Behavioral Use of Andrographis paniculata and Its Efficacy in Treating COVID-19 Among Regular Herb Users in Thailand

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ABSTRACT
This study investigates the behavioral patterns and efficacy of Andrographis paniculata (AP) usage during the COVID-19 pandemic among regular herb users aged 40 and above in Thailand. Utilizing qualitative research methods, including in-depth interviews, the study explores the factors influencing AP use and the outcomes experienced. The findings reveal a significant increase in AP consumption as a preventative measure against COVID-19, with participants often exceeding recommended doses. The study highlights high levels of satisfaction with AP's effectiveness in both preventing and treating COVID-19 symptoms.

Keywords: Herb, efficacy of Andrographis paniculata (AP), COVID-19

Introduction
Individuals aged 40 and above in Thailand have shown a strong interest in the use of herbal medicines, a trend rooted in the country's rich tradition of cultivating and utilizing a wide variety of medicinal plants. Over time, this demographic has developed a deep trust in the efficacy of Thai herbs, as documented by Chinsoi (2020). However, for patients who have been using conventional pharmaceuticals over an extended period, concerns about potential side effects have led them to explore alternative treatments, particularly herbal remedies. This shift in treatment preference, however, has raised issues related to the improper use of medications, such as self-

adjustment of dosages or the unsupervised consumption of herbal remedies, compound medicines, and other alternative treatments. These practices can result in delayed recovery, adverse reactions, or harmful interactions between herbal and conventional medicines, potentially leading to significant health risks.

This concern became especially pronounced during the COVID-19 pandemic, a period marked by widespread adoption of Andrographis paniculata (commonly known as AP) among the general public. The World Health Organization (2022) reported that AP has been clinically shown to enhance immunity in healthy individuals, possess antiviral properties, and reduce the severity of COVID-19 by inhibiting viral replication and preventing pneumonia. However, the usage guidelines for AP vary widely. For instance, to boost immunity, it is recommended to take 10 milligrams of andrographolide daily for five days, followed by a two-day break, continuing for up to 12 weeks. For asymptomatic COVID-19 patients, a daily dose of 60 milligrams of andrographolide for five consecutive days is advised, while those with mild symptoms are recommended to take 180 milligrams daily for the same duration. These varied recommendations can lead to consumer confusion, particularly among those lacking sufficient knowledge about AP. Additionally, the concurrent use of multiple medications, including AP, can result in risks such as overdose or adverse drug interactions, underscoring the need for careful consideration and guidance in its use.

Research Objectives

The objective of this study is to investigate the factors influencing the behavior of individuals aged 40 and above in Pak Kret District, Nonthaburi, Thailand, regarding the use of Andrographis paniculata (AP) during the COVID-19 pandemic.

Research Methodology

This study employs a qualitative research design, utilizing in-depth interviews to collect data. The target population consists of 200 individuals aged 40 and above, residing in Pak Kret District, Nonthaburi, Thailand, who regularly use herbal medicine for health maintenance.

Research Instruments

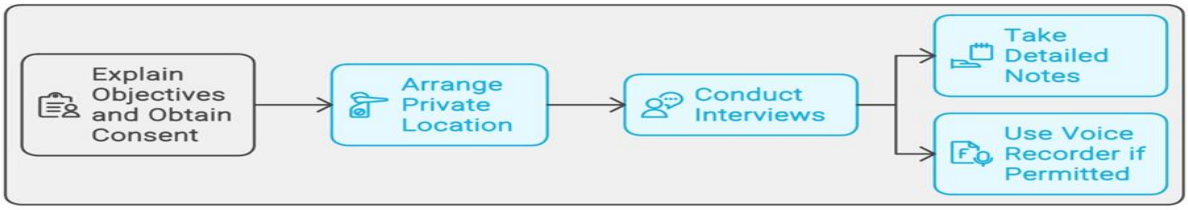
The primary data collection tool is a structured interview guide, developed based on the Health Belief Model, as adapted by Sutheewasinnon and Pasunon (2016). The interview guide covers several key areas: participants' knowledge and understanding of COVID-19 and the use of Andrographis paniculata, their methods of using AP during the pandemic, their confidence in and satisfaction with its effectiveness, and any side effects experienced from its use.

Data Collection Procedure

The data collection process involved the following steps:

1. Researchers explained the objectives of the study and obtained consent from participants prior to data collection.
2. Interviews were conducted in private settings, ensuring adherence to research ethics.
3. Data were collected through structured interviews, with details and observations recorded in notebooks. Voice recordings were also made with the participants' permission.

Figure 1. Flow diagram of data collection



Data Analysis

The data were analyzed using qualitative methods, involving descriptive and narrative analysis. The process included systematically categorizing the data into themes according to the structure of the interview questions. The analysis aimed to identify the components of each theme, examine the connections and relationships between these components, and ultimately uncover patterns in the behavior related to the use of Andrographis paniculata among residents of Pak Kret District, Nonthaburi, Thailand.

Research Findings

The in-depth interviews, following a preliminary selection through questionnaires (Nastasi & Schensul, 2005), involved 200 participants. The data were categorized into several key themes:

1) Demographic Information of Participants:

- Age Range: 40-65 years
- Gender Distribution:
  - Female: 125 participants (62.50%)
  - Male: 75 participants (37.50%)

Chronic Conditions Requiring Ongoing Medication:

- **Hypertension:**
  - Total: 62 participants (31.00%)
  - Female: 38 participants (30.40% of females)
  - Male: 24 participants (32.00% of males)
- **Diabetes:**
  - Total: 26 participants (13.00%)
  - Female: 18 participants (14.40% of females)
  - Male: 8 participants (10.67% of males)
- **High Cholesterol:**
  - Total: 58 participants (29.00%)
  - Female: 39 participants (31.20% of females)
  - Male: 19 participants (25.33% of males)

Table1. The Number of People with Chronic Diseases and Regular Use of Herbal Medicine

Condition	Total Number	Percentage of Respondents	Gender	Number	Percentage of Gender
A. Hypertension	62	31.00%	Female	38	30.40%
			Male	24	32.00%
B. Diabetes	26	13.00%	Female	18	14.40%
			Male	8	10.67%
C. High	58	29.00%	Female	39	31.20%

Cholesterol					
			Male	19	25.33%

2) Factors Influencing the Use of *Andrographis paniculata*

In-depth interviews were conducted to analyze the factors influencing the use of *Andrographis paniculata* (AP) during the COVID-19 pandemic (Chaichanawirote & Vithayachockitikhun, 2015). The analysis revealed the following key factors:

2.1 Knowledge and Attitudes Towards *Andrographis paniculata*

2.1.1 Knowledge of AP Usage:

All 200 participants were aware that *Andrographis paniculata* is an herbal remedy commonly used to treat colds, fevers, and sore throats (Caceres, D. D., Hancke, J. L., Burgos, R. A., & Wikman, G. K., 1997). They also recognized its use in treating mild COVID-19 symptoms during the pandemic.

2.1.2 Attitudes Towards AP Usage:

The in-depth interviews revealed that all 200 participants held a positive attitude towards AP, considering it a safe and effective herbal remedy due to its long history of use. However, their confidence in AP's efficacy during the COVID-19 pandemic varied:

- **Belief in COVID-19 Prevention:** 62 participants believed that AP could prevent COVID-19.
- **Belief in COVID-19 Treatment:** 144 participants believed that AP could treat COVID-19.
- **Uncertainty:** 45 participants were unsure whether AP could prevent or treat COVID-19 but used it based on recommendations from others.

3) Satisfaction with the Effectiveness of *Andrographis paniculata*

The interviews provided insights into the satisfaction levels of the 200 participants regarding the effectiveness of AP. Satisfaction was categorized as follows:

- **Very Satisfied (A):** The treatment was effective without the need for additional medication.
- **Satisfied (B):** The treatment was effective but required additional medication.
- **Dissatisfied (C):** The treatment was ineffective, requiring a switch to other medications.
- **Uncertain (D):** Uncertainty about the effectiveness of AP in treatment.

3.1) Use of AP for COVID-19 Prevention:

Participants took one AP capsule daily to prevent COVID-19.

- Total Users: 65 participants
  - **Very Satisfied (A):** 44
  - **Satisfied (B):** 11
  - **Dissatisfied (C):** 8
  - **Uncertain (D):** 2

3.2) Use of AP for Treating Sore Throat Due to COVID-19:

Participants took 2-3 AP capsules, 3-4 times daily, for 3-5 days.

- Total Users: 162 participants
  - **Very Satisfied (A):** 110
  - **Satisfied (B):** 31
  - **Dissatisfied (C):** 7
  - **Uncertain (D):** 14

3.3) Use of AP for Reducing Fever Due to COVID-19:
Participants took 2-3 AP capsules once daily.

- Total Users: 144 participants
  - **Very Satisfied (A):** 96
  - **Satisfied (B):** 28
  - **Dissatisfied (C):** 11
  - **Uncertain (D):** 9

Table2. The Purpose of Use and Satisfaction Levels of Andrographis Paniculata

Purpose of Use	Satisfaction Level A	Satisfaction Level B	Satisfaction Level C	Satisfaction Level D	Total Number of Users
To Prevent COVID-19	44	11	8	2	65
To Treat Sore Throat	110	31	7	14	162
To Reduce Fever from Infection	96	28	11	9	144

3.4) Side Effects from Using Andrographis Paniculata Symptoms Occurring After Continuous Use for More Than 5 Days
Number of Users: 181 People

Table3. The Side Effects from Using Andrographis Paniculata Symptoms Occurring

Symptom	Number (People)	Percentage
Numbness	8	4%
Cold Hands and Feet	12	6%
Dizziness	8	4%
Rapid Heartbeat	13	6.5%

Analysis and Discussion
Based on the research findings, the following analysis and discussion align with the study's objectives:

1) Behavior in Using *Andrographis paniculata* Among Older Adults During the COVID-19 Pandemic

Most individuals aged 40 and above had prior experience and familiarity with using *Andrographis paniculata* (AP) before the COVID-19 pandemic, typically consuming it in capsule form to alleviate cold symptoms, reduce fever, and soothe sore throats. However, the onset of the COVID-19 pandemic led to a noticeable increase in AP usage among this demographic. Many began using AP as a preventive measure against COVID-19, even when they exhibited no symptoms or only mild discomfort, driven by a fear of infection. Consequently, these individuals significantly increased their AP intake, often exceeding the recommended dosages provided by the Ministry of Public Health (Department of Thai Traditional and Alternative Medicine, 2021), sometimes by 2-6 times the suggested amount for immune support.

The continuous use of AP at these elevated dosages led to side effects such as numbness, cold extremities, and dizziness. These side effects are consistent with known precautions related to AP, which is characterized by its bitter and cooling properties that can affect blood circulation and body heat, leading to symptoms like numbness and dizziness (Worakunphanich, 2021). Despite experiencing these side effects, many users continued taking AP during the pandemic, motivated more by fear of contracting COVID-19 than by the adverse effects of the herb. In some cases, users paused consumption for 2-3 days when side effects occurred, only to resume later due to ongoing concerns about infection.

The concurrent use of AP with medications for chronic conditions, such as hypertension, highlights the risks associated with combining high doses of AP with prescription drugs. This practice may lead to severe health complications, particularly if essential medications are discontinued abruptly or for extended periods. The study found that users generally had a low awareness of potential interactions between AP and conventional medications, which could pose significant risks to their health.

2) Factors Influencing AP Usage Behavior During the COVID-19 Pandemic

The study identified several key factors influencing the behavior of older adults in using AP during the pandemic:

2.1 Knowledge of COVID-19 and AP Usage

The majority of participants were aware of the risk and severity of COVID-19, particularly those with pre-existing conditions. As a result, 65 participants (32.5%) reported using AP to prevent COVID-19 infection.

2.2 Attitudes Towards AP Usage

Most participants were regular users of herbal medicine and had a positive attitude towards AP, believing in its efficacy in treating COVID-19. A total of 144 participants (72%) were confident that AP could treat COVID-19. However, this positive attitude also led to a lack of caution when using AP alongside conventional medicines, increasing the risk of adverse interactions.

2.3 Satisfaction with AP's Effectiveness

The study revealed high levels of satisfaction among participants regarding the effectiveness of AP in preventing and treating COVID-19:

- **Prevention of COVID-19:**
  Taking one AP capsule daily resulted in 84.61% satisfaction, with initial confidence levels starting at 32%.

- **Treatment of Sore Throat from COVID-19:**
  Taking 2-3 AP capsules, 3-4 times daily for 3-5 days, led to 87.03% satisfaction, with initial confidence levels at 81% (Kligler, 2006).

- **Reduction of Fever from COVID-19:**
  Taking 2-3 AP capsules once daily resulted in 86.11% satisfaction, with initial confidence levels at 72% (Caceres, 1997).
- **Side Effects from Prolonged AP Use:**
  Prolonged use of AP (more than 5 days) led to side effects such as rapid heartbeat (6.5%) and cold extremities (6%), which were consistent with previous research findings (Worakunphanich, 2021).

Figure 2. Satisfaction and confidence levels with AP's Effectiveness

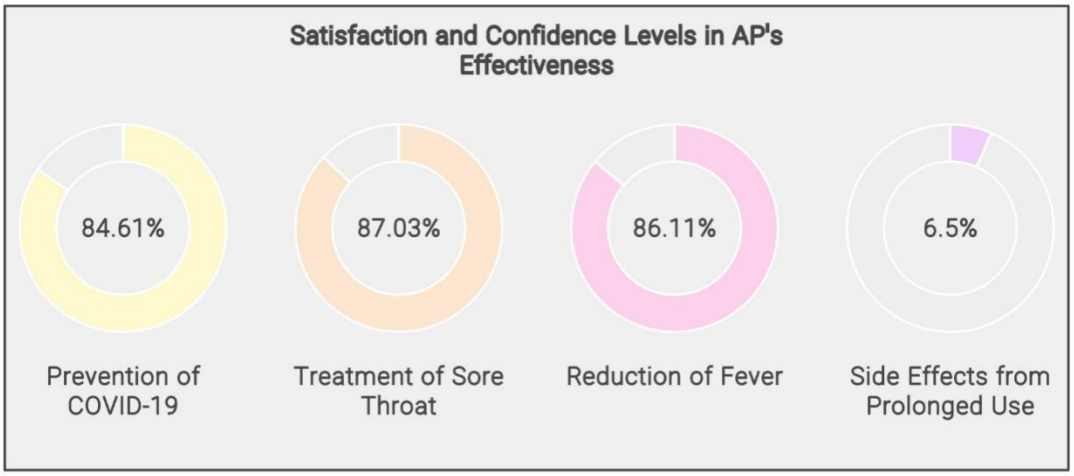


Figure 3. Andrographis paniculata (AP)

Conclusion and Recommendations

The study concludes that the increased use of *Andrographis paniculata* during the COVID-19 pandemic among residents of Pak Kret District, Nonthaburi, Thailand, was primarily driven by a desire to prevent infection. The herb was used more frequently and in higher doses, even for minor symptoms, with high levels of satisfaction reported regarding its effectiveness. The factors influencing this behavior included knowledge about COVID-19, positive attitudes towards herbal medicine, and satisfaction with AP's efficacy.

The findings suggest a strong public belief in and reliance on AP for preventing and treating COVID-19, which significantly influenced usage behavior. However, the tendency to overuse AP poses potential risks to health, such as liver and kidney damage, and adverse interactions with conventional medicines. Therefore, further studies are needed to assess the long-term effects of continuous AP use, and public education should be provided on the appropriate use of AP to avoid potential health risks.

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