



Factors Influencing the Use of Herbal Medicines in Public Health

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Abstract: To foster independence and cut costs, Thai traditional medicine and herbs are becoming more well-known within Thailand's healthcare system. Nonetheless, Pathum Thani Province's use of herbal medicines remains lower than the national average, highlighting a discrepancy between policy and reality, especially in areas such as Keha Rangsit Khlong Hok. Factors associated with the use of herbal medicines for self-care include personal factors, predisposing factors, enabling factors, and reinforcing factors. A survey study was carried out. A survey with an Item-Objective Congruence index of 0.92 was used to randomly select 318 residents (aged 20–59) from Keha Rangsit Khlong Hok, Pathum Thani Province. Chi-square tests and descriptive statistics were used to assess the data; (3) Results: Use of herbal medicine was low (mean 1.55), despite moderate to high attitudes (mean 3.44) and knowledge (46% high). There was a substantial ($p < 0.05$) correlation between usage and occupation, marital status, and gender; (4) Conclusions: Effective promotion strategies are needed to bridge the gap between the community's knowledge and attitudes on herbal medicine and its actual use.

Keywords: Behaviour; herbal medicine; healthcare

1. Introduction

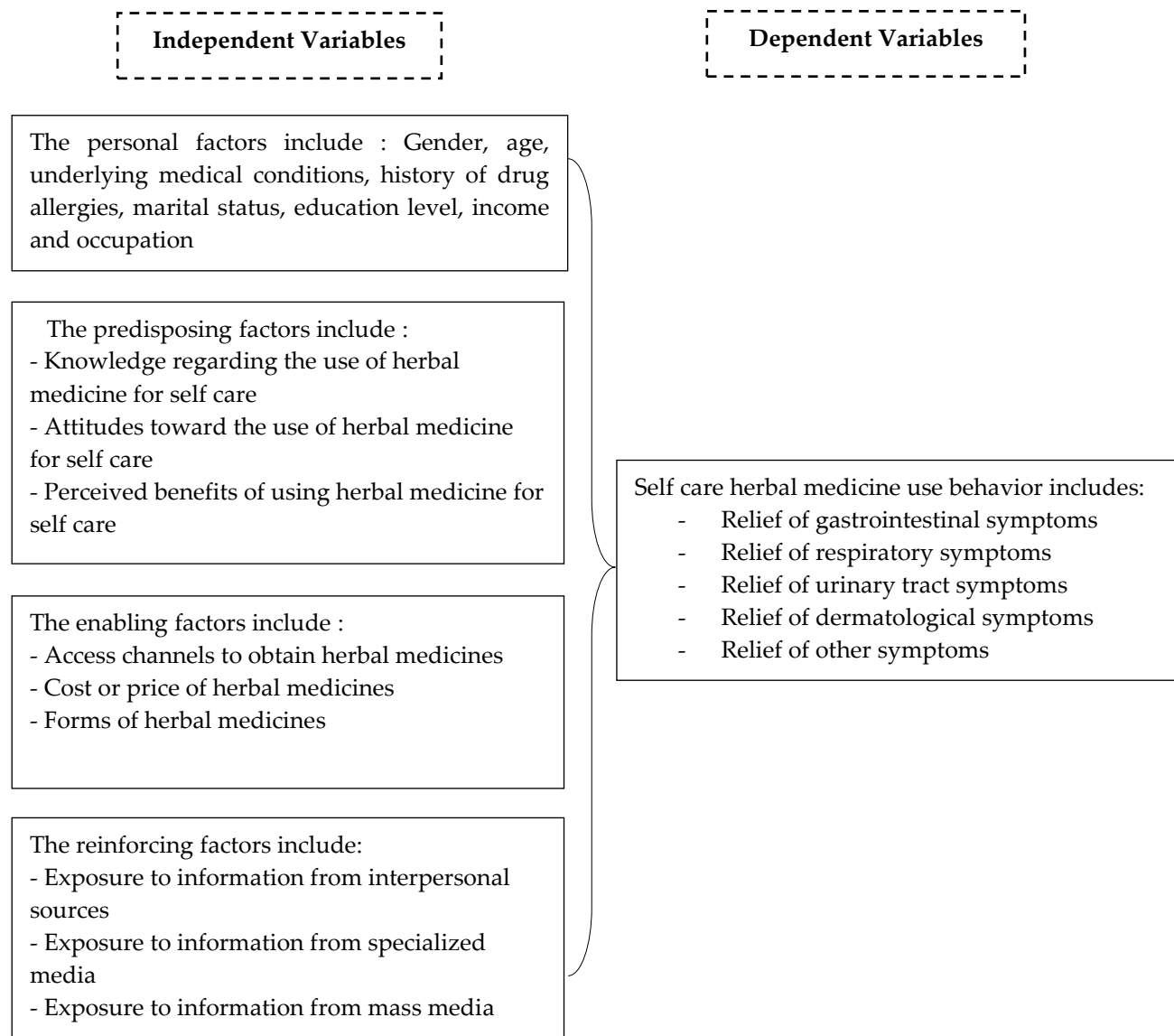
Thai traditional medicine and herbs, which have deep roots in Thai society, are a body of health knowledge that is increasingly being recognized in the nation's current healthcare system, particularly in relation to health self-reliance, a significant trend in health promotion for the twenty-first century (Ministry of Public Health [1]. According to the National Health Commission Office [2], the usage of herbs is considered a vital tool that helps people take basic care of themselves, reduce healthcare expenses, and lessen dependency on the modern medical system in non-essential situations. In an attempt to incorporate herbs into the mainstream healthcare system, government policy consistently promotes their use. It sets a goal for public health facilities to use medicines made from Thai herbs, with a minimum of 6% of total medicine use (Department of Thai Traditional and Alternative Medicine [3]). The rate of herbal medicine use in Health Region 4, which includes Pathum Thani Province, is still lower than the national average, at 3.60% compared to 5.53%, according to data from the Ministry of Public Health's Health Data Center [4]. This highlights a disconnect between public health behavior and policy.

Herbal medicine use behavior among the population is a health-related behavior influenced by multiple factors, including both personal and environmental determinants. Therefore, explaining such behavior requires applying relevant concepts and theories that comprehensively account for its underlying causes. The PRECEDE Model, developed by Lawrence W. Green and Marshall W. Kreuter, provides an appropriate framework for this purpose. This model is widely recognized in public health research for its strength in providing a systematic and stepwise approach to problem analysis. It begins with an assessment of health issues at the societal level, then links these to related behavioral and environmental factors, and further considers key determinants such as knowledge, attitudes, resources, and social support, all of which influence individual behavior. The model emphasizes the analysis of three major categories of factors affecting health behavior: predisposing factors, enabling factors, and reinforcing factors [5]. In the context of herbal medicine use, predisposing factors such as knowledge of herbal medicines, beliefs about their safety, and attitudes toward traditional Thai medicine influence individuals' decisions to use herbal remedies. Enabling factors, including access to herbal medicines or traditional Thai medical services, facilitate more convenient use. Meanwhile, reinforcing factors such as recommendations from healthcare professionals, family members, or peers serve as supportive influences that encourage continued and more confident use of herbal medicines.

In Pathum Thani Province, the Keha Rangsit Khlong Hok hamlet is situated in a semi-rural, semi-urban environment. The aging population is steadily growing, and the majority of people are workers with moderate to low average household incomes. According to data from the Pathum Thani Provincial Administrative Organization [6], 26% of the population is elderly, a demographic that is frequently at higher risk of health problems and in need of safe, affordable healthcare. Additionally, 82% of the population makes no more than 15,000 baht per month. Therefore, encouraging the usage of herbs is a good strategy for this community's circumstances. Additionally, it has been noted that some locals use plants daily, such as aloe vera for wound care, ginger, galangal, and lemongrass boiled for drinking to relieve cold symptoms, and Fah Talai Jone (*Andrographis paniculata*) during the COVID-19 epidemic. However, there are still prejudices or a lack of faith in the effectiveness of herbs compared to modern treatments, the selection process is not systematic, and thus, herbal use behavior lacks accurate knowledge and a systematic understanding [7]. As a result, researching the population's use of herbal medicines for self-care in this region is essential for developing community-level public health policies and providing baseline data for effective, long-lasting herbal health promotion initiatives.

To better understand the context, requirements, and constraints of the local population, it is crucial to investigate the self-care herbal medicine use behavior of residents in the Keha Rangsit Khlong Hok village, Pathum Thani Province. Given the lack of empirical evidence systematically explaining the causal factors influencing herbal medicine use in this urban community context and the absence of a clear theoretical framework, the application of the PRECEDE Model is highly important. This model enables a comprehensive analysis of the determinants of herbal medicine use behavior at both the individual and environmental levels, thereby contributing to the development of appropriate and safe strategies for promoting the use of herbal medicines. To develop policies or guidelines that support the appropriate use of herbal medicines in alignment with the community's way of life and available resources, thereby leading to a sustainable improvement in the population's quality of life.

1.1 Conceptual Framework



2. Materials and Methods

2.1 Study design and sample

This study explores the factors associated with the population's use of herbal medicine for self-care. There are 1,042 residents of Rangsit Klong Rok Housing Community in Pathum Thani Province aged 20 to 59. The sample group included 318 people living in the Rangsit Klong Rok Housing Community, Pathum Thani Province. The sample size was calculated using Taro Yamane's formula with a 5% margin of error. A simple random sample was used to select participants from the Keha Rangsit Khlong Hok village in Pathum Thani Province who use herbal medicine for self-care.

The formula used for calculation is:

$$n = \frac{N}{1 + Ne^2}$$

When:

- n represents the sample size
- N represents the population size
- e represents the acceptable margin of error, 5%

Substitute the variable

$$\frac{1,042}{1+1,042(0.05)^2}$$

Therefore, the calculated sample size was 289 participants. However, to account for potential data loss or participant attrition, the sample size was increased by 10%. Thus, the final sample size was 318 participants.

Inclusion Criteria for Volunteers

1. People aged 20-59 years old who live in the area of Rangsit Housing Community, Klong Hok, Pathum Thani Province.
2. People who have taken care of their personal health by using herbal medication.
3. People without hearing or speech disabilities.
4. People who are fully cognizant and capable of thinking.
5. People who can answer the interview questions and who can communicate in Thai.
6. People who have lived in the Keha Rangsit Khlong Hok community area in Pathum Thani Province for at least six months.

Exclusion Criteria for Volunteers

1. People who are unable to respond to the survey.
2. People who are unable to take part in the research project.

2.2 Ethical considerations

This study was approved by the Rajamangala University of Technology Thanyaburi Research Ethical Committee (RMUTT_REC No. COA 90/67). It was designed to adhere to established clinical study guidelines, including the CIOMS Guidelines, the Belmont Report, the Declaration of Helsinki, and the International Conference on Harmonization Good Clinical Practice (ICH GCP) [8],[9]. Participants in the study who qualified were selected after ethical approval. Before any study-related procedures began, each participant signed an informed consent form.

2.3. Data collection

After the research project was considered and approved by the Human Research Ethics Committee of Rajamangala University of Technology Thanyaburi, the researcher wrote a letter requesting permission to collect data to the head of the Rangsit Housing Community Group, Klong Hok, Pathum Thani Province. To obtain permission to conduct research and clarify the volunteers participating in the project regarding the purpose of the research, as well as to protect their rights and sign the Rights Protection Form. In the consent form to participate in the research, answer the questionnaire and complete it. The researchers then used the data to assess accuracy and completeness before using it for statistical analysis.

2.4 Research instruments and Data analysis**2.4.1 Research instruments**

This study used a tool to collect data across 5 episodes, developed based on the PRECEDE Model. The questionnaire was sent to 3 experts. Consider checking the accuracy, coverage, and appropriateness of the language used in each question. The index of item (Objective Congruence: IOC) is analyzed and found to be 0.92 [10]. The questionnaire was then improved and modified, and its reliability was tested on the sample (Try-Out) at the 95% confidence level using the coefficient method based on Cronbach's Alpha [11], yielding a coefficient of 0.82.

Part 1: General information questionnaire, including gender, age, medical conditions, and history of drug allergies: status, education level, income, and occupation. The questionnaire is a checklist and has 8 questions. It is a closed-ended questionnaire.

Part 2: Questionnaire on the knowledge and understanding of the use of herbal medicine based on the application of the PRECEDE Model, specifically the predisposing factors. The questionnaire has 14 questions, each with an estimation scale of 3 levels: Yes, No, and Unknown. The scoring criteria are as follows: 1 point for correct answers. Wrong answer and do not know 0 points. There are 3 levels of

knowledge classification: low, medium, and high. Bloom's [12] criteria, knowledge levels were divided into three categories: low knowledge (0–59.99%), moderate knowledge (60–79.99%), and high knowledge (80–100%).

Part 3: Questionnaire about attitudes and benefits in the use of herbal medicine. Based on the application of the PRECEDE Model, specifically the predisposing factors. There are 10 questions, and the messages have both positive and negative sides, with 5 rating-scale questions according to Likert's design [13]. The researcher used the criteria for classifying the score of Best [14] as follows: low level has an average of 1.00–2.33, medium level has an average of 2.34–3.66, and high level has an average of 3.67–5.00.

Part 4: Questionnaire on Herbal Medicine Use Behavior. Based on the application of the PRECEDE Model, specifically the enabling factors. The question is a rating scale with 3 levels: practice every time. Practice sometimes and never practice: Rate 3, 2, and 1, respectively. The criteria for classifying the score of Best [14] are as follows: Low level has an average of 1.00 – 1.66, medium level has an average of 1.67–2.33, and high level has an average of 2.34 – 3.00. Also inquire about the channels for obtaining herbs, their cost, and the form of the herbs. The question is multiple-choice. If you answer "yes", give 2 points; if you answer "no", give 1 point. The researcher used the criteria for classifying the scores of Best [14] as follows: Low level has an average of 1.00 – 1.66, medium level has an average of 1.67–2.33, and high level has an average of 2.34 – 3.00.

Part 5: Evaluation Form on Information and Suggestions About the Use of Herbal Medicines from Different Sources. Based on the application of the PRECEDE Model, specifically the reinforcing factors. The question will be an evaluation scale. There are 3 answers to choose from: ever, never, and don't answer. If ever, give 1 point, never, and don't answer 0 points. The researcher used criteria to classify the scores. As follows: Low level has an average of 0 – 0.5, high level has an average of 0.51 – 1.00.

2.4.2 Data analysis

Descriptive statistics were used to analyze the general characteristics of the study population, including gender, age, underlying medical conditions, history of drug allergies, marital status, educational level, income, and occupation, using frequency and percentage distributions. Data on predisposing, enabling, and reinforcing factors, as well as behaviors related to the use of herbal medicine for self-care, were analyzed by calculating the mean and standard deviation. The relationships between personal factors and herbal medicine use behaviors were examined using the Chi-square test.

3. Results and Discussion

3.1 Results

The purpose of this survey study is to examine the use of herbal medicine in public health care and to examine the relationship between individual characteristics, predisposing factors, enabling factors, and reinforcing factors in the behavior of using herbal medicine for public health care. Thus, the following arrangement is how the researcher would like to display the data:

Part 1: Respondents general data, It was found that most of them were female, 60 percent, 63 percent are in the 50–59 age range, 60 percent have no underlying medical conditions, 96 percent have never had a drug allergy, 63 percent are married, 45 percent have most Primary School Graduates, 31 percent income between 7,001 and 9,000 baht per month, and 54 percent are Trading profession.

Part 2: Knowledge of the use of herbal medicines in health care of the people in the Keha Rangsit Khlong Hok community in Pathum Thani Province, 46 percent have a high degree, followed by moderate at 38 percent and low at 16 percent of understanding about the use of herbal medicine for public health care, as indicated in Table 1.

Part 3. Attitudes and perceptions of the benefits of using herbal medicine in health care. Moderate consent overall ($\bar{x}$ = 3.44, S.D. = 0.71). When classified by item, it was found that using herbal medicine to relieve symptoms and get better, would you recommend or pass it on to others? It has the highest mean ($\bar{x}$ = 4.56, S.D. = 0.60). This is followed by supporting the use of herbal medicine in disease treatment ($\bar{x}$ = 4.42, S.D. = 0.69) and using herbal medicine to treat the disease or relieve its symptoms has no toxicity to the body, especially herbal medicine with information confirmed by the Ministry of Public Health ($\bar{x}$ = 4.24, S.D. = 0.90), according to Table 2.

Part 4: Behavior of Using Herbal Medicine for Public Health Care in the Keha Rangsit Khlong Hok community, Pathum Thani Province. Overall low levels ($\bar{x}$ = 1.55, S.D. = 0.53). When classified by aspect, the behavior of using herbal medicine for respiratory illnesses has the highest average ($\bar{x}$ = 2.19, S.D. = 0.71). Secondly, other illnesses ($\bar{x}$ = 1.76, S.D. = 0.39), skin illnesses ($\bar{x}$ = 1.60, S.D. = 0.23), gastrointestinal illnesses ($\bar{x}$ = 1.39, S.D. = 0.42) and urinary illnesses ($\bar{x}$ = 1.35, S.D. = 0.69) respectively. If classified by clause, it is found that behavior of using herbal medicine for respiratory illnesses is mostly consuming emblica when experiencing sore throat, cough, and phlegm symptoms had the highest average ($\bar{x}$ = 2.54, S.D. = 0.61), followed by *Andrographis paniculata* ($\bar{x}$ = 2.24, S.D. = 0.72) and lemon juice ($\bar{x}$ = 2.16, S.D. = 0.54), according to the item classification. The next, behavior of using herbal medicine for other illnesses is mostly using phlai to treat muscle pain had the highest average ($\bar{x}$ = 2.51, S.D. = 0.68), followed by eating boraphet to reduce fever and increase appetite ($\bar{x}$ = 1.63, S.D. = 0.56) and treating lice with a mixture of liquor and custard apple leaves ($\bar{x}$ = 1.51, S.D. = 0.75), according to the item classification. The behavior of using herbal medicine for skin illnesses is mostly treating burns with aloe vera ($\bar{x}$ = 2.50, S.D. = 0.59), followed by treating burns with gotu kola ($\bar{x}$ = 2.00, S.D. = 0.82), and treating bug bite rashes with *Clinacanthus nutans* ($\bar{x}$ = 1.73, S.D. = 0.60), according to the item classification. The behavior of using herbal medicine for gastrointestinal illnesses is mostly. Consuming turmeric for symptoms of indigestion, bloating, flatulence, and stomach disease had the highest average ($\bar{x}$ = 2.00, S.D. = 0.65), followed by neem leaves for improving food intake when feeling famished ($\bar{x}$ = 1.98, S.D. = 0.58), and senna leaves for constipation ($\bar{x}$ = 1.97, S.D. = 0.67), according to the item classification. Finally, the behavior of using herbal medicine for urinary illnesses is mostly consuming roselle juice for dysuria symptoms, which had the highest average ($\bar{x}$ = 1.61, S.D. = 0.61), followed by consuming red sugarcane ($\bar{x}$ = 1.28, S.D. = 0.49), and consuming lemongrass juice ($\bar{x}$ = 1.27, S.D. = 0.48), according to the item classification, as indicated in Table 3.

Part 5: Information Reception About the Use of Herbal Medicine for Health Care of the Public in the Keha Rangsit Khlong Hok village in Pathum Thani Province. Overall low levels ($\bar{x}$ = 0.34, S.D. = 0.47). When classified by aspect, it is found that reception of information from the mass media has the highest average ($\bar{x}$ = 0.36, S.D. = 0.54). Secondly, specific media ($\bar{x}$ = 0.36, S.D. = 0.54) and personal media ($\bar{x}$ = 0.32, S.D. = 0.35) respectively. If classified by clause, it is found that information reception from the mass media is mostly television ($\bar{x}$ = 0.87, S.D. = 0.33), websites ($\bar{x}$ = 0.81, S.D. = 0.39), and radio ($\bar{x}$ = 0.59, S.D. = 0.49) are the main sources of information for people on the use of herbal medicine for self-care. The next, information reception from the specific media is mostly pamphlets ($\bar{x}$ = 0.50, S.D. = 0.50), books or manuals ($\bar{x}$ = 0.43, S.D. = 0.49), and leaflets ($\bar{x}$ = 0.34, S.D. = 0.47). Finally, information reception from the personal media is mostly from friends ($\bar{x}$ = 0.77, S.D. = 0.42), family or relatives ($\bar{x}$ = 0.85, S.D. = 0.35), and community health volunteers ($\bar{x}$ = 0.42, S.D. = 0.49), according to the item classification, as indicated in Table 4.

The results of a Chi-Square analysis examining the association between personal characteristics and this behavior showed that gender, marital status, and occupation are all associated with the use of herbal medicine for health care at the 0.05 level of statistical significance, as indicated. When examined in detail, the findings indicate that gender is significantly associated with herbal medicine use behavior. Females tend to use herbal medicines for self-care more frequently than males. Regarding marital status, married individuals show a higher tendency to use herbal medicines compared to single individuals, which may reflect their roles in family health care. In terms of occupation, those engaged in trade or self-employment are more likely to use herbal medicines than those working as government officials or employees of state enterprises, as shown in Table 5.

Chi-Square analysis of the relationship between predisposing factors and the use of herbal medicine for health care revealed that, at the 0.05 significance level, attitudes toward the use of herbal medicine for self-care are associated with the use of herbal medicine for health care, as indicated in Table 6. The channels for obtaining herbal medicine and the forms of herbal medicine are related to the behavior of using herbal medicine for health care at a statistically significant level of 0.05, according to the results of a Chi-Square analysis that tested the relationship between enabling factors and the behavior of using herbal medicine for health care, as indicated in Table 7. As indicated in Table 8, the results of a Chi-Square analysis of the

relationship between reinforcing factors and the behavior of using herbal medicine for health care revealed that, at the 0.05 significance level, reinforcing factors are not related to this behavior.

3.2 Discussion

The study on herbal medicine use behavior for self-care among residents of the Keha Rangsit Khlong Hok community in Pathum Thani Province found that the population had a high level of knowledge about herbal medicines (46%). This finding is inconsistent with the study by Kritadech Mingmai [15], which examined knowledge, attitudes, and behaviors regarding herbal medicine use among elderly individuals with chronic diseases in Tha Ruea District, Phra Nakhon Si Ayutthaya Province. That study reported that the majority of participants had a moderate level of knowledge (57.5). This finding is also inconsistent with the study by Wilaiwan Chainarong [16], which examined factors associated with herbal medicine use for primary care among residents in Thanyaburi District, Pathum Thani Province, and reported that the majority of participants had a moderate level of knowledge (45.0%). Furthermore, it is inconsistent with the study by Somkiatyos Woradet et al. [17], which investigated factors related to self-care herbal medicine use among village health volunteers in Phatthalung Province and found that most participants had a moderate level of knowledge (68.8%). The findings revealed that residents of the Keha Rangsit Khlong Hok community in Pathum Thani Province had a high level of knowledge regarding the use of herbal medicines. This differs from previous studies conducted across various settings, which generally reported moderate levels of knowledge. Contextual factors may explain this discrepancy, as the study area is a semi-urban community with greater access to health-related information, particularly through mass media and digital platforms. This has enabled the population to receive continuous, diverse information about herbal medicines, compared with earlier studies, thereby contributing to a higher overall level of knowledge. In addition, government policies promoting the integration of herbal medicines into the healthcare system, such as the implementation of herbal medicine services in subdistrict health-promoting hospitals and the dissemination of knowledge through public health agencies, have played a significant role in enhancing public knowledge in the area. These factors may explain the inconsistency between this study's findings and those of previous research.

When considering the levels of attitudes and perceived benefits regarding the use of herbal medicines for self-care, the findings indicated that the majority of participants had moderate attitudes (mean 3.44). This is consistent with the study by Kritadech Mingmai [15], which investigated knowledge, attitudes, and behaviors related to herbal medicine use among elderly individuals with chronic diseases in Tha Ruea District, Phra Nakhon Si Ayutthaya Province, and found that most participants had moderate attitudes (58.2%). Similarly, this finding aligns with the study by Jaruwan Srisroi et al. [18], which examined factors influencing the consumption of herbal decoctions among residents in Khok Lai Village, Sakon Nakhon Province, and reported that the majority of participants had moderate attitudes (78.7%). It is also consistent with the study by Sanga Yookhong [19], which explored knowledge, attitudes, and behaviors related to herbal medicine use among village health volunteers in Yasothon Province and found that most participants had moderate attitudes (63.7%). Although most people perceive herbal medicines as beneficial, safe, and a viable option for self-care, there remain certain concerns and limitations. These include inconvenience in use, uncertainty regarding their effectiveness compared to modern medicine, and the perception that herbal medicines are traditional or outdated. The coexistence of both positive and negative factors contributes to attitudes that are neither distinctly high nor distinctly low, remaining at a moderate level. Furthermore, the current healthcare system, which integrates both modern medicine and herbal medicine, encourages individuals to adopt a "situational use" approach rather than relying on herbal medicine as a primary option. This, in turn, prevents attitudes from becoming strongly positive. In addition, influences from personal experiences and social information sources, such as word of mouth and mass media, which may include both supportive and skeptical perspectives on herbal medicine, also help maintain attitudes at a moderate level.

When considering the use of herbal medicine, the findings indicated that it was low (mean 1.55). This is inconsistent with the study by Kritadech Mingmai [15], which examined knowledge, attitudes, and behaviors related to herbal medicine use among elderly individuals with chronic diseases in Tha Ruea

District, Phra Nakhon Si Ayutthaya Province, and reported that the level of herbal medicine use behavior was moderate (54.7%). It is also inconsistent with the study by Wilaiwan Chainarong [16], which investigated factors associated with herbal use behavior for primary care among residents in Thanyaburi District, Pathum Thani Province, and found that the majority of participants had a moderate level of behavior (33.40%). Furthermore, it does not align with the study by Sukit Chaichompoo et al. [20], which explored factors related to herbal medicine use behavior among the population in Public Health Region 11, and reported that most participants demonstrated a moderate level of behavior (36.2%). This finding is also inconsistent with the study by Phitsanee Wijantruk [21], which investigated knowledge, attitudes, and behaviors related to the use of herbal products among residents of Nong Bua Sala Village, Mueang District, Nakhon Ratchasima Province, and reported that herbal product use behavior was at a moderate level (90.74%). It is likewise inconsistent with the study by Rosnanee Hemtrakunwong et al. [22], which examined factors associated with self-care herbal medicine use among residents in Yala Municipality, Sateng Subdistrict, Mueang District, Yala Province, and found that herbal medicine use behavior was at a moderate level (66.1%). Furthermore, it does not align with the study by Saroj Phetmanee et al. [23], which investigated factors related to herbal use behavior among residents of Pratu Chang Tok Community, Thaiburi Subdistrict, Tha Sala District, Nakhon Si Thammarat Province, and reported that the population demonstrated a moderate level of herbal medicine use behavior (84.6%). The findings revealed that the population's herbal medicine use behavior was low, unlike most previous studies, which reported a moderate level. Differences in contextual factors, population characteristics, and current determinants of health behavior may explain this discrepancy. As Keha Rangsit is a semi-urban community, residents have greater access to healthcare services and modern medicine, making herbal medicine less likely to be a primary option for self-care. Although the participants demonstrated a high level of knowledge and a moderate level of attitudes toward herbal medicine, these were not sufficient to translate into actual practice. This may be due to factors such as ease of use, habitual reliance on modern medicine, and confidence in treatment effectiveness. These findings contrast with those from rural settings or studies involving elderly populations, where individuals may rely more heavily on herbal medicine in their daily lives.

The analysis of the relationship between personal factors and herbal medicine use behavior for self-care revealed that gender, marital status, and occupation were significantly associated with herbal medicine use behavior ($p < 0.05$). This finding is consistent with the study by Punyanpat Chaimail et al. [24], which reported that occupation influences the likelihood of herbal medicine use, with individuals engaged in trade or hired labor being more likely to use herbal medicines than those in other occupational groups. This finding is inconsistent with the study by Wilaiwan Chainarong [16], which reported that age and educational level had a significant effect on basic herbal medicine use behavior. It is also inconsistent with the study by Wirinya Muangchang [25], which investigated factors associated with self-care herbal medicine use among residents in Mae Chai District, Phayao Province, and found that gender and occupation were not significantly associated with herbal medicine use behavior ($p = 0.473$ and $p = 0.535$, respectively). The findings revealed that gender, marital status, and occupation were significantly associated with herbal medicine use behavior. From an academic perspective, these personal factors can be interpreted as reflecting differences in "social roles and lifestyles," which influence health-related decision-making. Regarding gender, the observed association with behavior may be explained by the fact that females often assume greater responsibility for their own health and that of family members. As a result, they are more likely to acquire knowledge about and use herbal medicines more frequently than males. Regarding marital status, particularly among individuals with families, their behavior is often influenced by close family members, such as spouses or elderly relatives, who serve as sources of traditional knowledge on herbal medicine. This influence increases the likelihood of herbal medicine use. In terms of occupation, which was found to be significantly associated with behavior, this can be explained by differences in work characteristics and lifestyles that affect both access to and choices regarding herbal medicine use. For example, individuals engaged in trade or hired labor may have more flexible schedules, greater access to herbal products, and broader social networks that facilitate the exchange of information. Consequently, they are more likely to use

herbal medicines compared to those in other occupational groups. This finding is consistent with the study by Punyanpat Chaimail et al. [24].

The analysis of the relationship between predisposing factors and herbal medicine use behavior for self-care revealed that attitudes toward herbal medicine use were significantly associated with herbal medicine use behavior ($p < 0.05$). This finding is consistent with the study by Wirinya Muangchang [25], which examined factors related to the use of self-care herbal medicine among residents in Mae Chai District, Phayao Province. The study reported that predisposing factors, namely knowledge regarding the use of herbal medicine for self-care, attitudes toward herbal medicine use, and perceived benefits of herbal medicine, were significantly associated with herbal medicine use behavior, as determined using Pearson's correlation coefficient. Additionally, this result is in agreement with the study by Sansanee Rittongpitak [26], which found that attitudes were significantly related to herbal medicine use. The findings of this study are consistent with the conceptual framework of the PRECEDE Model, which explains that predisposing factors, particularly attitudes, beliefs, and perceived benefits, are key determinants of health behavior. This is also in line with health behavior theories, which suggest that individuals' perceptions of value and confidence in a treatment approach directly influence their behavioral choices. At the same time, although knowledge is an essential foundation, it alone may not be sufficient to generate behavior if individuals lack confidence or have unclear attitudes. Therefore, individuals who possess knowledge but lack positive attitudes may be less likely to use herbal medicines. In contrast, those with favorable attitudes, even with only a moderate level of knowledge, are more likely to engage in herbal medicine use behavior.

The analysis of the relationship between enabling factors and herbal medicine use behavior for self-care revealed that access channels to obtain herbal medicines and the forms of herbal medicines were significantly associated with herbal medicine use behavior ($p < 0.05$). This finding is consistent with the study by Wirinya Muangchang [25], which examined factors related to the use of self-care herbal medicine among residents in Mae Chai District, Phayao Province. The study reported that enabling factors, including access channels to obtain herbal medicines, cost or price, forms of herbal medicines, and promotional activities, were significantly associated with herbal medicine use behavior, as determined using Pearson's Product-Moment Correlation Coefficient. These findings support the study by Sukit Chaichompoo [20], which reported that ease of access to herbal sources is significantly associated with the use of herbal medicine. The results are also consistent with the PRECEDE Model, which identifies enabling factors such as access to resources and services as key components that facilitate health behaviors. Furthermore, the findings align with previous research indicating that accessibility of herbal medicines and the characteristics of herbal products are significantly associated with their utilization.

The analysis of the relationship between reinforcing factors and herbal medicine use behavior for self-care revealed no significant association ($p > 0.05$). This finding is inconsistent with the study by Wirinya Muangchang [25], which examined factors related to the use of self-care herbal medicine among residents in Mae Chai District, Phayao Province. That study reported that reinforcing factors, including exposure to information about herbal medicine use from interpersonal sources, specialized media, and mass media, were significantly associated with herbal medicine use behavior, as determined using Pearson's Product-Moment Correlation Coefficient. This finding partially contradicts the study by Somkiatys Woradet [27], which reported that social support was positively associated with herbal medicine use. This discrepancy may be attributed to differences in community characteristics or variations in support systems within the study area. When considered alongside the findings that predisposing and enabling factors were significantly associated with behavior, it can be inferred that decisions to use herbal medicines in this context may depend more on internal factors (e.g., attitudes) and accessibility (e.g., availability of herbal sources and product forms) than on external factors such as social support. Therefore, it can be concluded that the lack of association between reinforcing factors and herbal medicine use behavior may be due to the nature of the data and the relatively weak level of social support. In addition, differences in the social context of the study area compared with other settings may have contributed to the inability of reinforcing factors to significantly influence herbal medicine use behavior in this sample.

3.3 Figures, Tables, and Schemes

Table 1. The level of knowledge regarding the use of herbal medicines for self-care among the population (n=318)

Knowledge regarding the use of herbal medicines for self-care among the population	Frequency	%
High level	146	46
Moderate level	121	38
Low level	51	16
Total	318	100

Table 2. Attitudes and perceptions of the benefits of using herbal medicine in health care.

Topic	Mean	S.D.	Interpretation
1. The use of herbal medicine to relieve symptoms has a complicated and inconvenient procedure	3.44	1.00	Moderate
2. The use of herbal medicines to relieve symptoms has fewer side effects than the use of modern medicines.	3.79	0.76	High
3. The use of herbal medicine to relieve symptoms makes it feel unfashionable, backward, and archaic	3.64	0.94	High
4. The use of herbal medicines to relieve symptoms is not toxic to the body, especially herbs that have been confirmed by the Ministry of Public Health.	4.24	0.90	High
5. Looking at the characteristics, color, smell, and taste of herbal medicine, it is considered an obstacle to using herbal medicine.	2.39	1.01	Moderate
6. Herbal medicine is more beneficial than modern medicine.	3.71	0.68	High
7. Herbal medicine today is more effective than before.	3.90	0.64	High
8. There is confidence that herbal medicine is highly safe.	3.97	0.65	High
9. You will support the use of herbal medicine in disease treatment.	4.42	0.69	High
10. If you use herbal medicine to relieve symptoms and get better, would you recommend or pass it on to others?	4.56	0.60	High
Total	3.44	0.71	Moderate

Table 3. Behavior of Using Herbal Medicine for Public Health Care

Topic	Mean	S.D.	Interpretation
1. Gastrointestinal illnesses			
1.1 Herbal medicine used to treat stomach diseases			
1.1.1 Turmeric relieves bloating, indigestion, and fullness, and treats stomach diseases.	2.00	0.65	Moderate
1.1.2 Raw banana to treat stomach disease or mild diarrhea.	1.23	0.46	Low
1.2 Herbal medicine used to relieve symptoms of flatulence, bloating, and indigestion			
1.2.1 You consume garlic when you have symptoms of flatulence, bloating, and indigestion.	1.66	0.69	Low
1.2.2 You consume basil when you have symptoms of flatulence, bloating, or indigestion.	1.88	0.62	Moderate
1.2.3 You consume pepper when you have symptoms of flatulence, bloating, or indigestion.	1.78	0.61	Moderate
1.2.4 You consume fingerroot when you have symptoms of flatulence, bloating, or indigestion.	1.35	0.62	Low
1.3 Herbal medicine used to relieve constipation			
1.3.1 You consume senna when you have constipation.	1.07	0.29	Low

Table 3. Behavior of Using Herbal Medicine for Public Health Care (continue)

Topic	Mean	S.D.	Interpretation
1.3.2 You consume Senna alexandrina when you have constipation.	1.97	0.67	Moderate
1.3.3 You consume basil seeds when you have constipation.	1.20	0.44	Low
1.4 Herbal medicine used to relieve diarrhea			
1.4.1 You consume raw guava when you have diarrhea.	1.13	0.39	Low
1.4.2 You consume pomegranate peel when you have diarrhea.	1.10	0.36	Low
1.4.3 You consume mangosteen peel when you have diarrhea.	1.08	0.33	Low
1.5 Herbal medicine used to relieve nausea and vomiting			
1.5.1 You consume ginger when you have nausea, vomiting, or motion sickness.	1.64	0.57	Low
1.5.2 You consume a YA HOM THEP PA JIT POWDER when you have dizziness.	1.06	0.31	Low
1.6 Herbal medicine used to treat parasitic worms			
1.6.1 You consume Diospyros mollis to treat parasitic diseases.	1.08	0.30	Low
1.6.2 You consume Quisqualis indica to treat parasitic diseases.	1.02	0.14	Low
1.6.3 You consume artocarpus lacucha to treat parasitic diseases.	1.05	0.21	Low
1.6.4 You consume pumpkin seeds to treat parasitic diseases.	1.05	0.26	Low
1.7 Herbal medicine used to relieve a toothache			
1.7.1 When you have a toothache or tooth decay, you use streblus asper to temporarily relieve the toothache before seeing a dentist.	1.34	0.49	Low
1.7.2 When you have a toothache or tooth decay, you use Spilanthes acmella to temporarily relieve the toothache before seeing a dentist.	1.06	0.27	Low
1.8 Herbal medicine that relieves loss of appetite and helps improve appetite			
1.8.1 You consume bitter melon when you feel a loss of appetite because it will make you eat.	1.92	0.56	Moderate
1.8.2 You consume neem when you feel a loss of appetite because it will make you eat.	1.98	0.58	Moderate
Total	1.39	0.42	Low
2. Respiratory illnesses			
2.1 You consume lemon juice when you have symptoms of a sore throat, cough, and phlegm.	2.16	0.54	Moderate
2.2 You consume emblica when you have symptoms of a sore throat, cough, and phlegm.	2.54	0.61	High
2.3 You consume Solanum trilobatum when you have symptoms of a sore throat, cough, and phlegm.	2.05	0.84	Moderate
2.4 You consume Solanum indicum when you have symptoms of sore throat, cough, and phlegm	1.98	0.84	Moderate
2.5 You consume Andrographis paniculata when you have symptoms of sore throat, cough, and phlegm.	2.24	0.72	Moderate
Total	2.19	0.71	Moderate
3. Urinary Illnesses			
3.1 You consume lemongrass juice when you have symptoms of dysuria.	1.27	0.48	Low
3.2 You consume pineapple core when you have symptoms of dysuria.	1.24	1.16	Low
3.3 You consume roselle juice when you have symptoms of dysuria.	1.61	0.61	Low
3.4 You consume red sugarcane when you have symptoms of dysuria.	1.28	0.49	Low
Total	1.35	0.69	Low

Table 3. Behavior of Using Herbal Medicine for Public Health Care (continue)

Topic	Mean	S.D.	Interpretation
4. Skin Illnesses			
4.1 Treat ringworm/tinea versicolor			
4.1.1 You use White crane flower when you have ringworm/tinea versicolor.	1.50	0.56	Moderate
4.2 Herbal medicine used to treat Tinea Capitis			
4.2.1 You use Sapindus rarak to treat Tinea Capitis on the head or relieve an itchy scalp.	1.43	0.53	Moderate
4.3 Herbal medicine used to treat burns			
4.3.1 You use coconut oil to treat burns.	1.68	0.60	Moderate
4.3.2 You use aloe vera to treat burns.	2.50	0.59	Moderate
4.3.3 You use gotu kola to treat burns.	2.00	0.82	Low
4.4 Herbal medicine used to treat abscesses and blisters			
4.4.1 You use Gynura pseudochina when you have abscesses or blisters.	1.05	0.29	Low
4.4.2 You use Garden Balsam when you have abscesses or blisters.	1.01	0.10	Low
4.5 Herbal medicine used to relieve inflammation from insect bites			
4.5.1 You use barleria lupulina when you have rashes from insect bites.	1.73	0.60	Low
4.5.2 You use coccinia grandis when you have rashes from insect bites.	1.69	0.59	Low
4.6 Herbal medicine used to treat urticaria			
4.6.1 You use betel pepper when you have urticaria.	1.56	0.55	Low
4.7 Herbal medicine used to treat herpes/shingles			
4.7.1 When you have herpes/shingles, you use Clinacanthus nutans to heal.	1.52	0.55	Low
Total	1.60	0.23	Low
5. Other illnesses			
5.1 You use Zingiber montanum for muscle pain.	2.51	0.68	Moderate
5.2 You consume tinospora cordifolia to relieve fever and stimulate appetite.	1.63	0.56	Low
5.3 You consume Thai Copper Pod when you have insomnia.	1.39	0.58	Low
5.4 When you have lice, you use custard apple leaves mixed with liquor to treat them.	1.51	0.75	Low
Total	1.76	0.39	Low
Overall Total	1.55	0.53	Low

Table 4. Information Reception About the Use of Herbal Medicine for the Health Care of the Public

Topic	Mean	S.D.	Interpretation
Personal Media			
1. Family /relatives	0.85	0.35	High
2. Friends/neighbors	0.77	0.42	High
3. Public health personnel	0.16	0.36	Low
4. Teachers	0.17	0.37	Low
5. Traditional healers	0.08	0.27	Low
6. Village health volunteers	0.42	0.49	Low
7. Community leaders	0.10	0.30	Low
8. Others	0.05	0.21	Low
Total	0.32	0.35	Low

Table 4. Information Reception About the Use of Herbal Medicine for the Health Care of the Public (continue)

Topic	Mean	S.D.	Interpretation
Specific media			
1. Books/Manuals	0.43	0.49	Low
2. Billboards/Posters	0.22	0.41	Low
3. Leaflets	0.50	0.50	Low
4. Flyer	0.34	0.47	Low
5. Journals	0.08	0.27	Low
6. Herbal exhibitions	0.16	0.36	Low
7. Participate in training on herbs	0.33	0.47	Low
8. Others	0.06	0.23	Low
Total	0.36	0.54	Low
Mass media			
1. Radio	0.59	0.49	High
2. Television	0.87	0.33	High
3. Internet/Website	0.81	0.39	High
4. Village broadcast system	0.38	0.48	Low
5. Magazines	0.07	0.25	Low
6. Newspapers	0.22	0.41	Low
7. Others	0.03	0.17	Low
Total	0.36	0.54	Low
Overall Total	0.34	0.47	Low

Table 5. Relationship between Personal Factors and Herbal Medicine Use Behavior for Health Care (Chi-Square)

Topic	Herbal medicine use behavior	
	X ²	p-value
1. Gender	305.55	<.00*
2. Age	93.82	0.94
3. Underlying disease	50.23	0.10
4. History of drug allergy	45.26	0.22
5. Marital status	153.46	0.00*
6. Education level	170.88	0.19
7. Monthly income	311.08	0.05
8. Occupation	305.55	<0.00*

*p < 0.05, statistically significant

Table 6. Relationship between Predisposing Factors and Herbal Medicine Use Behavior for Health Care (Chi-Square)

Topic	Herbal medicine use behavior	
	X ²	p-value
1. Knowledge about using herbal medicine for self-care	483.50	0.35
2. Attitude towards using herbal medicine for self-care	917.16	0.00*
3. Perception of the benefits from using herbal medicine for self-care	340.92	0.12

*p < 0.05, statistically significant

Table 7. Relationship between Enabling Factors and Herbal Medicine Use Behavior for Health Care (Chi-Square)

Topic	Herbal medicine use behavior	
	X ²	p-value
1. Channels for obtaining herbal medicine	287.44	0.01*
2. The cost or price of obtaining herbal medicine	109.20	0.68
3. Forms of herbal medicine	154.26	0.01*

*p < 0.05, statistically significant

Table 8. Relationship between Reinforcing Factors and Herbal Medicine Use Behavior for Health Care (Chi-Square)

Topic	Herbal medicine use behavior	
	X ²	p-value
1. Information Reception of personal media	328.47	0.12
2. Information Reception of specific media	339.46	0.13
3. Information Reception of mass media	248.61	0.24

*p < 0.05, statistically significant

4. Conclusions

In conclusion, the results of the study on the healthcare use behavior of herbal medicines in the Keha Rangsit Community, Khlong Hok, Pathum Thani Province, show that positive attitudes and knowledge regarding the use of herbal medicines are not yet sufficient to alter behavior in the sample. To enhance the use of herbal medicine in public healthcare, systematic promotion is required, including making herbs available, developing modern product forms, and fostering awareness through trustworthy, easily accessible media.

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