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An evaluation of the effects of YaHom Thep Chit, traditional Thai herbal formulation, on migraine headaches among University students in Northern Thailand

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Migraine is a common neurological disorder that has a major impact on quality of life. The aims of this study were (1) to determine factors associated with migraine symptoms and (2) to assess the effects of traditional Thai herbal formulation, YaHom Thep Chit, on migraine outcomes among university students in the Northern region of Thailand. A two-phase study design was used. Phase 1 used a cross-sectional design with 396 participants to examine associations between demographic, behavioral and health-related variables and migraine. Phase 2 employed aquasi-experimental design to assess the effects of YaHom Thep Chit on migraine symptoms among a subset of participants. Statistical analyses included chi-square tests, Pearson's correlation, and logistic regression analyses. In Phase 1, migraine symptoms were significantly associated with abnormal body mass index (BMI), income, smoking status, sleep duration, energy drink consumption, family history of migraine, and stress ($p < 0.05$). In Phase 2, participants receiving YaHom Thep Chit demonstrated significant reductions in migraine frequency, duration, intensity, and migraine-related disability compared with the control group ($p<0.001$). These findings suggest that YaHom Thep Chit may be a potentially effective complementary approach for alleviating migraine symptoms. However, further randomized controlled trials are warranted to confirm these findings.

Keywords: Herbal medicine, MIDAS, Migraine, Quasi-experimental study, Thai traditional medicine, YaHom Thep Chit

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Migraines are a common disabling condition that affects %15.2of the global population. It is the second leading cause of health loss in terms of years lived with disability, and the first among women . Despite being so common, it is poorly recognized and too often undertreated[1]. Migraines have a significant impact on the quality of life for patients worldwide[2]. Migraines are characterized by throbbing headaches, typically occurring on one side of the head, and may be accompanied by symptoms such as nausea, vomiting, and sensitivity to light or sound[3]. The incidence of migraines is high, especially among adolescents and young adults, with prevalence rates varying based on gender and genetic factors[4,5].

Neurochemical changes, especially involving serotonin, and defective activation of the trigeminovascular system, which is responsible for headache pain, are considered to be characteristic of migraines in pathophysiological evidence[6]. The exact cause is unknown, but current theories suggest that migraine pathogenesis may be attributed to some abnormalities in brain chemistry, neural signaling or cerebral blood vessels that may be triggered by certain factors such as emotional stress, lack of sleep, diet and hormonal changes, the latter being especially common in women[7,8]. Management involves pharmacological and non-pharmacological measures, however research evidence suggests that misuse of acute analgesics may paradoxically increase headache frequency and decrease therapeutic efficacy. In this sense, non-pharmacological therapy can be a safer choice, minimizing the probability of bad drug reactions and the long-term use of drugs.

In Thai Traditional Medicine (TTM), migraine-like symptoms are commonly associated with a condition known as Lom Pakang (also called Lom Takangor Sannibat Lom Pakang) which is conceptualized as a disorder of the wind element affecting the body's internal balance[9]. TTM emphasizes a holistic approach to treatment, incorporating herbal

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formulations, massage therapy, and lifestyle modifications to restore equilibrium among the body's elements. Among these, aromatic herbal formulations known as YaHom are traditionally used to regulate "wind" disturbances and promote physiological balance[10].

According to TTM principles, "YaHom" (Thai traditional aromatic medicine) is used to nourish the heart not in the Western medical sense of regulating cardiac function, but rather in balancing the movement of wind elements throughout the body, which influence emotions, circulation, and overall physiological harmony (labeled as "subtle wind). Certain formulations of YaHom also address "coarse wind, "which refers to digestive wind disturbances, causing bloating and discomfort .Therefore, the composition of YaHom requires multiple herbal ingredients to harmonize wind, fire, and water elements, preventing excessive imbalance from affecting the earth element, which would make treatment more difficult. Due to their multifaceted role, YaHom formulations require a combination of multiple herbal ingredients to restore balance among the wind, fire, and water elements .Early use of YaHom can help prevent excessive imbalance, which could otherwise impact the earth element, making treatment more challenging.

In the 362-g powder formulation of YaHom Thep Chit, there are a total of 42 herbs, with jasmine being the primary ingredient, totaling 183 g. The formulation contains several active compounds, such as (R)-(-) linalool, isojasmone, linalool, and in dole, which have effects in reducing anxiety, relieving stress, exhibiting anti-inflammatory properties, calming the nervous system, and alleviating pain . These effects can help improve overall life efficiency . Additionally, the aromatic medicine formulation includes eight types of orange peel, which are known for their properties as a wind-relieving remedy to treat dizziness and alleviate symptoms of fainting or blurred vision[11].

Jasminum sambac (L) Aiton, commonly known as "*Arabian Jasmine*, "is a plant in the Oleaceae family. It is native to South and Southeast Asia. This plant is highly regarded in cultural practices, traditional medicine, and the perfume industry. Numerous scientific studies have investigated the chemical and pharmacological properties of this plant[12]. Its chemical composition comprises several important chemical components, including flavonoids, alkaloids, tannins, and saponins. Additionally, bioactive compounds such as linalool, benzyl acetate, and in dole are present, which contribute to the plant's fragrance and pharmacologicaleffects[13]. This plant contains phenolic compounds and flavonoids which are antioxidants that help to reduce cellular damage caused by oxidativereactions[14].

Although it is commonly used in traditional medicine and officially recognized, there is a lack of empirical clinical evidence to support the effectiveness of YaHom Thep Chit in migraine management. This represents an important knowledge gap in the current literature, particularly in the context of integrating traditional medicine with evidence-based clinical practice.

Accordingly, this study aimed (1) to identify factors associated with migraine symptoms and (2) to evaluate the effects of YaHom Thep Chit on migraine frequency, duration, intensity, and migraine-related disability among university students in Northern Thailand.

Materials and Methodology

This study consists of two parts .The first part is descriptive research using a cross-sectional design aimed at investigating the factors associated with headache symptoms .The second part is a quasi-experimental study designed to evaluate the efficacy of YaHom Thep Chitin alleviating migraine headache symptoms during the period from April 2022 to November 2023.

First part

This study was conducted, and data were collected at a university located in the northern region of Thailand .The total population studied was 4,520 individuals during the academic year 2023. The sample size was calculated using the formula of Krejcie and Morgan, with an attrition rate of 10%. After adjusting for attrition, the final sample size was 396.

Study participants and eligibility criteria

Participants were recruited from the general population in Phayao Province, Thailand. Eligible participants were adults aged 18 years and above, including both males and females, who had resided in the study area for at least three months. All participants were screened and diagnosed according to the principles of applied Thai traditional medicine by licensed practitioners. Individuals diagnosed with

migraine headache (Lom Pakang) were included in the study. In addition, participants were required to meet the diagnostic criteria for headache according to the International Classification of Headache Disorders(ICHD) and were assessed for stress using the Stress Test (ST-5) developed by the Department of Mental Health, Thailand.

Participants were excluded if they had acute or severe health conditions that could affect their participation in the study, such as severe headache, fever or contagious diseases (e.g., chickenpox or herpes zoster). Patients currently under conventional medical treatment for migraine were also excluded. Participants with known allergies to herbal medicines were also excluded. Patients with uncontrolled hypertension (systolic blood pressure ≥160 mmHg and/or diastolic blood pressure ≥100 mmHg) were also excluded from the study.

Data collection instrument

The questionnaire used in this study comprised six sections and 86 items in total, including: personal data, mental health assessment based on the Department of Mental Health, Thailand, environmental factors, time of onset based on Thai traditional medicine principles, headache pain assessment, and Migraine Disability Assessment Test (MIDAS). A total of 396 questionnaires were randomly distributed and received a 100% response rate.

The instrument was developed after a comprehensive review of the relevant literature and existing assessment tools. Content validity was assessed by a panel of 3 experts in applied Thai traditional medicine and public health who assessed each item for relevance, clarity and consistency with the study objectives. Later the questionnaire was reviewed in the light of their recommendations to improve the overall quality.

Construct validity was also considered during the development process to ensure that the questionnaire adequately captured the theoretical constructs underlying migraine-related factors and health behaviors. A pilot test was conducted with a sample of participants with demographic characteristics similar to the target population to assess the feasibility, clarity and understand ability of the instrument. The feedback received was used to make some minor adjustments.

The reliability of the questionnaire was evaluated by Cronbach's alpha coefficient which was 0.817, indicating good internal consistency. The instrument was therefore deemed reliable and suitable for the purposes of this study as shown in (Fig. 1).

Second part

From phase 1, a sample of 60 participants with stress levels from 7 to 12 points, assessed by the Stress Test (ST-5) developed by the Department of Mental Health, Thailand, equivalent to mild levels of stress according to mental health classification criteria, and a MIDAS score of ≥10 points, were selected. Then, a quasi-experimental study was conducted to evaluate the efficacy of YaHom Thep Chit in alleviating the symptoms of migraine headache.

The participants were divided into two groups as follows:

1. YaHom Thep Chit herbal medicine group (n=30). This group was given YaHom Thep Chit in the powder form. The medication was administered orally at a dose of three sachets (equivalent to 1000 mg per dose) three times daily for 12 weeks according to the recommended dosage regimen in the National List of Essential Medicines of Thailand for traditional herbal products.

2. Allocated to control group) n=30: (Received no herbal intervention and continued usual daily routines

The following assessments were conducted before and after the experimental treatment:

- Headache pain intensity, measured using a standardized pain score scale
- Duration of headache episodes
- Frequency (interval) of headache occurrences
- Systolic and diastolic blood pressure, measured using standard clinical procedures
- Headache-related disability, assessed using the Thai version of the Migraine Disability Assessment Questionnaire (Thai-MIDAS)

Content validity of the assessment instruments was examined by three experts in applied Thai traditional medicine and public health. Each item was evaluated for relevance, clarity and consistency with the study objectives. The instruments were then adjusted in line with the experts' suggestions to ensure their appropriateness and comprehensiveness in data collection.

Statistical analyses

Statistical analysis was performed with the Statistical Package for Social Sciences (SPSS) version 22.0. Means ± standard deviations (SD) were used to describe continuous variables, while categorical variables were described using frequencies and percentages. Descriptive and inferential statistical

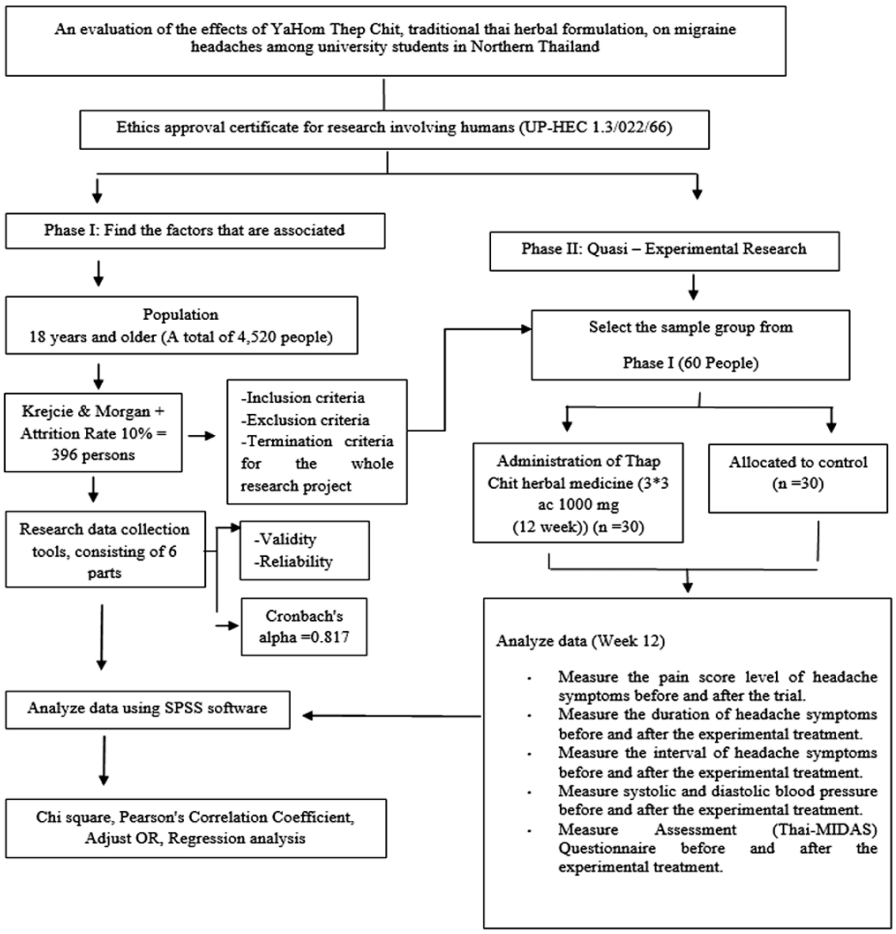

Fig. 1 — Diagram of the research process

analyses were performed. Descriptive statistics of demographic characteristics and prevalence of migraine headaches were calculated and presented in tabular form. Binary logistic regression analysis was initially conducted to identify factors associated with migraine headaches. Variables with a p-value < 0.05 in the univariate analysis were included in the multivariate analysis. Multiple logistic regression models were then constructed to control for potential confounding variables. Prior to model fitting, multicollinearity among independent variables was assessed, and model assumptions for logistic regression were evaluated to ensure the validity of the analysis. Adjusted odds ratios (adjusted ORs) with 95% confidence interval (CI) were calculated to determine the strength of associations. To reduce the risk of type I error due to multiple comparisons, appropriate consideration was given during the analysis, and results were interpreted with caution. The Chi-square test was used to assess associations between categorical variables.

Results

From Table 1, after adjusting for potential confounding variables, several factors remained significantly associated with migraine headaches.

Individuals with abnormal body mass index (BMI) (either below or above the normal range of 18.5–22.9 kg/m²) were more likely to experience headaches compared to those with normal BMI (adjusted OR = 2.218; 95% CI: 1.344-3.661). Similarly, participants with a monthly income of less than 10,000 Baht had a higher likelihood of experiencing headaches compared to those with higher income levels (adjusted OR = 3.545; 95% CI: 1.635-7.685).

In terms of lifestyle factors, individuals who reported sleeping less than 6 h per night were more likely to experience headaches (adjusted OR = 1.659; 95% CI: 1.013–2.717). Additionally, energy drink consumption was associated with an increased likelihood of headaches (adjusted OR = 1.797; 95% CI: 1.046–3.084).

Notably, participants with a family history of migraine demonstrated a substantially higher

likelihood of experiencing headaches (adjusted OR = 8.203; 95% CI: 3.636–18.504). Likewise, individuals experiencing stress were significantly more likely to report headaches compared to those without stress (adjusted OR = 5.774; 95% CI: 2.670–12.487).

290 participants (73.2%) were found to have no symptoms of depression or had very mild symptoms of depression .A total of 78 participants (19.7%) had mild depression symptoms, while 21 participants (5.3%) had moderate depression symptoms, and 7 participants (1.8%) had severe depression symptoms (Table 2).

Table 3 reveals the relationship between combined environmental factors, including light, sound, smell, weather changes, medication use, and depression assessment scores and headache symptoms, showed, r =0.660, 0.505, 0.477, 0.574, 0.488, 0.560, and 0.351,

Table 1 — Risk factor analysis of headache controlling for the influence of other factors

Factors	Crude OR (95% CI)	P-value	Adjust OR (95% CI	P-value
Sex				
Women	1		1	
Men	1.244 (1.975-0.784)	0.354	1.455 (2.756-0.768)	0.249
BMI				
Normal	1		1	
Abnormal	2.279 (3.455-1.504)	<0.001	2.218 (1.344-3.661)	0.002
Income				
Greater than 10001 Baht	1		1	
Less than 10,000 Baht	5.383 (2.810-10.310)	<0.001	3.545 (1.635-7.685)	0.001
Smoking				
No	1		1	
Yes	2.994 (5.848-1.933)	0.001	1.493 (3.780-0.590)	0.397
Sleep				
More than 6 h	1		1	
Less than 6 h	2.143 (3.228-1.423)	<0.001	1.659 (2.717-1.013)	0.044
Consumption of energy drinks				
No	1		1	
Yes	3.867 (6.009-2.488)	<0.001	1.797 (3.084-1.046)	0.034
Family history of migraine				
No	1		1	
Yes	12.894 (27.491-6.052)	<0.001	8.203 (18.504-3.636)	<0.001
Stress				
No	1		1	
Yes	8.738 (17.901-4.363)	<0.001	5.774 (12.847-2.670)	<0.001

Table 2 — The depression assessment tool by the Department of Mental Health (9Q)

Score range	Definition	Number (%)
<7	No symptoms of depression or very minimal symptoms of depression	290 (73.2)
7-12	Mild symptoms of depression	78 (19.7)
13-18	Moderate symptoms of depression	21 (5.3)
≥19	Severe symptoms of depression	7 (1.8)

(Median score 4 ; Max score 26; Min score 0)

Table 3 — The relationship between environmental factors Mental Health (9Q) and headaches

Variables	Headache score	Overall factors	Light	Noise	Smell	Weather	Medication use	Mental health
Headache score	1							
Overall factors	0.660**	1						
Light	0.505**	0.879**	1					
Noise	0.477**	0.757**	0.613**	1				
Smell	0.574**	0.806**	0.609**	0.491**	1			
Weather	0.488**	0.760**	0.559**	0.420**	0.504**	1		
Medication use	0.560**	0.537**	0.345**	0.521**	0.338**	0.297**	1	
Mental health (9Q)	0.351**	0.162**	0.119*	0.009	0.147**	0.256**	0.002	1

**P–value <0.001
*P–value <0.05

Table 4 — Regression analysis for predicting headache severity by including all factors in the equation

Variables	b	SE_b	β	t	P-value
Mental health (9Q)	0.038	0.005	0.271	7.959	<0.001
BMI	0.014	0.006	0.078	2.293	0.022
Light	0.083	0.041	0.099	2.051	0.041
Noise	0.017	0.037	0.022	0.465	0.642
Smell	0.221	0.035	0.275	6.370	<0.001
Weather	0.082	0.036	0.097	2.309	0.021
Medication use	0.253	0.026	0.378	9.794	<0.001

Constant 0.109 =; SE_{est}= ±0.432
R = 0.768; R^2 = 0.590 F =79.609; P-value<0.001

respectively. These factors exhibited a significant positive correlation with headache symptoms at a statistical significance level of p-value< 0.001.

Table 4 demonstrates that the six factors are highly correlated with headache symptoms, with a multiple correlation coefficient of 0.768. These factors collectively predict 59% of headache occurrences with statistical significance at p< 0.001, with a standard error of prediction of ± 0.432.

When considering the regression coefficients of the predictors, it was found that only the noise factor could not predict headaches (p-value = 6.642). In contrast, factors such as Mental Health (9Q), BMI, Light, Smell, Weather and Medication Use were significant predictors of headaches, with statistical significance at p-value < 0.05.

The regression equation for predicting headache symptoms, incorporating environmental factors, depression assessment (9Q) and Body Mass Index (BMI), in raw score form, is as follows:

Headache 0.109 + 0.038 (9Q) + 0.014 (BMI)
+ 0.083 (light) + 0.221 (smell) + 0.082 (weather)
+ 0.253 (medication use)

According to the (Table 5), a total of 396 volunteers participated in this study. Among them, 259 (65.4%) (participants had no or minimal disability, 76 (19.2%) participants had mild disability, 36 (9.1) participants had moderate disability, and 25 (6.3) participants had severe disability. The average number of days of disability due to migraine headaches was 5.80±9.05 days.

According to the (Table 6), the relationship between headache symptoms and Migraine Disability Assessment Test showed a statistically significant positive correlation at a p-value < 0.001, with a correlation coefficient (r = 0.361).

As presented in (Table 7), participants in the experimental group who received YaHom Thep Chit

Table 5 — The migraine disability assessment test

MIDAS score	Definition	Number (%)
0-5	Little or No Disability	259 (65.4)
6-10	Mild Disability	76 (19.2)
11-20	Moderate Disability	36 (9.1)
+21	Severe Disability	25 (6.3)

Mean 5.80±9.05 Days, MIN 0.00 Days, MAX 65 Days

Table 6 — The relationship between headaches and disability due to migraine disability assessment test

Variables	Headache score	MIDAS score
Headache score	1	
MIDAS score	.361**	1

**P-value <0.001

demonstrated improvements across multiple migraine-related outcomes compared to the control group. Specifically, the experimental group showed a lower mean headache frequency (2.40 vs. 4.30 episodes) and shorter duration of headache episodes (24.67 vs. 42.50 min). In addition, pain intensity was reduced in the experimental group compared to the control group (3.07 vs. 5.40). Physiological parameters showed a slight increase in systolic blood pressure and a modest decrease in diastolic blood pressure, but values in both groups were in the normal clinical range. Of importance, migraine-related disability (MIDAS score) was significantly reduced in the experimental group (16.00 vs. 5.47 days) reflecting a significant improvement in functional outcomes.

Discussion

The finding of an association between abnormal BMI and headaches adds to the previous evidence of a U-shaped association between body weight and migraine risk. Both underweight and overweight have been associated with inflammatory dysregulation, adipocytokine imbalance and hormonal changes that may predispose to migraine[15,16]. In particular, obesity has been linked to increased levels of calcitonin gene-

Table 7 — Effectiveness of Thap Chit herbal medicine in alleviating headache symptoms from migraines

Variables	Group				P-value
	Case	**95% CI**	**Control**	**95% CI**	
Frequency of pain					
Before	4.83±1.085		4.40±1.037		0.119
After	2.40±0.932	2.05-2.75	4.30±.915	3.96-4.64	<0.001
Duration of pain					
Before	52±9.432		50.50±13.35		0.617
After	24.67±11.81	20.26-29.08	42.50±10.48	38.59-46.41	<0.001
Pain intensity					
Before	5.57±.626		5.40±.621		0.305
After	3.07.±980	2.70-3.43	5.40±.621	5.17-5.63	<0.001
Systolic blood pressure					
Before	117.23±8.69		114.60±10.12		0.284
After	123.63±9.24	120.16-127.10	112.97±10.81	108.33-116.40	<0.001
Diastolic blood pressure					
Before	76.67±6.28		77.40±5.78		0.640
After	75.27±8.70	72.02-78.52	76.60±5.79	74.44-78.76	<0.001
The migraine disability assessment test					
Before	13.07±3.84		16.67±7.35		0.021
After	5.47 ±2.67	4.47-6.47	16.00±4.62	14.27-17.73	<0.001

related peptide (CGRP)[17], major neuropeptide in migraine pathogenesis[18,19].

Likewise, socioeconomic disadvantage may contribute to headache burden through limited access to health care[20], increased psychosocial stress, and poor lifestyle conditions. Behavioral factors such as lack of sleep and consumption of energy drink[21], possibly through mechanisms involving neuronal hyperexcitability, circadian disruption, and caffeine-related effects[22], further support the role of lifestyle in migraine pathophysiology. Sleep disruption has been associated with hyperexcitability of cortical neurons and decreased inhibition in trigeminovascular pathways that may precipitate migraine attacks[23,24]. Moreover, long-term sleep deprivation can lead to an increase in stress and hormonal imbalance, which can increase the risk.

Importantly, family history of migraine was the strongest predictor, consistent with the well-established genetic basis of migraine[25]. Psychological stress was also strongly associated with headache occurrence[26], consistent with evidence that stress-induced activation of the hypothalamic-pituitary-adrenal (HPA) axis leads to altered pain modulation and increased cortical excitability[27]. These findings together highlight the need for a holistic approach to migraine management that incorporates biological, behavioral, and psychosocial components.

The results of the interventional phase suggest that YaHom Thep Chit may be beneficial for migraine-related outcomes such as decreasing headache frequency, duration, intensity and disability[2]. Participants who received the herbal formulation consistently had better outcomes than the control group. These results are consistent with previous studies suggesting that traditional herbal formulations might possess therapeutic benefits via the regulation of neurogenic inflammation, serotonergic pathways and vascular regulation[28,29]. However, the precise mode of action of YaHom Thep Chit still needs to be elucidated and further investigated.

There were statistically significant changes in blood pressure, but all values were within the normal clinical range[30] and their clinical relevance is uncertain. The findings may be mild physiological effects rather than clinically meaningful changes and should therefore be interpreted with caution.

Importantly, the large reduction in migraine-related disability indicates that YaHom Thep Chit might possess significant functional benefits, with potential to improve quality of life and decrease the socioeconomic burden associated with migraine[31]. This is in line with increasing interest in integrative and complementary approaches in the management of chronic diseases.

However, this study has some limitations. Selection bias may be introduced and causal inference is limited by the quasi-experimental design without randomization. Furthermore, reliance on self-reported measures may be subject to recall bias. The relatively small sample size in the intervention phase may also have implications for the generalizability of the findings. Therefore, larger randomized controlled trials are recommended to

confirm these findings and to better elucidate the underlying mechanisms.

Conclusion

The results of this study suggest that YaHom Thep Chit may reduce frequency, duration, intensity, and migraine-related disability. Significant changes in blood pressure were observed, but it is not known if they are clinically relevant and warrant further investigation.

In addition, several factors were associated with the occurrence of headache, including abnormal BMI, low income, lack of sleep, consumption of energy drinks, family history of migraine, and psychological stress. These findings emphasize the multifactorial nature of migraine and the necessity of a comprehensive management approach targeting biological, behavioral and psychosocial determinants.

However, given the quasi-experimental design and the relatively limited sample size in the intervention phase, the findings should be interpreted with caution. Further randomized controlled trials with larger sample sizes are recommended to confirm these results and to elucidate the underlying mechanisms of action of YaHom Thep Chit.

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Conflict of Interest

The authors declare no conflict of interest, financial or otherwise.

Author Contributions

PS, ST, and STH made substantial contributions to the conception and design of the study, conducted the material preparation, data collection, and data analysis .PS and ST written first draft of the manuscript .The final manuscript was read and approved by all authors.

Ethics Approval and Consent To Participate

The study protocol was approved by the University of Phayao Human Ethics Committee, University of Phayao, Thailand (UP-HEC 1.3/022/66).

Informed Consent

Informed consent was obtained from the participants who participated in the study.

Declaration of generative AI in scientific writing

During the preparation of this work, we have used AI writing tools in order to enhance the language and readability. The content was reviewed and edited as needed after using the AI tools.

Data Availability

The data are exclusively retained by the authors.

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