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Original Article

Exploring Kratom Use in High-Prevalence Areas of Southern Thailand: Attitudes, Knowledge, and Consumption Patterns – A Mixed-Methods Study

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Abstract

Background: Kratom (*Mitragyna speciosa*), a tropical tree native to Southeast Asia, has traditionally been used in Thailand for medicinal and recreational purposes. Although recently legalized for medicinal use, concerns remain regarding its safety and potential for abuse.

Objectives: To investigate kratom consumption patterns and identify demographic, behavioral, and cognitive predictors of current and harmful use in high-prevalence rural communities in southern Thailand.

Methods: A cross-sectional study was conducted among 169 participants from southern Thai communities with high kratom use. A structured questionnaire assessed demographics, attitudes, knowledge, and usage patterns. Harmful use was defined as consumption of more than 20 leaves per day. Multiple logistic regression analysis identified predictors of current and harmful use.

Results: Among participants, 45 (26.6%) were current users, and of those 22 (48.9%) met the criteria for harmful use. Predictors of current use included younger age (adjusted OR [AOR], 0.97; 95% CI, 0.94-0.99), tobacco use (AOR, 16.12; 95% CI, 5.01-51.86), poor mental health (AOR, 8.8; 95% CI, 2.2-35.16), and favorable attitudes toward kratom (AOR, 1.12 per point; 95% CI, 1.06-1.18). Harmful use was associated with long-term consumption (AOR, 10.54; 95% CI, 1.01-109.9), boiling as the method of use (AOR, 80.96; 95% CI, 4.98-1315.6), and lower knowledge scores (AOR, 17.8; 95% CI, 1.57-201.68).

Conclusions: Current and harmful kratom use are linked to specific demographic and behavioral factors. These findings support the need for targeted public health education and regulation in high-risk communities.

Keywords: *Mitragyna speciose*, Kratom, Consumption patterns, Behavioral predictors, Southern Thailand

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Introduction

Kratom (*Mitragyna speciosa*), a tropical evergreen tree native to Southeast Asia — particularly Thailand — has been used for centuries for both medicinal and recreational purposes. Recently, its use has gained global popularity, especially in the United States, as an alternative to opioids for pain management and for its purported health benefits.[1, 2] However, the legal status of kratom remains contentious: some countries have banned it outright, whereas others regulate it as a controlled substance.[3-5]

Traditionally, kratom has been recognized for its analgesic, antipyretic, anti-inflammatory, and stimulant properties. In Thailand, it has been used to treat conditions such as diarrhea, cough, and pain. However, in 1943, the Thai government enacted the Kratom Act, prohibiting its use and possession because of concerns about addiction and social impact.[6] Although the act was repealed in 2019, legalizing kratom for medicinal and traditional use, concerns persist regarding its safety and potential for abuse. Studies have linked kratom to adverse effects, including seizures, liver damage, and withdrawal symptoms.[7-9]

Kratom contains several bioactive compounds, primarily the alkaloids mitragynine and 7-hydroxymitragynine, which interact with the opioid receptors in the brain — mainly the mu-opioid receptor. Mitragynine, a partial agonist, contributes to the analgesic and sedative effects of kratom, whereas 7-hydroxymitragynine, though less abundant, is a more potent analgesic. Both alkaloids also act on adrenergic and serotonergic receptors, producing stimulant effects and mood enhancement. However, these interactions raise concerns about dependence and addiction.[10-12]

In Thailand, kratom remains widely accepted in rural communities, especially in the southern region where it is cultivated and traditionally used to relieve fatigue and boost work endurance. Despite its cultural significance, recent developments in legal status and usage patterns — particularly among younger populations and in combination with other substances — have raised public health concerns. Studies have highlighted both therapeutic potential and risks of dependence, especially with high doses or mixed use.[13, 14] However, research on the social and cognitive factors — such as attitudes, beliefs, and knowledge — that shape real-world consumption patterns remains limited.[6]

This study investigated cognitive and perceptual factors influencing kratom use in high-prevalence rural areas of southern Thailand. Although prior research has addressed attitudes and regulatory opinions,6 few studies have quantitatively assessed how these factors relate to actual use and harmful consumption at the population level. Guided by the concept of knowledge as justified belief, this study explored community-level perspectives shaping kratom-related behavior. Understanding these influences is key to developing effective, culturally appropriate health promotion and harm reduction strategies.

Methods

Study Design and Setting

This cross-sectional study targeted regions with high rates of kratom consumption in southern Thailand, using a purposive sample. Communities were selected based on kratom prevalence and the willingness of local leaders to participate.

Data Collection and Questionnaire Development

The questionnaire was developed through a qualitative exploration grounded in literature review and community engagement. Initial insights were gathered through a civil society forum involving local stakeholders — including healthcare providers, community leaders, and individuals from high-kratom-use communities. Focus group discussions explored perceived benefits, risks, motivations, and sociocultural influences. These sessions were audio-recorded, transcribed, and analyzed using thematic analysis. Key themes — such as functional use (eg, for work), social normalization, concerns about dependence, and mixed perceptions of harm — informed the development of questionnaire items.

In-depth interviews were also conducted during a pilot test with 30 participants

from a demographically similar neighboring area. Thematic analysis of the interview data assessed the relevance, clarity, and cultural appropriateness of the questionnaire items. The inclusion criteria for the pilot phase included age 18 years or older and fluency in Thai.

The finalized questionnaire included the following sections: 1) demographic data included age, sex, education, occupation, religion, marital status, insurance status, and health conditions; 2) attitudes toward kratom use included 17 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with the total score ranged 17-85, with higher scores indicating more favorable attitudes; 3) knowledge of kratom included 11 true/false items scored 1 for correct and 0 for incorrect or "don't know" responses, with the total score ranged 0-11, with higher scores reflecting greater knowledge; and 4) health perception measures included participants rated their health, mental state, and coping abilities using a 5-point Likert scale based on self-perception, and the response options were very poor, poor, fair, good, and excellent.

Participants who reported current or previous kratom use completed an additional section. Patterns of kratom use were determined which included age at first use, frequency and quantity of consumption, duration, methods of use (eg, boiling or chewing), use with other substances, perceived dependence (eg, cravings, increased use), and social, financial, or health-related burdens, as well as quit attempts.

The primary outcome, harmful kratom use, was defined as consumption of more than 20 leaves per day — corresponding to an estimated mitragynine intake exceeding 150 mg/day — based on dependence-associated thresholds reported in literature.[13, 15] In April 2023, trained interviewers administered the finalized questionnaire to all eligible individuals available during the data collection period, using a census-based approach within the constraints of the community project timeline. Eligibility criteria included individuals aged 18 years or older, fluent in Thai, and residing in the selected high-kratom-prevalence communities during the study period. Individuals unable to provide informed consent (eg, due to cognitive or communication impairments) were excluded from participation. Overall, 169 participants were enrolled from an estimated study population of 600, yielding a margin of error of approximately 7%, which is acceptable for prevalence studies which use a 5%-10% range. All respondents completed the demographic, attitude, knowledge, and health perception sections, whereas those with kratom use experience completed the additional section on usage patterns by using questionnaire (Supplementary S1). Data were anonymized and securely stored, with access limited to the principal investigator. No incentives were provided for participation.

Data Analysis

Data were collected via Google Forms and processed in Excel version 16.74 (Microsoft Corp). Statistical analyses were conducted in R version 4.2.3 (R Project for Statistical Computing), using appropriate packages for data analysis and visualization. All questionnaires were fully completed; therefore, no missing data were included in the analysis.

For descriptive statistics, categorical variables, such as demographic characteristics and kratom use patterns, were summarized as frequencies, percentages, and mean (SD). Group comparisons (eg, current vs noncurrent users, harmful vs nonharmful users) were performed using the chi-square test or Fisher exact test as appropriate. Continuous variables were reported as medians with interquartile ranges (IQRs) and compared using the Mann–Whitney *U* test due to nonnormal distribution.

For multivariate analysis, univariate analysis with a significance threshold of $P < .20$

was used to identify potential predictors of kratom use. This threshold, commonly employed in exploratory studies, ensures that relevant variables are not prematurely excluded from multivariate modeling.[16] Logistic regression was then conducted to examine factors associated with attitudes and knowledge regarding kratom use. The final model was refined through backward stepwise regression based on the Akaike Information Criterion. Model fit was assessed using Nagelkerke's pseudo R-squared from the DescTools package[17] and Hosmer-Lemeshow test from the ResourceSelection package[18] to evaluate how well the predicted probabilities aligned with the observed outcomes. To assess the ability of the model to distinguish between harmful and nonharmful kratom use, a receiver operating characteristic (ROC) curve was constructed, and the area under the curve was calculated using the pROC package,[19] which provided a measure of classification accuracy. Statistical significance was set at $P < .05$.

This study was conducted and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies (Supplementary S2).[20]

Results

Demographic and Baseline Characteristics of Study Participants

This study included 169 participants from regions in southern Thailand with a high prevalence of kratom use. Demographic and baseline characteristics are summarized (Table 1). The sample comprised 52.7% females and 47.3% males, with a mean (SD) age of 47.7 (18.9) years. Fishing was the most common occupation (24.9%), followed by unemployment (24.3%) and temporary employment (16.6%). Most participants were Muslim (93.5%) and had completed only primary school (43.2%), and 79.9% were enrolled in the universal health coverage scheme. Participants rated their overall health as good (37.3%) and their mental state similarly (44.4%). Coping abilities were rated as excellent by 45.6%. Substance use included tobacco (29%), alcohol (7.7%), and cannabis (5.9%). Common underlying health conditions included hypertension (16.6%), diabetes mellitus (9.5%), and dyslipidemia (9.5%). Regarding kratom use, 26.6% were current users, 13.6% were former users, and 59.8% had never used it. The mean (SD) attitude score toward kratom use was 48.5 (12.4), and the mean (SD) knowledge score was 6.5 (2.5). The distribution of total attitude and knowledge scores by kratom use status, illustrated significant differences among the groups (Figures 1 and 2).

Table 1. Demographic and Baseline Characteristics of Study Participants

Baseline Characteristic	No. (%) (N = 169)
Sex	
Female	89 (52.7)
Male	80 (47.3)
Age, mean (SD), y	47.7 (18.9)
Occupation	
Agriculture	12 (7.1)
Temporary employee	28 (16.6)
Fishing	42 (24.9)

Table 1. Demographic and Baseline Characteristics of Study Participants (Continued)

Baseline Characteristic	No. (%) (N = 169)
Government	4 (2.4)
Self-employed	6 (3.6)
Student	17 (10.1)
Merchant	19 (11.2)
Unemployed	41 (24.3)
Religion	
Buddhism	11 (6.5)
Islam	158 (93.5)
Marital status	
Single	43 (25.4)
Married	112 (66.3)
Divorced	14 (8.3)
Education level	
Higher than bachelor	13 (7.7)
Vocational	5 (3.0)
High school	38 (22.5)
Middle school	37 (21.9)
Primary school	73 (43.2)
No education	3 (1.8)
Insurance type	
Cash	5 (3.0)
Disabled	3 (1.8)
Universal health coverage	135 (79.9)
Government	15 (8.9)
Health volunteer	4 (2.4)
Social security	3 (1.8)
Student	4 (2.4)
Health state (self-perception)	
Very poor	10 (5.9)
Poor	12 (7.1)
Fair	45 (26.6)
Good	63 (37.3)
Excellent	39 (23.1)
Mental state (self-perception)	
Very poor	3 (1.8)
Poor	9 (5.3)
Fair	24 (14.2)
Good	75 (44.4)
Excellent	58 (34.3)

Table 1. Demographic and Baseline Characteristics of Study Participants (Continued)

Baseline Characteristic	No. (%) (N = 169)
Coping abilities (self-perception)	
Very poor	1 (0.6)
Poor	5 (3.0)
Fair	27 (16.0)
Good	59 (34.9)
Excellent	77 (45.6)
Other substances used	
Cannabis	10 (5.9)
Smoking	49 (29.0)
Alcohol	13 (7.7)
Underlying diseases	
Hypertension	28 (16.6)
Diabetes mellitus	16 (9.5)
Dyslipidemia	16 (9.5)
Others	18 (10.7)
Kratom use	
Current	45 (26.6)
Former	23 (13.6)
Never	101 (59.8)
Total score, mean (SD)	
Attitude	48.5 (12.4)
Knowledge	6.5 (2.5)

Figure 1. Boxplot of Total Attitude Scores by Kratom Use Status

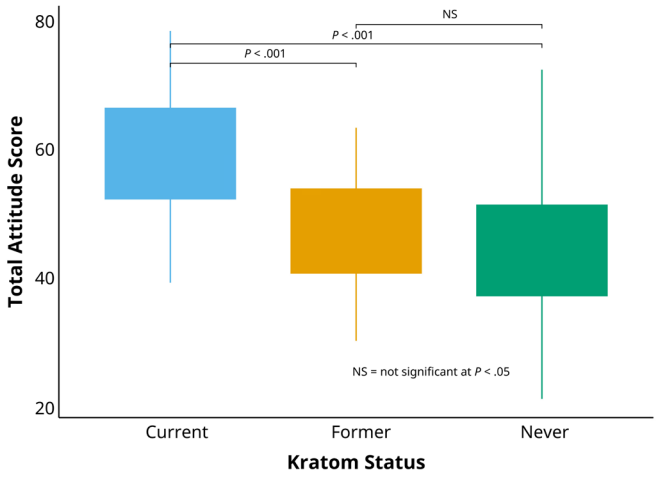
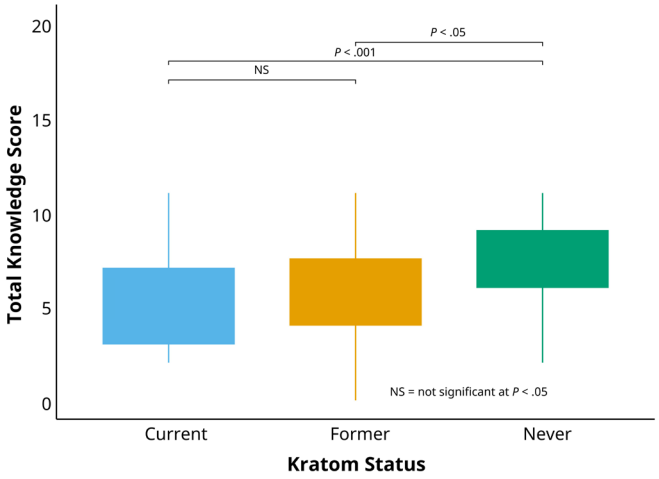


Figure 2. Boxplot of Total Knowledge Scores by Kratom Use Status



Kratom Usage Patterns and Methods

Among the 45 participants who reported current kratom use (Table 2), most were male (86.7%) with a mean (SD) age of 41.8 (14.7) years. On average, kratom use began at the mean (SD) age of 30.1 (15.0) years. Polysubstance use was common: 73.3% smoked tobacco, and 20% used both cannabis and alcohol. Initiation varied, with 44.4% starting on their own, 40% influenced by friends, and 11.1% by neighbors. Reported daily consumption ranged widely: 8.9% used < 1 leaf, 24.4% used 1-5 leaves, 8.9% used 6-10 leaves, 8.9% used 11-20 leaves, 15.6% used 21-30 leaves, and 33.3% used > 30 leaves per day — with the latter 2 categories reflecting harmful use. Current and harmful kratom use patterns by sex and age group, showed that males aged 21-40 had the highest prevalence of both, which indicated the significant involvement of this demographic in kratom use and related risks (Figure 3A and 3B). Long-term use was common, with 60% reporting use for over 5 years. The primary method of consumption was boiling the leaves (62.2%), followed by chewing and spitting them out (31.1%) or swallowing (6.7%). Furthermore, 48.9% reported mixing kratom with other substances — typically a cough suppressant, an amphetamine derivative, or cola.

Participants reported various burdens associated with kratom use, included increased consumption (20%), cravings (20%), social conflicts (6.7%), financial strain (24.4%), and health concerns (15.6%). Motivations for use varied. The most commonly cited reason was recreational use (42.2%), followed by enhanced work capacity (33.3%) and cough suppression (33.3%). Other reported motivations included stress relief (15.6%), muscle relief (20%), and social engagement (20%) (Figure 4).

In the past 3 months, 21 participants (46.7%) were advised to quit kratom, and 26 (57.8%) made independent attempts to stop. Reported reasons for relapse included easy access to kratom (7.7%), withdrawal symptoms (19.2%), social and workplace influences (38.6%), and continued use for cough suppression (7.7%). Motivations for quitting varied: 12 participants (46.2%) reported a loss of interest, 3 cited difficulty obtaining kratom (11.5%), and 4 were influenced by family or societal pressure (15.4%). Additional reasons included fear of side effects, financial strain, peer advice at work, and concerns about cognitive decline.

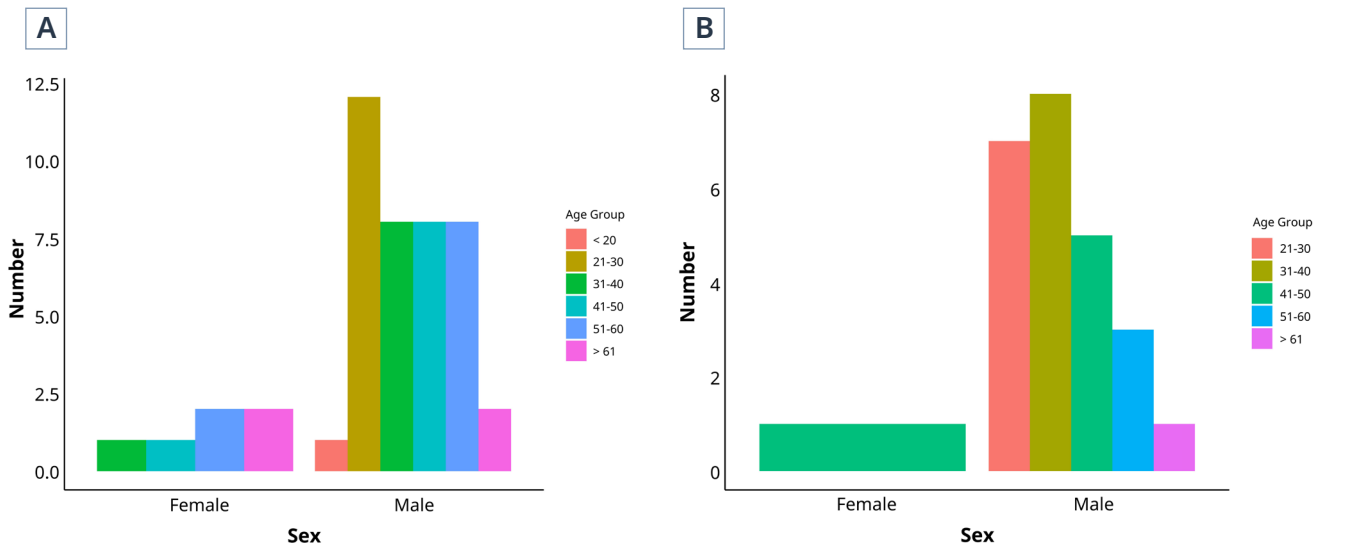
Table 2. Kratom Usage Patterns and Methods	
Baseline Characteristic	**No. (%) (N = 45)**
Sex	
Female	6 (13.3)
Male	39 (86.7)
Age, mean (SD), y	41.8 (14.7)
Initiation age of kratom use, mean (SD), y	30.1 (15.0)
Other substances used*	
Cannabis	9 (20.0)
Smoking	33 (73.3)
Alcohol	9 (20.0)
Influenced to use kratom by	
Friends	18 (40.0)
Neighbors	5 (11.1)
Themselves	20 (44.4)
Traditional doctor	2 (4.4)
Quantity of use, leaves/day	
< 1	4 (8.9)
1-5	11 (24.4)
6-10	4 (8.9)
11-20	4 (8.9)
21-30 (harmful use)	7 (15.6)
> 30 (harmful use)	15 (33.3)
Duration	
< 6 months	4 (8.9)
6-12 months	3 (6.7)
1-2 years	3 (6.7)
2-5 years	8 (17.8)
> 5 years	27 (60.0)
Consumption method	
Boil leaves to drink	28 (62.2)
Chew leaves without spitting out	3 (6.7)
Chew leaves and spit out	14 (31.1)
Mixing with supplements	
No	15 (33.3)
Cough suppressant	3 (6.7)
Mix (cough suppressant, derivative of amphetamine, cola)	22 (48.9)
Others**	5 (11.1)

Table 2. Kratom Usage Patterns and Methods (Continued)	
Baseline Characteristic	**No. (%) (N = 45)**
Burden of use (in past 1 month)	
Perceptions of increased consumption	9 (20.0)
Craving to use	9 (20.0)
Social conflicts	3 (6.7)
Financial strain	11 (24.4)
Health concerns	7 (15.6)
Reasons for kratom use	
Muscle relief	9 (20.0)
Cough suppression	15 (33.3)
Enhanced work capacity	15 (33.3)
Recreation	19 (42.2)
Stress relief	7 (15.6)
Withdrawal intolerance	5 (11.1)
Social engagement	9 (20.0)
Believed health benefits	5 (11.1)
Sleep issues	5 (11.1)
Quit attempts (in past 3 months)	
Somebody advised patient to quit	21 (46.7)
Tried to quit	26 (57.8)
Reason for relapse (in participants who tried to quit) (n = 26)	
Easy to purchase kratom	2 (7.7)
Withdrawal symptoms	5 (19.2)
Others	7 (26.9)
Influenced by social environment	2 (7.7)
Taking it for cough	2 (7.7)
Influenced by working environment	8 (30.9)
Reason for trying to quit (in participants who tried to quit) (n = 26)	
Decided to quit by oneself (got bored of using it)	12 (26.7)
Difficulty in purchasing kratom	3 (6.7)
Family, society, religion told to quit	4 (8.9)
Fear of side effects	3 (6.7)
Income insufficient for long-term use	2 (4.4)
Supervisor, coworkers told to quit	1 (2.2)
Thinking, reading slower than before	1 (2.2)

*Each participant could select more than 1 option.

**Sugar, coffee or lemon.

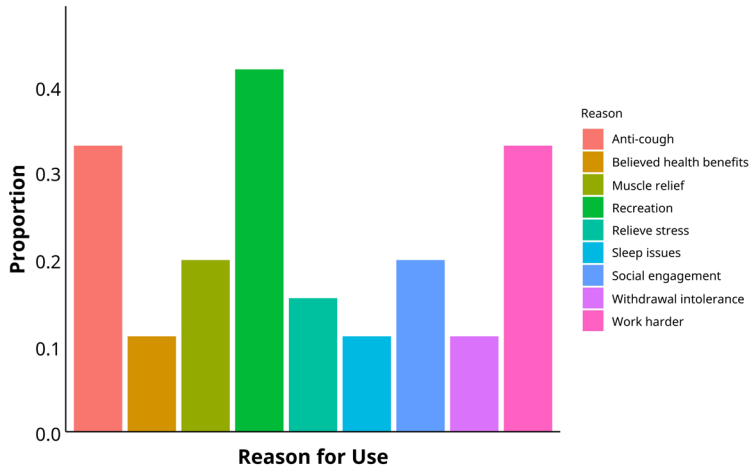
Figure 3. Distribution of Current and Harmful Kratom Use by Sex and Age Group



A, Current kratom use by sex and age group.

B, Current harmful kratom use by sex and age group.

Figure 4. Distribution of Reasons for Kratom Use Among Participants



Univariate Analysis of Factors Associated With Current and Harmful Kratom Use

The univariate analysis was summarized which compared behavioral and demographic characteristics between current kratom users and noncurrent users (including both former and never users), as well as between harmful and nonharmful users among current users.

Attitudes toward kratom use were significantly more favorable among current users, with a mean (SD) score of 59.6 (9.6), compared with 44.4 (10.7) in nonusers ($P < .001$). In contrast, knowledge about kratom was lower among current users, with a median (IQR)

score of 4 (3-7) vs 7 (5.8-9) in nonusers (*P* < .001). Sex differences were pronounced, with males comprising the majority of current users (86.7% male vs 13.3% female, *P* < .001). Current users were also younger, with a mean (SD) age of 41.8 (14.7) years compared with 49.8 (19.8) years among nonusers (*P* = .015). Fishermen were significantly overrepresented among current users, accounting for 46.7% (*P* < .001). Lifestyle factors such as smoking and alcohol use were also significantly associated with current kratom use, indicating a pattern of polysubstance use (Table 3).

Harmful kratom use, defined as consuming more than 20 leaves per day, was significantly associated with several factors. Individuals who began using kratom at a younger age were more likely to exhibit harmful usage patterns, with a mean (SD) initiation age of 23.5 (10.8) years compared with 36.4 (15.9) years among less intensive users (*P* = .003). Educational attainment also played a role, as those with only basic or lower education were more likely to exceed safe consumption levels. The method of consumption was a key determinant: individuals who boiled kratom were significantly more likely to engage in harmful use (95.5%, *P* < .001) than those who chewed the leaves. Moreover, mixing kratom with cough suppressants was strongly associated with harmful consumption, with 86.4% of such users exceeding the threshold (*P* < .001) (Table 4).

Multivariate Analysis of Factors Influencing Kratom Usage Patterns

Multivariate logistic regression analysis, identified key predictors of both current and harmful kratom use (Table 5). For current use, each additional year of age was associated with a 3% decrease in the likelihood of use (adjusted OR [AOR], 0.97; 95% CI, 0.94-0.99; *P* = .015). Current smokers had significantly higher odds of kratom use (AOR, 16.12; 95% CI, 5.01-51.86; *P*< .001), and individuals with poorer mental health were also more likely to use it (AOR, 8.8; 95% CI, 2.20-35.16; *P* = .001). A positive attitude toward kratom use was another strong predictor: for every one-point increase in the attitude score, the odds of kratom use rose by 12% (AOR, 1.12; 95% CI, 1.06-1.18; *P* < .001).

For harmful kratom use, the duration of use emerged as a significant predictor, with long-term users facing a higher risk (AOR, 10.54; 95% CI, 1.01-109.90; *P* = .049). The method of consumption also played a key role: individuals who boiled kratom had significantly greater odds of harmful use compared with those who chewed it (AOR, 80.96; 95% CI, 4.98-1315.6; *P* = .002). In addition, lower knowledge scores were associated with more harmful use (AOR, 17.8; 95% CI, 1.57-201.68; *P* = .02). The model fit was strong, with Nagelkerke's pseudo R-squared values of 0.62 for current use and 0.72 for harmful use. Hosmer-Lemeshow tests supported model calibration, and discrimination was confirmed by high area under the curve values (AUC) of 0.92 for current use and 0.94 for harmful use.

Table 3. Univariate Analysis of Factors Associated With Current Kratom Use

Factor	No. (%)			*P* Value
	Noncurrent Use (n = 124)	Current Use (n = 45)	Total (N = 169)	
Total attitude score, mean (SD)	44.4 (10.7)	59.6 (9.6)	48.5 (12.4)	< .001
Total knowledge score, median (IQR)	7 (5.8-9.0)	4 (3.0-7.0)	7 (4.0-9.0)	< .001
Sex				
Female	83 (66.9)	6 (13.3)	89 (52.7)	< .001
Male	41 (33.1)	39 (86.7)	80 (47.3)	

Table 3. Univariate Analysis of Factors Associated With Current Kratom Use (Continued)

Factor	No. (%)			*P* Value
	Noncurrent Use (n = 124)	Current Use (n = 45)	Total (N = 169)	
Age, mean (SD), y	49.8 (19.8)	41.8 (14.7)	47.7 (18.9)	.015
Religion				
Buddhism	9 (7.3)	2 (4.4)	11 (6.5)	.729
Islam	115 (92.7)	43 (95.6)	158 (93.5)	
Education level*				
More than basic education	83 (66.9)	30 (66.7)	113 (66.9)	.974
Below and equal to basic education	41 (33.1)	15 (33.3)	56 (33.1)	
Marital status				
Single	28 (22.6)	15 (33.3)	43 (25.4)	.085
Married	88 (71.0)	24 (53.3)	112 (66.3)	
Divorced	8 (6.5)	6 (13.3)	14 (8.3)	
Insurance type				
Universal health coverage	94 (75.8)	41 (91.1)	135 (79.9)	.075
Government	14 (11.3)	1 (2.2)	15 (8.9)	
Others	16 (12.9)	3 (6.7)	19 (11.2)	
Occupation				
Temporary employee	19 (15.3)	9 (20.0)	28 (16.6)	< .001
Fishing	21 (16.9)	21 (46.7)	42 (24.9)	
Others	33 (26.6)	8 (17.8)	41 (24.3)	
Student	15 (12.1)	2 (4.4)	17 (10.1)	
Unemployed	36 (29.0)	5 (11.1)	41 (24.3)	
Health state				
Very poor/poor/fair	57 (46.0)	10 (22.2)	67 (39.6)	.005
Good/excellent	67 (54.0)	35 (77.8)	102 (60.4)	
Mental health				
Very poor/poor/fair	23 (18.5)	13 (28.9)	36 (21.3)	.147
Good/excellent	101 (81.5)	32 (71.1)	133 (78.7)	
Coping abilities				
Very poor/poor/fair	25 (20.2)	8 (17.8)	33 (19.5)	.730
Good/excellent	99 (79.8)	37 (82.2)	136 (80.5)	
Cannabis				
Nonuser	123 (99.2)	36 (80.0)	159 (94.1)	< .001
User	1 (0.8)	9 (20.0)	10 (5.9)	
Smoking				
Nonuser	108 (87.1)	12 (26.7)	120 (71.0)	< .001
User	16 (12.9)	33 (73.3)	49 (29.0)	

Table 3. Univariate Analysis of Factors Associated With Current Kratom Use (Continued)

Factor	No. (%)			*P* Value
	Noncurrent Use (n = 124)	Current Use (n = 45)	Total (N = 169)	
Alcohol				
Nonuser	120 (96.8)	36 (80.0)	156 (92.3)	1.000
User	4 (3.2)	9 (20.0)	13 (7.7)	
Prior diagnosed hypertension				
No	98 (79.0)	43 (95.6)	41 (83.4)	.011
Yes	26 (21.0)	2 (4.4)	28 (16.6)	
Prior diagnosed diabetes				
No	110 (88.7)	43 (95.6)	153 (90.5)	.241
Yes	14 (11.3)	2 (4.4)	16 (9.5)	

*Basic education in Thailand refers to middle school.

Table 4. Univariate Analysis of Factors Associated With Harmful Kratom Use

Factor	No. (%)		*P* Value
	Not Harmful (n = 23)	Harmful (n = 22)	
Sex			
Female	5 (21.7)	1 (4.5)	.187
Male	18 (78.3)	21 (95.5)	
Age, mean (SD), y	47.5 (14.5)	35.8 (12.7)	.006
Initiation age of kratom use, mean (SD), y	36.4 (15.9)	23.5 (10.8)	.003
Health state			
Very poor/poor/fair	8 (34.8)	2 (9.1)	.071
Good/excellent	15 (65.2)	20 (90.9)	
Mental health			
Very poor/poor/fair	8 (34.8)	5 (22.7)	.372
Good/excellent	15 (65.2)	17 (77.3)	
Coping abilities			
Very poor/poor/fair	5 (21.7)	3 (13.6)	.699
Good/excellent	18 (78.3)	19 (86.4)	
Education level*			
More than basic education	19 (82.6)	11 (50)	.020
Below and equal to basic education	4 (17.4)	11 (50)	
Cannabis			
Nonuser	20 (87)	16 (72.7)	.284
User	3 (13)	6 (27.3)	

Table 4. Univariate Analysis of Factors Associated With Harmful Kratom Use (Continued)

Factor	No. (%)		*P* Value
	Not Harmful (n = 23)	Harmful (n = 22)	
Smoking			
Nonuser	9 (39.1)	3 (13.6)	.053
User	14 (60.9)	19 (86.4)	
Alcohol			
Nonuser	18 (78.3)	18 (81.8)	1.000
User	5 (21.7)	4 (18.2)	
Duration, y			
≤ 5	13 (56.5)	5 (22.7)	.021
> 5	10 (43.5)	17 (77.3)	
Method			
Boil	7 (30.4)	21 (95.5)	< .001
Chew	16 (69.6)	1 (4.5)	
Mixing with cough suppressant			
No	17 (73.9)	3 (13.6)	< .001
Yes	6 (26.1)	19 (86.4)	
Total attitude score			
≤ 50	8 (34.8)	2 (9.1)	.071
> 50	15 (65.2)	20 (90.9)	
Total knowledge score			
≤ 6	10 (43.5)	19 (86.4)	.003
> 6	13 (56.5)	3 (13.6)	

*Basic education in Thailand refers to middle school.

Table 5. Multivariate Analysis of Factors Associated With Current Kratom Use and Harmful Use

Factor	Adjusted OR (95% CI)	*P* Value
Current kratom use		
Increase of one year in age (continues variable)	0.97 (0.94-0.99)	.015
Current smoking (reference, do not smoke)	16.12 (5.01-51.86)	< .001
Very poor/poor, or fair mental health (reference, good/excellent)	8.8 (2.20-35.16)	.001
Increase of one point in attitude score (continues variable)	1.12 (1.06-1.18)	< .001
Harmful use		
Duration > 5 years (reference, ≤ 5 years)	10.54 (1.01-109.90)	.049
Method of use is boiling (reference, chewing)	80.96 (4.98-1315.60)	.002
Knowledge toward kratom use less ≤ 6 (reference, > 6)	17.8 (1.57-201.68)	.020

Discussion

This study offers a comprehensive analysis of kratom use in rural communities in southern Thailand, providing key insights into knowledge, attitudes, and usage behaviors. While knowledge about the effects of kratom varied, many users expressed positive attitudes toward its perceived benefits — such as increased stamina and pain relief — despite limited understanding of potential harms. Kratom use was particularly common among males aged 21-40, especially those in fishing and low-skilled occupations. Nearly half of current users engaged in harmful consumption, defined as > 20 leaves per day. Multivariate analysis identified several factors associated with both current and harmful use, including poor mental health, tobacco use, method of consumption, and favorable attitudes toward kratom. These findings highlight the need for targeted, culturally informed interventions.

The diverse reasons for kratom use, which ranged from enhancing work capacity to recreational purposes, reflect the complex motivations underlying its consumption. Many users may be drawn to its stimulant and euphoric effects, which offer temporary relief from the physical and mental demands of their occupations. This finding aligned with previous research in Thailand,[21] which reported that approximately 70% of kratom use was work-related, which is a distinct pattern from Western contexts,[1, 22-24] where kratom is more commonly used for medicinal purposes, such as pain management, mental health conditions, and as an opioid substitute. The usage patterns observed in this study contribute to the ongoing discourse on kratom as both a recreational and self-medicated substance. Although its pain-relieving properties are well-recognized, the potential for recreational use and dependence remains a critical concern. Understanding these contextual factors is essential for informing educational initiatives and developing strategies to mitigate the spread of kratom use.

The demographic specificity of kratom use noted in this study — predominantly among males in physically demanding occupations — was consistent with literature suggesting that manual laborers are at increased risk of initiating substance use as a coping strategy. These patterns also align with global trends, where substance use is strongly influenced by socioeconomic and occupational factors.[2, 23, 25] The significant association between smoking and kratom use points to a broader pattern of polysubstance use, raising significant public health concerns owing to the potential for compounded health risks. This study supports findings from previous research which have indicated that kratom users frequently consume other substances,[9, 23] particularly tobacco.[21] Research in Thailand has demonstrated a strong relationship between tobacco use and kratom consumption. This study also identified patterns involving other substances, such as cannabis which is of particular relevance as cannabis regulations in Thailand are currently undergoing major changes.[26] In the US, kratom use has been linked to multiple substances, including marijuana,[22] alcohol, tobacco, psychedelics, heroin, and prescription drugs.[25] Therefore, legalizing kratom solely on the basis of its potential scientific or medicinal benefits, without addressing its broader social context and potential to facilitate other substance use, may be inadequate.

In addition, this study has highlighted that individuals whose socioeconomic circumstances encourage kratom use often experience significant financial strain and health concerns because of prolonged consumption. These consequences play a critical role in shaping the decision to quit, which is frequently influenced by withdrawal symptoms and social pressures. This underscores the complex interplay between individual experiences and broader social influences.[23]

This study's results have also revealed a strong association between positive attitudes toward kratom and current use, suggesting that individuals who view kratom favorably are more likely to consume it. Conversely, limited knowledge about kratom is significantly linked to harmful use, indicating that misinformation or lack of awareness may lead to riskier consumption behaviors. These findings highlight the urgent need for educational programs that provide accurate information about the effects and risks of kratom.[6, 21]

Mental health status also plays a pivotal role, in which poorer mental health was significantly associated with higher levels of kratom use.[27] This finding emphasizes the importance of integrating mental health support into substance use interventions. By examining these factors, this study offers valuable insights into the demographic and behavioral characteristics linked to kratom use and highlights the need for public health strategies that address both the physical and psychological dimensions of substance use in communities.

A notable concern emerging from this study is the predominant method of kratom consumption, which involves boiling the leaves. This contrasts with earlier research showing that kratom used for work-related purposes was typically consumed by chewing the leaves directly.[6] This study's findings indicate that boiling may lead to the intake of larger — and potentially harmful — quantities. Moreover, this method is often accompanied by mixing kratom with substances such as codeine and amphetamines, a widespread and dangerous practice. This issue is not confined to this study area, and similar patterns are observed in other parts of Thailand, where kratom is commonly mixed into tea and distributed via delivery services, complicating regulation and enforcement.[28] These practices across different regions emphasize the urgent need for robust regulatory oversight by governmental bodies to curb risky consumption behaviors and protect public health.

Implications for Public Health

The patterns of kratom use identified in this study mirror global trends in which substance use is shaped by socioeconomic and occupational factors — particularly in settings where individuals rely on substances to cope with physically demanding work. These findings highlight the need for public health strategies that extend beyond general education, calling for targeted interventions which are tailored to high-risk demographics. Occupational health programs could play a critical role in reducing harmful kratom use by addressing substance use within physically intensive jobs. In parallel, community-based educational initiatives should be implemented to raise awareness of both the perceived benefits and potential risks of kratom, while considering the socioeconomic pressures and occupational stressors that influence substance use. By addressing these factors in the context of local conditions, such interventions can achieve greater relevance, impact, and sustainability.

Strengths, Limitations, and Future Research

A major strength of this study is its use of qualitative methods to inform the development of a culturally and linguistically appropriate quantitative survey. This mixed-methods approach ensured that the quantitative findings were grounded in the lived experiences of the community, enhancing the validity and contextual relevance of the data. Furthermore, active engagement with local communities during the questionnaire development phase strengthened the relevance and applicability of the findings.

Although the initial qualitative insights provided a strong foundation, the cross-sectional design limited the ability to draw causal inferences about the relationships between observed factors and kratom usage patterns. The study relied on self-reported data, which might have been subject to recall bias and social desirability bias. The relatively small sample size (n = 169) might have reduced statistical power to detect weaker associations and has limited the precision of prevalence estimates. In addition, the purposive selection of areas with known high kratom prevalence, might have affected the generalizability of the findings. Although this approach was valuable for identifying usage patterns in high-risk communities, the results may not reflect behaviors in regions with different socioeconomic or cultural contexts.

Future research should explore the dynamics of kratom use over time through longitudinal studies, particularly to assess its long-term health effects across varying social and cultural contexts. Expanding the scope to include more diverse populations and settings will help to clarify how socioeconomic factors influence usage patterns over time. Such studies can provide critical evidence to support the development of culturally informed public health interventions and policies, ultimately enhancing the effectiveness of targeted prevention and harm reduction strategies.

Conclusions

This study identified key demographic and behavioral factors associated with kratom use in high-prevalence areas of southern Thailand. Younger age, male sex, tobacco use, and positive attitudes toward kratom were significantly linked to current use. Harmful consumption — defined as > 20 leaves per day — was more common among long-term users, those who boiled kratom leaves, and individuals with limited knowledge of its effects. These findings highlight the need for evidence-based public health strategies that address both usage patterns and their underlying drivers. Interventions should prioritize knowledge enhancement, particularly among high-risk groups such as young males and manual laborers, and promote regulation of harmful consumption practices. The insights gained from this study may inform local health promotion efforts and support the development of targeted educational and regulatory measures to reduce the risks associated with kratom use.

Additional Information

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Ethics Approval: This study was approved by the Human Research Ethics Committee (HREC), Faculty of Medicine, Prince of Songkla University (REC 64-167-9-2 on 9 June 2021). HREC is the official institutional body responsible for ethical oversight of human research. The study was conducted in accordance with the Declaration of Helsinki. Before the study began — conducted as part of the Community Medicine curriculum — cooperation was sought from local public health authorities and relevant stakeholders in both government and private sectors. Researchers engaged with the community to build trust, which was a critical step considering the sensitive nature of the questionnaire. Informed consent was obtained from all participants. Data confidentiality and secure storage were ensured, with all responses anonymized and managed electronically by the research team.

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