ORIGINAL ARTICLE

A study on the effectiveness of a participatory self-care model for homebound older adults in Khueang Nai District, Ubon Ratchathani Province, Thailand

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Received: 29 April 2024 **Revised:** 30 July 2024 **Accepted:** 31 July 2024 **Available online:** January 2025
DOI: 10.55131/jphd/2025/230102

ABSTRACT

Thailand is undergoing a structural social transformation into a complete aging society. This study aimed to investigate the effectiveness of a participatory self-care model for homebound older adults in Khueang Nai District, Ubon Ratchathani Province, Thailand. Given the rapid growth of the older adult population, Thailand faces significant challenges in fostering a quality aging society. Promoting self-care abilities among older adults can mitigate frailty and enhance their quality of life. The study employed a cross-sectional design and a randomized controlled trial (RCT) with pre-post test measurements. The sample comprised 64 homebound older adults aged 60 years and above, divided into an experimental group (n=32) and a control group (n=32). Data were collected through a questionnaire assessing general information, self-care knowledge, health-promoting behaviors, and activities of daily living (ADL). Descriptive statistics and analytical tests (Independent t-test and Paired t-test) were utilized for data analysis. The results indicated that after the four-month implementation of the developed participatory self-care model, the experimental group demonstrated significantly higher mean scores in knowledge, health-promoting behaviors, and ADL compared to the control group ($p<0.05$). Additionally, the experimental group exhibited significantly lower mean blood pressure and blood sugar levels ($p<0.05$). However, there was no significant difference in body mass index (BMI) between the groups. These findings suggest that the developed participatory self-care model can effectively enhance health knowledge, behaviors, and daily living abilities while helping to control risk factors for chronic diseases in homebound older adults. This model has the potential to be expanded and applied to older adults' care in other areas to promote their quality of life and well-being.

Key words:
self-care model, homebound older adults, Activities of Daily Living (ADL)

Citation:
Nopadol Thongaram, Kanokporn Somporn, Thassaporn Chusak, Sutthisak Surirak. A study on the effectiveness of a participatory self-care model for homebound older adults in Khueang Nai District, Ubon Ratchathani Province, Thailand. J Public Hlth Dev. 2025;23(1):13-25 (https://doi.org/10.55131/jphd/2025/230102)

INTRODUCTION

The phenomenon of an aging society is garnering worldwide attention. The global elderly population is steadily increasing, projected to rise from 703 million in 2019 to 1.5 billion by 2050.[1] While developed countries currently have a higher proportion of older adults, developing nations are experiencing a more rapid increase in their elderly populations.[2] This demographic shift presents significant challenges in health, economic, and social domains, including increased demand for healthcare services,[3] the sustainability of pension systems,[4] and a shrinking labor force.[5] However, older adults play a crucial role in social and economic development through continued participation in the workforce, volunteerism, and caregiving for family members.[6] Therefore, it is imperative to formulate policies that not only address the emerging challenges but also promote the engagement and quality of life of the elderly population.

Thailand, a developing country, is rapidly transitioning into an aging society. According to data from the Department of Older Persons,[7] in 2019, the elderly population in Thailand (aged 60 and above) constituted 16.06% of the total population. This figure is projected to reach 30% by 2050, thereby classifying Thailand as a fully aged society.[8-9] The primary factors contributing to this continuous rise in the proportion of older adults include declining birth rates and increased longevity. The latest report on the situation of the Thai elderly indicates that in 2019, the majority of older persons (57.29%) were aged between 60-69 years, followed by those aged 70-79 years (30.35%) and 80 years and above (12.35%). Nearly all elderly individuals (95%) reside with their families, and 34.7% remain employed. However, more than half (56.2%) of the elderly individuals suffer from at least one chronic disease, such as hypertension, osteoarthritis, and diabetes, leading to higher healthcare costs for the elderly, which accounted for 2.5% of GDP in 2017.[10-11] This scenario underscores the significant challenges Thailand faces economically, socially, and in public health sectors to support a quality aging society. It is particularly crucial to develop appropriate healthcare and welfare systems for the elderly to ensure they can live with quality and security in their later years. Therefore, research on older adults is essential for generating knowledge and informing policy and practice recommendations to improve the long-term quality of life and well-being of Thai seniors.[12-14]

A literature review reveals that frail older adults are at higher risk of mortality, disability, and frequent hospitalization.[15] Comprehensive assessment and multidisciplinary management can reduce frailty severity, maintain independence in daily activities, and improve the quality of life of frail elderly patients.[16] Promoting self-care abilities in older adults can reduce frailty more effectively than general exercise programs.[17] Additionally, supporting the elderly in performing their daily routines helps reduce frailty levels, promote health and emotional awareness, and enhance their ability to carry out daily activities, providing a safe and effective alternative.[18] As a vulnerable population, older adults should receive holistic assessments and multidisciplinary management, along with care, encouragement, and reflection on the value of their life experiences, which will boost their motivation to perform daily tasks and improve their quality of life.

Ubon Ratchathani, a province in northeastern Thailand, is experiencing the challenges of an ageing society. Data from the Health Data Center (HDC) of the Ubon Ratchathani Provincial Public Health Office [19] (as of September 4, 2022) shows that Ubon Ratchathani has a total population of 1,868,519 across all districts, with 932,466 males and 936,053 females.

The elderly group accounts for 16.25% of the total provincial population, consisting of 7.49% males and 8.76% females. The district with the highest proportion of older adults is Mueang Ubon Ratchathani at 13.25% of the total elderly population, followed by Si Mueang Mai (9.18%), Khong Chiam (9.08%), and Khueang Nai (7.17%). This data clearly demonstrates the changing structure of Ubon Ratchathani's ageing society, prompting the government and relevant agencies to plan and address the emerging issues. Particular emphasis is placed on promoting self-reliance (Active Aging) and health literacy among the elderly, focusing on "no falls, no forgetfulness, no depression, and enjoying meals".[20] Therefore, addressing elderly issues at the local level requires systematic research processes for problem-solving and development. Based on a review of the literature relevant to older adults, it was found that knowledge was a significant basis for these efforts.[21] Therefore, it affects good self-care behavior as well. The self-efficacy theory is based on the belief that self-efficacy will help individuals succeed in changing health behaviors. Enhancing one's ability to act in a particular matter is an important factor that will help individuals achieve the desired behavior effectively.[22] Barthel's Activities of Daily Living (ADL) Index is an assessment tool that also helps screen the ability to perform daily activities to promote good health for older adults appropriately.

The researcher is interested in studying methods of care and health promotion for homebound older adults in Ubon Ratchathani province, which is rapidly becoming an ageing society. Older adults often face health problems, particularly those who are frail, putting them at risk of death, disability, and frequent hospitalization. Previous research indicates that holistic assessment, multidisciplinary management, and promoting self-care among homebound older adults can help reduce frailty severity, maintain the ability to perform daily activities and improve their quality of life. However, due to insufficient data on the care of homebound older adults in Khueang Nai District, Ubon Ratchathani province, and considering the area's unique context, culture, and lifestyle, which differ from other regions, there is a need for targeted research. Based on the above information, the researcher aims to study care models for homebound older adults in Khueang Nai District that are appropriate for the specific context of the area and to compare the effectiveness of self-care methods for these individuals. The research findings can be used to develop efficient guidelines for caring for homebound older adults in Khueang Nai District and potentially be extended to other locations with similar contexts.

METHODS

Study design

This study employs a cross-sectional design and is conducted as a randomized controlled trial (RCT) with two groups of participants. The participants are homebound older adults assessed according to the inclusion criteria of two sub-district health promoting hospitals. The participants will then be randomly assigned to the experimental and control groups to ensure that both groups have an equal chance of being selected for the experimental process. Measurements will be taken before and after the experimental intervention, following a pre-post test design. The experimental group will receive an intervention specifically designed for this study, while the control group will receive usual care. Measurements will be taken simultaneously for both groups, using identical tools and methods to ensure an accurate comparison of results. This approach allows for

comparisons between the experimental and control groups to assess the impact of the intervention, as randomization helps control for potential confounding factors. This enables any differences found between the groups to be inferred as resulting from the studied intervention. The RCT design enhances the internal validity of the study and helps reduce potential biases in the research process.

Population and sample

The study population consists of elderly individuals aged 60 years and above who have resided in Khueang Nai District, Ubon Ratchathani Province, for at least one year. The sample includes both male and female participants who have undergone an assessment of the activities of daily living (ADL) and obtained scores between 5 and 11, indicating they are homebound elderly individuals.

Sample size determination was performed using the G*power program with the following used to select Test family: t-tests, statistical test select Means: Difference between two independent means (two groups), Type of power analysis select; A priori: Compute the required sample size- given α, power, and effect size (Effect size = 0.84, α err prob = 0.05, Power = 0.95), resulting in a total of 64 participants. The participants were selected based on specific inclusion criteria and divided into two groups using purposive sampling: an experimental group of 32 individuals and a control group of 32 individuals, totaling 64 participants.

Inclusion Criteria for Study Participants:

1. Elderly individuals aged 60 years and above, residing in Khueang Nai District for at least one year.

2. Elderly individuals with ADL scores between 5 and 11 points.

3. Able to communicate, read, and write in Thai or communicate in the local language.

4. Able to communicate and provide information.

5. Willing to participate in all research activities throughout the study.

Exclusion Criteria:

1. Unable to participate in all research activities throughout the study.

2. Severe illness preventing participation in the research.

3. Relocation outside the study area.

Research instrument

The research instruments have been validated by three experts in the field of older adult care and these questionnaires were tested on a random sample of older adults who did not participate in this study to ensure the understandability and clarity of the questions. Cronbach's alpha total was 0.92. They are divided into four parts:

Part 1: General Information

This section inquires about health status, weight, height, blood sugar levels, and blood pressure.

Part 2: Self-Care Knowledge Test

A 10-item test assesses the basic understanding of self-care practices among homebound elderly individuals. Each item has two options: true or false. Each correct knowledge answer was given 1 point. Incorrect answers receive 0 points. The total score for the knowledge section is 10 points.

Part 3: Health-Promoting Behaviors Questionnaire

A 50-item questionnaire covering various aspects of health-promoting behaviors of homebound elderly individuals, including dietary habits, hygiene management, exercise, emotional management, and hobbies. A 3-point rating scale was used to assess 50 items with a maximum score of 150. Overall health-promoting behaviors questionnaire was interpreted as follows. The total score of less than 60.00% was poor. Health-promoting behaviors were not sufficient to provide self-care for good health. The total score of 60.0-70.0% was fair. Low levels of

health-promoting behaviors may be sufficient to practice correct self-care for good health. The total score of 70.0-80.0% was good. Sufficient health-promoting behaviors to practice self-care correctly for good health. The total score higher than 80.0% was excellent. High Health-Promoting Behaviors to correctly practice self-care to maintain good health sustainably and professionally.

Part 4: Barthel Activities of Daily Living (ADL) Assessment

Consisting of 10 items, this assessment examines daily activities such as eating, face washing, tooth brushing, getting out of bed, using the toilet, dressing, climbing stairs, bathing, and bowel and bladder control over the past week. A Barthel Activities of Daily Living (ADL) rating scale was used to assess 10 items, with a maximum score of 20. Overall, ADL questionnaire was interpreted as follows. The total score of less than 0-4 points was poor. ADL were not sufficient to provide self-care for good health and must receive help or be closely supervised. The total score of 5-11 points was fair. Low levels of ADL may be sufficient to practice correct self-care for good health, may ask for help or be closely supervised in some cases. The total score of 12 points upper was good. Sufficient High levels of ADL points can practice self-care correctly for maintaining good health. The total score higher than12 points was excellent for older adults.

Ethical approval

The research was approved by the Human Research Ethics Committee of Valaya Alongkorn Rajabhat University under The Royal Patronage, COA. No. 0004/2023, with the date of approval being March 10, 2023.

Statistical analysis:

Statistical analyses were conducted using a statistical analysis software package. Descriptive statistics were employed to analyze the general information of the sample, including health status, weight, height, blood sugar levels, blood pressure levels, knowledge, self-health promotion behaviors, and Barthel's Activities of Daily Living (ADL) scores of the elderly participants. The descriptive measures used were frequency, percentage, median, arithmetic mean (M), and standard deviation (SD) for comparing the general information between 2 groups. Analytical statistics, specifically the independent t-test and Paired t-test, were utilized to analyze the pre-test and post-test results of the randomized controlled trial for both the experimental and control groups. The Independent t-test was used to compare the outcomes between the two groups, while the paired t-test was employed to assess changes within each group from pre-test to post-test.

RESULTS

The study was conducted over a period of 4 months, from July 2023 to October 2023. The details of the study and its results are as follows:

1. The self-care model for homebound older adults in Khueang Nai District, Ubon Ratchathani Province was explained and discussed with service providers and network partners in the research area, including Sang Tho Health Promoting Hospital and Kut Takra Health Promoting Hospital. A total of 64 homebound older adults were selected and divided into an experimental group (32 individuals) and a control group (32 individuals) to test the elderly self-care model.

2. The activities for the participatory self-care model were outlined, including community health check-ups, training sessions on the 5 principles of self-care (diet, exercise, hygiene, emotion, and

hobbies), and follow-up by the civil society health network.

3. Health assessments were conducted before and after the implementation of the participatory self-care model for both the experimental and control groups.

The participants in the experimental and control groups who met the inclusion criteria and were not excluded from the study consisted of 32 individuals in each group. The results from the questionnaire on knowledge and self-care behaviors of the homebound elderly in both groups are summarized below:

Experimental group: Mostly female (25 people), with an average age of 72.06 (SD. 4.88), the majority had a BMI between 18.50-22.90 (40.60%), blood pressure between 110-121 mmHg (40.60%) and 122-133 mmHg (40.60%), and fasting blood sugar (FBS) > 126 mg/dl (71.90%). Control group: Mostly female (26 people), with an average age of 71.75 (SD. 5.11), the majority had a BMI between 18.50-22.90 (40.60%), blood pressure between 122-133 mmHg (43.80%), and fasting blood sugar (FBS) > 126 mg/dl (65.60%). Details are shown in Table 1.

Table 1. General information of home-bound elderly in Khueang Nai District, Ubon Ratchathani Province

General Information	Experimental Group (n=32)		Control Group (n=32)	
	Number	%	Number	%
Gender				
- Male	7	21.90	6	18.80
- Female	25	78.10	26	81.20
Age				
- 60 – 64 years	0	0	1	3.10
- 65 - 69 years	14	43.80	12	37.50
- 70 years and above	18	56.20	19	59.40
Average Age	Mean=72.06 SD.=4.88		Mean=71.75 SD.=5.11	
BMI				
- 18.50 – 22.90 (Normal)	13	40.60	13	40.60
- 23.00 – 24.90 (Overweight)	6	18.80	8	25.00
- 25.00 – 29.90 (Obesity Level 1)	10	31.30	9	28.10
- 30 and above (Obesity Level 2)	3	9.40	2	6.30
Blood Pressure				
Systolic				
110 – 121 mmHg	13	40.60	12	37.50
122 – 133 mmHg	13	40.60	14	43.80
134 mmHg and above	6	18.80	6	18.80
Diastolic				
63 – 71 mmHg	6	18.80	7	21.90
72 – 80 mmHg	11	34.40	9	28.10
81 mmHg and above	15	46.90	16	50.00
Fasting Blood Sugar (FBS)				
< 100 mg/dl	4	12.50	4	12.50
100 – 125 mg/dl	5	15.60	7	21.90
> 126 mg/dl	23	71.90	21	65.60

A comparison of the mean (M) and standard deviation (SD) of various variables between the experimental and control groups before the experiment was conducted. The variables studied include knowledge scores, health-promoting behavior scores, body mass index (BMI), systolic and diastolic blood pressure, fasting blood sugar (FBS) levels, and activities of daily living (ADL) scores.

The results showed that before the experiment, the mean values of all variables did not differ significantly ($p>0.05$) between the experimental and control groups. The experimental group had an average knowledge score of 6.78 (SD=1.73), while the control group had a score of 6.28 (SD=3.19). The mean health-promoting behavior score of the experimental group was 96.44 (SD=9.06), and the control group was 96.81 (SD=8.78). The average BMI of the experimental group was 22.84 (SD=2.96), and the control group was 22.28 (SD=3.06). The mean systolic blood pressure of the experimental group was 127.25 (SD=9.30), and the control group was 125.78 (SD=9.92). The mean diastolic blood pressure of the experimental group was 77.78 (SD=5.72), and the control group was 77.90 (SD=6.80). The average FBS level of the experimental group was 156.28 (SD=5.51), and the control group was 155.91 (SD=4.38). Lastly, the mean ADL score of the experimental group was 9.00 (SD=1.05), and the control group was 9.15 (SD=1.02).

Therefore, it can be concluded that before the experiment, the experimental and control groups had similar characteristics in all studied variables, with no statistically significant differences. Details are shown in Table 2.

Table 2. Comparison of Mean Values of Various Variables Between the Experimental and Control Groups Before the Experiment

Variable	Experimental Group **(n=32)**	Control Group **(n=32)**	t	p-value
Knowledge	M=6.78, SD=1.73	M=6.28, SD=3.19	0.778	0.440
Health-Promoting Behavior	M=96.44, SD=9.06	M=96.81, SD=8.78	0.168	0.867
Body Mass Index (BMI)	M=22.84, SD=2.96	M=22.28, SD=3.06	0.871	0.387
Systolic Blood Pressure	M=127.25, SD=9.30	M=125.78, SD=9.92	0.663	0.510
Diastolic Blood Pressure	M=77.78, SD=5.72	M=77.90, SD=6.80	1.123	0.265
Fasting Blood Sugar (FBS)	M=156.28, SD=5.51	M=155.91, SD=4.38	0.334	0.739
ADL Score	M=9.00, SD=1.05	M=9.15, SD=1.02	0.605	0.875

**Significant at the 0.05 level*

A comparison of the mean (M) and standard deviation (SD) of various variables between the experimental and control groups after the experiment was conducted. The variables studied included knowledge scores, health-promoting behavior scores, body mass index (BMI), systolic and diastolic blood pressure, fasting blood sugar (FBS) levels, and activities of daily living (ADL) scores.

The results showed that after the experiment, the experimental group had a significantly higher average knowledge score of 12.66 (SD=1.91) compared to the

control group's score of 9.03 (SD=3.51) (t=8.875, p<0.001). The mean health-promoting behavior score of the experimental group was 107.50 (SD=5.51), significantly higher than the control group's score of 94.10 (SD=8.30) (t=7.615, p<0.001). The mean systolic blood pressure of the experimental group was 119.41 (SD=7.64), significantly lower than the control group's value of 126.09 (SD=8.05) (t=-3.604, p=0.001). The mean diastolic blood pressure of the experimental group was 77.03 (SD=4.30), significantly lower than the control group's value of 81.31 (SD=3.78) (t=-3.790, p<0.001). The average FBS level of the experimental group was 149.72 (SD=6.91), significantly lower than the control group's level of 156.09 (SD=4.08) (t=-4.547, p<0.001). Lastly, the mean ADL score of the experimental group was 13.59 (SD=1.36), significantly higher than the control group's score of 11.13 (SD=0.61) (t=9.346, p<0.001).

However, the average BMI of the experimental group was 22.84 (SD=2.96), and that of the control group was 22.28 (SD=3.06), with no statistically significant difference (t=0.871, p=0.387).

In summary, following the implementation of the self-care model, the experimental group demonstrated significantly higher scores in knowledge, health-promoting behaviors, and activities of daily living (ADL) in comparison to the control group. Moreover, the experimental group exhibited significantly lower mean blood pressure and blood sugar levels than the control group. However, no significant difference was observed in the average body mass index (BMI) between the two groups. Detailed findings are presented in Table 3.

Table 3. Comparison of Mean Values of Various Variables Between the Experimental and Control Groups After the Experiment

Variable	Experimental Group (n=32)	Control Group (n=32)	t	p-value
Knowledge Score	M=12.66, SD=1.91	M=9.03, SD=3.51	8.875	0.000*
Health-Promoting Behavior Score	M=107.50, SD=5.51	M=94.10, SD=8.30	7.615	0.000*
Body Mass Index (BMI)	M=22.84, SD=2.96	M=22.28, SD=3.06	0.871	0.387
Systolic Blood Pressure	M=119.41, SD=7.64	M=126.09, SD=8.05	3.604	0.001*
Diastolic Blood Pressure	M=77.03, SD=4.30	M=81.31, SD=3.78	3.790	0.000*
Fasting Blood Sugar (FBS)	M=149.72, SD=6.91	M=156.09, SD=4.08	4.547	0.000*
ADL Score	M=13.59, SD=1.36	M=11.13, SD=0.61	9.346	0.000*

**Significant at the 0.05 level*

Considering the results of the data analysis in Tables 2 and 3, the study's findings can be summarized as follows: Prior to the implementation of the self-care model for home-bound elderly individuals, there were no statistically significant differences between the experimental and control groups in their average scores for self-care knowledge, health-promoting behaviors, body mass index, blood pressure, blood sugar levels, and activities of daily living (ADL). This lack of significant differences indicates that both groups exhibited similar characteristics

before the commencement of the experiment.

After the implementation of the self-care model for a period of four months, the experimental group demonstrated significantly higher mean scores for knowledge, health-promoting behaviors, and activities of daily living (ADL) compared to the control group at the 0.05 level of significance. Additionally, the experimental group exhibited significantly lower mean systolic and diastolic blood pressure, as well as reduced blood sugar levels compared to the control group. These results indicate that the developed self-care model effectively promotes health knowledge and behaviors, enhances the elderly's ability to perform daily activities, and aids in controlling blood pressure and blood sugar levels, which are critical risk factors for chronic non-communicable diseases in home-bound elderly individuals.

However, when considering the body mass index (BMI) after the experiment, no difference was observed between the two groups. This indicates that the developed self-care model may not significantly impact the BMI of the elderly. Both groups' average BMI values remained within the overweight and obesity level 1 range. This outcome suggests a need to further emphasize weight control and obesity prevention within the self-care model for homebound older adults.

DISCUSSION

From the study on the Effectiveness of a Participatory Self-Care Model for Homebound Elderly in Khueang Nai District, Ubon Ratchathani Province, Thailand, the research results can conclude that the experimental group had better results compared to the control group in terms of knowledge, behavior, blood pressure, FBS, and ADL scores. This improvement was due to the researchers and the group carrying out the activities according to the planned format, which consists of providing knowledge to the elderly group participating in the experimental activities 2 times a month, on the 1st and 3rd week of the month, with details as follows: During the 1st week of every month, knowledge was provided according to the 5 principles. (Knowledge about taking self-care of the body, managing emotions, choosing food, engaging in hobbies, and taking care of the health of older adults). In the third week, there was a follow-up by village health volunteers, such as blood pressure measurement, FBS, and ADL assessment. The above activities can be discussed as follows:

The effectiveness of the healthcare model significantly impacts the knowledge and health behaviors of the elderly. These findings are consistent with the study by Tang and Wang, which found that health knowledge among the elderly positively affects health behaviors ($P<0.01$). Additionally, the study by Kuska et al. highlights that elderly women, particularly those of increasing age, higher education, and better financial status, demonstrate significantly improved health behaviors. Therefore, it can be concluded that appropriate healthcare models and health promotion programs can effectively enhance the knowledge and health behaviors of the elderly. Socioeconomic factors must also be considered. Applying these study results can help improve the quality of life for the elderly population.

The effectiveness of the self-care model for homebound older adults on the ability to perform activities of daily living (ADL) is evident from the study results. These findings are consistent with the study by Rizal et al.,[20] which demonstrated that assisting the elderly with self-care by caregivers can enhance their ability to

perform ADLs. Similarly, the results align with the study by de Labra et al., [23]which found that light exercise effectively improves ADL performance in frail elderly individuals. However, the findings are inconsistent with the study by Linata and Jalalin,[24] which identified education level as the critical factor affecting the quality of life of the elderly, without directly specifying its relationship with ADL performance. These results support the notion that rehabilitation and exercise programs are beneficial in enhancing the elderly's ability to perform ADLs. Consequently, promoting simple exercise activities is essential for long-term elderly care. To obtain clearer information and further validate the effectiveness of the care model, additional experimental research should be conducted. This research should aim to confirm the model's efficacy and investigate various factors influencing the elderly individuals' ability to perform ADLs.

The effectiveness of the healthcare model in controlling blood pressure and blood sugar levels is corroborated by the study results. These findings are consistent with previous studies,[25-27] which demonstrated that health education and behavior modification programs can significantly aid hypertensive patients in better controlling their blood pressure. Specifically, group education combined with home visits by village health volunteers has been shown to improve knowledge about hypertension and assist in blood pressure control[23]. In addition, family health care and support play a crucial role in helping hypertensive patients manage their blood pressure more effectively[28-29]. An 8-week family counseling model, combined with weekly home visits, has been shown to significantly reduce both systolic and diastolic blood pressure[29]. Therefore, promoting family involvement in the care of hypertensive patients is a vital strategy for effectively controlling blood pressure.

Furthermore, the study highlights the importance of comprehensive health education and supportive care models in managing chronic conditions such as hypertension and diabetes. These approaches not only improve clinical outcomes but also enhance the overall quality of life for elderly individuals. To further validate these findings, additional research should be conducted to explore the long-term impacts of such healthcare models on blood pressure and blood sugar control.[30]

The effect of the healthcare model on body mass index (BMI) was examined in this study. The findings align with the study by Monteagudo et al., which implemented a 15-week multicomponent training program for the elderly and found no statistically significant difference in BMI. However, Gondoni et al.[31] reported that a comprehensive rehabilitation program significantly reduced BMI in elderly obese and cardiac patients over a 4-year follow-up period ($p<0.05$). This result is also supported by the study conducted by Cobos-Palacios et al., which found that a 12-month Mediterranean diet-controlled exercise program significantly reduced BMI, particularly in the young-old group (<75 years).[32]

In contrast, the current study found no change in BMI, potentially due to the short-term nature of the model's implementation. The experimental period might have been insufficient to observe significant changes in BMI among the elderly participants.

In conclusion, the participatory self-care model for home-bound elderly has demonstrated its effectiveness in promoting knowledge, health-promoting behaviors, the ability to perform activities of daily living, and controlling risk factors for chronic non-communicable diseases among the elderly. Therefore, this model should be expanded and applied in the care of home-bound elderly in other areas, considering various factors such as age groups (e.g.,

young-old vs. old-old), comorbidities (e.g., hypertension, diabetes, obesity), and geographical settings (urban vs. rural areas). Further research should also contemplate longer intervention periods and follow-up times to assess long-term effects on outcomes such as body mass index. Additionally, incorporating socioeconomic factors and education levels into future applications of this model is crucial. By adapting the model to these specific contexts and populations, we can further enhance the quality of life and well-being of diverse groups of home-bound older adults across different settings.

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