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## Lifestyle Changes Using the Plan-Do-Study-Act Cycle among Older Thai Adults – A Focus Group Study

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### ABSTRACT

The aim of this study was to explore experiences of applying the Plan-Do-Study-Act (PDSA) cycle among older Thai adults. A qualitative research approach was used based on focus group interviews with eight male and five female participants aged 62–78 years old. Data was analyzed using qualitative thematic analysis. The findings presented how older adults set, carried out, and adjusted their own lifestyle change plans to enhance active aging. Although participants experienced difficulties at first, learning during the group process following the PDSA steps became easier. Support from the moderator during meetings, as well as family during the execution of their plans at home ensured successful application of the PDSA cycle. The PDSA cycle encouraged participants to be concerned about their health, something they themselves found beneficial. This tool will be useful to apply in health practice and policy when performing group activities to enhance active aging.

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Active aging; empowerment; health; lifestyle change; Thailand

## Background

The world population is aging rapidly. The global population aged 65 years or over comprised 10% of the world's population in 2022 according to the United Nations Department of Economic and Social Affairs, Population Division (2022). Similarly, Thailand's population comprised of nearly 1 in 5 (19.57%) persons aged 60 and over in 2021 (National Statistic Office Thailand, 2022). When aging, people might be ill or limited by disabilities. However, some can also remain active contributors to their families, peers, and communities

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(Bousquet et al., 2015). The growth of older populations increases the demands on health and social care systems, and a care solution that enables older adults to live independently with a good quality of life in their own surroundings for as long as possible is needed (Franke, Sims-Gould, Lusina-Furst, & McKay, 2020). Maintaining an active lifestyle may impact older individuals' sense of mastery, self-esteem, and social relationships, as well as increase their feelings of happiness (Parisi et al., 2014).

Various programs have been provided for the older population to help them to maintain their abilities and to maintain activities of daily living and to increase their importance as a social resource. One strategy for supporting older adults in realizing their potential for their physical, social, and mental well-being across their life is active aging (World Health Organization, 2002). This strategy applies to both individuals and population groups. The key goal of active aging is to maintain the autonomy and independence of older people (Bousquet et al., 2015). This concept was adopted by the World Health Organization (WHO) to optimize opportunities to enhance quality of life as people age. Active aging consists of three basic pillars: health, participation, and security. Active aging could refer to growing older in good health, being a full member of society with an increased level of social engagements and having increased independence in one's daily life (Barslund, Von Werder, & Zaidi, 2017). Therefore, active aging does not merely mean being physically active but also being actively involved in social, economic, cultural, spiritual and civic affairs (Bousquet et al., 2015; Teater, 2016). This concept has been promoted at policy level worldwide, and the positive impact of its implementation has been found in European countries for several years (Principi et al., 2021). The word "active" refers to continuity and participation (Bousquet et al., 2015; Teater, 2016). However, the term needs to be refined regarding practical applications for persons who have limitations in being active in daily activities. These could be persons who are extremely old or those who are satisfied with reducing their level of social participation in their older age (Bousquet et al., 2015; Gonot-Schoupinsky, Garip, & Sheffield, 2021). Moreover, the term should also be adapted to suit specific contexts in which older adults have unique perspectives on active aging, such as in Thailand (Thanakwang, Isaramalai, and Hattakit (2014); Wongsala, Anbäcken, & Rosendahl, 2021).

Having such a rapidly aging population challenges Thailand's government to prepare systems and programs that support older people within the country to age well. In 2018, the Thai government officially stated that "active aging" was part of the national agenda, thereby confirming the belief that older Thai adults play an important role in moving Thai society forward (Larpsombatsiri, 2019). Most of the activities provided for older adults in Thailand are commonly operated by health personnel (Foundation of Thai Gerontology Research and Development institute (TGRI), 2019). Major activities to promote active aging in Thailand are usually provided at a group level in senior

citizen schools, senior citizen clubs, and health care units. There were 29,359 clubs and 2,327 schools registered in 2021 (Foundation of Thai Gerontology Research and Development institute (TGRI), 2022). Older Thai adults tend to respect and usually follow the advice given by health providers since they perceive that health providers will help them to improve and maintain their health (Chunuan, Vanaleesin, Morkruengsai, & Thitimapong, 2007). Although health providers and other staff have an important role in providing activities and environments for older adults to enhance active aging (Larsson Ranada & Österholm, 2022), the plans for the programs provided should be based on individual abilities, values, and resources according to the needs and goals of older adults (Gonot-Schoupinsky et al., 2021). A way to address this discrepancy is to provide an additional program to supplement ordinary activities encouraging older adults to set goals, as well as to evaluate and adjust their activities to improve active aging on their own. The concepts and tools that are used in practice should support older adults in managing their own activities, promoting their active aging, and being available for group activities in clubs and schools for older adults.

This study is part of a research project applying the PDSA cycle (Plan-Do-Study-Act) to promote ability and responsibility to handle lifestyle change in order to enhance active aging among Thai older adults (Wongsala, Rosendahl, Manasatchakun, & Anbäcken, 2022). The PDSA cycle is also known as the Deming cycle; it has been used within organizations, such as industries and health care organizations (Knudsen et al., 2019; Taylor et al., 2013). This cycle provides a circular structure in the shape of a four-step sequence for the repeated testing of continuous learning and improvement. The cycle begins with the plan step (P), which refers to identifying and creating a plan to reach a goal. The do (D) step involves implementing an action according to the created plan that leads to the goal. In the study (S) step one evaluates the planned activity to see if there are signs of improvement or one identifies problem areas for further improvement. The act (A) step ends the cycle; it can be used to adjust the goal, change the way it is carried out, or make the action permanent (Taylor et al., 2013).

There are international studies that use the PDSA cycle to encourage individual lifestyle changes through group activities among older adults. In both a Swedish and a British project, the PDSA cycle was applied in group meetings with senior participants (Gilbertson & Batty, 2011; Nilsson, 2006). Both projects demonstrated success in encouraging older adults to manage their individual lifestyle changes. The PDSA cycle in particular reminded participants about and reawakened them to being inspired about actively aging when being active during aging is the responsibility of individuals. If lifestyle change is the key to success, such change needs to be promoted in the sense that it strengthens individual motivation. However, the traditional activities in Thailand that are mostly provided at a group level seem to

promote less confidence in and less encouragement of older Thai adults' own initiative.

The previously mentioned Thai study (Wongsala et al., 2022) presented how participants interacted and expressed implementing lifestyle changes during participating in meetings called Lomwong Saangsook meetings (hereafter LS-meetings) while applying the PDSA cycle. At that time, the participants showed how they had made their own lifestyle changes following the PDSA cycle while LS-meetings were conducted. In contrast, this current study explores experiences of Thai older adults and their perspectives of the process of applying the PDSA cycle to enhance active aging after the LS-meetings had finished.

### **Aim**

This study aims to explore experiences of applying the PDSA cycle among older Thai adults.

## **Data and methods**

### **Study design**

This is a follow-up study from a previous study in which older Thai adults applied the PDSA cycle to a type of group activity called LS-meetings (Wongsala et al., 2022). "Lomwong Saangsook" is a Thai term that was given a new definition by author one. The words collectively refer to the shape of a circle and building happiness together. The four LS-meetings using the PDSA cycle were carried out to encourage older adults to become involved in forming their own ways of promoting active aging through group activities. Before applying the cycle, an introduction about how to participate in the PDSA cycle and a mini lecture about the topic were given by the moderator of the LS-meetings. The topics presented were related to the three basic pillars of active aging, namely, health, participation, and security (World Health Organization, 2002). After that, the steps of the cycle were applied (Table 1).

The LS-meetings followed a cycle-like procedure according to the P, D, S, and A steps; thus, the cycle could be conducted repeatedly. Each pillar, health, participation, and security were presented sequentially after finishing the last steps of the previous pillar. For example, the participation pillar was presented to implement the necessary plan after the act step of the health pillar had been completed.

Since the focus of this study was to explore older Thai adults' experiences of having applied the PDSA cycle, focus group interview method was selected in this study. As a method, focus groups have the advantage of exploring group effects, which are direct outcomes of the interaction between participants.

**Table 1.** Steps of the PDSA Cycle used in the LS Meeting.

Step	Aim	Activities
Plan	The participants set measurable goals	Participants formulated what their concerns were and what needed to be changed and designed a plan for how to reach this individual goal. To identify the change and improvement, participants designed the measures used to evaluate the outcome of change. The method of evaluating the results was appropriate for each participant.
Do	Each participant carries out the plan and thereby changes the behavior.	Actions are taken by each individual. The PDSA cycle may run several times if the change was complex. The moderator acted like a coach by encouraging and supporting group members.
Study	The impact of the changes is focused on and the changes are measured and reflected upon.	In this stage, the impact of the changes is measured as the outcomes of the changes are focused and reflected upon. Then, the participants reflected on what they had learned and demonstrated their improvement.
Act	Summarize what should be continued or adjusted and carried out during the next cycle (this step looks like the Plan step but with the added experiences and learning from having carried out the changes of the previous cycle of Plan, Do, and Study.)	Outcomes are monitored to test the validity of the plan for signs of progress and success, or problems and areas for improvement. The Act step closes the cycle, integrating the learning generated by the entire, previous process, which can be used to adjust the goal, change methods, reformulate a goal altogether, or broaden the learning.

Note: This table demonstrates aims and activities of each step while applying the PDSA cycle to LS meeting.

A strength of focus groups is that they provide a chance to observe the extent and nature of participants' agreements and disagreements. The focus group approach can also expose a range of participant viewpoints. The participants can form their own opinions more easily than they can in one-to-one interviews. Interactions of focus group participants can support, confirm, or augment valid meanings by reacting to the guidance of a moderator and by allowing the participants to express themselves and negotiate in a group (Holloway & Galvin, 2017). Focus group interviews were thus used to disclose how older adults in the northeastern region of Thailand described their experiences of applying the PDSA cycle at the group level.

### **Setting and participants**

Data collection took part in one of the four major provinces in northeastern Thailand. Focus group interviewees consisted of 13 participants from the original 15 older adults who had participated in the LS meetings. Two of the LS-meeting participants dropped out. Therefore, the two focus groups were composed of eight males and five females aged 62–78 years old, with an average age of 69.08 years (see Table 2).

The participants were older Thai adults without severe illness, who were able to communicate without difficulties, and who were willing to participate in the study. These individuals lived in three villages around a health care unit.

**Table 2.** Participant characteristics.

Characteristic	Number
Age	
60–65	6
66–70	3
71 & above	4
Occupation	
Gardener	2
Self-employed	2
Retired	7
Housekeeper	2
Gender	
Male	8
Female	5
Education	
Primary school	12
Secondary school	1
Married status	
Married	6
Widowed	7
Focus group (male/female)	
Group AHT	7 (4/3)
Group B	6 (4/2)

This health care unit was a Sub- district Health Promoting Hospital. These provide a wide range of primary health care in Thailand. The health personnel here supported the researchers' team by providing the place and inviting the participants to join the meetings. All participants had previously been informed about participating in the LS-meetings and in the focus groups. They were informed about ethical considerations and gave their written consent to participate in the study.

### **Data collection**

The 13 participants were divided into two focus groups, both having males and females, with a total of seven and six in each group. This is in accordance with the recommendations of the focus group interview method since small groups have been shown to be more conducive for everyone to express their viewpoints (Holloway & Galvin, 2017). The focus groups were conducted by author one, author three, and author four. The first focus group was led by author three while author one acted as assistant. The second focus group was led by author one while author three acted as assistant. Author four acted as assistant in both focus groups. The assistants took notes and handled the audio-video recording. The assistants also supported the moderator by encouraging the participants to discuss a given issue under the guidance of the moderator. Each focus group interview varied between 60–90 minutes in length. The older adults in each group were asked to share their experiences of applying the PDSA cycle related to the pillars of active aging. The questions asked were semi structured. Some yes-no questions were used to remind

participants of their individual goals which were defined at the LS-meetings. Follow-up questions were asked to clarify the researchers' understanding. The questions were as follows: *Did you follow through on your plan after the LS meeting? Did you achieve your goals to promote health, security, or participation in your daily life? How have you carried your individual plan? What kind of changes or improvements occurred when you followed your plan? Could you please tell me how you feel? Did you experience any problems or issues when following through on your plans? Could you please tell me how you feel about participating in the meetings?*

### **Data analysis**

The audio-recorded focus group interviews were transcribed verbatim. Bilingual translation experts translated all transcripts from Thai to English. Then, the first, third, and fourth authors verified the correctness to avoid loss of meaning, as two of the authors were non-Thai speaking. The transcriptions in Thai were analyzed by two Thai authors. They conducted the thematic analysis described by Braun and Clarke (2006). This includes six phases. In the first step, all authors read the transcribed texts line by line separately several times to familiarize themselves with the data. Author one listened to the audio-recorded interviews, watched video recordings, and read the field notes to confirm what was said and communicated among the participants to strengthen the interpretation of the data. In the second step, the first and third authors separately identified the words in the statements that related to how participants described their experiences of participating in every step of the PDSA cycle. Author four suggested notable meaning from transcribed materials and communications among participants which were addressed in the fieldnotes. In the third step, author one and author three generated codes to identify features of interesting and meaningful data (semantic, content, or latent) regarding the experiences of applying the PDSA cycle for lifestyle changes. Improvements made while participating in the LS-meetings were also identified. These codes were discussed between the two authors and agreed to. In the fourth step, themes were first defined by author one and author three. Concept mapping was used to collate the codes by gathering all the data relevant to each potential theme. In this step, the themes related to the experiences of participants were identified. In the fifth step, authors one and three reviewed themes by checking the relationship of the themes to the coded extracts and the entire dataset. In the sixth step, all authors discussed refining and generating clear definitions and names of each theme. All themes were confirmed by all authors. The last phase reported the results of the analysis, which are presented below.

## Findings

The findings illustrate older adults' experiences of applying the PDSA cycle for lifestyle change, which they presented in the LS-meetings. Although they did not mention the name of any steps, their experiences were expressed related to each step of the PDSA cycle. At the LS-meetings, topics referring to change were based on the basic pillars of active aging, health, participation, and security. The participants therefore were also asked to express experiences of applying the PDSA cycle related to the three basic pillars of active aging.

Four themes emerged from the analysis: 1) goals based on daily routines, 2) roads taken to achieve the goals, 3) aspects affecting goal achievement, and 4) improvements influencing daily living. The first theme "goals based on daily routines" described what had been chosen to be changed. This is the task of the Plan step of the PDSA cycle. Participants decided to take small steps forward to reach their personal goals, which were based on their daily life routines. The second theme "roads taken to achieve the goals" presented how participants opted to reach their goal, which consisted of the difficulties and challenges that they faced during the subsequent steps of the PDSA cycle. The theme describes how the participants dealt with the obstacles and found new ways to think about taking responsibility for their own health. This theme also shows how participants applied the Study step. The Study step also provided the opportunity to learn from each other. The third theme "aspects affecting goal achievement" presented the factors that influenced the possibility of the participants reaching success in regard to their goal. The fourth theme "Improvements that influenced daily living" presented how the participants had improved after taking part in the meetings applying the PDSA cycle. Quotes sometimes include three dots ... to show that some words are left out but without changing the meaning of the quote. Explanatory notes in brackets [] are likewise added for readability. Fictive names are used to secure confidentiality of the participants.

### **Goals based on daily routines**

Applying the PDSA cycle to enhance active aging starts by defining a goal in the Plan step. Difficulties setting individual goals were found at the beginning. The participants said it was difficult to think about what should be changed, and why changing was needed, it was hard to decide about defining an individual goal. Support and explanation by the moderator of the LS-meetings was therefore needed at the beginning.

*Pong: ... Planning is too hard to do by yourself. I need your advice. Moderator: I will only advise you a little bit. You all decided [your own goal] and did so by yourselves. Therefore, the important person is not me but rather everyone else ... Pong: When you ask me to*

*think and plan, I sometimes cannot come up with any good ideas. The planning process is hard for me. (Group A)*

Participants described that the examples given before setting plans were helpful as a guideline. When the participants understood that the changes could be small and based on their daily routines, they felt confident to define their individual goals. Most participants had defined individual goals and were clear about how to reach their goals by deciding a point of departure regarding their ordinary daily routines. It seemed easier for them to set individual goals and plan to carry out the lifestyle change when they considered the individual goal as a small change. Participants also explained that the difficulty in setting a plan was related to self-perception and a lack of confidence in expressing. Sometimes they felt that they lacked the ability to explain their ideas to the group.

*Sam: It [carrying out the plan following the steps of PDSA cycle] is not hard. I feel it is not harder than what I've done daily, so it isn't hard for me . . . Kham: It is not so difficult because what you advised [in the mini lecture] seemed similar to what I always do. Therefore, it is not too hard. I do not have to think so much. It is neither too difficult nor too easy. It is doable just through the daily activities that I have always done. (Group A)*

Some participants talked about defining individual goals by adapting their way of carrying out daily routines, such as adjusting a little bit in detail or increasing the amount of exercise. Ultimately, these individuals found their own ways by adjusting their personal goals. Moreover, after having set individual goals, the participants applied the Do step. When they faced some obstacles, they had the opportunity to learn to deal with the obstacles from each other when participating in the Study step at the LS-meetings. Moreover, they could learn from their own experiences.

*Sampo: I did exercise before you came, but not like this. I did work chores like sawing wood and anything that needed to be done around the house. For me, house chores are not a form of exercise. However, now, when I exercise as I promised, I feel like doing house chores is only an extra benefit. The exercises that were advised by you made me feel better. (Group B)*

Health, which is the first pillar of active aging was most mentioned. The pillar of health was seen as the most important one for older adults. Moreover, health was easy to think about and changing it was a concrete daily activity. Thus, small scale changes to the daily routine related to the health pillar were easier.

*Sam: I think it's good. It's good that we get to talk about health because we cannot go far when being unhealthy. Health is the key. Other parts are also good, but you must be healthy first . . .*

*Taw: Yes. It's like we have something more to do to be healthy. (Group A)*

Although Thai older adults faced difficulties in setting goals and planning from the beginning, they could set their own individual plans. Support by the moderator helped them to think about adjusting their daily routines so that they would become their own individual goals. Planning to change familiar activities on a small scale was easier.

### **Roads taken to achieve the goals**

After setting individual goals and deciding how to carry them out, the rest of steps of the PDSA cycle were experienced as being easier. Challenges during plan implementation were outlined in the Do step of the PDSA cycle. Activities were adopted and adjusted while carrying out these plans on the health pillar. There was, for example, intensive talk about using a specific type of preservation (monosodium glutamate) to improve the taste of food. A woman who had a plan to reduce the utilized amount of this preservation was worried about how dissatisfied her family would be. She said that this change would be hard to deal with, but she decided to add a little bit of sugar instead and asked her family to support her goal. Another woman experienced the challenge that she could not do one thousand arm swings in a single set, so she divided it into three or four sets according to her available free time.

A man talked about his failure to save a little bit of money daily; he decided to maintain a monthly allowance instead. This shows his individual goal related to the pillar security of active aging.

*Lert: I told you that I will save two hundred baht per month. Sometimes, saving one or two baht a day doesn't help me reach my goal. I give it all to my grandchildren. They have no parents. However, I have a monthly allowance from the government, right? So, I'll save some of that in case one day I don't have any income. I learned from that. I will save at least two hundred baht a month. (Group A)*

When some participants faced challenges, they adjusted their execution plan by themselves and looked for activities that were better and more suitable to their daily living style. In addition, they could carry out (the Do step) and deal with the obstacles by applying and reforming (the Study step) the activities to attain (the Act step) their goals by themselves. Moreover, learning from each other and the group dynamics also affected the participants' success in reaching their goals.

### **Aspects affecting goal achievement**

There was both support and obstacles when participants tried to reach their individual goals. One example of this is family support. When one participant planned to exercise at home, her grandchildren gave her an indoor exercise bike. This made it easier for her to exercise safely. However, extended family

members were sometimes experienced as obstacles in carrying out the Do step of the PDSA cycle. For example, family members might not understand or support, changes in eating habits as highlighted in the previously mentioned example of an older woman who planned to reduce unhealthy food conditions. This woman was worried that her family members would not agree with her goal since the taste of the food she prepared might change. Family members could thus both be supportive and act as obstacles in carrying out plans.

Since carrying out the individual plans was done in private and could not be observed, the group process was experienced as a support and inspiration for reaching one's goal. Expressing one's goal to the group was a kind of promise to follow up in the next meeting and was therefore important to keep, according to the participants. This viewpoint demonstrates the influences of the experienced group dynamics when applying the PDSA cycle, which the following quote elucidates.

*Mak: I promised [to carry out an individual plan], I promised myself. I have to keep it. If you only teach, I can remember it, but we promise to each other, so it's like a promise from the heart. (Group B)*

In addition, suggestions made by other participants were also considered since they presented what they learned from one another or in some cases copied the plans of others if doing so benefited them. Some participants decided to define an additional goal when they discovered an activity carried out by someone else that they thought might be useful for themselves.

*Mak: She told someone. There was somebody who mentioned coffee. I listened and then tried to think about my own plan . . . Tim: We merged it with our plans. Mak: Yes. Whatever people said. How they exercised; I wanted to do just like them. I copied them; they can't blame me. I know myself well. Sometimes I can't because of my health condition. (Group B)*

The moderator's role was important. The moderator kept the group together, ensured everybody had a say, explained pedagogically, and gave examples to make sure the participants understood the idea of the PDSA cycle and the steps. Participants showed that they always trusted the moderator as a health professional. The advice from the moderator helped them to apply each step. Although the moderator only guided and encouraged the participants until they defined their own goals by themselves, the participants still experienced that encouragement by the moderator was needed.

*Pong: If you [the moderator] did not give advice to us, we would do nothing. We have done things because of your advice . . . Lert: If you had not come and advised us, then we would have maintained our fate . . . Jit: We always follow the health staff suggestions. Moderator: However, do not forget that what we have done was not done just on my advice; rather, you planned this by yourselves, right? Could you please share some ideas about this? . . . Sam:*

*Well! . . . I was doing exercise by myself before you came. After your advice, it got even better. (Group A)*

The group dynamics, mainly centered around learning from each other and keeping promises, could also affect goal attainment. Moreover, the moderator's role of balancing between advising and mentoring influenced the success of applying the PDSA cycle. Ultimately, the benefits experienced by older adults themselves while following the steps of the cycle were mentioned as reasons for participating in the meetings. The participants showed that they had improved in several ways after participating in the LS-meetings.

Factors affecting goal attainment thus included family support, group dynamics (including learning from each other and keeping promises), the moderator's role which consisted of balancing between giving suggestions and mentoring, and the participants' perceived benefit of following the steps of the PDSA cycle. All the mentioned factors affected the achievement of setting plans and goals, as well as carrying out the plans, which led to reaching the goals.

### ***Improvements influencing daily living***

The benefits of participating in the LS meetings and applying the PDSA cycle were expressed in several ways. The participants were pleased to carry out their plans because they felt that doing so benefitted their lives. While one woman said that she had been drinking a lot of water to benefit her body, another man talked about trying to increase his amount of exercise. The participants also described the LS-meetings as inspiring, as they could socialize with one another in the group, and they were reminded to take care of themselves.

*Tim: Our body, our internal organs have their own diseases, like gas. When we drink water, it wipes out all that bad stuff. A few days ago, my stomach hurt; I drank water and it felt better, lighter . . . Sam: The exercises that were suggested by you? I think, they make me feel better . . . Pram: I have knowledge and ideas. You advised doing this and that. Once I did them, I felt very happy. So glad. It feels relaxing in my body and my mind. (Group B)*

Notably, the participants turned to thinking about how the activities benefited them. Instead of only performing activities as part of a daily routine, they paid more attention to the results of doing the activity. A couple of women compared their ways of thinking before and after applying the PDSA cycle. They described that before participating in the LS-meetings, they only drank water when they were thirsty. However, now, they paid attention to drinking water as well as measuring how much. By following the PDSA cycle steps, they determined how much water they drank by drinking water from bottles and paying attention to measuring their intake by counting bottles.

*Tim: I usually drink a lot of water, many of those six-baht bottles. Before I joined the group, I never counted how many, but I've started doing so after our meeting. If you hadn't come, I would never have known. Everywhere I go, I bring a bottle of water . . . Pram: Stretching like this [shows some stretching moves]. After I did it, I felt lighter, truly good. I used to feel stiff. After I followed Sam's exercise plan, I felt like it can be done regularly. I feel better. My legs feel lighter. (Group B)*

When asked about maintaining what they had done during the time of the meeting using the PDSA cycle, one of the noteworthy answers from the participants was that doing so was good for them, so they would continue carrying out the cycle. They also stated that they were willing to participate in the meetings.

*Sam: It [the meeting] has given me more new knowledge. Pong: It has made my mind happy and cheerful . . . Jit: I have a willingness to do, so I do not feel burdened . . . Pram: Thinking about it, I think staying home alone makes one feel lonely. Sometimes I think, um, meeting with you is good, so I feel glad and proud to join the meetings. (Group A)*

Most participants mentioned that they had carried out the steps of the PDSA cycle and joined the meetings because they had experienced that it was beneficial to their physical and mental health.

*Sam: I think it is good, like we have all said. Yes, as you told us, we follow the steps because doing so is good . . . Sampo: After I exercised, I felt lighter. I never felt this active before. I think it makes me feel better . . . Tim: Well, I'm proud. If I am stressed about something, when I come here, I talk about something else, I feel better. For me, this meeting was good. I get to improve myself. It's better than doing nothing. (Group B)*

Regarding the pillar participation of active aging, the participants talked about helping people in their community, such as going to the temple, and acting as a monk's helper. They talked about how good they felt when doing such things and how being a monk's helper made them feel respected and proud to help others.

For the pillar of security, the participants talked about their financial state, saving money, doing more meditation and praying. One woman talked about her housekeeping account and how she had never done it before. She was surprised to find how much money she spent daily, and she planned to use this account to better organize her housekeeping money.

*Mak: I'll keep my housekeeping account. I recorded my spending, and I found I spent a lot. I get my income and expenses mixed up sometimes. I think it's good. When I pick up a pencil, it is still a little stiff. I am not good at writing. Therefore, I must take my time. It's like reminding myself to let my brain work so I won't forget what I learned from school. (Group B)*

It not only surprised her but was also a chance to return to writing words and numbers after having rarely done so for a long time. She had enhanced her active aging through improving her situation related to her security pillar of

active aging such as better money management and the happiness that came with being reminded of something she had not done for a long time.

The participants experienced their own lifestyle changes regarding their health, participation, and security in various ways. They described the difficulties they had found and how they dealt with them. Participants also mentioned obstacles they had faced and how they had been supported. They improved their way of thinking by paying better attention to taking care of themselves. In the end, all lifestyle changes they performed and desired to reach their goals were according to their daily lives in their context.

## Discussion

Findings illustrate the viewpoints of the older adults themselves from their experiences of participating in LS-meetings applying the PDSA cycle. Difficulties described initially were related to the plan (P) step of the PDSA cycle and could be related to a lack of motivation to make lifestyle changes. One of the difficult aspects experienced when changing something is the motivation to make the change, especially when one does not see what needs to change (Cherry, 2021; Sujic, Beaton, & Bogoch, 2016). Having the initiative to improve one's health alone is not common among Thai people, especially when they meet health personnel (Chunuan et al., 2007). Older adults may feel insecure when being challenged with a new way of thinking, taking responsibility for their own aging and health. According to common gerontological knowledge, people often find it harder to adapt to new situations as they age. On average, older people find it harder than younger people to find new ways of acting to achieve goals. An older person who is learning something new often needs more time, explanations, as well as concrete examples in the processing of new knowledge (Carstensen & Hartel, 2006; Matamales et al., 2016). Once they had examples and understood the steps of the PDSA cycle, these older Thai adults could define their own individual goals more easily. The Plan step of the PDSA cycle can inspire one's own sense of responsibility to think about what should be changed. The idea behind encouraging change in the PDSA cycle is to start with small steps of change, which are realistic and easy to follow and thus reach one's goal. Many small steps of change can lead to larger changes and more challenging goals. Starting with a small-scale step can increase one's confidence in acting and learning. It also minimizes the risk of failure for participants (Taylor et al., 2013). Certainly, the plans and goals set were new, but most of them were applied based on daily routines and consisted of small and simple changes. The Do, Study, and Act steps of the PDSA cycle provide the opportunity for participants to evaluate and adjust their activities to reach the goal by themselves when faced with obstacles or to find better ways of reaching the overall goal which enhances active aging.

Family could be both supportive and non-supportive of lifestyle changes while applying the PDSA cycle. Older Thai adults in the study area usually live in multigenerational housing. They usually have close family relationships and are supported by their family (Knodel, Prachuabmoh, & Chayovan, 2011). It is noteworthy that British (Gilbertson & Batty, 2011) and Swedish (Nilsson, 2006) studies which both applied the PDSA cycle in a group context to make individual lifestyle changes, made no mention of any kind of support in between the group meetings from family members.

Thai culture like other Eastern countries is said to be more collectivist (Buriyameathagul, 2013). The findings of this study show family influence on older adults and on the PDSA cycle. Group dynamics were also influenced by the predominant collectivist culture in Thai society. Society can influence individual decision making and behaviors through interaction between an individual and society (Lim, 2022). When each participant expressed their goals to the group, doing so could be seen as making a promise that the person must then keep. This peer pressure encouraged the participants to maintain progress toward carrying out their plan and achieving their goal. This characteristic of Thai older adults should be noted when conducting LS-meetings.

Learning from one other was another aspect of support. Participants saw examples of setting individual plans and defining goals. Each participant also copied other participants' activities, then adapted them to their own positive lifestyle. Thus, according to the study participants' experiences, individual lifestyle changes made through group activities are easily accepted and applied. The findings also point out that older adults inspired one another. Among these older participants there were persons who had the potential to be a moderator of the group meetings. This would thus empower these older Thai adults to own their aging. The group process proved to be advantageous in enhancing the success of lifestyle changes made by applying the PDSA cycle. This outcome is suitable for the regular activities applied in senior citizen clubs, senior citizen schools, and health care units in Thailand (Foundation of Thai Gerontology Research and Development institute (TGRI), 2019).

Health care staff have an important role in providing activities and environments in setting places such as daycare units to support opportunities to enhance active aging by older adults themselves (Larsson Ranada & Österholm, 2022). Similarly, health care personnel in Thailand take the role of key person in senior citizen schools, senior citizen clubs, and health care units. Older Thai adults commonly believe and follow the advice of their health provider (Chunuan et al., 2007). Balancing the role of the moderator, who is seen as a health provider, could affect the success of applying this tool.

This current study provided further knowledge about promoting the ability and responsibility to enhance active aging at home. Older people desire to live in their own homes until the end and it is therefore important to promote the ability to live in one's own home independently (Lim & Bowman, 2022). This

study shows the older adults' perceptions of the moderator's supporting role in the LS-meetings during the application of the PDSA cycle. The findings also show that some of the participants may need some guidelines, confirmation, and encouragement for their self-confidence, which may be helpful when using this tool. Believing in and following the advice of health professionals could be both positive and negative. On the positive side, doing so could motivate older Thai adults to be willing to participate in the meetings and to keep their promises to reach their goals. On the other hand, getting used to following advice rather than thinking independently might become a barrier to initiating and managing individual change. Thus, health providers working as moderators in LS-meetings must be educated to understand the concept of the PDSA cycle and how to use it. Otherwise, they can easily fall into the 'old roles' of being the authority regarding health with the older adults as submissive listeners. They should balance their role between being a leader and facilitator when applying the PDSA cycle. The moderator also should have the skills to nurture self-confidence in participants by creating a friendly and relaxed meeting atmosphere, as well as by giving participants the time to learn.

The findings also showed that participants were concerned about their health and wanted to do things that were good for them. Thus, being more concerned about their health and maintaining healthy behaviors could motivate their lifestyle changes after participating in the meetings using the PDSA cycle. However, although health, which is the first pillar of active aging (World Health Organization, 2002), was emphasized, the pillars of participation and security were also provided as topics to be changed.

The PDSA cycle, especially at the study step, provided opportunities for evaluation, discussion, and learning from each other and influenced the participants' decisions to keep or adjust their plans. Meanwhile, the PDSA cycle could provide an opportunity for older Thai adults to maintain a new mind-set, i.e., that they have potential, rather than feeling that they are older persons with slow thinking and fewer social skills. Perhaps this change mirrors notions of the self-image of older adults in Thailand.

The diversity of the participants pointed to individual differences in terms of thinking, verbalizing thoughts, and plan setting abilities. This may have affected tool utilization ability in some participants. In addition, some differences, such as gaps in educational level, could affect self-perception, social participation, work, and other active aging activities among older adults, according to Arpino and Solé-Auró (2017), as well as social inequalities related to the level of active aging and health status indicators, as reported by de Souza Braga, Lima-Costa, César, and Macinko (2015). Thus, a moderator who applies the PDSA cycle to an activity should be cognizant of the culture and group characteristics, as well as the individual differences among the participants.

Active aging aims at providing an opportunity to enhance one's quality of life. The PDSA cycle also encouraged older adult participants to actively engage in activities that benefited them. This is in line with the perspectives of the active aging of older Thai adults that was reported in the study by Thanakwang et al. (2014), which showed that older Thai adults in the study identified active aging as the process of being actively engaged in one's life in the sense that older adults make contributions and achieve happiness by doing things that are beneficial for themselves, their family, and their community. The participants experienced that the LS-meetings which used the PDSA cycle were helpful in contributing to promoting planning, carrying out, evaluating, and adapting to better ways of living actively according to their own initiatives. This study found that older Thai adults can find their own ways to adapt and manage lifestyle changes. This outcome is in line with the concept that each individual older adult should consider either engaging or disengaging in activities according to their abilities, values, and resources (Gonot-Schoupinsky et al., 2021). The PDSA cycle could encourage older adults to think about participating in social activities even if these older people have fewer social interactions as they age and thus have less social contact than younger people.

**Limitations:** A limitation of this study is the relatively small number of participants and the fact that the LS meetings were only conducted four times. Nonetheless, as this is a qualitative study that explores variations of experiences, the data material was assessed as being sufficient. The inclusion criteria used in this study did not include the perspectives of participants with illnesses or those with less social participation; however, doing so could have added more depth to the study. The PDSA cycle should further be applied to meetings in a real setting, such as senior citizen schools, and senior citizen clubs where various older adults can be found.

## **Conclusions**

The experiences related to having used the PDSA cycle show that Thai older adults have the potential to undertake initiatives enhancing active aging by themselves. Adjusting daily living to a new lifestyle made goal setting in the Plan step easier. LS-meetings that follow the PDSA cycle provide the environment to learn in a group dynamic with the support of moderators in the meetings. Older Thai adults were empowered to think about their responsibility and ability to enhance their own active aging. The success of managing lifestyle changes by themselves made the participants more confident about undertaking initiatives enhancing active aging in their own new ways. The PDSA cycle has the potential to be used by health providers in the Thai context.

### ***Suggestions for practice and policy***

Since the findings show that Thai older adults could enhance active aging by themselves when applying the PDSA cycle to group meetings, this intervention should be offered to policy makers to promote using this tool by health providers on a practical level. It could be a tool for encouraging responsibility and growing the capacity of older adults to enhance active aging by themselves in senior citizen clubs, senior citizen schools, and other care units in Thailand.

### ***Suggestions for future research***

This pioneering study into the application of the PDSA cycle to promote the capacity and responsibility of older adults to enhance active aging in Thailand is also reflected by a paucity of international studies. Therefore, further studies focusing on the application of the PDSA cycle in various contexts should be conducted both in Thailand and internationally. In the Thai context, because living in an extended family where several family members are involved in the application of the PDSA cycle for lifestyle change, means peer pressure similar to the LS-meeting groups described in this study. Therefore, research on using the PDSA cycle where several family members are involved could possibly increase the likelihood of maintaining lifestyle changes. It will be useful to find out how to apply this distinctive point to promote enhancing active aging by applying the PDSA cycle.

Some participants showed potential leadership abilities. A study into the promotion of older adults to become involved in facilitating PDSA cycle meetings should be conducted. It might be of benefit to find a way of encouraging older adults to provide group meetings and enhance active aging by themselves.

### **List of abbreviations**

LS meeting: Lomwong Saangsook meeting

PDSA: Deming cycle, which consists of four steps, namely, plan, do, study and act

WHO: World Health Organization

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## Author contributions

Author one contributed to the study design, data collection, data analysis, and wrote the manuscript. Author one and author three performed the focus groups, while author four acted as an assistant, observed and performed note taking. Author two, author three, author four, and author five refined the study design, assisted in the interpretation of data, conducted critical reading of the manuscript, and participated partly in writing or gave suggestions during the writing process. All authors have read and approved the manuscript.

## Ethical Approval

This study was approved by the ethics committee of the regional Swedish Ethical Review Authority Uppsala, Sweden, number 2016/567 (2003:460), and the Institutional Review Board Committee of Boromarajonani College of Nursing Nakhonratchasima, Faculty of Nursing, Praboromarajchanok Institute, Thailand, number AF09-10COA No. 001/2560. All participants received oral and written information about the overall purposes, protocols, time required for participation, and the right to withdraw from the study. The written consent forms were completed before collecting data. Confidentiality was maintained in all data collection and analysis processes. Materials were kept in a safe place and protected against exposure.

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## Data Sharing Statement

Not applicable. The datasets generated and/or analyzed during the current study are not publicly available due to the restrictions of our ethical vetting; as this is an ongoing doctoral research project with unpublished data, the data are available from the corresponding author upon reasonable request.

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