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Research Paper

The Effectiveness of "Active Aging" Intervention on the Hope and Worry of Retired Women: A Quasi-experimental Study

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ABSTRACT

Objective: Active aging promotes optimal health, social participation, and well-being in older adults. This study examined the effectiveness of an active aging intervention on the levels of hope and worry among retired women. We assessed whether this training can significantly enhance hope and reduce worry in older women.

Methods: A quasi-experimental design with a control group was employed in a study involving 59 retired women residing in Tehran, Iran. Participants were selected using convenience sampling and randomly assigned to the intervention and control groups. The adult hope scale (AHS), Penn state worry questionnaire (PSWQ), and Sharkey's physical activity questionnaire were administered before and after the intervention. We used analysis of covariance for data analysis.

Results: The intervention significantly increased hope (pre-test: 27.21±8.65 vs post-test: 32.60±5.49) and physical activity (pre-test: 12.12±4.17 vs post-test: 17.54±4.23). In contrast, it reduced worry (pre-test: 52.27±8.45 vs post-test: 47.10±7.35) compared to the control group, hope (pre-test: 26.33±9.72 vs post-test: 27.12±6.31), physical activity (pre-test: 15.25±6.38 vs post-test: 13.33±5.20), and worry (pre-test: 53.43±8.15 vs post-test: 51.31±7.61). Multivariate analysis of covariance revealed significant differences after the intervention ($P<0.001$) in all three variables.

Conclusion: Active aging interventions effectively enhance hope, reduce worry, and promote physical activity in older women, supporting their broader implementation in health promotion programs.

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Highlights

- Active aging training increased hope and enhanced emotional well-being while reduced anxiety among older women.
- Participants became more physically active and engaged in regular exercise.
- Cognitive and social activities improved memory and reduced feelings of loneliness.
- Findings support the value of community-based retirement preparation and active aging programs.

Plain Language Summary

This study tested a program called "active aging education" designed for older women. The program included mental exercises, physical activities, and social engagement to support healthy aging. Women who joined the program felt more hopeful, had lower anxiety, moved to a greater extent, and reported better memory and less loneliness than those who did not participate. These results suggest that such programs can help older adults stay active, connected, and emotionally healthy as they age.

Introduction

Over the past few decades, global life expectancy has increased significantly—by more than 8 years since 1990—accompanied by a rapid rise in the older population (United Nations Department of Economic and Social Affairs, 2019). In 2020, more than 703 million individuals aged 60 and above, representing 9% of the world's population, were recorded. This number is projected to reach 1.5 billion (16%) by 2050 (United Nations, 2019). Older adults utilize nearly half of all hospital admissions, 70% of hospital services, 90% of nursing home beds, and 85% of chronic care beds globally (Fogg et al., 2018). By 2050, it is anticipated that 21.5% of the global population will be elderly, with Iran's aging population projected to increase dramatically from 9% to 28% (United Nations, 2020). These demographic shifts present profound global challenges, particularly concerning the health and well-being of older adults living alone (World Health Organization [WHO], 2020).

The WHO defines old age as being 60 years or older. While the global population is growing at an annual rate of 1.7%, the population aged 65 and older is increasing at a faster rate of 2.5% (WHO, 2020). Psychology plays a crucial role in understanding the cognitive and emotional changes associated with aging, thereby contributing to efforts that support healthy aging. Recognizing the need for comprehensive global action, the United Nations designated 2021–2030 as the decade of healthy ageing—a worldwide initiative aimed at improving the quality of life for older adults and their communities. This initiative emphasizes cognitive well-being and supports research that promotes mental, emotional, and physical health during aging, with a focus on the quality-of-life strategies rather than treatment (Prince et al., 2024; WHO, 2020).

Aging is also associated with unpredictable financial burdens related to retirement and long-term care (Van Nimwegen & Ekamper, 2018). As a multifactorial process, aging involves various physiological and psychological changes, including increased vulnerability to mental health conditions. Age-related brain changes and physical decline contribute to the rising prevalence of mental and behavioral disorders in older adults (Ingle & Nath, 2008). In addition to physical health challenges, many older individuals face significant psychosocial stressors such as bereavement, social isolation, economic hardship, and chronic illnesses. These factors can diminish self-esteem, increase emotional distress, and a pervasive sense of hopelessness (Sajeev et al., 2022).

Hopelessness is a prevalent and concerning emotional state among older populations. In countries such as the United States, this condition imposes a substantial financial strain on healthcare systems, particularly due to the high costs of care following both apparent and hidden suicide attempts, as well as the treatment of chronic illnesses exacerbated by persistent psychological distress (Zhang et al., 2021). Beyond its economic implications, hopelessness profoundly impacts the emotional and psychological well-being of older individuals and their families.

Numerous studies have shown that hopelessness and suicidal ideation significantly compromise the quality of life in older adults, increasing the risk of premature death and suicide (Ferreira et al., 2018). As people age, they are more susceptible to both physical and psychological disorders, which can intensify feelings of despair and decrease overall well-being (Sajeev et al., 2022). Anxiety, although common across all age groups, tends to be more prevalent and debilitating in older adulthood (Alipour et al., 2006). Various factors, including declining self-confidence, reduced physical activity, the loss of loved ones, limited independence, chronic diseases, environmental changes, fear of death, and inadequate social support, contribute to heightened levels of stress and anxiety (Boyd, 2008). These conditions negatively affect quality of life, increase disability, and raise mortality rates, making early identification and intervention critical (Lavretsky et al., 2011).

Without strategic planning and intervention, the rising proportion of elderly individuals globally will place unsustainable pressure on health systems (Davodi et al., 2023). In response, health promotion efforts have increasingly focused on mitigating the burdens of aging through preventive and supportive measures. One such approach is the concept of "active aging" (Rudnicka, 2020). WHO defines active aging as the process of optimizing opportunities for health, security, and participation to enhance quality of life as individuals age (Hijas-Gómez et al., 2020). This concept encourages older adults to remain engaged in life according to their personal preferences, abilities, and needs (Mendoza & Fernandez, 2016).

Multiple studies underscore the importance of proper nutrition, regular physical activity, and community engagement in supporting active aging (Kim et al., 2020). For instance, a comparative study across 14 European countries found that active aging practices significantly improve well-being among older adults, indicating the need for supportive public and social policies (Vega-Tinoco et al., 2022). While research on aging has often focused on lifestyle factors and quality-of-life determinants, the majority of studies on active aging have been concentrated at the macro-policy level, with limited attention paid to individualized interventions (Davodi et al., 2023).

Emerging qualitative research also highlights the significance of psychological constructs, such as forgiveness and emotional regulation, in the well-being of older adults across different cultural contexts (Prabhakar et al., 2025; Tiwari et al., 2025). Yet, practical evidence on how targeted active aging programs can reduce hopelessness and anxiety—particularly among older women who often face compounded social and economic vulnerabilities—remains limited.

To address this gap, the present study examines the effectiveness of an active aging educational intervention in increasing hope and reducing anxiety among retired women. By integrating cognitive training, physical activity, and social engagement, this study seeks to provide evidence for individualized, community-level programs that can complement broader healthy aging strategies and support the psychological well-being of older adults.

Materials and Methods

The present study employed a quasi-experimental clinical trial design with an intervention and a control group. This design was chosen because it allowed us to evaluate the effects of the active aging training program in a real-world setting where full random assignment was not feasible due to administrative and ethical considerations.

The research population included all retired older women from the Tehran Teachers' Retirement Association and Administration in 2024. Participants were selected through purposive sampling based on predefined inclusion criteria: being 60 years or older, having retired, cognitively capable of participating (as assessed by a brief cognitive screening tool), and willing to join the study.

After screening and recruitment, the participants were randomly assigned to either the intervention or control group using a computer-generated randomization list. To minimize potential bias, allocation was performed by an independent researcher not involved in the intervention delivery. Although blinding participants to the nature of the intervention was not possible due to the educational format, outcome assessors were blinded to group assignments to reduce assessment bias. A total of 68 women, who scored lowest on the adult hope scale (AHS) and highest on the penn state worry questionnaire (PSWQ), were selected through convenience sampling and randomly assigned to either the intervention group (to receive the active aging training intervention) or the control group. For the sample size formula (Equation 1), the Cohen formula was used, resulting in 34 participants per group, adjusted to 36 participants per group to account for dropout risk. Ultimately, 3 participants from the intervention group and 6 from the control group dropped out.

$$1.\ n = \frac{2(Z^1 \propto 2/ + Z^2 - \beta)^2 . \sigma^2}{(\mu 1 - \mu 2)^{\ 2}}$$

The inclusion criteria were as follows:

Aged 65 or older, retired from the ministry of education in Tehran, minimum high school education, capable of participating in sessions, not currently receiving psychological treatment, no diagnosis of major depressive or anxiety disorders, at least one month has passed since the prior therapy.

The exclusion criteria were as follows:

Psychiatric disorders interfering with participation (e. g. severe personality disorders), ongoing psychological treatment, participation in other interventions, missed more than 3 consecutive sessions, withdrawal of consent.

Study instruments

Snyder et al. (1991) developed AHS. It is used to measure levels of hope. This self-report questionnaire consists of 12 items and is designed to assess three dimensions: Agency thinking (4 items), pathway thinking (4 items), and fillers (4 items). The internal consistency of the overall scale ranges from 0.74 to 0.84, and the test, re-test reliability has been reported as 0.80 (Snyder & Lopez, 2007). The concurrent validity of the scale, as measured by correlations with instruments assessing optimism, goal achievement expectancy, and self-esteem, ranges from 0.50 to 0.60. The items are scored based on a 5-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The scale is suitable for individuals aged 15 and above. Among the 12 items, 4 assess agency thinking (items 2, 9, 10, and 12), 4 assess pathway thinking (items 1, 4, 7, and 8), and 4 are considered filler items (items 3, 5, 6, and 11). The scale, therefore, comprises two subscales: Agency and pathway. The filler items (3, 5, 6, and 11) are not included in the scoring of the hope construct, although they are reversed for consistency checking. Notably, items 3, 7, and 11 are scored in reverse. The total score ranges from 12 to 60, with scores between 12 and 24 indicating a low level of hope, 24 and 36 indicating a below-average level of hope, and scores above 36 reflecting a high level of hope. The reliability of this questionnaire was reported to be 0.82, based on Cronbach’s α, in the present study.

The PSWQ is a 16-item self-report instrument developed by Meyer et al. (1990) to assess excessive, uncontrollable, and pervasive worry. It is widely used as a screening tool for generalized anxiety disorder. The questionnaire employs a 5-point Likert scale ranging from 1 (“not at all typical of me”) to 5 (“very typical of me”). It comprises two subscales: General worry (items 1-11) and absence of worry (items 12-16). Items 1, 3, 8, 10, and 11 are reverse-scored. Total scores range from 16 to 80, with scores between 16 and 32 indicating low worry, 33 to 48 indicating moderate worry, and scores above 48 reflecting high levels of worry. A cut-off score of 43 is commonly used to distinguish individuals with clinically significant worry (Startup et al., 2006). Higher scores indicate a greater degree of worry. The internal consistency of the PSWQ has been reported to range from 0.86 to 0.93, and test, re-test reliability over a 2- to 10-week period ranges from 0.74 to 0.93 (Meyer et al., 1990). In the present study, the questionnaire demonstrated excellent reliability, with a Cronbach α coefficient of 0.90, indicating high internal consistency.

The Sharkey physical activity questionnaire was used to assess the participants’ level of physical activity. This 5-item Likert scale instrument offers 5 response options per item. Each item is scored from 1 to 5, yielding a total score between 5 and 25. Individuals scoring above the cut-off score of 10 are classified as physically active. The reliability of this questionnaire was reported to be 0.78 based on the Cronbach α (Khodabakhshi-Koolaee & Fourozan, 2023).

Data collection procedure

After obtaining the necessary permissions and registering the study with the Iran National Committee for Ethics in Biomedical Research, and determining the sample size, the relevant questionnaires were administered to the selected participants. Ethical considerations included obtaining permission to access the research site, explaining the study’s objectives and the method for completing the questionnaires, informing participants of their right to participate or decline, assuring them of the confidentiality of their personal information, and ensuring they provided informed consent. Each intervention session focused on a key component of active aging, such as hope, agency thinking, emotion regulation, problem-solving, physical activity, and nutrition. For instance, the sessions on hope included both theoretical discussions and practical exercises, such as Snyder’s hope formula and (short-term and long-term) goal setting. The protocol combined theoretical education with practical exercises to help the participants integrate these concepts into their daily lives. A notable strength of this intervention was its dual focus on the cognitive and behavioral aspects of aging. Cognitively, the participants learned to identify cognitive distortions and self-defeating thoughts and replace them with healthier perspectives through cognitive-behavioral techniques, including thought recording and challenging irrational beliefs. Behaviorally, exercises involved plan-

ning regular physical activity, tracking sleep patterns, and organizing meal schedules to promote behavior change. The protocol also included both individual and interpersonal strategies. The educational approach emphasized active participation and experiential learning, utilizing methods such as group discussions, sharing personal experiences, role-playing, and take-home assignments (Table 1). For example, during the self-talk session, the participants recorded their thoughts and analyzed them in group discussions. The intervention took place at the Tehran Teachers' Retirement Association and Administration, with sessions held every Wednesday from 10:00 to 12:00, as agreed upon by the participants and the instructor. The intervention lasted for 4 months and was facilitated by a PhD candidate in counseling psychology.

Data analysis

Data analysis was conducted with SPSS software, version 26. Descriptive statistics, including measures of dispersion (variance) and central tendency (Mean±SD), were employed. In inferential statistics, after checking the assumptions, a one-way analysis of covariance (ANCOVA) was used to test the hypotheses.

Table 1. Active aging training protocol overview (Bandepour et al. 2024; Dias & Couceiro, 2017)

Session	Goal	Content	Homework Assignments
1	Introduction to active aging and program goals	Presentation on active aging concepts	Reflect on a meaningful activity or situation and set a short-term goal for the next session.
2	Anatomy and biology of hope	Story about hope; definition and concepts; hope formula	List good memories and identify associated strengths; set achievable short-term goals.
3	Agency thinking and pathway strategies	Introduction to agency thinking and pathway strategies; negative emotions from failed goals	Set goals for the upcoming week using agentic self-talk and pathway strategies to achieve success.
4	Wayfinding, thinking, and problem-solving skills	Problem-solving discussion in goal pursuit	Identify upcoming important events and take incremental steps toward them.
5	Hope and hopelessness	Hope during anxiety; prerequisites of hope	Apply the hope model to life; list hopeless situations and evaluate short-term, weekly, and long-term goals.
6	Introduction to the A→B→C model	Physiological, cognitive, and behavioral processes; cognitive components of emotions	Write five major negative events using the ABC model; track daily unpleasant events.
7	Self-talk and irrational beliefs (suitcase metaphor)	Types of self-talk; introduction to cognitive therapy	Monitor and record internal dialogue: situations, thoughts, and related feelings.
8	Cognitive restructuring via disputation	Identifying automatic thoughts; recognizing and reframing self-defeating thoughts	Apply disputation techniques in real-life scenarios; use facilitative self-talk.
9	Nutrition and movement (taught by an expert)	Role of nutrition in healthy aging; physical health importance	Describe physical traits and use thought recording; follow dietary guidelines and identify creative eating strategies.
10	Relaxation and physical activity	Relaxation technique; brain-body connection	Engage in 30 minutes of moderate aerobic activity daily, including incidental movement.
11	Sleep well to think better	Purpose of sleep; sleep cycle education	Track sleep and wake times; monitor sleep behaviors using the provided chart.
12	Lifelong learning	Memory and self-involvement; cognitive reserve exercises	Try a new skill and teach at least three existing abilities to others.
13	Prioritizing relationships	Gratitude exercises; positive life events	Reflect on positive daily events; visit or call someone meaningful; assess weekly happiness levels (0–10 scale).
14	Retirement reflection	Discussion on retirement; importance of meaningful work	Bring nostalgic items (eg, photos, music, books) and share memories from your adolescence.
15	Final session	Administer AHS, PSWQ, and Sharkey's questionnaire	Complete all home assignments and reflect on personal progress.

Abbreviations: AHS: the adult hope scale; PSWQ: Penn state worry questionnaire.

Results

The intervention group consisted of 31 individuals, while the control group had 28 members. The mean age of the participants in the intervention group was 69.516±5.721 years, and that of the participants in the control group was 68.714±5.474 years. The educational distribution of the participants was also examined. In the control group, 9 participants held a high school diploma, 6 had an associate's degree, 10 had a bachelor's degree, and 3 had a master's degree. In the intervention group, 9 participants held a high school diploma, 11 had an associate's degree, 9 had a bachelor's degree, and 2 had a master's degree.

Education level distribution also does not differ significantly (P=0.902), indicating demographic comparability between groups (Table 2).

P reflect the significance of group differences after intervention, as determined by multivariate analysis of covariance. These findings indicate that the active aging intervention significantly improved hope, reduced worry, and increased physical activity levels in the intervention group compared to the control group (Table 3).

As shown in Table 4, the multivariate analysis of covariance revealed a significant difference between the post-test means of the intervention and control groups for hope, worry, and physical activity (P<0.001). In other words, the difference between the scores of the two groups indicates that, overall, the active aging intervention program had a significant effect on improving hope and reducing worry in retired women.

Table 2. Demographic characteristics of participants in the control and intervention groups

Characteristic		Mean±SD/No. (%)		P
		Control Group (n=28)	Intervention Group (n=31)	
Age (y)		68.71±5.47	69.52±5.72	0.578[a]
Education level	High school diploma	9(32.1)	9(29.0)	0.902[b]
	Associate's degree	6(21.4)	11(35.5)	
	Bachelor's degree	10(35.7)	9(29.0)	
	Master's degree	3(10.7)	2(6.5)	

[a]Age difference between the two groups is not statistically significant (P=0.578).

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Table 3. Descriptive statistics and analysis of covariance P for hope, worry, and physical activity scores before and after the intervention (n=59; Intervention: n=31, Control: n=28)

Variables	Group	Mean±SD		Mean Change	P
		Before the Intervention	After the Intervention		
Hope	Control	26.33±9.72	27.12±6.31	+0.79	0.003
	Intervention	27.21±8.65	32.60±5.49	+5.39	
Worry	Control	53.43±8.15	51.31±7.61	-2.12	0.001
	Intervention	52.27±8.45	47.10±7.35	-5.17	
Physical activity	Control	12.52±6.83	13.33±5.20	+0.81	0.009
	Intervention	12.12±7.14	17.54±4.23	+5.42	

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Table 4. Multivariate Analysis of Covariance for the Differences Between the Intervention and Control Groups

Source of Change	Wilks' Lambda	F	df	Error df	Sig.	Effect Size (η^2)
Hope	0.522	19.176	2	55	0.003	0.402
Worry	0.416	16.445	2	55	0.001	0.317
Physical Activity	0.353	12.255	2	55	0.009	0.287
Group	0.756	21.371	2	55	0.000	0.766

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Discussion

The present study demonstrated that participation in an active aging educational program significantly improved hope and reduced anxiety among older women in the intervention group compared to the control group. These findings support the hypothesis that structured, multidimensional interventions can significantly enhance psychological well-being in later life.

Active aging, as conceptualized by WHO (Hijas-Gómez et al., 2020) and further elaborated upon by Bowling and Dieppe (2005), provides a holistic framework that encompasses physical health, psychological resilience, and social participation. The observed increase in hope aligns with theories that emphasize the role of cognitive stimulation and goal-directed engagement in sustaining optimism and purpose in aging populations Smith & Argentina (2020). Activities such as memory training, skill-building, and reflective exercises likely contributed to this outcome by reinforcing self-efficacy and cognitive vitality, which are core components of hope and perceived control.

The intervention also effectively reduced anxiety, consistent with research showing that addressing older adults' physical, emotional, and social needs can buffer stress and psychological distress (Haselwandter et al., 2015). Within this framework, social engagement serves as both a protective factor and a mediator of risk. By reducing isolation and strengthening support networks, programs can alleviate anxiety related to concerns about declining independence and mortality (Khodabakhshi-Koolaee & Forouzan, 2023). This supports the broader theoretical model, which posits that social participation directly enhances emotional well-being (Oliveira et al., 2016; Bowling, 2008).

Physical activity emerged as another key outcome, with participants reporting increased movement and exercise following the program. This finding aligns with existing evidence that structured physical activity improves functional ability, supports autonomy, and reduces the risk of falls (Dogra et al., 2022; Dugravot et al., 2020). Educational components addressing exercise safety and benefits appear particularly effective in overcoming misconceptions and the fear of injury, consistent with health behavior models suggesting that knowledge and perceived efficacy influence the adoption of healthier lifestyles (Taylor et al., 2021).

Furthermore, the results can be situated within the context of emerging cultural research that emphasizes psychosocial constructs, such as forgiveness and emotional regulation, in the well-being of older adults (Prabhakar et al., 2025; Tiwari et al., 2025). These findings underscore the importance of culturally informed interventions that target both cognitive and emotional domains, acknowledging that social and cultural contexts influence psychological resilience.

While the study shows promise, cautious conclusions must be drawn regarding causality due to the quasi-experimental design. Nonetheless, the random allocation of participants and blinded assessment help strengthen the internal validity of findings.

Conclusion

The active aging protocol demonstrated beneficial effects by decreasing feelings of hopelessness and anxiety, while notably boosting physical activity among older adults. The results indicate that the protocol has played a significant role in enhancing the overall quality of life through improvements in both mental and physical health. Therefore, adopting similar initiatives could be a valuable approach to support the well-being of the elderly population. Future research should include long-term follow-ups in conjunction with immediate post-intervention assessments to yield more robust evidence. Additionally, to strengthen the reliability and applicability of future findings, it is recommended that different individuals—

preferably those independent of the research team—conduct the interventions and administer the questionnaires. The study results also have practical implications, as they can inform the design of preparatory programs for individuals nearing retirement, helping them manage the transition more effectively. Considering the growing aging population, there is an urgent need to develop and roll out such training initiatives, ideally integrated with intergenerational collaboration across educational institutions, community settings, and media platforms.

Limitations and future directions

While the results of this study are encouraging, several limitations must be considered. First, the relatively short follow-up period limits the ability to assess the long-term sustainability of the intervention's effects. Future studies should incorporate longitudinal designs to evaluate whether the improvements in hope, anxiety reduction, and physical activity persist over time.

Second, the use of convenience sampling may restrict the generalizability of the findings to the broader population of retired individuals. Involving a more diverse and representative sample would strengthen the validity of future research. Moreover, this study focused exclusively on women; expanding future research to include male participants would enhance the applicability of the results across genders. Third, the study relied on self-reported measures, which may introduce biases such as social desirability and inaccuracies in recall. Employing objective assessment tools and triangulating data sources could improve reliability. Lastly, future research should also investigate the effectiveness of active aging interventions across diverse cultural and socioeconomic backgrounds. Understanding how such factors influence the efficacy and accessibility of these programs will be critical for developing inclusive, targeted health promotion strategies for aging populations.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Arak branch, Islamic Azad University, Arak, Iran (Code: IR.IAU.ARAK.REC.1402.007).

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Authors' contributions

Conceptualization and supervision: Anahita Khodabakhshi-Koolaee; Methodology and investigation: Akram Bandehpour and Anahita Khodabakhshi-Koolaee; Writing the original draft, review & editing: Anahita Khodabakhshi-Koolaee and Akram Bandehpour, Data collection and data analysis: Anahita Khodabakhshi-Koolaee, Akram Bandehpour, Davood Taghvaei and Ahghar Ghodsi.

Conflict of interest

The authors declared no conflict of interest.

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