this regard, a study conducted a multi-disciplinary active aging intervention among the community elderly. The results showed that the multi-disciplinary intervention improved mental health, healthy life, social participation and active aging.²³ Also, the results of a study in Finland emphasize the need for individual counseling in promoting active aging programs.¹⁹ Because from a practical viewpoint, integrated health interventions designed and implemented in health centers in Iran mainly focus on high-priority diseases such as diabetes, hypertension, depression, and cardiovascular disease, no programs or training regarding active aging are provided;²⁴ on the other hand, performing community-based interventions in these centers is very rare, considering the critical role that community health nurses have in the levels of prevention, especially health promotion. Therefore, this research is designed and implemented with the primary objective of determining the effectiveness of health-promoting training programs on active aging for elderly individuals.

METHODS

This study is a randomized clinical trial conducted on 60 old adults from September to December 2021. The research sample included all the elderly who presented to the health and treatment center number 1 in one district of Mashhad. Amongst all health centers affiliated with health center number 1, on an availability basis, a center with sufficient elderly patients was selected as the research environment. This center was the Daneshamooz health center. The researcher selected the elderly based on the inclusion criteria. The method of blinding of this study was single blinding; the evaluator of the results, who was a person outside the research team, was blinded and was not aware of the type of the intervention assigned to the elderly.

After obtaining written informed consent,

the demographic characteristics were obtained. Active aging questionnaire, i.e. mental test (AMT) questionnaire, activities of daily living scale (ADL), and instrumental activities of daily living scale (IADL) were completed as self-reports by the elderly participants. Then, random allocation to the two groups of intervention and control was conducted through simple block allocation methods, so that, first, six blocks of four units were formed. Then, a lot was held to determine the block's arrangement. The elderly subjects were allocated to the intervention or control groups based on the block codes. When six blocks received the end, the sampling was repeated on these blocks to the point that all units were included in the research. The flowchart of CONSORT is shown in Figure 1.

The inclusion criteria were age 60 or over, no history of a disabling disease (which could hinder the participation of the elderly in the study) such as leg and pelvis fracture, a score of eight or more in the AMT questionnaire,²⁵ assessment of the activity level, a score of seven or more in the IADL and ADL questionnaires,²⁶ no history of abdomen operation during the past three months, and willingness to participate in the study. Subjects were excluded if the elderly had any acute physical disease, had contagious diseases such as influenza and Covid-19 during the study, refused to continue the study, were unwilling to participate in the meetings, or were absent in more than two meetings. For the sample size calculation, during the primary phase (pilot), data gathering questionnaires were presented to a group of 20 subjects. After analysis of the mean and variance, the sample size was calculated with a confidence interval of 95%, error of 5%, power of 80%, and considering 10% loss of the sample volume as 60 subjects (in each group 30 persons) according to the following formula:

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times [(S_1^2 + S_2^2)]}{(X_1 - X_2)^2}$$

$$27 = \frac{(1.96 + 0.84)^2 \times [(5.7^2 + 5.4^2)]}{(70.5 - 74.7)^2}$$

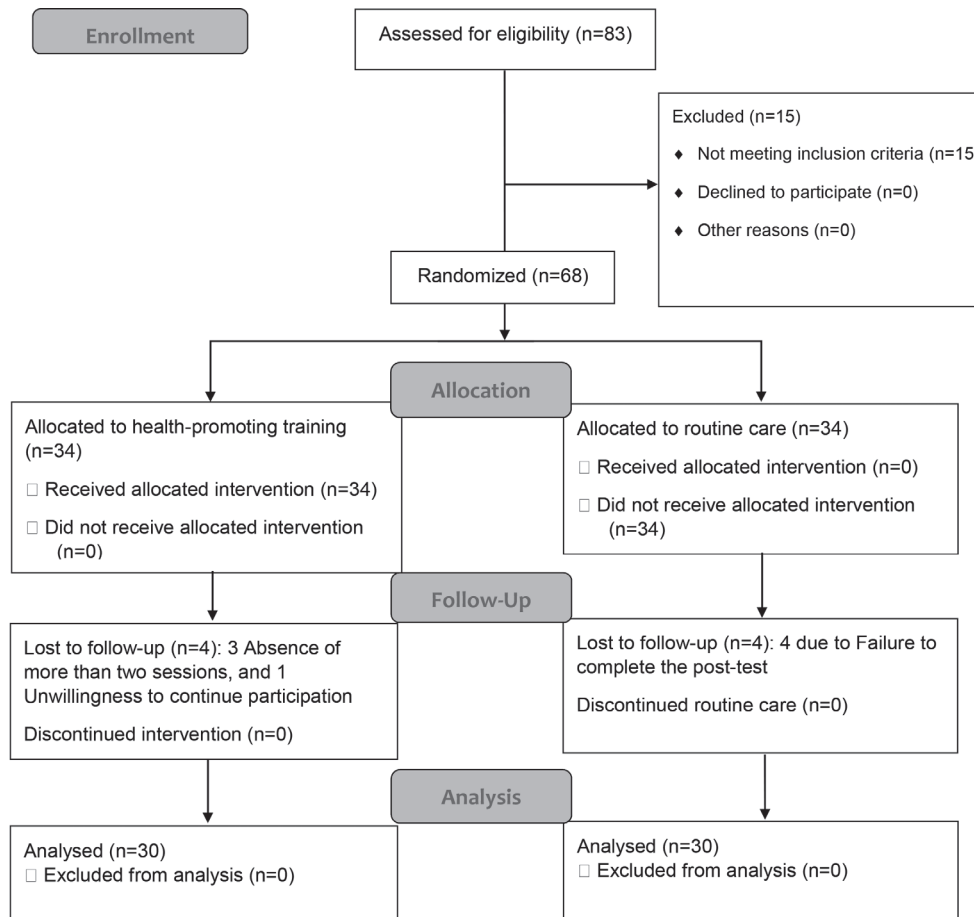


Figure 1: CONSORT Flow Diagram

Active aging questionnaire was made by Mohammadi.et.al. It contains 40 questions, and is scored using the Likert 5 scale (none=0, little=1, to some extent=2, greatly=3, very highly=4). This scale has six subscales. The lowest and the highest scores in active mind maintenance subscale are 0-24, agent attitude subscale 0-28, physical-functional activity subscale 0-32, social contacts 0-28, productive engagement 0-32, and in the subscale of social institutional participation 0-16. The total active aging score range is 0-160, and the higher scores (0-160) demonstrate a higher degree of active aging. The content validity of the measurement tools was reviewed based on Content validity index of Waltz and Base, and the credit ratio of the contents of Lawshe [21] were reviewed. The mean content validity index was 0.906. The reliability based on internal consistency and test-retest method indicated that Cronbach's α coefficient, Pearson correlation coefficient, and inter-cluster correlation coefficient were 0.876,

0.951, and 0.996, respectively ($P < 0.01$).²⁷

The source for the training as mentioned above was the four-volume book of training on healthy lifestyle in advanced ages published by the Ministry of Health and Medical Education and the gerontology and geriatric books.⁸ Then, the educational package was prepared, and seven professors approved the validity of the educational package's content in gerontology at the Nursing and Midwifery Faculty of Mashhad (Table 1). Subsequently, the health-promoting training intervention was conducted in the intervention group. The intervention group consisted of three groups of ten people and the educational sessions consisted of six sessions for each group; every week, one training session was held. Religious and physical education and psychology experts were present in the educational sessions. In each session, one subject was educated, with different durations based on the subject. The last 10 minutes of every session were dedicated to questions and

Table 1: Content of training sessions

Topic of session	Session content
Nutrition	Explaining the needs of the body do different nutrients such as sugars and fats and proteins, introduction to main categories of nutrients, nutrition advice such as encouraging regular breakfast meals, weight control and maintenance, consumption of fruits and vegetables in the daily diet
Physical activity	Recommendation of regular and appropriate exercise according to the physical condition; slow walking in two morning and evening sessions, each time 10 to 15 minutes, and gradually increasing its duration,
Responsibility	Responsibility interventions such as harms of smoking and tobacco use, regular visits by physicians for prevention and screening diseases
Stress management	Introduction of leading causes of stress in the advanced ages such as the death of relatives and retirement, familiarizing with the presentations of stress and recommendations of strategies for coping with stress such as engagement in other activities, listening to the music, employment of tranquilizing exercises by a psychology expert
Communications	Interpersonal communication interventions and skills for living a happy life and communicating with the family, friends, and old acquaintances, not remaining alone, and holding regular friendly gatherings at home, or out such as a park
Spiritual aspects	Spiritual growth interventions include participation in religious ceremonies such as prayers, recital of the Holy Quran, visiting holy shrines, and focusing on spiritual growth by a religious expert

answers of the participating elderly. In the control group, routine care was performed including subjects related to nutrition was taught, and follow-up of laboratory tests, and blood pressure monitoring were done. After the end of the study, one health center personnel held an educational session for the control group to ensure adherence to ethical principles. After the end of the intervention, active aging questionnaire was completed by both intervention and control groups. During one and a half months of the study, between the sessions, the researchers kept in contact and called the subjects in the intervals between the sessions through phone calls to ensure that the programs were run and the elderly were satisfied with the programs; their suggestions and demands were followed by phone calls. After data collected were analyzed in two levels of descriptive statistics and inferential statistics. The results of descriptive statistics were expressed as mean±SD for continuous variables and as frequencies and percentages for categorical ones. As to the use of the appropriate test to compare the main variables between the two groups, first the normality of the distribution of the variables was examined and tested. For this purpose, Kolmogorov-Smirnov and Shapiro-Wilk tests were used.

Mann-Withney U and Wilcoxon was used for non-normal variables and independent t-test and paired t-test were used for normal variables. All the analyses were performed using the SPSS statistical software (version SPSS-25). Statistical significance was set at $P < 0.05$.

The current study was approved by the ethics committee of Mashhad University of Medical Sciences with the code of IR.MUMS.NURSE.REC.1400.034. The research units were assured that their names would not be mentioned in the study and that they could withdraw from the study whenever they wished with no effect on their routine care.

RESULTS

In the current study, a total of 60 persons aging 60 and higher participated. There were no significant differences between demographic features (age, gender, education, employment status, income, marital status) in both groups ($P > 0.05$). Demographic characteristics of the intervention and control groups are shown in Table 2.

The results showed that the distribution of active mind maintenance variables, physical-functional activity, social contacts,

Table 2: Demographic characteristics of the elderly

Variable		Intervention Group	Control Group	P value
Age (Mean±SD)		66.5±5.1	66.4±4.4	0.95*
Gender	Man	16 (53.3)	13 (43.3)	0.79**
N (%)	Woman	14 (46.6)	17 (56.7)	
Education	Primary	7 (23.3)	7 (23.3)	0.98**
N (%)	Intermediate	10 (33.3)	10 (33.3)	
	High school	6 (20)	7 (33.3)	
	University	7 (23.3)	6 (20)	
Employment status	Housewife	9 (30)	9 (30)	0.96**
N (%)	Public sector	5 (16.7)	6 (20)	
	Laborer	6 (20)	7 (23.3)	
	Self-employed and other	10 (33.3)	8 (26.7)	
Income	None	7 (23.3)	7 (23.3)	0.99***
N (%)	Low	9 (30)	9 (30)	
	Moderate	14 (46.7)	13 (43.3)	
	Sufficient	0	1 (3.3)	
Marital status	Single	10 (33.3)	11 (36.7)	0.78**
N (%)	Married	20 (66.7)	19 (63.3)	

*Mann-Withney; **Chi-Square; ***Exact Chi-Square

Table 3: Comparison of the total and dimensions of active aging between the intervention and control groups

Active aging dimensions		Intervention group (N=30)	Control group (N=30)	P value
		Median±IQR ^a	Median±IQR	
Active mind maintenance	Pre-intervention	9.00±2.00	8.50±2.25	0.78***
	Post-intervention	13.00±4.00	8.00±2.00	<0.001***
P value		<0.001*	0.65*	
Physical-functional activity	Pre-intervention	15.00±4.00	15.00±3.25	0.94***
	Post-intervention	16.00±4.00	15.00±4.00	0.03***
P value		0.05*	0.99*	
Social contacts	Pre-intervention	11.50±4.00	12.00±4.00	0.95***
	Post-intervention	16.00±3.25	11.50±4.00	<0.001***
P value		<0.001*	0.05*	
Productive engagement	Pre-intervention	13.50±6.00	13.50±6.00	0.85***
	Post-intervention	19.00±6.00	13.50±6.00	<0.001***
P value		<0/001*	0.58*	
Social-institutional participation	Pre-intervention	6.00±1.00	6.00±1.00	0.81***
	Post-intervention	9.00±4.00	6.00±1.00	<0.001***
P value		<0.001*	0.65*	
		Mean±SD	Mean±SD	
Agent attitude	Pre-intervention	13.7±1.60	13.6±1.70	0.87****
	Post-intervention	13.6±1.60	13.5±1.60	0.96****
P value		0.32**	0.21**	
		Median±IQR	Median±IQR	
Total score of active aging	Pre-intervention	68.50±3.00	68.50±3.25	0.79***
	Post-intervention	85.00±8.25	68.00±3.25	<0.001***
P value		<0.001*	0.14*	

^aInterquartile range; *Wilcoxon; ** Paired t-test; *** Mann-Whitney U; ****Independent t-test

social institutional participation, productive engagement, and active aging total score were normal. Only the distribution of agent attitude was not normal.

According to the information from Table 3, a significant difference was shown in most dimensions of active aging including active mind maintenance, physical-functional

activity, social contacts, productive engagement, and social institutional participation between the control and intervention groups after the intervention ($P < 0.05$). As to the dimensions of agent attitude, no significant difference was shown between the control and intervention groups after the intervention ($P = 0.96$).

After the intervention, the median score of the total active aging showed a significant difference between the intervention and control groups ($P < 0.001$). In the intervention group, the mean score of the total active aging increased significantly after the intervention ($P < 0.001$) (Table 3).

DISCUSSION

The research results showed that health promotion educational program of this study had positive and significant effects on active aging in the elderly. Due to the low cost, convenience, and applicability of this program, its use seems to be beneficial for the elderly. This program can have positive effects on obtaining desirable health outcomes and increase the independence of the elderly because, in addition to the educational needs of the elderly in the field of health and health behaviors, it also pays attention to the social and psychological needs of the elderly.

A study was performed to investigate the motivation promotion (self-selected and social activities) and physical activities of the elderly. This intervention included consultation and personal support to increase collaboration in physical and social activities outside the house. For personalization, the participants were identified based on their initial health status, social contacts, and level of welfare. The consultation protocol was designed according to their activities and preferred goals. The personal consultation intervention did not affect their motility and behavioral dynamism in the personal and social dimensions of the elderly individuals. However, their physical performance was improved.²⁸ This finding is inconsistent with those of the current study.

The intervention basis in the present study was group training sessions, and essential topics such as responsibility and communication were considered in the current study; the ground was on personal interventions. This unique intervention could improve the physical activity of the elderly. Still, as motility and activity have deeper dimensions, such as the sense of belonging to society and increased responsibility towards self, the need for attention to education for communication and social interactions is necessary.

An intervention, similar to our study, used a clinical trial design to strengthen active aging in the healthy elderly over 60 years. The program "I am active" as the intervention in this research was a program for stimulating active aging via motivation and improvement of physical activity, nutrition, and cognitive function. These training sessions were held by a team of one psychologist and a nutritionist. Ultimately, the elderly in the intervention group had self-sufficiency and better quality of life, but the dimensions of these concepts were similar to the current research.⁹ The employment of psychology and nutrition experts can be considered as the similarities between the two studies. Additionally, the present study considered the critical concept of psychological skills such as stress management and communication using an expert.

The dimensions of active aging are diverse and include physical activities; for this reason, an expert in sports affairs in the form of a trainer was included in the education in the current study. A study considered all dimensions of active aging according to the health-promotion approach with the group education for the elderly with the objective of decreasing fatigue and frailty in them. The inclusion criteria for the study units were independence in daily activities and lack of cognitive impairment. Compared to before the study, the intervention group was significantly delayed in fatigue and increased independence. This led to the outcome that this group of the elderly was more active

compared to the control group and had a better approach to aging and increased age.²⁹ In the present study, similarly, having daily or physical activity, independence, and lack of reliance on others were included. Additionally, the health-promoting approach as a group and the technique of interpersonal discussion can be considered. Group training activities with the health-promoting approach were effective interventions for the promotion of health of the elderly who were confronted with the risk of weakness and fatigue and can have positive effects on health and more independence in the elderly; occasionally, these activities affected the cognition of the elderly individual, leading to independence and increased activity in this group.³⁰ The health promotion approach has been influential in the lifestyle of the elderly, including self-sufficiency as an essential factor in active aging.³¹ It seems that education with the approach of health promotion considering the capacities and concepts in its content about the dimensions of active aging can promote the achievement of this concept. The main strength of this study was providing an intervention program utilizing a group-based approach to help the community elderly to improve their healthy life, social participation, and active aging. Our study focused on the short-term effects in 6 weeks. We are not sure how the intervention effects may sustain for extended periods. We selected only one community in this study, and caution should be exercised when interpreting the findings.

CONCLUSION

The findings showed a practical approach to promoting active aging as an intervention at the level of health centers. Most of the studies have looked at active aging through the lens of macro-policies. However, the results of our study showed that in addition to the macro-view, interventions promoting active aging should also be addressed at the executive level. Considering the positive and significant effect of the community-based interventions and attention to the affordability, convenience, and

its safety, the health care monitoring personnel, particularly nurses, are recommended to use the program in their health centers. An intervention similar to this study is also suggested to be done with more time and by using new educational methods such as multimedia.

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Conflict of Interest: None declared.

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