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# The Efficacy of the "CREB Innovation" Derives From the Application of Bandura and Orem's Theory towards Self-Care Knowledge, Self-Efficacy, Self-Care Behavior, and Satisfaction among Older Thai Hypertensive Patients in Thailand

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***Abstract***

*Objectives: The "CREB innovation" (C=counseling and empowerment, R=role models, E=effective communication, B=backward design) was developed based on Bandura's self-efficacy and Orem's self-care theories to help elderly individuals control their blood pressure. The study aimed to evaluate its effectiveness in four phases: Phase 1 involved theoretical studies; Second entailed developing the "CREB innovation"; Third tested its effects on self-care knowledge, behaviors, and BP; and the fourth assessed satisfaction. The sample included elderly residents of Chaiyapoom province. Instruments measuring self-care knowledge, behaviors, and satisfaction had Cronbach's alpha coefficients of 0.87, 0.87, and 0.85, respectively. Data was analyzed using content analysis and paired t-tests. Results showed significant improvements in self-care knowledge, behaviors, and both systolic and diastolic BP after implementing the CREB innovation (P<.05). Satisfaction with the program was 93.33%. The findings suggest that integrating mastery experiences, live modeling, verbal persuasion, and emotional support through the CREB innovation effectively enhances BP control in the elderly. The Ministry of Health should promote this approach to manage hypertension in older adults.*

***Keywords:*** *"CREB" innovation, Orem theory, Bandura theory, elderly, hypertension*

## Introduction

Aging is one of the processes of life that develops and deteriorates by a person's physical condition, beginning at birth and continuing throughout life. After the age of 30, the process of body transformation commences. Asia has 65% of the world's population and is aging more rapidly than Western nations. 857 million people will be 65 or elderly, a 314% increase from the 2000s 207 million. The percentage of individuals aged 65 plus will increase from 6% to 18% by 2050 (Victor HH Goh, 2005). Thailand has the fastest-growing senior population of all Southeast Asian nations (Nimsuntorn et al., 2018). The increase in the elderly population in Thailand has had socioeconomic impact, including government policies to accommodate the increase in the elderly population and cover medical care for chronic diseases such as hypertension in older people (National Statistical Office (NSO), 2014).

The elderly population with hypertension is expanding(National Statistical Office (NSO), 2014). Chaiyaphum Province is one of the provinces where the incidence of hypertension has been increasing continuously. It was found that the percentage of elderly patients with hypertension per 100,000 population was 6.56, 8.43, and 0.31 respectively. Complications resulting from the inability to control BP in hypertensive patients is a public health concern due to several variables arising from the patient's pathology and behavioral issues. Therefore, it is necessary to use processes or activities such as using media for health communication, empowerment, role models and inspiration by prototypes, and desired outcomes by backward design, for hypertensive patients to attain self-care knowledge and influence positive self-care behaviors.

According to Bandura's theory, personal, behavioral, and environmental factors were engaged in the self-care effectiveness of elderly hypertensive patients. Bengtsson et al. (2018) found that the

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interactive mobile phone self-management support system can facilitate the current transformation of patients from primary care recipients to health advocates (Bengtsson et al., 2018). Almeida et al., (2021) revealed that the prototype of the application designed to motivate hypertensive people is an innovative technological resource that provides individuals taking antihypertensives with the following: access to messages and videos with validated content of a motivating nature; more knowledge about the disease and medication use; alarms with reminders of the time to take medications; and individualized control and care (Almeida TC et al., 2021). Self-efficacy can alter a person's effort to achieve a goal and overall performance. As a result, self-care programs for chronic conditions frequently incorporate the concepts (Pouresmail Z et al., 2017; Yatim HM et al., 2019). By modifying patient behavior and treatment acceptance, self-efficacy can improve physical and mental health (Royani Z et al., 2015). Self-care for hypertension involves following diet and lifestyle guidelines, such as not smoking, managing weight, eating a low-salt, low-fat diet, staying active, limiting alcohol consumption, monitoring BP, getting regular checkups, and avoiding stress (Yatim HM et al., 2019). Teaching hypertensive patients self-care enhances medication adherence, Reisi M et al., 2017).

In this study, the researchers employed Orem's theory of self-care, which is decision based and stresses a person's voluntary and purposeful self-care. Allowing the individual to exchange information, vocal instructions, and communication, such as Group Line and TikTok, together with Bandura's theory that focuses on learning about the elderly with the disease, is acceptable in this circumstance, high BP and composition are connected. The three interconnected components were the personal factor (P) of successful self-care modeling, the behavior condition (B) of self-care in a variety of methods, and the environmental condition (E) via support and intervention. Innovative communications are utilized to engage communities and families. The theory of Orem and Bandura was applied into the “CREB innovation” through a participatory and analytic process in which community and atakeholders from various fields, provide feedback on various fields. This study aimed to assess the effectiveness of the "CREB innovation " on self-care knowledge, self-efficacy, self-care behavior, and satisfaction in hypertensive older people. The research findings will lead to the development of a community- and lifestyle-appropriate self-care approach for older adults with hypertension.

## Materials and Methods

The research process consisted of four phases of research and development (R&D), as indicated in Figure 1. The specifics of every phase vary based on the objectives of each phase, the number of target audiences for each activity, and the variety of accessible data-gathering techniques.

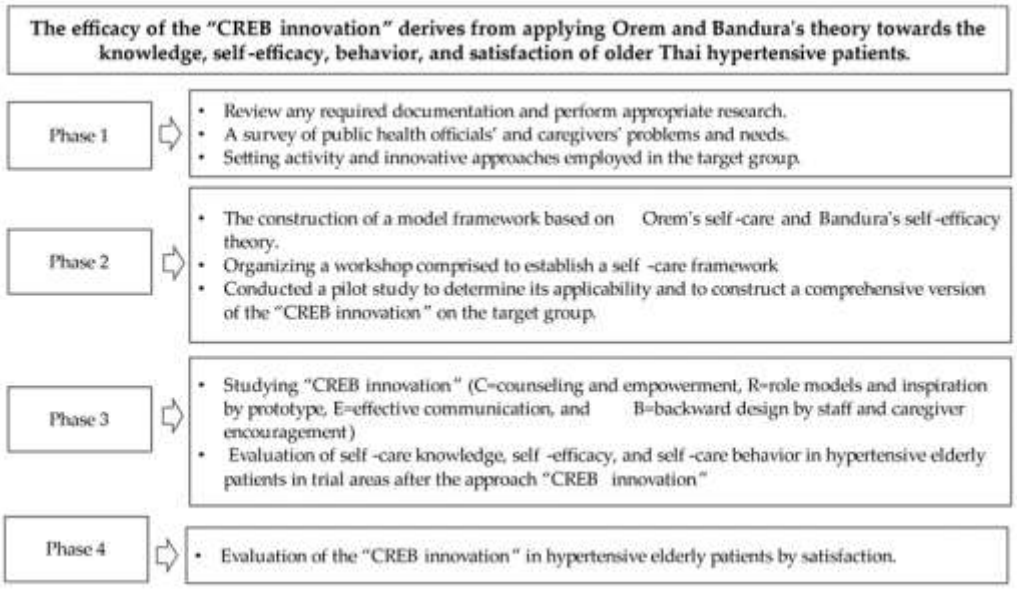


**Fig 1. Overview of study procedures.**

**Phase 1**: Basic studies and associated theories were performed to gather the essential knowledge for planning and developing activities.

The sample size was 32 participants. Eight public health officers are responsible for hypertension in the sub district, twelve senior hypertensive persons enrolled as patients at the hypertension clinic of the Na Fai Subdistrict Health Promoting Hospital who had been on antihypertensives for the last one year and twelve caregivers of hypertensive elderly patients. Research instruments were structured interviews that were reviewed by qualitative research experts and senior public health officers. Three structured interviews were conducted using questionnaires and in-depth interviews with the following;

1) Public health officers regarding self-care capacity promotion activity/innovation approaches with elderly hypertensive patients.

2) Elderly hypertensive patients regarding the necessity and requirements of self-care activities, health problem history, and activity/innovation guidelines.

3) Caregivers regarding self-care behavior and activity/innovation strategies used in geriatric hypertensive patients.

## Data Analysis

Content analysis of interviews was done regarding the problems and requirements of public health officials, caregivers, and elderly patients with hypertension. In addition to the completeness the data was verified by submitting to a triangular review with the relevant parties before concluding the research results including in planning for the next stage.

**Phase 2** included the construction of a self-care innovation framework designed for elderly hypertensive patients following the primary data in Phase 1: This phase began by organization of a seminar based on experts and connoisseur ships to develop the framework. The researchers selected 15 people involved in the care of hypertensive patients using purposive selection. This sample included five people who had been involved in the care of hypertensive patients for the past three years, five public health officers from the non-communicable diseases department and five academicians from Chaiyaphum Rajabhat University. The results of the second phase of the interview led to the development of the innovation framework "CREB" derived from content analysis by applying Bandura's theory and Orem self-care theories.

Following phase 2, a pilot study was then conducted on senior hypertensive patients from Ban Lao Subdistrict Health Promoting Hospital, Mueang District Chaiyaphum Province. Then, the "CREB innovation" was implemented in experimental areas.

The third phase of "CREB innovation" in hypertensive geriatric patients was implemented in the Na Fai subdistrict of Mueang District, Chaiyaphum Province. The sample size in the experimental innovation was 30 people based on (Polit, D.F., & Beck, C.I., 2003). For a patient to enter the trial group, the patient had to be elderly with hypertension, without any complications, able to read and write, able to use the telephone to communicate through the Line and Tik Tok programs and willing to cooperate with the research. A prototype software was created to use "the CREB innovation" and it was implemented as follows

**Step 1**: **C=Counseling & Empowerment**

Public health officials highlighted the potential for self-care and blood pressure control behaviors in older adults and the investigator-patient interactions by encouraging the suggestion of potential alternatives, including the participation of older people in decision-making to help them develop problem-solving skills and control factors that influence health, resulting in lifestyle changes. Health education on hypertension and everyday words of encouragement that seniors can reach through Line Group and Tik Tok groups under the name Pinto Jai self-care were shared. The concept is that the development of self-care potential and BP control behavior in the elderly is based on an interaction innovation between the researcher and the patient that emphasizes the appraisal of problems and situations by encouraging the suggestion of possible alternatives. In

addition, it encourages them to participate in decision-making to aid in the development of problem-solving skills and control over factors influencing their health resulting in behavioral lifestyle changes, and correct behavior, and lowers the risk of complications for a better quality of life. Two research tools were used for this;

1) The Empowerment Program for Elderly Hypertensive Persons was devised by applying Gibson's Empowerment Framework to a literature review and pertinent research. It was divided into three stages over four weeks, with each step requiring 1-2 hours.

Step 1: Assessment of readiness through relationship building and motivation by introducing oneself, inquiring about family problems and illnesses, and self-interacting with other family members to assist the patient and understand the impact that poor interactions with others, particularly underlying illnesses, can have on mental health.

**Step 2**: **Change steps**

1) Promote interaction by investigating the patient's actual circumstance and by investigating responses to emotional and behavioral illnesses, depersonalization thinking, and family relationship issues by motivating, evaluating, and analyzing real-world scenarios to arrive at solutions, including evaluating individual power sources.

2) Empowerment to solve illness-related problems by encouraging patients to believe they can independently solve problems.

**Step 3**: **Practice new skills**

1) Self-management of illness by supporting and motivating the development of communication skills, addressing medication adverse effects, and involving patients in making their own decisions regarding problem-solving.

2) Enhancing confidence and sustaining action to achieve life goals by promoting self-care behavior, and resolving issues with oneself to achieve life goals.

R=Role Models & Inspiration by Prototypes:

We applied and integrated the Health Belief Model (HBM) in creating the perceived severity and perceived benefit of older patients with hypertension and the IMB model for which the operation process is divided into three steps as follows (Khorsandi et al., 2017; Peyman & Abdollahi, 2017):

1: Public health officials and role models educated older people with hypertension about the effects of complications and the benefits of BP control so that they understand, and can tell others how to control BP and complications healthily.

2: In the second week the positive motivation of the hypertensive patients to acquire self-assurance was strengthened through a process of reflection between the researcher and the group following the viewing of the role model clip.

3: The role model strengthened the self-efficacy of the patients so that they recognize their abilities and have the confidence to control high BP to normal levels through stretching exercises and stress management.

**E=Effective communication**

Three individuals per group formed a two-way communication channel through Line and Tiktok and engaged each other by creating video segments, messages, or cuisine every morning in the Line application group. Using the TikTok application, public health officials and caregivers of elderly patients with hypertension posted short clips of sustenance and patients who can take care of themselves and control their blood pressure, and words of encouragement. The focus group questions were developed based on the Empowerment concept of Gibson 4. The process is to discover the realities and critical reflections of older adults to identify the health problems of the elderly, the activities that they must do and why they should do them.

**B=Backward design**

After all activities, the research staff designed the evaluation structure to assess the kind of knowledge and understanding that is important for older adults to have, the ways in which it is important for them to have desirable characteristics and to determine some things that they should know and use in their daily lives. A structured interview was reviewed by experts in qualitative research, health care for the elderly, and public health scholars working with the elderly. The researcher presented the questionnaire created to measure knowledge, self-efficacy, and self-care behavior based on the study documents, and related research to three experts to verify the validity and appropriateness of the questionnaire, the language, and the Index of item objective congruence (IOC). It was 0.67, 1.00, and 1.00 in ascending order. Afterwards, 30 elderly patients with hypertension who have the same characteristics as the sample group were assessed to find the confidence value of each set of tools and analyze the quality of the tools as follows: (1) self-care knowledge was analyzed using Kuder Richardson's KR 20 formula, equal to 0.74, (2) self-efficacy, (3) self-care behavior scale was obtained by finding Cronbach's alpha coefficient, 0.87 and 0.87, respectively.

Phase 4: Evaluation after the trial of the "CREB innovation"

The quality of the activity patterns, namely: comparative results of self-care knowledge, self-efficacy, self-care behaviors, and systolic and diastolic blood pressure before and after phase 3, and assessment of satisfaction among elderly patients with hypertension were evaluated. To ensure the instrument quality, the researcher carried the contentment evaluation form to three experts to verify the questionnaire's accuracy and language. Furthermore, the objective congruence (IOC) of the item was 1.00. The past measurements were examined by experts to experiment with 30 elderly patients with hypertension with the same characteristics as a sample group to find the confidence value of each set of tools and analyze the quality of the tools. The reliability was obtained by finding the alpha Cronbach coefficient equal to 0.85. The data was then analyzed and presented as descriptive statistics.

This study received ethical approval from The Human Research Ethics Committee. Chaiyaphum Provincial Public Health Office Research Project Number EC 15/2562.

Figure 2. Below shows an overview of the study.

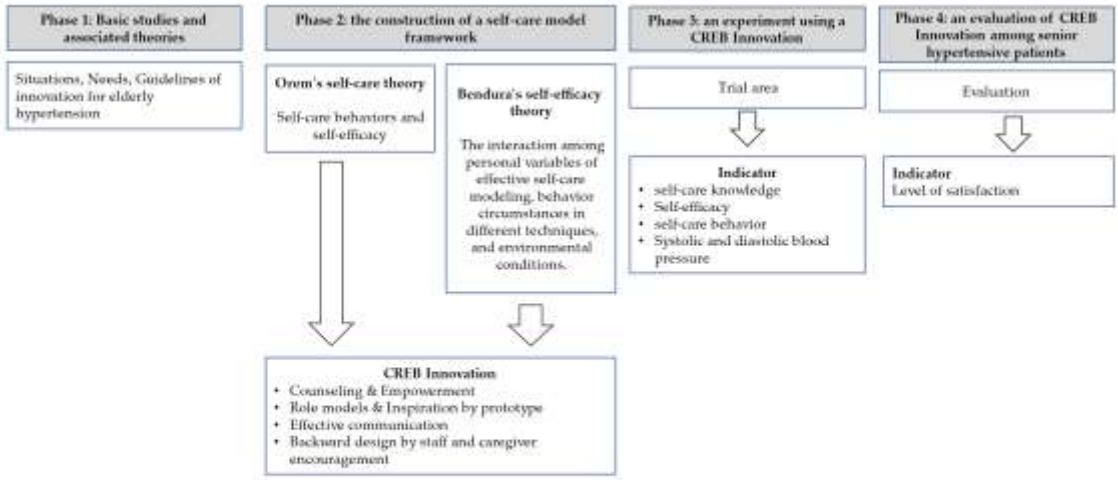


**Fig 2. Overview of the study**.

## Results

The study results were divided into three sections according to the study period.

Phase 1: Basic studies and associated theories:

The result of the interviews with the public health officials showed that the majority of the existing high blood pressure control and prevention operations entail screening for new patients and then referring them to doctors for further management. According to the procedure, which emphasizes staff supervision over encouraging patients to take care of their health, patients continue to lack self-care awareness, believing that taking medication alone is sufficient, resulting in suboptimal control of hypertension.

From the elderly hypertensive patients, the results revealed that all patients who were treated would receive blood pressure indicators from the staff and the team would always explain what was detected. Additionally, all patients were educated on hypertension and other comorbidities. For self-care during the illness, they received health care advice from health personnel including knowledge on potential end organ damage. The caregivers revealed that some of the patients consume foods with added sugar, lack weight control, don't regularly exercise, drink alcohol, stopped taking a drug when there were no abnormal symptoms, and lacked interest in self-directed learning about the disease.

Phase 2; Construction and development of an innovation using fundamental data from Phase 1's analysis and synthesis.

The second phase reviewed the activities of older hypertensives who perceived self-care efficacy and self-care to control BP within the normal range. These activities resulted in an innovation named “the CREB innovation” The activities that the researchers engaged in in order to implement the CREB innovation were evaluating the participants on selfcare knowledge and their behaviors. A workshop was conducted to review the innovation and ensure that it was applicable to the target population. The workshop revealed that adopting the system was useful as it would instill confidence and promote self-care among elderly hypertensive patients.

Phase 3: Study of a self-care approach in hypertensive elderly patients in trial areas.

After implementation and participation in the CREB innovation activity, several themes important in the lives of hypertensive patients came up. This phase revealed that the participants understood the following;

1. It was important for them to avoid risk factors such as alcohol and smoking and should engage in activities such as exercise and meditation that promote health.
2. They should educate themselves on various food options to avoid and those suitable for them

A comparison of the self-care knowledge of the elderly with hypertension and those without hypertension revealed that the knowledge of the elderly with hypertension was greater. As indicated in Table 1, post-experiment perceptions of self-care efficacy and behavior were greater than pre-experiment perceptions and post-experiment high BP levels were considerably lower than pre-experiment levels ($p<.05$).

**Table 1** Comparison of the mean values of knowledge, self-efficacy, behavior, and systolic and diastolic blood pressure before and after the experiment among elderly patients with hypertension and BP levels (n=30).

| Items | $\bar{x}$ | S.D. | t | Df | p-value |
|---|---|---|---|---|---|
| Self-care Knowledge | | | | | |
| Before the experiment | 14.02 | 2.25 | -5.43 | 29 | <.01 |
| After the experiment | 17.28 | 2.12 | | | |
| Self-efficacy | | | | | |
| Before the experiment | 1.79 | 0.16 | 2.76 | 29 | <.01 |
| After the experiment | 2.04 | 0.11 | | | |
| Self-care behaviors | | | | | |
| Before the experiment | 1.98 | 0.35 | 2.25 | 29 | <.03 |
| After the experiment | 2.16 | 0.31 | | | |
| Systolic blood pressure | | | | | |
| Before the experiment | 151.32 | 4.76 | 14.63 | 29 | <.01 |
| After the experiment | 138.64 | 5.09 | | | |
| Diastolic blood pressure | | | | | |
| Before the experiment | 98.07 | 6.33 | 14.72 | 29 | <.01 |
| After the experiment | 93.42 | 6.84 | | | |

Phase 4: The satisfaction evaluation of the "CREB" approach for hypertensive elderly.

The majority of elderly hypertensive patients who participated in the activities reported a high degree of satisfaction (85.71%). This study considered that the participants were more satisfied than the judging criterion stated in Table 2 since satisfaction was greater than 60% as shown in Table 2.

**Table 2** Classifies the number and proportion of elderly hypertensive patients according to their level of satisfaction with their self-care activity patterns (n=30).

| **Level of satisfaction** | **n** | **Percentage** |
|---|---|---|
| Moderate satisfaction | 2 | 6.67 |
| High level of satisfaction | 28 | 93.33 |
| Total | 30 | 100.00 |

## Discussion

Based on the findings of the study, the creation of the CREB innovation for elderly hypertensive patients reveal the following:

Counseling and positive thinking empowerment for the elderly encourages them to develop the confidence to solve problems independently. It leads to greater happiness and a more meaningful existence. It is a process of interpersonal communication founded on professional knowledge and competence in which the counselor assists the client in effectively addressing problems, gaining a better understanding of the situation, and making decisions with self-assurance. The comprehensive Health Empowerment process enables target groups to utilize their innate capacity to care for and improve their health. It is regarded as the mechanism and core of the "Good Health and Well-being" strategy, which focuses on strengthening holistic health. Education level and family support affected self-care behavior only in patients with uncontrolled hypertension. Several studies have shown that the factors affecting self-care behavior among patients with hypertension include age, social support and self-efficacy, Lee et al. (2010). Even though previous studies have investigated the factors affecting self-care behavior according to various categories of participants, no studies of the differences between elderly patients with controlled and uncontrolled hypertension have been conducted (Soon-Ok Yang et al., 2014). Therefore, it is difficult to directly compare the results of previous studies with our findings. According to this study, the participants' knowledge, self-care abilities, and self-care behaviors all improved because of learning how to take better care of themselves from their role models. In addition to being capable of controlling BP as would be

anticipated, the results indicate that older people with high education and high family support have been doing good self-care behaviors. Given these findings, health officers should develop health strategies, and administrators should implement policies that include patient assessments and interventions based on patients' educational levels and incorporate family support services as well as. The assessment of the challenges and demands of public health authorities, caregivers, and elderly hypertensive patients indicated that healthcare facilities lack self-care models for the health of old hypertensive patients. In place of self-care, patients were accustomed to having village health volunteers (VHVs) care for and monitor them.

The conception and development of a self-care model for older hypertensive patients and the instruments utilized for self-care activities. We presented fundamental knowledge on the challenges and needs of the employees responsible for preventing and controlling hypertension, which the service center needed as a form of self-care in health education for patients with hypertension. The self-efficacy and encouragement of health workers in teaching, rewarding, and empowering themselves and carers in assisting determines the activities in establishing an activity model to encourage older persons with diseases.

Role model and inspiration by Prototype is an integrated activity supported by four factors: experience from successful actions, observing the actions of others, persuasive communication, and emotional and physiological states, which is an activity design based on Bandura theory. This is because it is a direct experience that leads to success and increases an individual's ability to engage in blood pressure-controlling behaviors. Prototype actions serve as a model and source of motivation, the subjects experienced emotional arousal through the development of positive relationships and the use of verbal persuasion by public health officials to encourage health-promoting behaviors. Bandura(1997) stated that efficacy-activated processes play a key role in the self-regulation of motivation and help patients achieve treatment goals for their disease (Bandura, 1997a). In addition, health staff can instill greater confidence in patients by using methods such as forming groups where patients with severe hypertension can share their mastery experiences related to self-regulation of BP control. Another, less direct way to enhance patient self-efficacy is to empower and encourage health staff to apply verbal persuasion and emotional arousal strategies to build patients' trust in clinical care and provide them with greater emotional support. Education level and family support affected self-care behavior only in patients with uncontrolled hypertension (Hashemlu et al., 2015). The factors affecting self-care behavior among elderly patients with essential hypertension were knowledge and self-efficacy and depended on the age, and duration of the disease, social support, and education (EunJu Lee & Euna Park., 2017a; Jeon, 2008; Soon-Ok Yang et al., 2014). Previous studies have shown that high self-efficacy is associated with self-care behaviors such as weight management, low-salt diet adherence, regular physical exercise, medication adherence, and tobacco use cessation for controlling blood pressure (Pourghane et al., 2022; Warren-Findlow et al., 2012). The studies' results are consistent with our study findings that self-care behavior and self-efficacy were lower in the uncontrolled hypertension group than in the controlled hypertension group (Gi & Park, 2012a; Riegel et al., 2012; Warren-Findlow et al., 2012). These results are consistent with previously studied findings that self-efficacy is a core factor in programs developed for self-care and chronic disease management (Breaux-Shropshire et al., 2012; Straßner et al., 2019). In a study by Warren-Findlow et al. (2012), 41% of African American patients with hypertension (who had a higher rate of uncontrolled hypertension than Asian or White patients) reported having poor self-care behavior; self-care behavior was strongly associated with self-efficacy (Warren-Findlow et al., 2012). The results of these studies suggest that designing care plans to encourage patients to have more confidence in their self-care ability would be an effective way to manage their BP. The application of Bandura's self-efficacy theory and Orem's theory of self-care was shown by the research of documents, concepts, and theories about the construction of a self-care model for elderly patients with hypertension. A person's behaviors are affected by Orem's self-care and can improve the quality of life of patients with hypertension (Khademian et al., 2020). A person's perception of self-efficacy is derived through learning from prior triumphs, utilizing examples, convincing words, and emotional stimulation, as well as providing emotional support, value, and encouragement, as well as material and financial assistance to attain their goals.

Effectiveness Communication is a type of health communication because it integrates the science of communication to be used as a tool to disseminate health information for the benefit of preventing illness in the public, which complies with the definition of The National Center for Infectious Diseases Health Communication is the ability to increase the level of knowledge and awareness of health problems, approach health problems, and influence perceptions, beliefs, and attitudes, which change social norms and result in immediate behavioral change. Explaining, informing about, cooperating with, and wishing to receive health services consistent with Orem (1985) states that self-care is the practice of self-initiated activities to maintain one's health and well-being and, when performed effectively, contributes to the structure and development of functions and development (Dorothea. Orem, 1985). For a person to be able to take care of himself properly, it requires initiative and continuous practice of self-care activities. Motivating and making continuous efforts, giving importance to good health, recognizing self-care behaviors, and reducing the risk of disease by doing activities regularly. To carry out such activities, it must rely on influential stimuli to induce a person to perform a behavior, a stimulus that causes a person to have reinforcement, including the media of a person with the power of persuasion, which is a sociological concept that corresponds to the story. Opinion Leader in the Two-Step Flow of Information to Source Credibility theory of communication arts that believes that personal media has influence and makes the target group easy to follow because of the credibility of the character. Therefore, role modeling and inspiration by prototype is an integrated activity for the sample group to receive support from all 4 sources such as the experience of successful action, seeing examples from others, persuasive communication.The purpose of the activity is for the subjects to learn the results of mastery experiences from successful role models in self-care as well (Live Modeling), Bandura believes that Mastery Experiences are most effective in improving self-efficacy because it is the direct experiences that facilitate and increase the individual's ability to perform positive behaviors in controlling BP in role activities, and model and inspiration by that Prototype. The subjects received Emotional Arousal by building good relationships and using verbal persuasion from healthcare professionals to encourage positive behaviors in taking care of their health.

Backward design is a design of a learning unit that has learning standards/ indicators as goals and is a step that we implemented because it applies indicators (Self-efficacy and self-care behaviors in BP control) to learning management to develop the sample and lead the learners to attain self-care competency and desirable characteristics by focusing on the learners. Backward design is typically employed in educational research where instruction is designed with "desired outcomes" in consideration (Beverly et al., 2014a). This is a best practice for administering instructional design to ensure that learners attain the subject's required competencies. This investigation employed a backward design in public health and research on elderly patients with hypertension. The research team determined through these activities that the elderly were: The main goal was to reduce hypertension to its baseline levels and to get evidence of understanding: measuring knowledge and self-care behavior in older adults in aspects such as reducing food consumption, including high-sodium food ingredients such as fish sauce, taking medication, and managing emotions; and 3) Instructional design by integrating activities such as social networking, role modeling, inspiration on a prototype, etc., as well as the severity perception of complications resulting from the inability to control BP, functionality, social media experience, physical characteristics such as vision, and dependence influence cognitive and activity differences among senior adults. Therefore, the social network of the study subjects was lower than that of the middle-aged adults, like that of the elderly in the community or the diabetic elderly, and higher than that of the elderly in urban vulnerable groups. The reason seems to be due to various negative changes such as a decrease in physical function, decrease and loss of social role (Lee & Kim, 2017), and the reasons for the higher level of the social network compared to elderly in urban vulnerable groups are that they have frequent communication with their neighbors due to the characteristics of rural areas, and many people participate in various programs and exchanges and support with friends while using the elderly welfare center and senior centers. Social networks may deficit lead to cognitive, mental, and physical health problems, resulting in poor quality of life (Luo et al., 2012), and among the types of social networks, 80.4% of the elderly people who are isolated, rated their health condition

as bad, and as the health condition is worse, the social relationship is slowed and passive, so health status is an important factor in maintaining and shaping social relations (Chang & Kim, 2017).

In developing self-care knowledge for patients to perceive their self-care correctly, it was found that health knowledge was one of the critical factors that would cause patients to perceive severity and perceived susceptibility factors arising from complications beyond social orientation. Self-care behaviors were defined as decisions and actions taken to regulate personal functioning in the interest of well-being including health, nutrition, lifestyle, environmental conditions, income and socio-economic status, and self-treatment (Bandura, 1997b; Han HR et al., 2014), and self-efficacy was defined as a judgment of one's own ability to accomplish a certain level of performance. Self-care behaviors and self-efficacy have been shown to contribute to successful hypertension management and a reduced risk of complications. Effective self-care behaviors reduce hospitalizations and improve the quality of life (Creber et al., 2016). The relationship between self-efficacy and self-care is also compounded by the variety of behavioral changes required for the optimal management of essential hypertension. Self-efficacy on one task may not influence self-efficacy on another. Additionally, each self-care behavior has its barriers to regular performance. For example, the barriers to medication adherence (concerns about side effects, and costs of medications (Monteiro et al., 2019) are different from the barriers to smoking cessation (anxiety, easy access to cigarettes. Self-care in patients with high BP has been announced as a key step in reducing the hypertension pandemic (Korzh et al., 2022; Warren-Findlow et al., 2012). Self-care behavior is considered a major determinant of BP control in some studies. In other studies, behaviors such as proper use of medications, exercise, proper nutrition, and weight control are further examples of self-care. However, despite evidence that lifestyle changes and adhering to treatment recommendations can control BP, prevent hospitalization, and decrease mortality, many patients do not practice self-care behaviors.

However, factors other than age, sex, marital status, employment, duration of hypertension, knowledge and beliefs about it, and self-efficacy related to self-care and hypertension have been emphasized (Korzh et al., 2022). Only self-efficacy significantly affected self-care behavior in the latter group, whereas self-efficacy, education level, and family support affected self-care behavior in the former group. Bandura (1997) defined self-efficacy as "one's belief in one's ability to achieve goals in specific situations." (Bandura, 1997a). In chronic patients, self-efficacy is defined as an individual's ability to accomplish health-promoting behaviors and is a core component of most programs developed to improve self-care and self-management in such patients (Gi & Park, 2012b)(Gi & Park, 2012; Yang et al., 2014). However, few studies have investigated self-efficacy as a factor affecting self-care activities among patients with uncontrolled hypertension. As stated above, variables that have been related to self-care include demographic characteristics such as age, economic status, gender, marital status, and education level as well as other variables such as disease duration, depression, education, knowledge of hypertension management, perceived severity of hypertension, family support, and self-efficacy.

In this study, technology in the form of LINE Group and Tik Tok was utilized as one health-promoting activity and as a channel for the model person to convey the practice guidelines to serve as an example for others in controlling BP, which corresponds to the Lancet Commission's identification of ten key actions to promote hypertension management globally (Olsen et al., 2016). One of these actions that encourage healthy behavior in hypertensive patients is the promotion of constant education using new technologies such as telehealth. It is the delivery of healthcare services remotely via information and communication technologies. It comprises an increasing number of applications and services, such as two-way video, telephone, email, the internet, smartphones, and wireless tools (Omboni & Ferrari, 2015). The telehealth intervention of interest in this initiative is delivered via telephone by the provider and includes home blood pressure monitoring (HBPM). In addition to the 2017 ACC/AHA Guideline (Omboni & Ferrari, 2015), a meta-analysis and systematic review(McLean et al., 2016) as well as a quasi-experimental study (Bernocchi et al., 2014) discovered that telephone and HBPM interventions led to clinically or statistically significant improvements in BP control. This may explain the differences in BP control rate and other clinic-based investigations. Environmental and emotional factors affect clinic BP

(Morawski et al., 2018). Clinic BP does not represent patients' BP during normal activities (Parati G et al., 2013). The satisfaction evaluation of patients with hypertension who participated in the activity revealed that they were extremely happy (93.33%), which exceeded the established standards. The health of elderly patients with hypertension employs a range of instructional techniques, including lectures, films, demonstrations, and group activities, to address the patients' education-related requirements. In the first phase, hypertensive patients were more satisfied with their activity patterns, which is consistent with the findings of Beverly (2014), who found that the elderly required in-depth discussions with one-on-one caregivers about their needs and preferences for managing the underlying disease and its complications (Beverly et al., 2014b).

## Conclusion

By comparing the self-care knowledge, self-care behaviors, and blood pressure of hypertension older people, it was found that after activity was higher than before activity, the blood pressure test decreased significantly statistically (P<.05), and the satisfaction of elderly hypertensive patients was 93.33%. The principle of this study was to develop self-care knowledge and self-care behavior to control BP control for normal levels in older people through a "CREB innovation" that integrates backward design, role models, and inspiration through prototypes, counseling, and elderly positive thinking empowerment, and effective communication. It is a process of increasing knowledge, self-care behaviors, and satisfaction for the senior to raise awareness and approaches to solving health problems, as well as creating an influence that affects the perception of information that affects behavior change regularly by using available stimuli. Power to motivate a person to be satisfied reinforcement, including persuasive personal media, which, according to Orem (1985), states that "self-care is the practice of self-initiated and self-directed activities to maintain one's health and well-being." According to Bandura's theory, all three main factors are interrelated between individuals, environment, and behavior to achieve self-care ability.

### Credit authorship contribution statement

Sakchai Pattra: Conceptualization, Data curation, Formal analysis, Investigation, Methodology. Sanhawat Chaiwong: Methodology, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Authors' note Data from our study can be accessed on request to the authors.

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

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