Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

The Effect of a Healthy Aging Program based on the Salutogenic Model on the Quality of Life, Healthy Aging, and Sense of Coherence

Gülçin KURT

gulcinkurt86@gmail.com

Ministry of Health

Esma ATASOY

Ankara Yıldırım Beyazıt University

Research Article

Keywords: Chronic disease, healthy aging, nursing, older adults, quality of life, salutogenic model, sense of coherence

Posted Date: March 10th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8575741/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

Additional Declarations: No competing interests reported.

Abstract

Background

This study aimed to evaluate the effect of an educational program based on the salutogenic model on the quality of life, healthy aging level, and sense of coherence in older individuals aged 60–70 years with chronic diseases residing in nursing homes.

Methods

The study employed a quasi-experimental pretest-posttest control group design and included 72 older adults diagnosed with hypertension (HT) or diabetes mellitus (DM) living in two nursing homes in Ankara (36 intervention, 36 control). Data were collected between January 31 and April 18, 2025, using the Individual Sense of Coherence Scale, Healthy Aging Scale, and Quality of Life Scale. The intervention group participated in an 8-week educational program, while no intervention was applied to the control group. Data were analyzed using independent and paired sample t-tests via SPSS 25.0, and the effect of the intervention was assessed through regression analysis.

Results

In the intervention group, the mean sense of coherence score increased from 60.66 ± 9.52 in the pretest to 64.78 ± 8.70 in the posttest ($p < 0.001$). Similarly, healthy aging scores significantly improved from 115.50 ± 15.93 to 122.91 ± 14.12. The quality of life score also increased from 22.44 ± 10.50 to 24.69 ± 9.54 after the intervention ($p < 0.001$). No significant changes were observed in the control group ($p > 0.05$). Posttest comparisons between the groups revealed statistically significant differences in favor of the intervention group across all measures.

Discussion

The educational program developed based on the salutogenic model enhanced the quality of life, healthy aging, and sense of coherence among older adults.

Trial Registration

This study was registered at ClinicalTrials.gov (Identifier: NCT07130435) on 15 August 2025. The trial was retrospectively registered.

Introduction

Aging is a complicated process that is shaped by the effect of genetic components, the lifestyle, and diseases[1]. It is a universal condition with biological, psychological, and social dimensions and is characterized by decreasing function[2]. The world population is rapidly becoming older in the 21st century, and it is predicted that the population over 60 years old will increase from 1 billion in 2020 to 1.4 billion in 2030 and 2.1 billion in 2050[3,4]. There is a similar trend in Turkiye and the elderly population ratio has increased from 5.7% in 2000 to 10.6% in 2024[5]. In addition, the life expectancy at birth has been reported to be 77.6 years in 2024[6]. This increase emphasizes the importance of successful and healthy aging and these concepts require the holistic evaluation of physical, mental, and social wellness[7]. The ability to maintain healthy lifestyles in the elderly is related to many factors such as sociodemographic characteristic, social support systems, and health education[8,9].

Within this framework, the salutogenic model developed by Antonovsky to explain the relationship between stress and disease provides an approach that is not based on disease but on health resources[10,11]. The model provides an important theoretical basis for the development of healthy aging strategies[10]. There are various studies on the effect of the salutogenic approach within the context of elderly health in the literature[12,13]. The applications in Turkiye are mostly in the psychiatry and public health fields[12,14,15]. Integration of the salutogenic approach to elderly care indicates that it is possible to have a healthy life despite chronic diseases by preventing the association of aging solely with diseases[16]. The model is evaluated mostly using the “Sense of Coherence” and “Generalized Resistance Sources” concepts[9]. In addition, it is reported that the Sense of Coherence Scale can be used as a screening tool in determining the individuals under risk such as for rapid functional decline[16].

Elderly individuals staying at nursing homes constitute a group at risk because of various factors such as being away from social support, chronic disease load, and psychosocial fragility[17]. This can compromise their quality of life, healthy aging status, and sense of coherence levels. The salutogenic model supports the ability of individuals to cope with stress and their becoming aware of the current health potential[10] and seems to be an effective approach for studies on fragile groups such as those staying in a nursing home[18]. Salutogenesis-based education programs can therefore make a significant contribution to increasing the quality of life, develop healthy aging behaviors, and strengthening the sense of coherence in elderly individuals.

The capacity of elderly individuals to cope with stressors and assign meaning to their life experiences is critical for mental coherence[19]. The sense of coherence, the main component of the salutogenic model, supports maintenance of health by enabling the effective use of the personal and social resources by the individual[20]. The model therefore provides a protective framework that emphasizes the strong aspects of elderly individuals. Public health nurses have important roles in this process such as evaluating the health status of the elderly individual, providing education, defining the risks, and supporting chronic disease management[21]. The salutogenic approach strengthens the meaning of life, stress-coping skills, and sense of coherence in the elderly when integrated into nursing procedures and therefore creates a sustainable and supportive care model[16,18,20].

Within this context, the study aims to determine the effects of an education program based on the salutogenic model on the quality of life, healthy aging behaviors, and a sense of coherence in elderly individuals with a chronic disease living in nursing homes. The program is expected to have a positive effect on the responses of elderly individuals to stressors, adding meaning to their life processes and supporting their health (Figure1.1).

Methods

This was a semi-experimental intervention study with a pretest-posttest control group. Permission was obtained to conduct the study from the Ankara Yıldırım Beyazıt University Ethics Committee (19.12.2023, 10-553) and also to work at the nursing homes in Ankara (06.06.2024, 1636047), and the study was registered at ClinicalTrials.gov with the “NCT07130435” number. Ethical approval for this study was obtained from the Ethics Committee of Ankara Yıldırım Beyazıt University. Written informed consent was obtained from all participants prior to participation, and the informed consent form is included as a supplementary file. That is this study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Ethics Committee of Ankara Yıldırım Beyazıt University. This research received no external funding. The study was conducted at two nursing homes in Ankara that offered one-, two-, and three-person rooms and various social activities. The intervention group consisted of 119 employees (6 nurses) and the control group of 107 employees (4 nurses). The study group had 250 subjects in

total. Sample size was determined so as to have 32 subjects in each group, using G*Power 3.1 and taking into account the effect size (Cohen's d=0.50), alpha level (α=0.05), and test power (1–β=0.80). A total of 72 subjects were included in the study, taking into account possible losses.

The inclusion criteria were age 60-70 years, Mini-Mental State Examination score ≥24, and being a DM or HT patient for at least 3 years. Exclusion criteria were perception difficulty, severe hearing/sight loss, not attending more than 2 consecutive sessions, and not being able to conduct independent daily living activities (Figure 2.1)

Intervention and Result Outputs of the Study

Intervention: The main independent variable for which the effect was desired to be measured was the intervention program to be administered to support healthy aging.

Intervention Outputs: The quality of life in the elderly, sense of coherence, and the healthy aging level.

Result Output: The main independent variable for which the effect was desired to be measured was the intervention program to be administered to support healthy aging.

Data Collection Forms

Sociodemographic Characteristics Data Collection Form: The form developed by the author after a review of the relevant literature consisted of 31 questions[12,22,23]. The form included demographic questions such as those on age, gender, marital status, monthly income, physical exercise, meals (number and form), frequency of shopping, and the daily sleep routine.

Individual Sense of Coherence (Consistency) Scale (ICS): The scale was developed by Antonovsky in 1987. It is a self-evaluation scale consisting of a total of 13 items scored between 1 and 7. The scale has 3 subfactors of clarity, manageability, and meaning. This scale includes 4 meaning items, 5 clarity items, and 4 manageability items.

Healthy Aging Instrument: The scale was developed by Thiamwong et al. in 2008. The 5-item Likert type scale (1: Definitely disagree, 5: Definitely agree) includes 35 items in 9 subscales (Being self-sufficient and living easily; Stress management; Social relationships and support; Personal care and self-awareness; Being virtuous; Being physically active; Cognitive activity; Being social; Accepting aging). The score range is 35-175.

Quality of Life in the Elderly Scale (CASP-19): The Quality of Life in the Elderly Scale CASP-19 is a 19-item scale developed by Hyde et al.[24]. The scale has four subdimensions consisting of control, autonomy, pleasure, and self-realization.

Study Conduct

The study took place between 23 January and 17 April, 2025 and the pretest and posttest took a mean duration of 30 minutes for each subject. The intervention group participated in the 8-week education program, a week after which the posttests were repeated. The intervention and control group were found to be similar regarding the demographic and health-related characteristics (p>0.05).

The subjects were provided identity badges at the start of the sessions and the education took place between 14.00 and 16.20 on Thursdays in groups of 12. Any unattending subjects completed the session with the next group.

The education included the headers of active and healthy aging, sleep, the physiological and psychological processes and sustainable management of DM and HT, stress, and social support mechanisms within the scope of the salutogenic model. The negative health beliefs of elderly individuals were converted into positive beliefs at the end of the program and the social activities used were Kundalini Yoga and breathing techniques.

The IBM SPSS 25.0 software was used to analyze the data obtained from the study. When evaluating the data, descriptive statistics such as number and percentage means and standard deviations were employed. Skewness and kurtosis values were calculated to determine whether the data showed a normal distribution. The fact that these values were within the ±3 range indicates normal data distribution.

The t-test for independent samples was used for binary group comparisons and the one-way variance analysis (F test) to compare more than two groups as the parametric test assumptions were met. Post-hoc analyses were conducted if there was a significant difference between the groups. In addition, the changes within the groups were evaluated with the dependent samples t-test. The posttest scores were evaluated as the dependent variable and the intervention performed as the independent variable to determine the effect of the intervention, and simple regression analysis with dummy variable was performed.

Results

Table 3.1 *Demographic Characteristics of the Subjects*

		Group				Chi-square	p-value
		Intervention (n=32)		Control (n=36)			
		Number	Percentage	Number	Percentage		
Age	65 and under	13	40.6	9	25.0	1.890[P]	0.169
	66 and over	19	59.4	27	75.0		
	Female	16	50.0	18	50.0		
	Male	16	50.0	18	50.0		
Education	Primary School	8	25.0	13	36.1	1.353[FE]	0.887
	Middle School	8	25.0	7	19.4		
	High School	7	21.9	8	22.2		
	University	4	12.5	4	11.1		
	Illiterate	5	15.6	4	11.1		
Marital status	Single	2	6.3	4	11.1	2.097[FE]	0.675
	Divorced	9	28.1	9	25.0		
	Partner's death	21	65.6	21	58.3		
	Married	0	0.0	2	5.6		
Financial status	Income less than expenses	13	40.6	13	36.1	1.303[P]	0.521
	Income equals expenses	12	37.5	18	50.0		
	Income more than expenses	7	21.9	5	13.9		
Chronic diseases	DM	16	50.0	17	47.2	0.000[CC]	1.000
	HT	16	50.0	19	52.8		
Physical activity	Yes	14	43.8	17	47.2	0.082 [P]	0.774
	No	18	56.2	19	52.8		

P: Pearson chi-square; FE: Fisher Exact chi-square; CC: Yates correction;

The distribution of the participants' demographic characteristic was homogenous, in other words the characteristics were similar in the intervention and control groups. In the intervention group, the age distribution was 40.6% of the subjects aged 65 or less and 59.4% aged 66 or more, with males making up 50% and females 50%. In the control group, 25% were aged 65 or less and 75% were aged 66 years or more, with males again making up 50% and females 50%. As regards the financial status, 40.6% had an income less than expenses, 37.5% an income equal to expenses, and 36.1% an income more than expenses in the intervention group while these numbers were 36.1% with an income less than expenses and 50% an income equal to expenses in the control group DM and HT were each

present in 50% of the individuals in the intervention group while in the control group 47.2% had DM and 52.8% had HT as a chronic disorder. The physical activity status was none in 56.2% of the intervention group and 52.8% of the control group (Table 3.1).

Table 3.2 *Demographic Characteristics of the Subjects 2*

Mood in last two weeks	Very good	9	28.1	4	11.1	4.150 FE	0.253
	Good	12	37.5	14	38.9		
	Moderate	7	21.9	14	38.9		
	Bad or very bad	4	12.5	4	11.1		
Visitors	Has visitors	23	71.9	17	58.3	9.546 FE	0.122
	Does not have visitors	9	28.1	15	41.7		
Social activities	Participates	22	68.8	31	86.1	2.970P	0.085
	Does not participate	10	31.3	5	13.9		
Nursing home living feeling	Loneliness	11	34.4	11	30.6	2.870FE	0.211
	Security	12	37.5	21	58.3		
	Other	9	28.1	9	11.1		
Life expectations	A good life	1	3.1	0	0.0	5.274 FE	0.371
	Doing gymnastics	0	0.0	1	2.8		
	Happiness	1	3.1	4	11.1		
	Comfortable death	26	81.3	28	77.8		
	A healthy life	2	6.3	0	0.0		
	None	2	6.3	3	8.3		
Relaxation activities (Multiple responses)	Sleeping	4	12.5	4	11.1	0.000CC	1.000
	Walking	7	21.9	15	41.7	3.032P	0.082
	Praying	7	21.9	16	44.4	3.855P	0.050
	Manual work	1	3.1	0	0.0	0.004 CC	0.953
	Chatting	4	12.5	1	2.8	1.140 CC	0.286
	Solitude	3	9.4	2	5.6	0.019 CC	0.891
	Music	4	12.5	0	0.0	2.790 CC	0.095
	Books	1	3.1	0	0.0	0.004 CC	0.953
	Watching TV	5	15.6	3	8.3	0.307 CC	0.579
		Mean±SD				t-test	p-value
Age (years)		66.97±3.25		67.47±2.21		-0.754	0.453
Daily sleep duration (hours)		7.50±1.30		7.72±1.50		-0.649	0.519
Daily uninterrupted sleep duration (hours)		3.19±1.75		2.81±1.64		0.930	0.356

P: Pearson chi-square; FE: Fisher Exact chi-square; CC: Yates correction

Analysis of the mood of the participants in the last 2 weeks showed that it was stated to be very good in 28.1%, good in 37.5%, moderate in 21.9%, and bad in 12.5% in the intervention group while the relevant numbers were 11.1%, 38.9%, 38.9%, and 11.1% respectively in the control group. Social activity participation rate was 68.8% in the intervention group and 86.1% in the control group. In the intervention group, 34.4% felt lonely and 37.5% felt confident while the respective numbers in the control group were 30.6% and 58.3%. Evaluation of the participant's responses regarding their expectations showed that the rate expecting a comfortable death was 81.3% in the intervention group and 77.8% in the control group. Assessment of what the participants did to relax revealed that in the intervention group 21.9% went for a walked, 21.9% prayed, 12.5% chatted, 12.5% listened to music, and 15.6% watched television while in the control group 41.7% went for a walk and 44.4% prayed. The mean daily sleep duration was calculated as 7.50±1.30 hours and the mean daily uninterrupted sleep duration 3.19±1.75 hours while the relevant numbers for the control group were 7.72±1.50 hours and 2.81±1.64 hours, respectively (Table 3.2).

Table 3.3 *Between Groups and Time-related Changes in Sense of Coherence Scale Scores*

		Group				Between groups t-test	p-value	Effect size
		Intervention		Control				
		Mean	SD	Mean	SD			
Individual Sense of Coherence Total Score	Pretest	60.66	9.52	58.11	7.05	1.262	0.211	0.3066
	Posttest	64.78	8.70	58.56	7.19	**3.229**	**0.002***	0.7845
Within group t-test		**-4.381**		-1.276				
p-value		**0.000***		0.210				
Effect size		0.774		0.213				
Clarity	Pretest	19.41	4.95	18.06	3.82	1.268	0.209	0.3080
	Posttest	20.38	4.50	18.22	3.80	**2.140**	**0.036***	0.5199
Within group t-test		**-3.164**		-1.357				
p-value		**0.003***		0.183				
Effect size		0.559		0.226				
Manageability	Pretest	16.75	2.76	17.42	3.16	-0.922	0.360	0.2240
	Posttest	18.28	2.79	17.56	3.23	0.986	0.328	0.2396
Within group t-test		**-3.790**		-1.221				
p-value		**0.001***		0.230				
Effect size		0.670		0.203				
Meaning	Pretest	19.47	3.21	17.75	2.56	**2.453**	**0.017***	0.5961
	Posttest	20.97	2.39	17.83	2.58	**5.178**	**0.000***	1.2580
Between groups t-test		**-3.735**		-1.000				
p-value		**0.001***		0.324				
Effect size		0.660		0.167				

**p<0.05*

There was no statistically significant difference between the pretest scores of the intervention and control groups from the individual sense of coherence scale (t=1.262; p=0.211). This indicates that the groups were homogenous at the initial stage. However, a statistically significant difference was found between the groups for the individual sense of coherence posttest scores (t=3.229; p=0.002) where the score was significantly higher in the intervention group than the control group. Evaluating the scores for clarity, manageability, and meaning revealed a statistically significant increase over time in the intervention group (p<0.05) while there was no statistically significant increase or decrease in the control group (p>0.05). Although there was a statistically significant difference in both the pretest and posttest scores, the difference between the groups was statistically higher for the posttest scores than the pretest scores (Table 3.3).

Table 3.4 *Between Groups and Time-related Changes in the Healthy Aging Scale Scores*

		Group				Within group t-test	P value	Effect size
		Intervention		Control				
		Mean	SD	Mean	SD			
Healthy Aging Scale Total Score	Pretest	115.50	15.93	107.00	15.25	**2.246**	**0.028***	0.5457
	Posttest	122.91	14.12	108.17	14.61	**4.218**	**0.000***	1.0248
Within group t-test		**-5.648**		-1.420				
p-value		**0.000***		0.165				
Effect size		0.998		0.237				
Staying physically active	Pretest	18.25	4.85	16.72	4.63	1.327	0.189	0.3225
	Posttest	20.97	3.53	16.92	4.44	**4.127**	**0.000***	1.0028
Within group t-test		**-5.059**		-1.420				
p-value		**0.000***		0.165				
Effect size		0.894		0.237				
Social support and having relationships	Pretest	16.81	4.48	14.53	4.65	**2.057**	**0.044***	0.4997
	Posttest	17.91	3.98	14.78	4.68	**2.948**	**0.004***	0.7163
Within group t-test		**-3.060**		-1.426				
p-value		**0.005***		0.163				
Effect size		0.541		0.238				
Managing stress	Pretest	15.37	4.00	12.83	4.00	**2.615**	**0.011***	0.6353
	Posttest	16.91	3.15	12.97	3.92	**4.529**	**0.000***	1.1003
Within group t-test		**-3.766**		-1.221				
p-value		**0.001***		0.230				
Effect size		0.666		0.203				
Accepting aging and being self sufficient	Pretest	16.53	2.87	16.36	2.03	0.284	0.777	0.0691
	Posttest	16.91	2.73	16.50	1.99	0.706	0.482	0.1716
Within group t-test		**-2.675**		-1.221				
p-value		**0.012***		0.230				
Effect size		0.473		0.203				
Having awareness and being capable of self-care	Pretest	11.50	2.49	11.31	2.64	0.312	0.756	0.0757
	Posttest	12.12	2.28	11.44	2.61	1.137	0.260	0.2763
Within group t-test		**-2,510**		-1,405				
p-value		**0,017***		0,169				

Effect size		0,444		0,234				
Doing helpful things	Pretest	9.28	0.92	9.31	0.95	-0.107	0.915	0.0259
	Posttest	9.31	0.90	9.33	0.89	-0.096	0.924	0.0233
Within group t-test		-1.000		-1.000				
p-value		0.177		0.167				
Effect size		0.033		0.022				

Staying cognitively active and participating in social activities	Pretest	9.78	2.56	8.08	3.26	**2.365**	**0.021***	0.5746
	Posttest	10.75	2.09	8.25	3.25	**3.714**	**0.000***	0.9022
Within group t-test		**-3.572**		-1.435				
p-value		**0.001***		0.160				
Effect size		0.631		0.239				
Living simply and being virtuous	Pretest	13.28	1.75	13.17	1.61	0.281	0.779	0.0684
	Posttest	13.31	1.69	13.25	1.59	0.157	0.876	0.0381
Within group t-test		-1.000		-1.357				
p-value		0.325		0.183				
Effect size		0.177		0.226				

**p<0.05*

The differences between the intervention and control groups regarding the pretest and posttest scores of the healthy aging scale were found to be statistically significant (pretest t=2.246; p=0.028; posttest t=4.218; p=0.000). The scores of the intervention group were higher for both measurements and the difference between the groups was more significant for the posttest.

Analysis of the subdimensions revealed that the staying active subdimension showed no difference in the pretest but there was a significant difference in the posttest. A significant difference was found in the stress management subdimension for both the pretest and posttest. There was no difference in the posttest for the accepting aging and being self-sufficient subdimensions. There differences within and between the groups were not significant for the doing virtuous work subdimension. A significant difference was found between the groups for both measurements regarding the staying cognitively active and participating in social activities subdimensions. No significant difference was found in the within group or between groups comparisons for the living simply and being virtuous subdimensions (Table3.4).

Table 3.5 *Between Groups and Time-related Changes in the Quality of Life in the Elderly Scale Scores*

		Group				Between groups t-test	p-value	Effect size
		Intervention		Control				
		Mean	SD	Mean	SD			
Quality of Life in the Elderly Scale Total Score	Pretest	22.44	10.50	26.64	8.67	-1.807	0.075	0.4390
	Posttest	24.69	9.54	26.81	9.02	-0.967	0.337	0.2359
Within group t-test		**-2.612**		-1.276				
p-value		**0.014***		0.210				
Effect size		0.462		0.213				
Control	Pretest	7.03	3.77	7.67	3.18	-0.754	0.454	0.1831
	Posttest	6.47	2.71	7.64	3.14	-1.636	0.107	0.3974
Within group t-test		1.738		1.000				
p-value		0.092		0.324				
Effect size		0.307		0.167				
Autonomy	Pretest	5.97	3.52	7.14	2.34	-1.629	0.108	0.3957
	Posttest	6.56	3.30	7.22	2.53	-0.930	0.356	0.2261
Within group t-test		**-2.343**		-1.000				
p-value		**0.026***		0.324				
Effect size		0.414		0.167				
Pleasure	Pretest	4.09	2.63	5.69	2.38	**-2.636**	**0.010***	0.6404
	Posttest	5.09	2.69	5.69	2.38	-1.092	0.279	0.2654
Within group t-test		**-3.712**		-1.000				
p-value		**0.001***		0.324				
Effect size		0.656		0.167				
Self-realization	Pretest	5.34	2.70	6.14	2.43	-1.280	0.205	0.3110
	Posttest	6.56	3.04	6.25	2.60	0.457	0.649	0.1111
Within group t-test		**-3.542**		-1.000				
p-value		**0.001***		0.324				
Effect size		0.626		0.167				

**p<0.05*

The independent samples t-test was used for between groups comparisons of the quality of life in the elderly scale and the dependent samples t-test for within group changes. There was no significant difference between the general pretest and posttest scale scores (p>0.05). No significant difference was found between the pretest and posttest

scores of the group for the control and autonomy subdimensions (p>0.05). For the pleasure subdimension, there was only a significant difference between the intervention and control groups in the pretest (p<0.05). No significant difference was found between the pretest and posttest scores for the self-realization subdimension (p>0.05) (Table3.5).

Table 3.6 *Covariance Analysis for Individual Sense of Coherence Posttest Scores*

Group	Mean	SD	Source	F value	p-value	Eta squared
Intervention	64.78	8.70	Individual Sense of Coherence pretest	228.311	0.000	0.778
Control	58.56	7.19	Group	19.421	0.000	0.230

Covariate variable: Individual Sense of Coherence pretest scores

The covariance analysis for the Individual Sense of Coherence revealed significant differences between the posttest scores of the groups. The pretest scores had a strong and significant effect on the posttest scores (F=228.311; p<0.001; Eta²=0.778). In addition, the group variable also had a significant effect on the posttest scores (F=19.421; p<0.001) and explained 23% of the variance (Eta²=0.230). Accordingly, the intervention group received significantly higher posttest scores than the control group (Table3.6).

Table 3.7 *Covariance Analysis for Healthy Aging Scale Posttest Scores*

Group	Mean	SD	Source	F value	p-value	Eta squared
Intervention	122.91	14.12	Healthy Aging Pretest	342.240	0.000	0.840
Control	108.17	14.61	Group	26.719	0.000	0.291

Covariate variable: Healthy Aging Scale pretest scores

The covariance analysis for the Healthy Aging Scale posttest scores shows significant differences between the groups. The pretest scores had a strong and significant effect on the posttest scores (F=342.240; p<0.001; Eta²=0.840). The group variable also had a significant effect on the posttest scores (F=26.719; p<0.001) and explained 29.1% of the variance (Eta²=0.291). Accordingly, the intervention group received statistically significantly higher posttest scores than the control group (3.7).

Table 3.8 *Covariance Analysis for the Quality of Life in the Elderly Scale Posttest Scores*

Group	Mean	SD	Source	F value	p-value	Eta squared
Intervention	22.44	10.50	Quality of life in the Elderly Scale Pretest	445.800	0.000	0.873
Control	26.64	8.67	Group	6.174	0.016	0.087

Covariate variable: Quality of Life in the Elderly Scale pretest scores

The covariance analysis of the Quality of Life in the Elderly posttest scores showed significant differences between the groups. The pretest scores had a strong effect on the posttest scores (F=445.800; p<0.001; Eta²=0.873). The group variable also had a significant effect (F=6.174; p<0.05; Eta²=0.087) and the intervention group received higher posttest scores than the control group (Table 3.8).

Discussion

The individual sense of coherence score increased from 60.66 in the pretest to 64.78 in the posttest in elderly individuals receiving education based on the salutogenic model. However, there was no significant change in the control group (58,11→58.56). This indicates that the intervention increased the sense of coherence; however, the fact that Cronbach's Alpha coefficient was 0.508 for the pretest and 0.596 for the posttest indicates that scale reliability is low and the findings should be interpreted carefully. The cognitive characteristics of the elderly individuals and item clarity may have had a negative effect on the reliability.

The effect size of the intervention is η^2=0.23 and is moderate according to Cohen (Table 3.6). This result indicates that the salutogenic approach is an effective method to increase the sense of coherence. According to the salutogenic concept, the sense of coherence is related to the individual's perception of stress factors as clear, manageable, and meaningful[25, 26]. The education provided in the study associated these three subdimensions with chronic disorders, possibly facilitating stress management in the elderly and contributing to their assigning a more positive meaning to their lives.

The stress created by living in a nursing home, the lack of social support, and chronic disorders weaken the sense of coherence. This is consistent with studies showing the effect of the social support level on the quality of life in elderly individuals in Turkiye[27] and in the international literature[28]. The literature reports that salutogenic interventions cause an increase in the sense of coherence, self-awareness, and health behaviors in elderly subjects suffering from the metabolic syndrome[29]. In addition, a long-term study from Sweden has reported that the increase in the sense of coherence lasts for five years[30] while a meta-analysis has reported the effect to continue for at least three months[31].

Nursing interventions based on salutogenesis are known to strengthen the individuals' sense of meaning, control, and coherence[11]. The education program used in this study also aimed to enable elderly individuals to become aware of their strong aspects, develop a positive perception of aging, and increase their psychological endurance, and therefore supported individual sense of coherence.

The current study has shown that an education program based on the salutogenic model resulted in a significant increase in the health aging behaviors of elderly individuals (Table 3.4). The results are consistent with studies in the literature showing that salutogenic approaches increase quality of life, self-adequacy, and adaptation skills in the elderly[22, 32, 33, 34]. Interventions such as the SHAPE program support healthy aging by strengthening coping with stress and assigning meaning to life[22, 34].

The effect size calculated in the study is η^2=0,29 and moderate according to Cohen (Table 3.7). This result indicates that the program not only transfers data but also contributes to the individuals' rearranging their lifestyle and also to their accepting healthy behaviors and applying them in their daily life. The content focused on DM–HT, mini-exercises, meditation, breathing therapy, and the healthy lifestyle examples used for the education served to solidify the behavioral change.

The salutogenic approach interventions are believed to be effective in the long term as they require the steps of awareness, meaningfulness, and manageability for behavioral change. The literature also specifies that physical activity solidifies the feelings of identity, autonomy, and social belonging and supports healthy lifestyles[35]. The current study also found the posttest score to be significantly higher in the elderly participating in physical activity (Table 3.4, 3.5).

Various studies have demonstrated that healthy aging needs to be evaluated with a holistic assessment of not only biological but also psychosocial and environmental elements, and that social support, social participation, and social relationship have marked positive effects on the psychological wellbeing and cognitive functions of elderly individuals[36, 37, 38]. It can therefore be said that the program in the current study supports healthy aging by supporting the access to social resources and the social roles of individuals.

The study reporting that salutogenesis-based group interventions increase self-management and a healthy lifestyle in hypertensive patients[39] is also consistent with the current study. Multidimensional healthy aging programs are believed to strengthen the feeling of identity, autonomy, and social belonging through physical activity[22]. A salutogenic approach in nursing care aims to make the individual become aware of and strengthen his/her potential and is therefore directly related to nursing education related to the development of healthy aging behaviors.

The fact that the elderly individuals started to use more positive and self-valuing statements instead of negative statements at the end of the program shows the psychosocial improvement effect of the intervention. The education program has contributed to the elderly individuals developing more positive approaches towards their body, social environment, and their life.

The current study found that an education program based on the salutogenic model provides a significant increase in the quality of life level of elderly individuals compared to those who did not receive this education (Table 3.5). This result is consistent with the WHO approach that defines healthy aging as a state of physical, mental, and social wellness[40]. Salutogenic interventions have been reported to increase the adaptation capacity and self-adequacy but with variable results on the quality of life in the literature[41]. The SHAPE program has provided results with a positive effect on the quality and meaning of life[22]. The findings from the current study are short-term and the resultant increase should be interpreted as mostly influencing awareness and psychological relaxation.

The effect size calculated for the quality of life in this study is η^2=0,087 and small according to Cohen (Table 3.8). Higher test scores in the intervention group indicate that the program was effective in increasing the quality of life. Considering the multidimensional structure of the quality of life, one can conclude that interventions based on the salutogenic model can be used as a supporting tool.

Quality of life is related to multidimensional components such as physical health, psychological wellness, social relationships, and environmental support[42, 43]. Chronic disease, physical limitations, and social isolation can decrease the satisfaction elderly individuals receive from life. Salutogenic approaches can increase this satisfaction by increasing awareness and social interaction. The current study is consistent with the literature emphasizing the importance of social support systems and programs that increase resilience[44].

Similarly, salutogenesis-based group programs are known to increase the quality of life and psychological strength[45]. It is important to adjust adaptations according to the living conditions of the individual due to the variety of factors that influence the quality of life (physical health, independence, financial status, the environment, culture)[46]. The fact that this study was performed on individuals living in a nursing home could have provided additional benefit by increasing social interaction.

The salutogenic approach in nursing care supports the addition of meaning to the individual's life, developing positive thinking skills, and increasing life satisfaction[11]. The program used has strengthened the connection of the participants with their life through activities based on self-awareness, group sharing, and meaningfulness. The

“Living a meaningful life” feeling is reported to be one of the main markers of the quality of life and to be at the center of salutogenic education[47].

Conclusion

The education program developed based on the salutogenic model resulted in a significant increase in the sense of coherence, healthy aging behavior, and quality of life perception in elderly individuals living in a nursing home. The individual sense of coherence scores increased markedly in the intervention group, while there were favorable developments in the physical, mental, social, and emotional dimensions of healthy aging. In addition, the social relationships, psychological wellbeing, and environmental adaptation of the elderly individuals became stronger, and negative acceptance of aging was replaced by a living perception based more on hope and focused on meaning. These results indicate that the salutogenic approach increases the capacity of the elderly individuals to guide their life, cope with stress, and effectively use personal resources, in addition to emphasizing the importance of holistic care in nursing applications.

RECOMMENDATIONS

In light of these findings, we recommend integrating salutogenic education programs to the routine nursing care provided at nursing homes with the nurses providing holistic evaluations that include the psycho-social needs of elderly individuals, and increasing the time provided for fortification approaches within graduate/postgraduate training. Professionals working in institutional care environments should receive education for salutogenic communication and support, and it is necessary to include cultural content that fortifies awareness of resources such as social support, life experience, belief systems, and humor of elderly individuals in these programs. In addition, advanced research on various groups to compare efficacy and monitoring the long-term sustainability of intervention programs will contribute to planning future elderly care services based on scientific developments.

Declarations

- I confirm that I understand BMC Public Health is an open access journal that levies an article processing charge per articles accepted for publication. By submitting my article I agree to pay this charge in full if my article is accepted for publication.
- I declare that the authors have no competing interests as defined by BMC, or other interests that might be perceived to influence the results and/or discussion reported in this paper.
- The results/data/figures in this manuscript have not been published elsewhere, nor are they under consideration (from you or one of your Contributing Authors) by another publisher.
- I have read the Nature Portfolio journal policies on author responsibilities and submit this manuscript in accordance with those policies.
- All of the material is owned by the authors and/or no permissions are required.
- Yes, I have research data to declare.
- All data supporting the findings of this study are included within the article and its supplementary materials
- This research did not receive funding.

Ethics approval: This was a semi-experimental intervention study with a pretest-posttest control group. Permission was obtained to conduct the study from the Ankara Yıldırım Beyazıt University Ethics Committee (19.12.2023, 10-

553) and also to work at the nursing homes in Ankara (06.06.2024, 1636047), and the study was registered at ClinicalTrials.gov with the “NCT07130435” number. Ethical approval for this study was obtained from the Ethics Committee of Ankara Yıldırım Beyazıt University. Written informed consent was obtained from all participants prior to participation, and the informed consent form is included as a supplementary file. That is this study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Ethics Committee of Ankara Yıldırım Beyazıt University. This research received no external funding.

Consent for publication: Not applicable

Availability of data and materails: Data sharing is not applicable.

Competing interest: The authors declare that they have no competing interests.

Funding: Not applicable

Authors contribution: Gulcin Kurt designed the study and methodology, conducted the data collection, and performed the analyses. She interpreted the research findings and drafted the manuscript. Esma Atasoy reviewed the methodological aspects of the study, contributed to the interpretation, and supported the manuscript revision process. All authors reviewed the final version of the manuscript, discussed the content, and approved it for publication.

References

1. Mazzeo, R. S., Cavanagh, P., Evans, W. J., Fiatarone, M., Hagberg, J., McAuley, E. (1998). Exercise and physical activity for older adults. *Medicine & Science in Sports & Exercise, 30*(6), 992–1008. https://doi.org/10.1097/00005768-199806000-00025
2. Naldan, M. E., Kara, D., Soyalp, C., Gürol, A. (2018). Yoğun bakım ünitelerinde çalışan sağlık personelinin yaşlılığa ilişkin ayrımcı tutumlarının değerlendirilmesi. *Bakırköy Tıp Dergisi*, 14, 8–16. https://search.trdizin.gov.tr/tr/yayin/detay/287586
3. World Health Organization (WHO). (2024). *Ageing and health.* https://www.who.int/news-room/fact-sheets/detail/ageing-and-health (Access date: 20.05.2025)
4. United Nations, Department of Economic and Social Affairs, Population Division. (2019). *World population ageing 2019* (ST/ESA/SER.A/444). United Nations.
5. Turkish Statistical Institute (TÜİK). (2025). *İstatistiklerle yaşlılar 2024*. https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Yaslilar-2024-54079#:~:text=T%C3%9C%C4%B0K%20Kurumsal&text=Ya%C5%9Fl%C4%B1%20n%C3%BCfus%20olarak%20kabul%20edilen,112%20bin%20298%20ki%C5%9Fi%20oldu. (Access date: 20 April 2025)
6. World Bank. (2024). *Life expectancy at birth, total (years) – Türkiye*. World Bank Data. https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=TR
7. Urtamo, A., Jyväkorpi, S., Strandberg, T. (2019). Definitions of successful ageing: A brief review of a multidimensional concept. *Acta Biomedica, 90*(2), 359–363. https://doi.org/10.23750/abm.v90i2.8376
8. Dye, C. J., Willoughby, D. F., Battisto, D. G. (2011). Advice from rural elders: What it takes to age in place. *Educational Gerontology, 37*(1), 74–93. https://doi.org/10.1080/03601271003608871
9. Tan, K. K., Chan, S. W. C., Vehviläinen-Julkunen, K. (2014). Self-care program for older community-dwellers: Protocol for a randomized controlled trial. *Central European Journal of Nursing and Midwifery, 5*(4), 145–155.

https://doi.org/10.15452/cejnm.2014.05.0010

10. Antonovsky, A. (1996). The salutogenic model as a theory to guide health promotion. *Health Promotion International, 11*(1), 11–18. https://doi.org/10.1093/heapro/11.1.11
11. Eriksson, M. and Lindström, B. (2008). A salutogenic interpretation of the Ottawa Charter. *Health Promotion International, 23*(2), 190–199. https://doi.org/10.1093/heapro/dan014
12. Eren, D. (2018). Sağlıklı olmayı desteklemeye yönelik eğitim programının yaşlıların yaşam kalitesi, bütünlük duygusu ve psikolojik sağlamlıkları üzerine etkisi [Doktora tezi, Ege Üniversitesi]. YÖK Ulusal Tez Merkezi. https://acikbilim.yok.gov.tr/handle/20.500.12812/352764
13. Pelikan, J. M. (2017). The application of salutogenesis in healthcare settings. In M. B. Mittelmark, S. Sagy, M. Eriksson, G. F. Bauer, J. M. Pelikan, B. Lindström, & G. A. Espnes (Eds.), *The handbook of salutogenesis* (pp. 261–266). Springer. https://doi.org/10.1007/978-3-319-04600-6_26
14. Ödek, Ö. (2024). Salutogenez Model Ve Duygusal Özgürlük Teknikleri Kullanılarak Tip 2 Diyabetli Bireylere Verilecek Bakımın Bütünlük Duygusu Ve Yaşam Kalitesine Etkisi [PhD thesis, Erciyes University]. Higher Education Council National Thesis Center.
15. Sağlam, Y. ve Yıldırım Şişman, N. (2021). Adölesanlarda salutogenez sağlık göstergesi ölçeğinin Türkçe geçerlilik ve güvenilirlik çalışması. *2nd International 3rd National Public Health Nursing Congress*, 7-9 January 2021, Ankara.
16. Quehenberger, V. and Krajic, K. (2017). Applications of salutogenesis to aged and highly-aged persons: Residential care and community settings. In M. B. Mittelmark, S. Sagy, M. Eriksson, G. F. Bauer, J. M. Pelikan, B. Lindström, & G. A. Espnes (Eds.), *The handbook of salutogenesis* (pp. 325–335). Springer International Publishing. https://doi.org/10.1007/978-3-319-04600-6_32
17. Taşkıran, M. (2020). Huzurevinde kalan yaşlı bireylerin yalnızlık düzeyleri ile depresyon ve yaşam doyumu arasındaki ilişkinin incelenmesi [Yüksek lisans tezi, İstanbul Gelişim Üniversitesi]. YÖK Tez Merkezi. https://tez.yok.gov.tr/
18. Eriksson, M. and Lindström, B. (2006). Antonovsky's sense of coherence scale and the relation with health: A systematic review. *Journal of Epidemiology & Community Health, 60*(5), 376–381. https://doi.org/10.1136/jech.2005.041616
19. Meléndez, J. C., Fortuna, F. B., Sales, A., Mayordomo, T. (2015). The effects of instrumental reminiscence on resilience and coping in elderly. *Archives of Gerontology and Geriatrics, 60*(2), 294–298. https://doi.org/10.1016/j.archger.2014.12.001
20. Mittelmark, M. B., Sagy, S., Eriksson, M., Bauer, G. F., Pelikan, J. M., Lindström, B., Espnes, G. A. (Eds.). (2017). *The handbook of salutogenesis*. Springer. https://doi.org/10.1007/978-3-319-04600-6
21. Akdemir, N., & Akyar, İ. (2009). Geriatri hemşireliği. *Akademik Geriatri***,** 1(2), 73–81.
22. Seah, S. H. (2022). Salutogenic Healthy Ageing Programme Embracement (SHAPE): An intervention designed based on the salutogenic model for older adults living alone or with spouses only. *BMC Geriatrics, 22*(1), 1–11. https://doi.org/10.1186/s12877-022-03605-3
23. Yıldırım, H., Isik, K., Cengizhan, S. Ö. (2021). Psychometric evaluation of the healthy aging instrument in older adults. *Educational Gerontology, 47*(6), 235–246. https://doi.org/10.1080/03601277.2021.1905787
24. Hyde, M., Wiggins, R. D., Higgs, P., Blane, D. B. (2003). A measure of quality of life in early old age: The theory, development and properties of a needs satisfaction model (CASP-19). *Aging & Mental Health, 7*(3), 186–194. https://doi.org/10.1080/1360786031000101157

25. Seah, B., Espnes, G. A., Ang, E. N. K., Lim, J. Y., Kowitlawakul, Y., Wang, W. (2020a). Achieving healthy ageing through the perspective of sense of coherence among senior-only households: A qualitative study. *Aging & Mental Health*, 1–10. https://doi.org/10.1080/13607863.2020.1725805
26. Seah, B., Espnes, G. A., Ang, E. N. K., Lim, J. Y., Kowitlawakul, Y., Wang, W. (2020b). Mobilisation of health assets among older community dwellers residing in senior-only households in Singapore: A qualitative study. *BMC Geriatrics, 20*(1), 411. https://doi.org/10.1186/s12877-020-01827-9
27. Erol, S., Sezer, A., Şişman, F. N. (2016). Huzurevinde yaşayan yaşlı bireylerin yaşam kalitesi ve sosyal destek düzeyleri. *İç Hastalıkları Dergisi, 23*(1), 61–70.
28. Courtin, E. and Knapp, M. (2017). Social isolation, loneliness and health in old age: a scoping review. *Health & Social Care in the Community, 25*(3), 799–812. https://doi.org/10.1111/hsc.12311
29. Lee, C., Payne, L. L., Berdychevsky, L. (2020). The roles of leisure attitudes and self-efficacy on attitudes toward retirement among retirees: A sense of coherence theory approach. *Leisure Sciences, 42*(2), 152–169. https://doi.org/10.1080/01490400.2018.1448025
30. Lövheim, H., Graneheim, U. H., Jonsén, E., Strandberg, G., Lundman, B. (2013). Changes in sense of coherence in old age – A 5-year follow-up of the Umeå 85+ study. *Scandinavian Journal of Caring Sciences, 27*(1), 13–19. https://doi.org/10.1111/j.1471-6712.2012.00988.x
31. Liu, Y., Zhang, B., Montayre, J., Koduah, A. O., Leung, A. Y. M. (2025). Non-pharmacological interventions targeting sense of coherence among older adults and adults with chronic conditions: A meta-analysis with trial sequential analysis. *Journal of Advanced Nursing, 81*(4), 2165–2198. https://doi.org/10.1111/jan.16558
32. Guo, C., Deng, M., Yu, M. (2024). Interventions based on salutogenesis for older adults: An integrative review. *Journal of Clinical Nursing, 33*(7), 2456–2475. https://doi.org/10.1111/jocn.17028
33. Tan, K. K., Chan, S. W. C., Wang, W., Vehviläinen-Julkunen, K., He, H. G. (2015). A salutogenic program to enhance sense of coherence and quality of life for older people in the community: A feasibility randomized controlled trial and process evaluation. *Patient Education and Counseling, 99*(1), 108–116. https://doi.org/10.1016/j.pec.2015.08.003
34. Wiesmann, U., Becker, M. L., Hannich, H.-J. (2017). Positive aging in nursing home residents: A salutogenic analysis. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry, 30*(2), 77–85. https://doi.org/10.1024/1662-9647/a000166
35. Zhuori, N., Cai, Y., Yan, Y., Cui, Y., Zhao, M. (2019). Does social support affect the health of the elderly in rural China? A meta-analysis approach. *International Journal of Environmental Research and Public Health, 16*(18), 3471. https://doi.org/10.3390/ijerph16183471UNFPA. (2016). *Current overview of Turkey's population*.
36. Zeng, Y., Wang, R., Zhang, Q. (2019). Social participation and health among older adults: Evidence from China. *BMC Public Health, 19*, Article 745. https://doi.org/10.1186/s12889-019-7091-3
37. Kelly, M. E., Duff, H., Kelly, S., McHugh Power, J. E., Brennan, S., Lawlor, B. A., Loughrey, D. G. (2017). The impact of social activities, social networks, social support and social relationships on the cognitive functioning of healthy older adults: A systematic review. *Ageing & Society, 37*(8), 1584–1601. https://doi.org/10.1017/S0144686X16000351
38. Kolcu, M. (2016). *Hipertansiyonu olan yaşlılara yönelik eğitimin yaşam kalitesi, ilaca uyum ve hipertansiyon yönetimine etkisi* [PhD thesis, Haliç Universty Health Sciences Institute]. Higher Education Council National Thesis Center. https://tez.yok.gov.tr/UlusalTezMerkezi/tezDetay.jsp?id=VUbskYk7xGhjsliqsT_79A&no=w--bXx-KxdUMEsebGiTtxw

39. World Health Organization (WHO). (2020). *Decade of Healthy Ageing: Baseline report*. https://www.who.int/publications/i/item/9789240017900
40. Chow, E. K. M., Seah, B., Chan, J. J. Y., Wang, W. (2023). Salutogenic-based interventions among community-dwelling older adults: A systematic review and meta-analysis. *Health Promotion International, 38*(3), daac007. https://doi.org/10.1093/heapro/daac007
41. Ateş, R., Başkurt, Z., Başkurt, F., & İnce Parpucu, T. (2023). Yaşlılarda sağlığı geliştirme davranışlarının fiziksel performans ve yaşam kalitesine etkisi. *Geriatrik Bilimler Dergisi, 6*(2), 94–102. https://doi.org/10.47141/geriatrik.1298825
42. Bowling, A. (2005). [Chapter title]. In *Ageing well: Quality of life in old age* (pp. 45–67). Maidenhead: Open University Press.
43. Borglin, G., Jakobsson, U., Edberg, A. K., Hallberg, I. R. (2006). Older people in Sweden with various degrees of present quality of life: Their health, social support, everyday activities and sense of coherence. *Health & Social Care in the Community, 14*(2), 136–146. https://doi.org/10.1111/j.1365-2524.2006.00603.x
44. Langeland, E., Vinje, H. F., Bull, T. (2016). Salutogenic-Oriented Mental Health Nursing: Strengthening Mental Health Among Adults with Mental Illness. In M. B. Mittelmark, S. Sagy, M. Eriksson, G. F. Bauer, J. M. Pelikan, B. Lindström, & G. A. Espnes (Eds.), *The Handbook of Salutogenesis* (pp. 71–83). Springer International Publishing. https://doi.org/10.1007/978-3-319-04600-6_4
45. Gabriel, Z. and Bowling, A. (2004). Quality of life from the perspectives of older people. *Ageing and Society, 24*(5), 675–691. https://doi.org/10.1017/S0144686X03001582
46. Super, S., Wagemakers, M. A. E., Picavet, H. S. J., Verkooijen, K. T., Koelen, M. A. (2015). Strengthening sense of coherence: Opportunities for theory building in health promotion. *Health Promotion International, 31*(4), 869–878. https://doi.org/10.1093/heapro/dav071

Figures

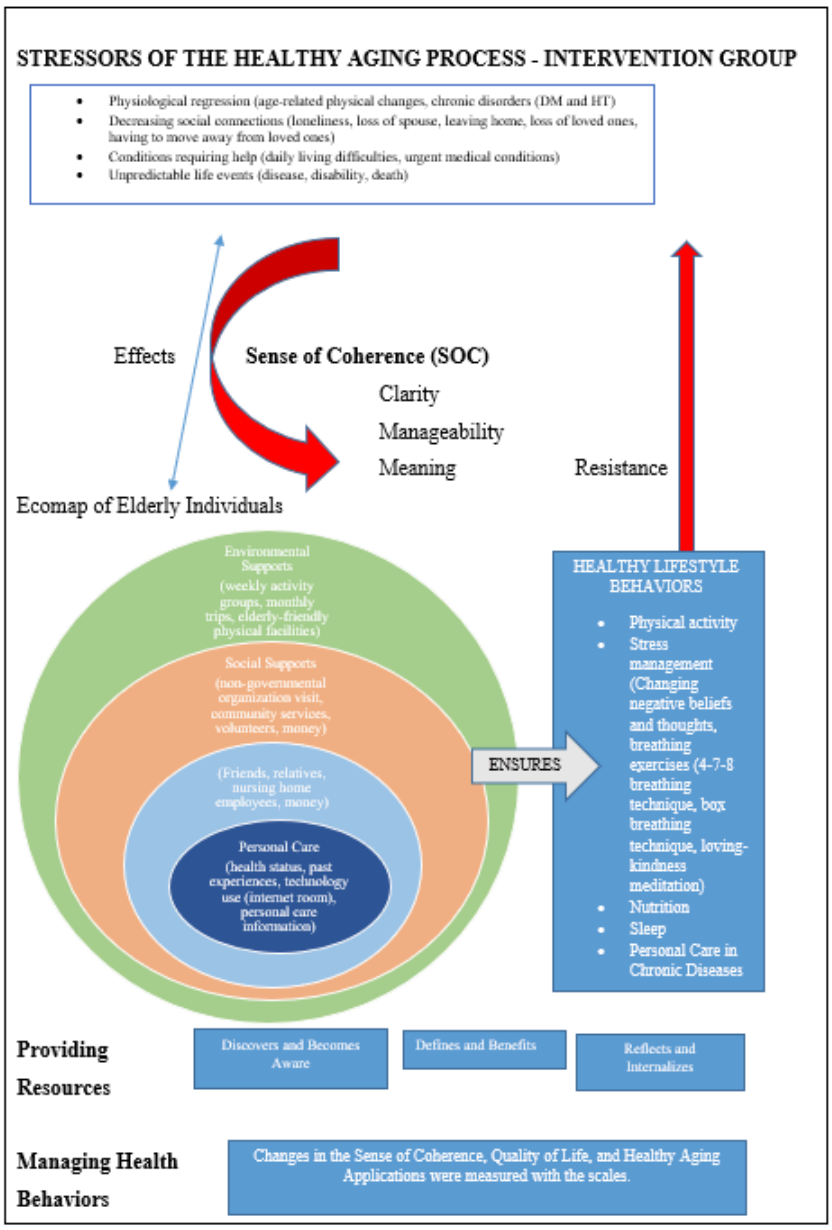


Figure 1

Figure 1.1. The Conceptual Framework of the Study

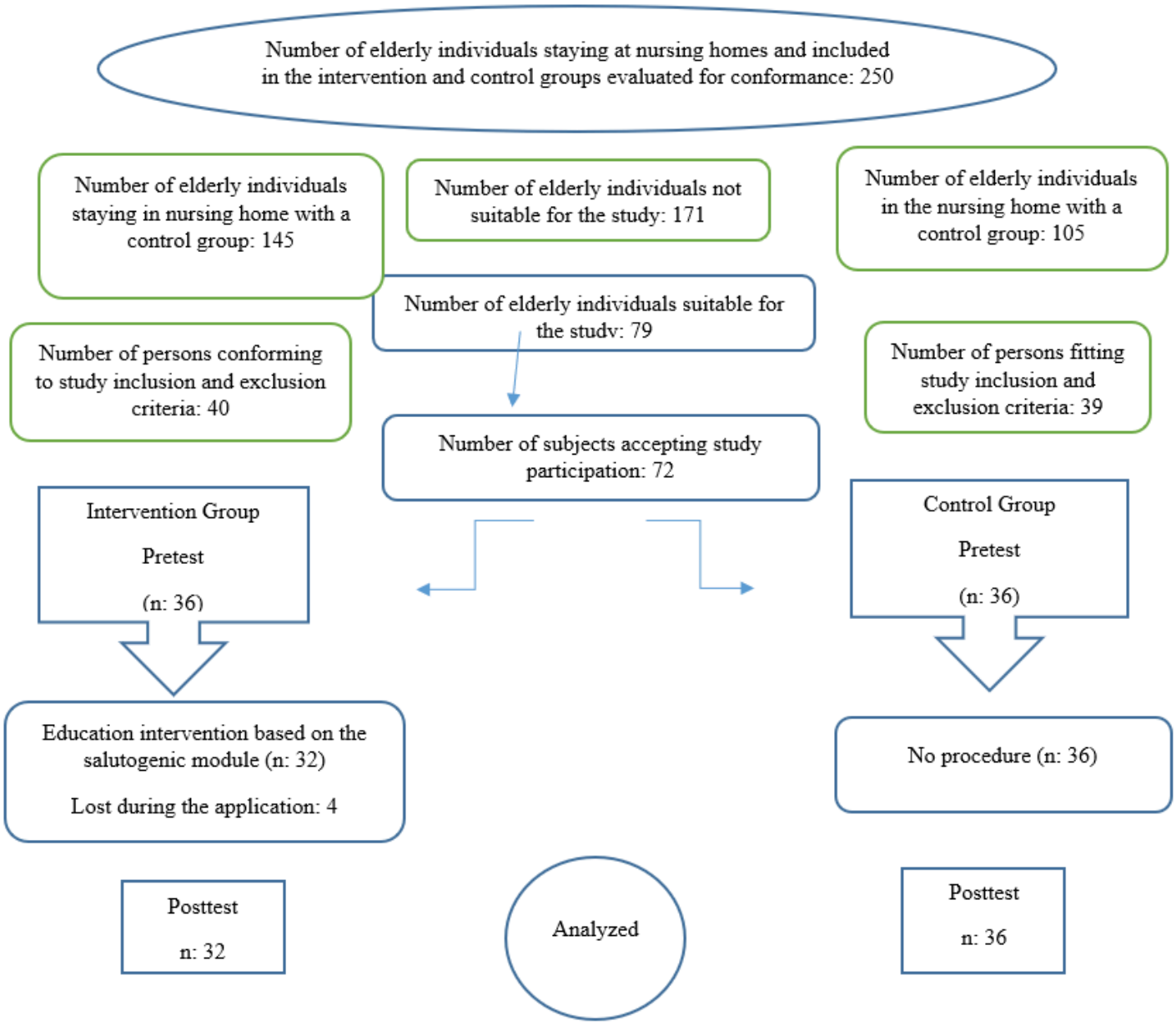


Figure 2

Figure 2.1 *Flow Chart of the Study*