

## Knowledge, Attitude, and Practices of Traditional Herbs and Spices Consumption among Adults in Malaysia

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### ABSTRACT

This research aimed to assess knowledge, attitude, and practices regarding traditional herbs and spices consumption among Malaysian adults aged 18 to 60 years. A 5-parts close-ended questionnaire was partially adapted and modified from articles and validated by 11 experts. Data collection was performed by using an online questionnaire (n=281). Most participants are female (75.4%) and Malay (85.1%), followed by Chinese (10.0%), Indian (2.1%), and other ethnicities (2.8%) such as Sabah natives, Iban, Dusun, and Javanese. Most respondents consumed traditional herbs and spices. *Centella asiatica* ('pegaga'), ginseng, *Labisia pumila* ('kacip fatimah'), and longjack ('tongkat ali') were the most consumed herbs whereas lemongrass, garlic, ginger, turmeric, and star anise were the most consumed spices. The study found good knowledge, fair attitude, and poor practice regarding traditional herbs and spices consumption. Knowledge was significantly associated with ethnicity, while consumption status was associated with attitude and practice levels. A moderate and positive correlation was observed between attitudes and practices. Enhancing public knowledge and promoting positive attitudes towards these traditional ingredients is essential for preserving cultural heritage and incorporating them into modern diets.

**Keywords:** attitude, consumption, knowledge, traditional herbs and spices

### INTRODUCTION

Herbs and spices have diverse properties and are widely used in cooking, traditional medicine, and for various health purposes. They hold significant economic importance as essential ingredients in food, medicine, perfumery, and cosmetics (Jiang 2019). Research has highlighted their numerous health benefits, including immune system support, disease prevention, and cardiovascular health improvements, attributed to their rich content of polyphenols and other phytochemicals (Muchtaridi *et al.* 2022a; Ikram *et al.* 2022). For instance, garlic has been shown to lower cholesterol levels by up to 9% when

consumed daily, and garlic extract can prevent blood clots and reduce blood pressure (Tapsell *et al.* 2006). Moreover, the flavor-enhancing properties of herbs and spices lead to reduced salt usage, providing additional cardiovascular health benefits (Anderson *et al.* 2015).

The historical use of herbs and spices dates back thousands of years in ancient civilizations like Egyptian, Chinese, and Indian cultures, valued for their medicinal properties, flavor enhancement, and food preservation (Ahmad *et al.* 2021). In Malaysia, traditional medicine systems, including Traditional Chinese Medicine (TCM), Ayurvedic medicine, traditional Malay medicine (e.g., *jamu*), and Islamic medical practices,

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reflect the nation's multi-racial and multicultural nature (Ikram *et al.* 2015; Williams 2021).

Herbs play a crucial role in all these traditional medicine systems. The study is driven by health concerns and knowledge about the benefits of herbs and spices, as observed in European studies (Szűcs *et al.* 2018). However, there is a paucity of research on the consumption of traditional herbs and spices in South Asian countries, particularly Malaysia. Previous research has mainly focused on the development of indigenous plants and herbal products (Muhammad *et al.* 2022; Arisanti *et al.* 2023; Muchtaridi *et al.* 2022b), but there is a limited understanding of the consumption patterns of traditional herbs and spices among Malaysian adults. Thus, this study aims to fill this research gap by investigating the knowledge, attitudes, and practices of traditional herbs and spices consumption among Malaysian adults.

## METHODS

### Design, location, and time

Cross-sectional non-experimental research was conducted in Malaysia to determine the knowledge, attitudes, and practices of traditional herbs and spices consumption among Malaysian adults aged 18 to 60 years old from December 2022 to July 2023. Ethical clearance for this study was received on 31st May 2023 from the Universiti Teknologi Mara (UiTM) Research Committee, with the reference number FERC/FSK/MR/2023/00126.

### Sampling

The convenience purposive sampling method was used to select participants based on their availability to complete the questionnaire forms and adherence to the inclusion and exclusion criteria set for this study. Based on sample size calculation using Raosoft software calculator with a 95% confidence level, 5% margin of error, and 50% response distribution, the initial sample size (n) was 385. After data checking and cleaning, data for 281 respondents were proceeded for further analysis.

The eligibility criteria were: 1) Malaysian adults aged 18–60 years; 2) Ability to read and write in Bahasa Malaysia or English; 3) Able to provide informed consent; 4) Willing to take part in the study.

### Data collection

Data collection was conducted by using the self-administered, close-ended questionnaire. All questionnaires provided were in English and Malay versions. Participants were invited to take part in the study through various communication channels, including email, WhatsApp, Telegram, Facebook, Twitter, and Instagram. An online questionnaire, including a consent form, was distributed via Google Forms. The questionnaire comprised 5 sections, covering socio-demographic data, a Food Frequency Questionnaire (FFQ) regarding traditional herbs and spices, knowledge, attitude, and practice about traditional herbs and spices consumption. Participation was voluntary, and participants were required to complete the questionnaire by answering all the questions. The average time required for completing the questionnaire was approximately 5 to 15 minutes.

**Research instruments.** A 5-part close-ended bilingual questionnaire was utilized to assess the participants' socio-demographic information, food frequency regarding traditional herbs and spices, as well as knowledge, attitude, and practices toward herbs and spices consumption. The questionnaire was partially adapted and modified from relevant studies (Zaidi *et al.* 2022; Jamaludin *et al.* 2022; Blanton, 2020; Teh *et al.* 2019; Szűcs *et al.* 2018; Othman *et al.* 2013) and translated into Malay. Eleven experts, with expertise in the field of study, evaluated each item for clarity, relevance, and appropriateness. The questionnaire's content validity was evaluated using the index of Content Validity (CVI), the Scale-level Content Validity Index based on the Average Method (S-CVI/Ave), and the Scale-level Content Validity index based on the Universal Agreement method (S-CVI/UA). Items that received a value of 0.78 or higher are accepted while some of the items that received lower values were eliminated or revised (Yusoff 2019). The validity test revealed 53 items received CVI values greater than 0.78, considered acceptable, except for item 10 with a CVI value of 0.64 was eliminated. A pilot test was conducted to ensure all participants understood the questions.

**Food Frequency Questionnaire (FFQ) of traditional herbs and spices.** There were 10 types of traditional herbs and 10 types of traditional spices that were included in the FFQ which was

chosen from the common traditional herbs and spices in Malaysia (Zakaria *et al.* 2019). The questionnaire provided clear instructions on how to use the FFQ and included visual illustrations for each item listed. Frequency of the consumption was recorded in six categories: 1) Daily; 2) Few times a week; 3) Once a week; 4) Two or three times per month; 5) Once a month; and 6) Do not know or never (Szűcs *et al.* 2018).

**Knowledge, attitude, and practice of traditional herbs and spices consumption.** All the questions were partially adapted and modified from several studies (Zaidi *et al.* 2022; Jamaludin *et al.* 2022; Blanton 2020; Teh *et al.* 2019; Szűcs *et al.* 2018; Othman *et al.* 2013). The total scores for each domain were calculated and categorized as poor ( $\leq 50\%$  of total score), moderate (51% to 69%), and good ( $\geq 70\%$  of total score) (Harrington 2016; Jamaludin *et al.* 2022; Ikram *et al.* 2023).

**Knowledge domain.** The third part focused on the participants' knowledge of herbs and spices consumption. This domain consisted of nine closed-ended statement questions regarding the general knowledge of traditional herbs and spices consumption. Each question was provided with two scales, 'yes' and 'no' with the marks 1 and 0 respectively. It gave a total score range of 0–9 for the knowledge section.

**Attitude domain.** In the fourth part, the consumers' attitudes towards herbs and spices consumption were measured. It consisted of 18 statements with five Likert scale answers provided. Likert scale answers were scored as follows: Strongly agree–5; Agree–4; Neutral–3; Disagree–2; Strongly disagree–1 with the total score range of 0–90. 'Strongly agree' indicated maximum adherence towards traditional herbs and spices consumption. The statement was overall related to their belief in the benefits of traditional herbs and spices consumption, preferences, and the availability of the products.

**Practice domain.** In the last part, participants' practices on traditional herbs and spices intake are evaluated. It consists of seven questions with three choice answers as follows: 'yes', 'no', and 'not sure'. Subjects were asked about their practice towards traditional herbs and spices consumption, such as their habits of taking traditional herbs and spices products during sickness. Each question regarding good practice was provided with a score of "1" for yes, while the lowest practice was given "0" for no or not sure.

### **Data analysis**

The Statistical Package for the Social Sciences (SPSS) version 27.0 was used to analyze the data collected in this study.

## **RESULTS AND DISCUSSION**

### **Socio-demographic characteristics**

A total of 281 Malaysian adults aged 18 to 60 years were included in the data analysis. Among them, 75.4% were female and 24.6% were male. Participants were categorized into young adults (18–30 years), adults (31–50 years), and older adults (51–60 years), with 69.0% falling in the young adult category. Ethnically, the majority were Malay (85.1%), followed by Chinese (10.0%), Indian (2.1%), and other ethnicities (2.8%). Most participants held a Bachelor's degree (70.1%,  $n=197$ ). Single status was more prevalent among female participants (64.5%) compared to males (76.8%). Socioeconomic status was assessed using monthly household income, categorized into low ( $<RM2,500$ – $RM4,850$ ), normal ( $RM4,851$ – $RM10,970$ ), and high ( $>RM10,971$ ) according to Malaysian household income groups. Participants were predominantly in the bottom category (59.8%), followed by middle (28.1%,  $n=79$ ), and top (12.1%,  $n=34$ ) categories. Additionally, 68.7% were students ( $n=193$ ), while 31.3% were currently not students ( $n=88$ ).

### **Traditional herbs and spices consumption patterns among adults in Malaysia**

The findings revealed that most participants (55.2%) consumed traditional herbs and spices, while 44.8% of participants did not consume them. This indicates that traditional herbs and spices hold a significant place in the dietary habits of the study population, with more than half of the respondents incorporating them into their daily meals. This might be due to Malaysia's diverse ethnic groups each bringing their unique culinary heritage, which heavily influences the consumption patterns of traditional herbs and spices (Ishak *et al.* 2019; Perry 2017).

Beyond culinary uses, traditional herbs and spices held importance in Malaysian traditional medicine practices. Various communities valued the medicinal properties of these elements, using them to address common ailments and enhance overall well-being (Tengku Mohamad

*et al.* 2019). Additionally, studies have reported varying consumption levels across different regions, with the highest in India, South Africa, and Latin America. European countries, however, exhibited lower consumption (Gajewska *et al.* 2020; Vázquez-Fresno *et al.* 2019).

The overall findings demonstrate none of the sociodemographic characteristics analyzed were significantly associated ( $p > 0.05$ ) with traditional herbs and spices consumption. Gender, age, socioeconomic status, ethnicity, educational level, and marital status did not appear to play a significant role in determining the participants' likelihood of consuming traditional herbs and spices (Table 1).

### **Common traditional herbs and spices consumption among adults in Malaysia**

In this study, traditional herb and spice consumption was categorized as 'at least once per month' and 'do not know or never.' Among the listed traditional herbs, *Centella asiatica* ('pegaga') was the most commonly consumed (40.6%), followed by ginseng (31.7%), *Labisia pumila* ('kacip fatimah') (20.6%), and longjack (17.4%). However, a majority of respondents were unaware of listed herbs like *Orthosiphon aristatus* ('misai kucing'), *Morinda citrifolia* ('mengkudu'), *Andrographis paniculata* ('hempedu bumi'), *Ficus deltoidea* ('mas cotek'), and *Phyllanthus niruri* ('dukung anak'), highlighting a potential knowledge gap in the diverse range of traditional herbs available in Malaysia.

Regarding traditional spices, lemongrass was the most consumed spice (92.9%), likely due to its strong presence in Malaysian cuisine. Garlic (91.5%), ginger (90%), turmeric (89%), and star anise (87.5%) were also popular, enhancing flavors while offering potential health benefits. These consumption patterns reflect Malaysia's rich culinary and medicinal traditions.

These findings are consistent with prior research on the significance of traditional herbs and spices in Malaysian cuisine (Abas *et al.* 2006; Raji *et al.* 2017). In a different study, black pepper, garlic powder, and cinnamon were found to be the most commonly consumed herbs and spices among respondents (Blanton 2020).

### **Levels of knowledge, attitude, and practices of traditional herbs and spices consumption among adults in Malaysia**

According to Szűcs *et al.* (2018), knowing the health benefits of herbs and spices can positively influence consumption habits. As presented in Table 2, the majority of the participants (81.1%) displayed a good level of knowledge, indicating a favorable understanding of traditional herbs and spices consumption. However, analyzing associations between knowledge and sociodemographic factors like gender, age, education, marital status, socioeconomic status, and student status, no significant differences were observed ( $p > 0.05$ ). This implies that these demographic factors did not significantly influence the participants' knowledge of traditional herbs and spices consumption. Yet, a statistically significant relationship ( $p < 0.05$ ) was observed on the association between knowledge and ethnicity ( $p = 0.033$ ), indicating varying knowledge levels among different ethnic backgrounds. This aligns with previous studies like Teh *et al.* (2019), where the results indicated no statistically significant difference in knowledge scores based on socio-demographic profiles such as gender, age, marital status, educational level, and employment ( $p > 0.05$ ). However, a significant difference in knowledge scores was observed between different racial groups ( $p < 0.05$ ). Similarly, Kim Sooi and Lean Keng (2013) reported no significant difference ( $p > 0.05$ ) in knowledge scores based on socio-demographic characteristics such as age, occupation, and education level.

In terms of attitude towards traditional herbs and spices consumption, most respondents (51.2%) had a fair attitude towards traditional herbs and spices, followed by 39.1% with a good attitude and 9.6% with a poor attitude. This variation in attitudes reflects the complexities of individuals' perceptions and beliefs surrounding traditional dietary practices in the context of modern lifestyles. Gender, age, socioeconomic status, and student status showed no significant associations with attitude levels ( $p > 0.05$ ), indicating the limited influence of these demographics on attitudes. However, a statistically significant association was observed between attitude and consumption status ( $p < 0.05$ ), that the participants' attitudes towards traditional herbs and spices consumption were linked to their actual consumption practices (Table 3). Similar patterns were observed in the study by Teh *et al.* (2019) on consumers' attitudes

*Traditional herbs and spices consumption*

Table 1. Association between consumption of traditional herbs and spices and socio-demographic characteristics

Characteristics	Consumption of traditional herbs and spices		Total (n=281) n (%)	p
	No (n=126) n (%)	Yes (n=155) n (%)		
Gender				0.589
Male	29 (23.0)	40 (25.8)	69 (24.6)	
Female	97 (77.0)	115 (74.2)	212 (75.4)	
Age group				0.694
Young adults	90 (71.4)	104 (67.1)	194 (69.0)	
Adults	30 (23.8)	41 (26.5)	71 (25.3)	
Older adults	6 (4.8)	10 (6.5)	16 (5.7)	
Ethnicity				0.135 <sup>a</sup>
Malay	108 (85.7)	131 (84.5)	239 (85.1)	
Chinese	14 (11.1)	14 (9.0)	28 (10.0)	
Indian	0 (0.0)	6 (3.9)	6 (2.1)	
Others	4 (3.2)	4 (2.6)	8 (2.8)	
Education level				0.284 <sup>a</sup>
Secondary school	2 (1.6)	2 (1.3)	4 (1.4)	
Certificate	2 (1.6)	1 (0.6)	3 (1.1)	
Pre-University (STPM, Matriculation, Foundation)	4 (3.2)	10 (6.5)	14 (5.0)	
Diploma	17 (13.5)	11 (7.1)	28 (10.0)	
Bachelor's degree	89 (70.6)	108 (69.7)	197 (70.1)	
Postgraduate (Master's degree, PhD)	12 (9.5)	22 (14.2)	34 (12.1)	
Others	0 (0.0)	1 (0.6)	1 (0.4)	
Marital status				0.781 <sup>a</sup>
Single	89 (70.6)	101 (65.2)	190 (67.6)	
Married	35 (27.8)	52 (33.5)	87 (31.0)	
Divorced	1 (0.8)	1 (0.6)	2 (0.7)	
Widowed	1 (0.8)	1 (0.6)	2 (0.7)	
Socioeconomic status				0.108
Top	10 (7.9)	24 (15.5)	34 (12.1)	
Middle	34 (27.0)	45 (29.0)	79 (28.1)	
Bottom	82 (65.1)	86 (55.5)	168 (59.8)	
Student				0.095
Yes	93 (73.8)	100 (64.5)	193 (68.7)	
No	33 (26.2)	55 (35.5)	88 (31.3)	

<sup>a</sup>Fisher-Freeman-Halton Exact. Significant value at p<0.05; STPM: *Sijil Tinggi Persekolahan Malaysia*

Table 2. Association between level of knowledge regarding traditional herbs and spices consumption and socio-demographic characteristics (n=281)

Characteristics	Level of knowledge			Total (n=281)	<i>p</i>
	Poor (0–50) n (%)	Fair (51–69) n (%)	Good (70–100) n (%)		
Gender					0.330 <sup>a</sup>
Male	0 (0.0)	9 (17.6)	60 (26.4)	69	
Female	3 (100.0)	42 (82.4)	167 (73.6)	212	
Age group					0.100 <sup>a</sup>
Young adults	2 (66.7)	28 (54.9)	164 (72.2)	194	
Adults	1 (33.3)	20 (39.2)	50 (22.0)	71	
Older adults	0 (0.00)	3 (5.9)	13 (5.7)	16	
Ethnicity					0.033 <sup>a</sup>
Malay	1 (3.33)	42 (82.4)	196 (86.3)	239	
Chinese	2 (66.7)	4 (7.8)	22 (9.7)	28	
Indian	0 (0.0)	1 (2.0)	5 (2.2)	6	
Others	0 (0.0)	4 (7.8)	4 (1.8)	8	
Education level					0.384 <sup>a</sup>
Secondary school	0 (0.0)	2 (3.9)	2 (5.3)	4	
Certificate	0 (0.0)	0 (0.0)	3 (1.3)	3	
Pre-University (STPM, Matriculation, Foundation)	0 (0.0)	2 (3.9)	12 (5.3)	14	
Diploma	0 (0.0)	9 (17.6)	19 (8.4)	28	
Bachelor's degree	2 (66.7)	33 (64.7)	162 (71.4)	197	
Postgraduate (Master's degree, PhD)	1 (33.3)	5 (9.8)	28 (12.3)	34	
Others	0 (0.0)	0 (0.0)	1 (0.4)	1	
Marital status					0.066 <sup>a</sup>
Single	2 (66.7)	29 (56.9)	159 (70.0)	190	
Married	1 (33.3)	20 (39.2)	66 (29.1)	87	
Divorced	0 (0.0)	2 (3.9)	0 (0.0)	2	
Widowed	0 (0.0)	0 (0.0)	2 (0.9)	2	
Socioeconomic status					0.942 <sup>a</sup>
Top	0 (0.0)	6 (11.8)	28 (12.3)	34	
Middle	1 (33.3)	16 (31.4)	62 (27.3)	79	
Bottom	2 (66.7)	29 (56.9)	137 (60.4)	168	
Student					0.180 <sup>a</sup>
Yes	1 (33.3)	32 (62.7)	160 (70.5)	193	
No	2 (66.7)	19 (37.3)	67 (29.5)	88	
Consumption					0.579 <sup>a</sup>
Yes	1 (33.3)	26 (51.0)	128 (56.4)	155	
No	2 (66.9)	25 (49.0)	99 (43.6)	126	

Chi-square test used unless otherwise noted; <sup>a</sup>Fisher-Freeman-Halton Exact. Significant value at  $p < 0.05$ ; STPM: *Sijil Tinggi Persekolahan Malaysia*

*Traditional herbs and spices consumption*

towards Chinese herbal tea, where gender, race, marital status, education, and employment did not show significant associations ( $p>0.05$ ) while age groups showed significance ( $p<0.05$ ). Such similarities across studies indicate that attitudes towards traditional herbs and spices consumption might be less influenced by sociodemographic factors.

Even though the majority of respondents showed good knowledge and fair attitude levels, they had poor practice levels (48.4%) towards traditional herbs and spices consumption which scored less than 50%. The poor practice level might be related to the availability of traditional herbs and spices at home and taste preferences toward healthy food (Jamaludin

*et al.* 2022). Those who have easy access to these ingredients and a preference for healthier options are more likely to incorporate them into their meals. Furthermore, low Socioeconomic Status (SES) individuals may face challenges in accessing and affording traditional herbs and spices, which can impact their consumption practices. Limited financial resources may hinder their ability to use these ingredients (Dean & Sharkey 2011). Notably, a significant connection between consumption status and practice levels was identified ( $p<0.05$ ), indicating that those consuming traditional herbs and spices tended to exhibit more favorable practices. Meanwhile, in a study conducted by Zaidi *et al.* (2022), only the educational status and gender of the respondents

Table 3. Association between level of attitude regarding traditional herbs and spices consumption and socio-demographic characteristics (n=281)

Characteristics	Level of knowledge			Total (n=281)	P
	Poor (0–50) n (%)	Fair (51–69) n (%)	Good (70–100) n (%)		
Gender					0.806
Male	7 (25.9)	33 (22.9)	29 (26.4)	69	
Female	20 (74.1)	111 (77.1)	81 (73.6)	212	
Age group					0.180
Young adults	19 (70.4)	102 (70.8)	73 (66.4)	194	
Adults	4 (14.8)	36 (25.0)	31 (28.2)	71	
Older adults	4 (14.8)	6 (4.2)	6 (5.5)	16	
Ethnicity					0.940 <sup>a</sup>
Malay	25 (92.6)	119 (82.6)	95 (86.4)	239	
Chinese	2 (7.4)	17 (11.8)	9 (8.2)	28	
Indian	0 (0.0)	3 (2.1)	3 (2.7)	6	
Others	0 (0.0)	5 (3.5)	3 (2.7)	8	
Education level					0.690 <sup>a</sup>
Secondary school	0 (0.0)	2 (1.4)	2 (1.8)	4	
Certificate	0 (0.0)	2 (1.4)	1 (0.9)	3	
Pre-University (STPM, Matriculation, Foundation)	1 (3.7)	8 (5.6)	5 (4.5)	14	
Diploma	1 (3.7)	18 (12.5)	9 (8.2)	28	
Bachelor’s degree	24 (88.9)	93 (64.6)	80 (72.7)	197	
Postgraduate (Master’s degree, PhD)	1 (3.7)	21 (14.6)	12 (10.9)	34	
Others	0 (0.0)	0 (0.0)	1 (0.9)	1	
Marital status					0.809 <sup>a</sup>
Single	19 (70.4)	97 (67.4)	74 (67.3)	190	

Continue from Table 3

Characteristics	Level of knowledge			Total (n=281)	p
	Poor (0–50) n (%)	Fair (51–69) n (%)	Good (70–100) n (%)		
Married	8 (29.6)	43 (29.9)	36 (32.7)	87	
Divorced	0 (0.0)	2 (1.4)	0 (0.0)	2	
Divorced	0 (0.0)	2 (1.4)	0 (0.0)	2	
Widowed	0 (0.0)	2 (1.4)	0 (0.0)	2	
Socioeconomic status					0.546
Top	5 (18.5)	16 (11.1)	13 (11.8)	34	
Middle	10 (37.0)	39 (27.1)	30 (27.3)	79	
Bottom	12 (44.4)	89 (61.8)	67 (60.9)	168	
Student					0.728
Yes	18 (18.5)	102 (70.8)	73 (66.4)	193	
No	9 (33.3)	42 (29.2)	37 (33.6)	88	
Consumption					
Yes	10 (37.0)	70 (48.6)	75 (68.2)	155	
No	17 (63.0)	74 (51.4)	35 (31.8)	126	

Chi-square test used unless otherwise noted; \*Fisher-Freeman-Halton Exact Test. Significant value at  $p < 0.05$

STPM: *Sijil Tinggi Persekolahan Malaysia*

were found to be significant ( $p < 0.05$ ) for an association of demographics with the practices of herbal medicines.

The analysis of correlation coefficients revealed that no statistically significant correlation existed between knowledge and attitude scores towards traditional herbs and spices intake ( $r = 0.001$ ,  $p = 0.985$ ), nor between knowledge and practice ( $r = 0.049$ ,  $p = 0.413$ ). These findings suggest that there is no significant linear relationship between these pairs of variables. However, a moderate and positive correlation was observed between attitude and practice scores ( $r = 0.456$ ) with a highly statistically significant association ( $p < 0.001$ ). This indicates that as attitudes towards traditional herbs and spices consumption increase, so does the level of actual practice.

Similarly, a study on Medicinal Plants (MPs) among Malaysian consumers found that consumers' attitudes have a stronger association with their practices compared to knowledge and practice, demonstrating moderate relationships (Arumugam 2019). This aligns with the findings of Ekor (2014), which also showed that the

relationship between attitude and practice is stronger than that between knowledge and practice. Individuals are more likely to consume medicinal plants when they hold positive attitudes and beliefs about them. However, it's important to acknowledge that the knowledge, attitude, and practice of individuals may not be directly interlinked, as they can also be influenced by external factors such as socio-economic status or family lifestyle (Jamaludin *et al.* 2022).

## CONCLUSION

Notably, *Centella asiatica* ('pegaga') was found to be the most consumed traditional herb, while lemongrass emerged as the most commonly consumed spice. Ethnicity showed a statistically significant association with knowledge level, while consumption status was associated with attitude and practice levels. A moderate and positive correlation was observed between attitudes and practices ( $p < 0.001$ ). This finding showed the importance of enhancing public knowledge and promoting positive attitudes towards these traditional ingredients



is essential for preserving cultural heritage and incorporating them into modern diets.

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#### DECLARATION OF CONFLICT OF INTERESTS

The author(s) declare no conflict of interest.

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