



HIGHER KNOWLEDGE LEADS TO BETTER ATTITUDES TOWARDS VEGETARIAN DIET IN SELANGOR

LAU KA ZHI, NURUL BATRISYIA SHARUDDIN, WAN HAFIZ WAN ZAINAL SHUKRI, ASMA' ALI, ABDUL RAIS ABDUL RAHMAN AND SITI NUR'AFIFAH JAAFAR*

Faculty of Food Science & Agrotechnology, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

*Corresponding author: afifah@umt.edu.my

ARTICLE INFO	ABSTRACT
Article History: Received: 2 October 2024 Revised: 2 October 2024 Accepted: 19 November 2025 Published: 15 May 2026 Keywords: Selangor, knowledge, practice, vegetarian consumers, vegetarian diet.	A growing number of Malaysians is embracing plant-based diets, including vegetarianism, partly due to its perceived positive impact on health and climate change mitigation. Despite this, the relationship between knowledge, attitudes, and practices among vegetarian consumers in the state of Selangor remains unclear. This study seeks to examine how knowledge influences both attitudes and practices, and how attitudes impact the dietary behaviour of vegetarians. Utilising a cross-sectional approach, the research engaged 120 vegetarians residing in Selangor. The results showed that more than half of respondents had medium level of knowledge about vegetarianism and positive attitudes towards it. Furthermore, those who knew more about vegetarianism also had more positive attitudes. However, no specific link was observed between what people knew and how much they followed a vegetarian diet. Also, those who were more receptive towards vegetarianism tended to eat more plant-based meals. In future, this study may be expanded nationwide to get a better understanding of what Malaysians know and perceive about vegetarian diets, as well as their response. This way, we can encourage more sustainable food choices for a healthier planet.

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Introduction

Vegetarianism is the consumption of a diet devoid of meat, fish, and animal by-products (Gisslen, 2011; Sergeantanis *et al.*, 2021) that is traditionally practised by Buddhists, Hindus, and followers of other eastern religions. In modern times, it has gained popularity and acceptance in a wide segment of society for humane reasons and the health benefits it supposedly brings. A vegetarian diet is rich in antioxidants and fibre while being low in cholesterol and saturated fat, helping to reduce the risk of obesity, diabetes, and heart disease (Cheah *et al.*, 2018).

The demand for vegetarian food in Malaysia is rising, as seen in the growing number of vegetarian restaurants. Oliver's Travel (2017) reported that Malaysia ranked third as the most vegetarian-friendly country, with 1,185 vegetarian restaurants serving 27,000 diners.

In 2016, the country recorded two million vegetarians, including seasonal practitioners (Torlak *et al.*, 2022); however, the census data has not been updated since (Darmalinggam *et al.*, 2020).

Despite this growth, those practising vegetarianism face several challenges in Malaysia. The country's meat-centric diet makes it difficult for vegetarians to find diverse meal options, as traditional Malaysian cuisine heavily revolves around meat, poultry, and fish as the main dishes. While vegetarian restaurants are increasing, their numbers are still fewer than mainstream eateries. Additionally, many Malaysians lack awareness of the nutritional benefits of a vegetarian diet and may perceive it as restrictive or less satisfying (Le Tan *et al.*, 2021).

A study on 167 young adults in the Klang Valley in Peninsular Malaysia found that 86% of full-time vegetarians described their dietary experience as bland due to limited food choices (Subramaniam, 2011). This highlights the importance of studying vegetarian consumers to better understand their dietary preferences. A deeper comprehension of vegetarian cuisine is essential to meet their needs, making it crucial for future research to explore the factors influencing vegetarian food choices (Kai *et al.*, 2020). Several factors impact consumer decisions when selecting vegetarian restaurants, including food quality, menu variety, service standards, consumer satisfaction, restaurant ambiance, and overall dining experience (Lavallee *et al.*, 2019; Muller, 2020).

However, these studies did not examine consumer understanding of vegetarian cuisine. Assessing this is essential, as strict vegetarians must avoid meat, eggs, and dairy, which can lead to potential nutrient deficiencies (e.g., vitamin B-12, protein, and cholesterol) if their diet is not well-planned (Watanabe *et al.*, 2014). Similarly, Godos *et al.* (2016) noted that unbalanced vegetarian diets could lead to nutritional inadequacies, particularly when major food groups are excluded. This suggests that a lack of knowledge about the nutritional adequacy of vegetarian diets can have detrimental effects on health. Without adequate understanding, vegetarians may exclude animal products without replacing them with nutritionally equivalent alternatives, which increases health risks such as type 2 diabetes (da Costa Birchall *et al.*, 2018).

Despite the growing vegetarian population in Malaysia, limited research has examined the Knowledge, Attitudes, and Practices (KAP) of vegetarian consumers. While numerous studies on vegetarianism exist in Western contexts, their findings may not be applicable to Malaysia due to cultural and dietary differences (Ching *et al.*, 2019). Therefore, further research is needed to investigate the relationship between knowledge and attitudes towards vegetarian diets in Malaysia and how these factors influence actual

dietary practices. Understanding these dynamics will help address nutritional gaps and enhance consumer awareness of a well-balanced vegetarian diet.

Materials and Methods

Research Design and Sampling

A cross-sectional quantitative methodology was employed for the current study, utilising self-administered structured questionnaires to gather data over 1½ months. Respondents were recruited from the Selangor Malaysian Vegetarian Society. The members' contact details were obtained with the society's permission and they were contacted by phone. Only those willing to participate were given the questionnaire. Eventually, a total of 120 members agreed to join this study.

This convenience sampling was suitable at that time, whereby members of the target population met the criteria of a vegetarian with easy accessibility, geographical proximity, availability at a given time, and had the willingness to participate (Etikan *et al.*, 2016). Each respondent was informed about the purpose of the study as stated in the cover page of the questionnaire. The recommended sample size was maintained at a minimum of 100 subjects (Gravetter & Forzano, 2011). All protocols executed in this research adhered to the ethical principles delineated in the Declaration of Helsinki (World Medical Association, 2013).

Questionnaire Structure

The questionnaire comprised four sections. Section A had eight items relating to the respondent's socio-demographic profile (gender, race, religion, age, marital status, education, employment status, and monthly income). Knowledge towards vegetarianism was measured through 17 items in Section B. Section C consisted of 17 items pertaining to attitudes towards vegetarianism. Lastly, there were four items measuring practices towards vegetarianism in Section D. Items in Section C were rated using a five-point Likert scale whereas Section

B were rated using a nominal scale. All items in this research were adapted from past studies (Lea & Worsely, 2003; Le *et al.*, 2018; Bettinelli *et al.*, 2019; Vergeer *et al.*, 2019; Smugovic *et al.*, 2021) with modifications. A pilot study was administered to confirm the reliability and validity of all items in the questionnaire. Reliability test produced a Cronbach's alpha of 0.740, which was acceptable (Gravetter & Forzano, 2011). In terms of measurement items, the r-value fell within the range of 0.384 to 0.773, showing significant correlation among the questionnaire items. This indicated that the convergence validity had been achieved.

Data Analysis

Data was analysed using Statistical Package for the Social Science (SPSS) version 20.0 (IBM, 2012). The data for respondents' attitudes towards vegetarianism was found to be not normally distributed. Thus, the results were reported as descriptive data using the median

and inter-quartile range as variables. Frequency and percentage were also reported for the rest of the variables. Spearman correlation test was used to determine the relationship between knowledge and attitudes towards vegetarian diet. Associations between knowledge and practices and between attitudes and practices towards vegetarianism were examined using Fisher's Exact Test.

Results and Discussion

Demographic Characteristic of Respondents

Of the 120 respondents, 60.8 % (n=73) were females. Majority were Chinese (92.5%), followed by Indians (6.7%) and others (0.8%). Most respondents were Buddhists (74.1%), followed by Hindus (6.7%), and Christians (2.5%). Those in the "others" category of religion included Taoism, Confucian, and free-thinkers (16.7%). The demographics are presented in Table 1.

Table 1: Demographic characteristics of respondents

Items	Descriptions	Frequency	Percentage (%)
Gender	Male	47	39.2
	Female	73	60.8
Race	Chinese	111	92.5
	Indian	8	6.7
	Others	1	0.8
Religion	Buddhism	89	74.1
	Hinduism	8	6.7
	Christianity	3	2.5
	Others	20	16.7
Age	14 years old or below	1	0.8
	Between 15-24 years old	34	28.4
	Between 25-34 years old	30	25.0
	Between 35-44 years old	31	25.8
	Between 45-54 years old	13	10.8
	Between 55-64 years old	9	7.5
	64 years old or above	2	1.7
Marital status	Single	72	60.0
	Married	45	37.5
	Divorced	3	2.5

Highest education level	SPM or equivalent	14	11.7
	STPM/Diploma/Matriculation or equivalent	35	29.2
	Bachelor degree	57	47.5
	Postgraduate degree or others	13	10.8
		1	0.8
Employment status	Employed full-time	70	58.3
	Employed part-time	6	5.0
	Unemployed	3	2.5
	Housewife	5	4.2
	Student	31	25.8
	Retired	5	4.2
Monthly income	No income	37	30.8
	RM1,000.00 or below	5	4.2
	RM1,001.00 to RM2,000.00	7	5.8
	RM2,001.00 to RM3,000.00	5	4.2
	RM3,001.00 or above	66	55.0

Knowledge towards Vegetarianism

Respondents were asked to answer 17 questions regarding vegetarianism, mainly about the different classes of foods and nutrients to assess their knowledge level. Answers were scored for each respondent with full score of 17/17. A score scale was developed to differentiate respondents' level of knowledge, which were high (70% -100%), medium (40% - 69%), and low (0% - 39%). It was observed that majority of respondents (51.7%) had medium level of knowledge towards vegetarianism, with the score ranging between 40% to 69%. There were 38.3% respondents who scored a high knowledge level and only 10% who scored in the low knowledge level as presented in Figure 1.

Most respondents had high knowledge level and showed scores more than 70% in the following items: "Vegetarian diet has higher consumption of plant foods that are high in antioxidant and fibre"; "Vegetarian diet relies on pulses (e.g., beans, chickpeas, and lentils) as a source of protein"; "Nuts are high in protein and fibre"; "It is not possible to obtain adequate, quality protein on any type of vegetarian diet"; "Eating less saturated fat can help to reduce the risk of heart disease"; and "Vegetarian diet has lower consumption of saturated fat and cholesterol". This indicated that respondents understood these questions clearly.

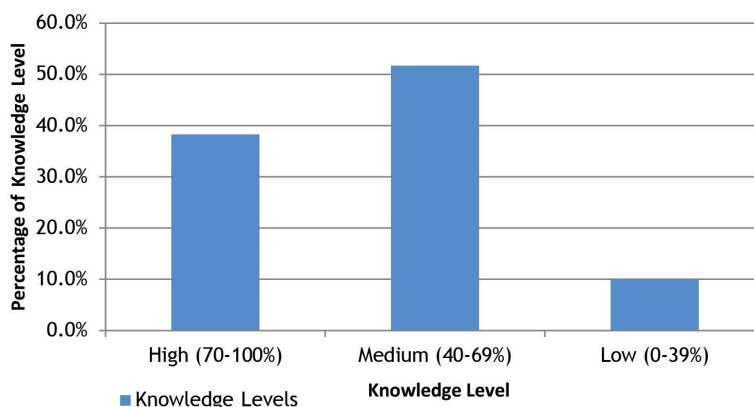


Figure 1: Knowledge levels of respondents

Almost half of the respondents (48) showed medium knowledge level in the item “Some foods contain a lot of fat but no cholesterol” (40%). A majority of the participants exhibited a moderate level of knowledge, as evidenced by their scores exceeding 40% on the following assessment items: “It is not possible to obtain adequate, quality protein on any type of vegetarian diet”; “Eating less saturated fat can help to reduce the risk of heart disease”; “Vegetarian diet has lower consumption of saturated fat and cholesterol”; “Baked beans are high in protein and fibre”; “Saturated fats are mainly found in vegetable oils”; “Polyunsaturated fats are mainly found in vegetable oils”; “Saturated fats are mainly found in dairy products”; “Saturated fat is less important fat for people to cut down”; and “Unsaturated fat is the most important fat for people to cut down”.

However, 31 and 25 respondents showed the lowest level of knowledge in the following questionnaire items, respectively: “There is less calcium in a glass of skimmed milk than in a glass of whole milk” (25.8%) and “There is more protein in a glass of whole milk than in a glass of skimmed milk” (20.8%).

Respondents exhibited an uneven distribution of knowledge and comprehension across all inquiries. This suggested that they did not entirely comprehend the dimensions of vegetarianism queried in the survey, as evidenced by their low scores on the following items like “There is less calcium in a glass of skimmed milk than in a glass of whole milk” and “There is more protein in a glass of whole milk than in a glass of skimmed milk”. This phenomenon might be attributed to the diverse educational backgrounds of the respondents.

Individuals with advanced education might possess a more extensive understanding of vegetarianism. Education was essential as it equipped consumers with the necessary resources and tools to adopt a proper vegetarian diet, besides promoting health in the context of vegetarianism (Saintila *et al.*, 2020). Educational programmes should be augmented to guarantee the sufficient dissemination of

vegetarian-related knowledge to consumers, thereby enabling individuals adhering to a vegetarian lifestyle to maintain an appropriate dietary regimen (Bettinelli *et al.*, 2019).

It is further observed that the respondents exhibited substantial knowledge regarding the following items: “Vegetarian diet has higher consumption of plant foods that are high in antioxidant and fibre”; “Vegetarian diet relies on pulses (e.g., beans, chickpeas, and lentils) as a source of protein”; “Nuts are high in protein and fibre”; “It is not possible to obtain adequate, quality protein on any type of vegetarian diet”; “Eating less saturated fat can help to reduce the risk of heart disease”; and “Vegetarian diet has lower consumption of saturated fat and cholesterol”.

Respondents who demonstrated proficiency in the aforementioned queries implied familiarity with these topics, indicating that they possessed a sound understanding of specific aspects of vegetarian practice. Notably, a significant proportion of respondents in this study were university graduates (57%), which elucidate the rationale behind the respondents’ favourable responses to these items. It was noteworthy that the second largest group of respondents held a pre-university qualification of STPM, diploma, or matriculation. From the perspective of the findings, the educational level of respondents might enhance their motivation to explore the essential requisite for adopting vegetarian practices.

Another significant observation was the 40% of participants exhibiting a moderate level of understanding concerning the inquiry: “Some foods contain a lot of fat but no cholesterol”. Furthermore, more than half of the respondents also demonstrated a moderate level of knowledge (achieving scores exceeding 40%) on questions such as, “It is not possible to obtain adequate, quality protein on any type of vegetarian diet”; “Eating less saturated fat can help to reduce the risk of heart disease”; “Vegetarian diets are characterised by lower consumption of saturated fat and cholesterol”; “Baked beans are rich in protein and fibre”; “Saturated fats

are predominantly found in vegetable oils”; “Polyunsaturated fats are primarily located in vegetable oils”; “Saturated fats are chiefly contained in dairy products”; “Saturated fat is of lesser significance for individuals to restrict”; and “Unsaturated fat is the most crucial type of fat for individuals to reduce”. A plausible explanation for this might be the insufficient emphasis on these elements as essential components in the adoption of vegetarian practices, stemming from the observation that vegetarianism was not a compulsory lifestyle in Malaysia (Jahirul, 2018). This consequently resulted in the respondents’ inadequate comprehension of these concepts. Overall, the respondents did not exhibit a high degree of knowledge regarding vegetarianism

across all queried items. This raised a significant concern because, despite the assertion of their vegetarian status, the results indicated that the majority of respondents possessed a moderate level of understanding only pertaining to vegetarianism. There was knowledge deficiency in specific areas (i.e., There is a lower calcium content in a glass of skimmed milk compared to a glass of whole milk; There is a greater protein content in a glass of whole milk than in a glass of skimmed milk), suggesting a potential likelihood that the respondents did not adhere to a proper vegetarian diet. Table 2 illustrates the accurate responses provided by the participants regarding their knowledge of vegetarianism.

Table 2: Correct responses of respondents for knowledge towards vegetarianism

Statements		Number of Respondents (n = 120)	Percentage (%)
1.	Eating more fibre, vegetables, and fruits can help to reduce the risk of getting kinds of cancer.	113	94.2
2.	Wholegrain bread contains more vitamins and minerals than white bread.	112	93.3
3.	Vegetarian diet has higher consumption of plant foods that are high in antioxidant and fibre.	107	89.2
4.	Vegetarian diet relies on pulses (e.g., beans, chickpeas, and lentils) as a source of protein.	100	83.3
5.	Nuts are high in protein and fibre.	99	82.5
6.	It is not possible to obtain adequate, quality protein on any type of vegetarian diet.	95	79.2
7.	Eating less saturated fat can help to reduce the risk of heart disease.	94	78.3
8.	Vegetarian diet has lower consumption of saturated fat and cholesterol.	92	76.7
9.	Baked beans are high in protein and fibre.	75	62.5
10.	Saturated fats are mainly found in vegetable oils.	58	48.3
11.	Polyunsaturated fats are mainly found in vegetable oils.	57	47.5
12.	Saturated fats are mainly found in dairy products.	56	46.7
13.	Saturated fat is less important fat for people to cut down.	52	43.3
14.	Unsaturated fat is the most important fat for people to cut down.	51	42.5
15.	Some foods contain a lot of fat but no cholesterol.	48	40.0
16.	There is less calcium in a glass of skimmed milk than in a glass of whole milk.	31	25.8
17.	There is more protein in a glass of whole milk than in a glass of skimmed milk.	25	20.8

Attitudes towards Vegetarianism

Respondents were asked to rate 17 questions regarding vegetarianism using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The “strongly agree” scales of 4 and 5 indicated positive attitudes, whereas 1 and 2 indicated the opposite. The scale of 3 was considered a neutral response. It was observed that most respondents agreed to every item asked in the positive attitudes towards vegetarianism, as depicted in the Table 3, except a neutral response to the question, “I always follow a low-fat diet”.

It was observed that a significant proportion of respondents concurred with most items presented concerning their attitudes towards vegetarianism, with the exception of the item, “I always follow a low-fat diet”, to which they exhibited a neutral response. This suggested that respondents generally had favourable attitudes towards vegetarianism. Interestingly, there existed an uncertainty regarding the

relationship between “Following a low-fat diet” and vegetarianism itself. This ambiguity might be attributed to a lack of adequate knowledge on this particular subject, as indicated by their moderate comprehension on certain items like: “Eating less saturated fat can help to reduce the risk of heart disease” and “Vegetarian diet has lower consumption of saturated fat and cholesterol”. It is plausible that many thought vegetarianism was associated with health advantages, which compelled them to express positive attitudes that aligned with societal expectations, thereby elucidating the rationale behind most of the agreement with various items posed in this segment.

Regarding the respondents’ ambivalent attitudes towards the item “Following a low fat diet”, an alternative explanation might be that they perceived adherence to a low-fat diet as non-essential in their vegetarian lifestyle. It was

Table 3: Respondents’ attitudes towards vegetarianism

	Statements	Median	Interquartile Range (IQR)
1.	I think eating vegetarian diet is interesting.	5.00	1.00
2.	I think there is enough protein in vegetarian diet.	5.00	1.00
3.	I think there are enough vitamins and minerals in vegetarian diet.	5.00	1.00
4.	I think vegetarian diet is good for health.	5.00	0.00
5.	I do have enough willpower to follow vegetarian diet.	5.00	1.00
6.	I think I will not look strange if I follow vegetarian diet.	5.00	1.00
7.	I am very particular about healthiness of food.	4.00	2.00
8.	I always follow a healthy and balanced diet.	4.00	1.00
9.	I always follow a high fibre diet.	4.00	1.00
10.	It is important for me that my daily diet contains a lot of vitamins and minerals.	4.00	1.00
11.	I do worry about healthiness of food.	4.00	2.00
12.	My food choice is affected by the healthiness of food.	4.00	1.00
13.	My food choice is affected by animal welfare.	4.00	2.00
14.	I need more information about vegetarian diet.	4.00	2.00
15.	I think eating vegetarian diet is convenient.	4.00	2.00
16.	I do not lack of the right vegetarian diet cooking skills.	4.00	2.00
17.	I always follow a low-fat diet.	3.00	1.00

Note: 5-point Likert scale was used, where: 1 = Strongly disagree; 5 = Strongly agree.

crucial to enhance the respondents' perception of this attribute, as a low-fat vegetarian diet held the potential to mitigate the risk of cardiovascular disease (Kai *et al.*, 2020). As such, it was essential to educate vegetarian consumers about the importance of a low-fat diet to encourage their consumption, augment their awareness, and foster positive attitudes on the beneficial outcomes associated with low-fat diets, which, ideally, would be reflected in their actual vegetarian practices.

Practice towards Vegetarianism

Respondents were asked to answer four questions to assess their self-reported practice level. The data included the types of vegetarian diet practiced, duration, frequency

of consumption, and frequency of consumption outside their homes. Most of the respondents had been on vegetarian diet for one to five years ($m=40$, 33.3%). There were 34 respondents who had been on a vegetarian diet for more than 10 years (28.3%), followed by 24 respondents for 6 to 10 years (20.0%) and 11 respondents for both starting from birth and less than a year (9.2%). For the frequency of vegetarian diet consumption, majority of the respondents were consuming vegetarian diet daily (76.7%). Amongst the 92 respondents who consumed vegetarian diet daily, there were 26 respondents (21.7%) only who were eating a vegetarian diet outside their homes daily. Most of the respondents (26.7%) were consuming vegetarian diet outside homes occasionally as depicted in Table 4.

Table 4: Practice towards vegetarianism of respondents

Practices	Number of Respondents (n = 120)	Percentage (%)
Type of vegetarian		
Vegan	20	16.7
Lacto-ovo-vegetarian	49	40.8
Lacto-vegetarian	23	19.2
Ovo-vegetarian	4	3.3
Semi-vegetarian	24	20.0
Duration of practicing vegetarian diet		
From birth	11	9.2
Less than 1 year	11	9.2
1 to 5 years	40	33.3
6 to 10 years	24	20.0
More than 10 years	34	28.3
Frequency of vegetarian diet consumption		
Every day	92	76.7
4-6 times a week	3	2.5
2-3 times a week	3	2.5
Once a week	2	1.7
Once in two weeks	6	5.0
Occasionally	14	11.6
Frequency of vegetarian diet consumption outside home		
Every day	26	21.7
4-6 times a week	22	18.3
2-3 times a week	24	20.0
Once a week	10	8.3
Once in two weeks	6	5.0
Occasionally	32	26.7

It is observed that most of the respondents were lacto-ovo-vegetarian (40.8%), followed by semi-vegetarian (20.0%), lacto-vegetarian (19.2%), vegan (16.7%), and ovo-vegetarian (3.3%). This clearly showed that a significant number of respondents were actively consuming vegetables, eggs, and dairy products while deliberately avoiding meat, fish, and poultry. Other prominent groups included semi-vegetarians (who incorporate plant foods with occasional meat) and lacto-vegetarians (who consume only dairy products) (Torlak *et al.*, 2022). The diverse types of vegetarianism practiced by respondents illustrated their strong understanding of various vegetarian diets. The predominant practice was lacto-ovo-vegetarianism, demonstrating that the majority are well-acquainted with this vegetarian classification.

There exists a likelihood that some respondents in this study were infrequent vegetarians who opted for vegetarian foods when they were available (Abrahamse, 2020), even though the majority asserted that they consumed a vegetarian diet daily (76.7%). Regarding the frequency, 60% of respondents reported eating vegetarian meals outside their homes either daily or more than twice a week. This trend is likely due to the convenience of purchasing food outside rather than cooking at home. This research underscored the urgent need to enhance the availability of vegetarian food options in the market and food outlets to met the demands of Malaysian vegetarians.

Relationship between Knowledge and Attitudes towards Vegetarianism

The Spearman correlation test was conducted to determine the relationship between knowledge and attitudes towards vegetarianism. The result showed that there was a significant positive

relationship between the knowledge level and attitudes towards vegetarianism ($r = 0.261$, $p < 0.01$). The r-value of 0.261 showed that strength of the relationship was weak (Corder & Foreman, 2009), as shown in Table 5.

The strength of the relationship between knowledge and attitudes towards vegetarianism was significantly positive but weak ($r = 0.261$, $p < 0.01$), showing that respondents' attitudes towards vegetarianism increased slightly with increasing knowledge. This result was in line with Hamiel *et al.* (2020), who found significant positive correlation between knowledge and attitudes. It indicated that respondents' vegetarian practices could be enhanced with better knowledge and positivity towards vegetarianism.

In other words, respondents believed that vegetarianism was associated with positive health outcomes (Oussalah *et al.*, 2020), although their knowledge on elements associated with the diet might be inadequate. Sergeantanis *et al.* (2021) agreed that vegetarianism was associated with virtues, including morality, empathy and being self-sacrificial for the greater good, and this led to better mental health (Lavallee *et al.*, 2019).

These perceptions could lead to more positive attitudes towards vegetarianism, regardless of their level of knowledge. In India, the practice of vegetarianism tended to be based on religious and traditional reasons rather than health beliefs. Therefore, India ranked among countries with the largest number of vegetarians, estimated at 300 to 400 million practitioners (Azhar *et al.*, 2023). Studying vegetarianism is challenging due to the difficulty in defining the types of vegetarians, differentiating between vegetarianism, and interpreting the discrepancy between self-reported identification and self-reported behaviour.

Table 5: Relationship between knowledge and attitudes towards vegetarianism

	Attitudes	
	Correlation Coefficient	Sig.
Knowledge	0.261**	0.004

Note: ** Correlation is significant at the 0.01 level (2-tailed).

Association between Knowledge and Practice towards Vegetarianism

Table 6 shows no significant association between knowledge and practices ($p > 0.05$) of vegetarianism, indicating that respondents' knowledge did not affect their practices.

No significant association was also found between knowledge and all items related to "practices" in the questionnaire ($p > 0.05$), indicating that respondents' knowledge level did not affect their practices towards vegetarianism. Possible clarification behind this finding is average knowledge and understanding of respondents could slightly alter their practices, which was reflected through their self-reported responses of vegetarianism. The result was inconsistent with Moorman *et al.* (2004), who found that knowledge could affect the diet practice of individuals. Several other factors were known to affect people's practices such as family patterns, habits, and tradition and religion (Babic-Zielinska, 2006). Muller

(2020) concurred that vegetarian practitioners needed a profound knowledge on nutrition as efficient comprehension would help them sustain their proper vegetarian diet over a longer time. Vegetarianism could comprise a variety of diets that excluded some or all animal products, hence, a deep and extensive knowledge and comprehension was essential to avoid any associated risks. This was because the restrictions in a vegetarian diet (vegan, lacto-ovo-vegetarian, lacto-vegetarian, ovo-vegetarian, and semi-vegetarian) made it difficult to meet the correct intake of all required nutrients (Baldassarre *et al.*, 2020).

Association between Attitudes and Practices towards Vegetarianism

The practice towards vegetarianism includes the types of vegetarian diet practiced, duration of time of practicing vegetarian diet, frequency

Table 6: Association between knowledge and practice towards vegetarianism (n = 120)

Variables	Knowledge Levels		Fisher's Exact Test	Significant
	Low n (%)	High n (%)		
^a Type of vegetarian				
Vegan	8(6.7)	24(20)	p = 0.168	NS
Other categories	12(10)	76(63.3)		
^b Duration of practicing vegetarian diet				
Less than 5 years	15(12.5)	17(14.2)	p = 0.677	NS
More than 5 years	36(30)	52(43.3)		
^c Frequency of vegetarian diet consumption				
Frequent (Everyday)	25(20.8)	7(5.8)	p = 0.515	NS
Less frequent (Weekly and occasionally)	67(55.8)	21(17.5)		
^d Frequency of vegetarian diet consumption outside home				
Frequent (Everyday)	5(4.2)	27(22.5)	p = 0.454	NS
Less frequent (Weekly and occasionally)	21(17.5)	67(55.8)		

Note: S: Significant by Fisher's Exact test at $p < 0.05$; NS: Not significant by Fisher's Exact test at $p > 0.05$; 0 cells (0.0%) have an expected count less than 5. The minimum expected count is 5.33^a, 13.60^b, 7.47^c, 6.93^d.

of vegetarian diet consumption, frequency of preparing vegetarian diet on own, and the frequency of consumption of vegetarian diet outside home. The results, as shown in Table 7, pinpointed a significant association between attitude level and frequency of vegetarian diet consumption ($p < 0.05$). However, there was no significant association between attitudes and other practices towards vegetarianism ($p > 0.05$).

An important positive link appeared to be between the extent of attitudes and the occurrence of food choices ($p < 0.05$); there was still no considerable link found between attitudes and different actions tied to vegetarianism ($p > 0.05$). This observation indicated the respondents' attitudes towards vegetarianism as having a significant impact on the frequency of their commitment to the diet, though this impact did not encompass other related behaviours. In essence, a rise in the regularity of vegetarian dietary practices was linked to advancement in respondents' viewpoint regarding vegetarianism.

The principal reasons motivating individuals to pursue a vegetarian diet were connected to the enhancement of personal health, which could be ascribed to the presumed health benefits and in alleviating the risk of chronic illnesses (Hopwood *et al.*, 2020).

The positive perceptions held by respondents concerning vegetarianism might contribute to an increased consumption of vegetarian food as a strategy to achieve good health and longevity (Hamiel *et al.*, 2020). This fostered positive attitudes among respondents as they could maintain their conviction on health benefits. This finding was in line with evidence from another similar study (Zhang *et al.*, 2021), which demonstrated that their participants' positive attitudes towards vegetarian diets were significantly associated with the frequency of vegetarian meal consumption. Favourable attitudes towards vegetarianism were essential, as they empowered individuals to maintain his or her diet consistently.

Table 7: Association between attitudes and practices towards vegetarianism (n = 120)

Variables	Attitude Levels		Fisher's Exact Test	Significant
	Negative n (%)	Positive n (%)		
^a Type of vegetarian				
Vegan	4 (3.3)	42 (35)	p = 0.08	NS
Other categories	16 (13.3)	58 (48.3)		
^b Duration of practising diet				
Less than 5 years	24 (22.5)	22 (18.3)	p = 0.128	NS
More than 5 years	27 (22.5)	47 (39.2)		
^c Frequency of consumption				
Frequent (Everyday)	23 (19.2)	23 (19.2)	p = 0.000	S
Less frequent (Weekly and occasionally)	69 (57.5)	5 (4.2)		
^d Frequency of consumption outside home				
Frequent (Everyday)	9 (7.5)	37 (30.8)	p = 0.820	NS
Less frequent (Weekly and occasionally)	17 (14.2)	57 (47.5)		

Note: S: Significant by Fisher's Exact test at $p < 0.05$; NS: Not significant by Fisher's Exact test at $p > 0.05$; 0 cells (0.0%) have an expected count less than 5. The minimum expected count is 7.67^a, 10.73^b, 9.20^c, 19.55^d.

Conclusions

In a nutshell, over half of the respondents showed moderate knowledge level, but most of them had positive attitudes towards vegetarianism. This study also identified their self-reported practice level in terms of vegetarian diets practiced, duration of practising their diet, frequency of consumption, and frequency of consumption outside home. It was highlighted that most of the respondents were lacto-ovo-vegetarian and had been on their diet between one and five years.

A significant positive relationship was found between the knowledge level and attitudes towards vegetarianism. No significant association was found between knowledge and practice towards vegetarianism. A significant association was found between attitude level and frequency of vegetarian diet consumption. However, no significant association was found between attitudes and other practices towards vegetarianism. Overall, this study's findings provided a comprehensive and in-depth understanding of vegetarian consumers in Selangor, Malaysia, through the investigation of vegetarian diet's KAP.

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Conflict of Interest Statement

The authors declare that they have no conflict of interest.

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