

Research Article

Knowledge, Awareness and Attitude on Monosodium Glutamate among Muslim Consumers in Brunei Darussalam

Nurulain Najiha Hamidun^{1,*}, Nor Surilawana Sulaiman², and Norkhairiah Hashim³

¹ Halalan Thayyiban Research Centre, Universiti Islam Sultan Sharif Ali, Brunei Darussalam; njhmn@gmail.com;  ORCID ID: <http://orcid.org/0009-0006-3984-3736>

² Halalan Thayyiban Research Centre, Universiti Islam Sultan Sharif Ali, Brunei Darussalam; surilawana.sulaiman@gmail.com;  ORCID ID: <http://orcid.org/0000-0002-4227-9703>

³ Halalan Thayyiban Research Centre, Universiti Islam Sultan Sharif Ali, Brunei Darussalam; norkhairiah.hashim@unissa.edu.bn;  ORCID ID: <http://orcid.org/0000-0001-9631-3789>

* Correspondence: njhmn@gmail.com.

Abstract: As Muslims now emphasise the need to consume only what is halal, they might often overlook the 'thayyib' element in the halalan thayyiban. Monosodium Glutamate (MSG) is one of the most controversial food enhancers, as studies have associated MSG consumption with multiple illnesses. Moreover, the use of MSG is prevalent in the Brunei community. The study aims to assess the knowledge, level of awareness and attitude toward MSG among Muslim consumers in Brunei. This study also aims to know the importance of acquiring knowledge on MSG among Muslim consumers. A questionnaire survey via Google Forms was used for this study. The survey gained 120 respondents and the data were extracted and analysed statistically using Statistical Package for Social Science (SPSS) version 25. The findings show that most respondents only acquire a basic knowledge of MSG. Next, most respondents were found to have an average awareness of MSG and a negative attitude towards MSG. Regarding the importance of acquiring knowledge on MSG, the findings show that 81% of the respondents asserted that it is important to acquire knowledge on MSG with the preservation of health as the most prevalent answer consumers give. Based on these findings, recommendations were made for authorities to raise awareness, educate the public on nutrition, ingredients, and labelling, organise educational programs, regulate MSG use in food outlets, and improve halal product labels. Overall, this research has provided valuable insights into the knowledge, awareness, and attitudes of Muslim consumers in Brunei towards MSG for consumers, authorities, policymakers, industry players, and public health.

Keywords: Attitude; Awareness; Brunei; Halal; Health; Knowledge; MSG; Thayyib.



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1. INTRODUCTION

According to Ali, Kamraju and Vani (2017), health is the actual wealth of life. In this modern area, with all the accessible knowledge and information gained, people are now more aware and conscious about their health and well-being. Islam is a religion with stringent laws and a lifestyle that benefits humanity. Islam has set regulations in every aspect of Muslims' life, including Islamic dietary law. Muslims are obligated to follow these divine revelations as it is considered a form of Ibadah.

Muslims acknowledge the importance of living a good, healthy life based on Islamic principles (Dolatkhah et al., 2020) by being mindful of what they consume—halal, thayyib or safe consumption.

The Japanese chemist, Kikunae Ikeda, first encountered monosodium glutamate (MSG) in 1909 (Jubaidi, Mathialagan, Mat Noor, Taib, & Budin, 2019) or 1910 (Marshall, 1948) while analysing *Laminaria japonica*, a seaweed that was frequently used as a seasoning in Japanese cuisine (Swan, 1982; Kazmi, Fatima, Perveen, & Malik, 2017). Ikeda discovered that it contained glutamate and surmised that this was the ingredient that improved the flavour of the meals it was cooked with. Since 1948, MSG has been added to foods in ever-increasing amounts or doubled every decade (Shrestha, Jha, Lal Das, & Yadav, 2018). By 1972, the MSG world's production was estimated to reach 262,000 metric tonnes (Shrestha, Jha, Lal Das, & Yadav, 2018) and the United States alone uses more than 20,000 tons (Livingstone, 1981). It is sold as a flavour enhancer under the brand name Accent and Ajinomoto Powder in addition to MSG, and it can be found in seasoned salts, soy sauce, a variety of dry and prepared meals, bouillions, meat bases, and several cooked and frozen foods (Swan, 1982). Due to its low cost, it is frequently utilised as a filler in various Oriental dishes (Swan, 1982).

The Miscellaneous Additives in Food (Amendment) Regulations 1982 S.I. No. 14 1982 has permitted to use of MSG as a flavour modifier (Rhodes, Titherley, Norman, Wood, & Lord, 1991). MSG is also regarded as a food additive (Quines, et al., 2014) that improves the flavour of food (Schiffman, 2003) and can be used in place of salt (Frieder & Grimm, 1984). For instance, MSG serves as both the primary ingredient and component of the savoury taste (called umami) in hot-pot chicken powder (Lingling, Min, Yaping, & Qing, 2019). MSG is also an essential ingredient in the cuisines of China and Japan and is used commercially in broths, soups, canned and frozen vegetables, flavouring and spice blends, gravies, meats, poultry, sauces and other combinations (Britannica, 2022). Younger generations, including Indians, are extremely enamoured with Chinese, Japanese, fast food and ready-serve foods like 2-minute noodles and soups that contain MSG (Sharma, Singh, Ahluwalia, & Kaur, 2009).

However, MSG has been linked to several diseases, such as obesity, central nervous system disorders, physiological changes in adipose tissue, hepatic injury, cytokine release syndrome, and reproductive disorders (Niaz, Zaplatic, and Spoor, 2018). MSG is a known risk factor for atherosclerosis since it causes hyperlipidaemia, hyperglycaemia, and oxidative stress in the blood, erythrocytes, liver, and heart. (Kuldip & Ahluwalia, 2007; Kuldip & Ahluwalia, 2005; Kuldip & Ahluwalia, 2003; Kuldip & Ahluwalia, 2002; Ahluwalia, Tewari, & Choudhary, 1996; Choudhary, Malik, Puri, & Ahluwalia, 1996).

Moreover, studies from the 1980s mention that MSG, a common food flavouring, can lead to bronchospasm (Allen & Baker, 1981). Additionally, Allen et al. (1984) reported that 12 subjects developed asthma following an oral MSG challenge. Despite the lack of evidence to support the link between it and bronchospasm, MSG is still labelled as a food additive that may cause an asthma attack (Mathison, Stevenson, & Simon R.A., 1985; Ortolani, et al., 1984). In addition, three subjects reported responses to various food substances, one of whom revealed that she had once experienced wheezing after eating Chinese food (Schwartzstein, Kelleher, Weinberger, Weiss, & Drazen, 1987). Furthermore, the 'Chinese restaurant syndrome', which includes headache, flushing, numbness, muscle tightness, generalized weakness and bronchoconstriction in asthma (Kolawole, 2013; Husarova & Ostatnikova, 2013), was the first term first used to describe the reaction to MSG almost five decades ago (Kwok, 1968). Within 30 minutes of consuming Chinese food or other foods high in MSG, the syndrome manifests itself (Henderson & Raskin, 1972; Schaumberg, Byck, & Gerati, 1969).

A problem arises when there are conflicting views regarding the consumption of MSG and its potential health risks among scholars. From what has been addressed in the previous paragraphs, the wide range of literature justifies the negative health risks of consuming MSG. Nonetheless, some studies on MSG claimed the opposite. For instance, according to Zanghirescu et al. (2019), many of the

reported negative health effects of MSG are shown to be insufficiently relevant. This is because they are based on unrealistic levels that do not correspond to the amounts commonly consumed in food products.

Moreover, a notable problem that needs addressing is the prevalent use of MSG in Brunei Darussalam. This is because different people have different opinions about MSG, and some claim it is safe to consume. By reviewing consumers' opinions regarding MSG through Pelita Brunei (2019), most of them acknowledged that MSG is commonly associated with various illnesses and potential health risks. However, they claimed MSG to be safe for consumption and that all the health risks linked with MSG are only a myth. They expressed that their family and the past generation have been using it in their cooking, indicating that MSG has been used for a long period and shows no serious adverse health effects towards them. They also added to their claim that MSG has been commercialised through world-class factories and sold worldwide to add flavour to food. If MSG has been confirmed to have serious health complications, MSG producers like Ajinomoto will not prosper until now.

Consequently, from these contradicting claims on MSG, the best solution for the consumer is to be aware of the MSG intake without consuming it in excess, as it contradicts the thayyiban aspect in the concept of halalan thayyiban. Hence, the objective of this research are as follows: (1) to know the knowledge on MSG among Muslim consumers in Brunei Darussalam, (2) to identify the level of awareness and attitude among Muslim consumers in Brunei Darussalam on MSG, and lastly (3) to analyse why Muslim consumers need to acquire knowledge on MSG.

2. METHOD & MATERIAL

This study has implemented the mixed approach—quantitative and qualitative—as the research method. This is due to the attributes of the research questions that need to be assessed.

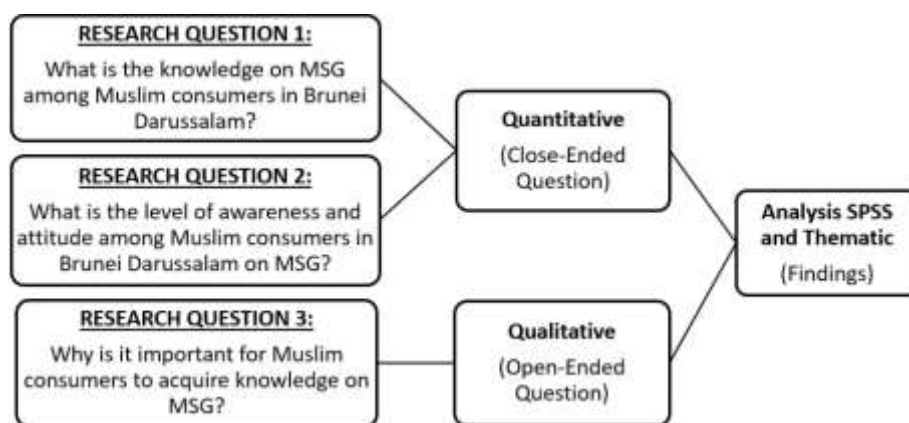


Figure 1. Research Design

As for the quantitative approach itself, it produces objective data that can be communicated through statistics and numbers. This approach would be suitable for research question number 1 and 2. Furthermore, for research question number 3, the research implemented both quantitative and qualitative approaches. Despite it being more challenging to analyse than closed-ended questions, open-ended questions provide useful insights that quantitative data lacks. Moreover, for research question 3, it is reasonable to use an open-ended question. However, to lessen the difficulty of evaluating the data gathered, the researcher decided to give close-ended and only one open-ended question for the convenience of both parties—the researcher and respondents.

Both qualitative and quantitative data were obtained through the survey as a tool to obtain primary data. The questionnaire was aimed at Muslim respondents about 100 respondents in Brunei Darussalam. Respondents are selected randomly or using random sampling but exclusively for Muslims by spreading out the survey via Google Forms. Respondents were given both closed-ended and open-ended questionnaires to fill out in order to assess their knowledge, awareness and attitude toward MSG. The survey enlisted the participation of people from four districts of Brunei Darussalam. The responses to a 5- point Likert scale question on the level of awareness and attitude were addressed as follows: SDA = Strongly Disagree, D = Disagree, NL = Neutral, SA = Strongly Agree, A = Agree, and N = Number.

3. FINDINGS

The study uses IBM Statistical Package for Social Science Statistics (SPSS) version 25.0 to examine the primary data gathered from the survey questionnaires. For each survey item, descriptive statistics were calculated. The findings are consistent with the objectives of the study, which are to analyse the knowledge on MSG, to evaluate the level of awareness and attitude toward MSG, and to evaluate respondents' perceptions on the importance of learning about MSG among Muslim consumers in Brunei Darussalam.

The data was analysed using descriptive statistics in the form of a frequency table, which shows the number, percentage, mean, and standard deviation in each variable category. SPSS frequency tables are preferred by researchers because they allow them to arrange and summarize survey data in a tabular style that is simple to interpret.

Table 1 displays the mean score range from low to high which will be used to interpret the reasoning aspects of the research's findings. The table indicates a high degree of reasoning if the mean score is 3.68 or higher. Nevertheless, it will be considered to have a low degree of reasoning if the mean score is below 2.33. It is considered average and acceptable if it is between the range of 2.34 and 3.67.

Table 1. Mean Score Range

Mean Range	Interpretation
1.00 – 2.33	Low
2.34-3.67	Average
3.68-5.00	High

In addition, the research used Cronbach's alpha to test the reliability level for items in the findings as shown in Table 2. In terms of reliability, if the alpha value is less than 0.60, it will be considered low, less reliable and unacceptable. Unlike the alpha value of over 0.60, the results or findings are very good and acceptable.

Table 2. Cronbach Alpha Score Range

Cronbach's Alpha Score	Level of Reliability
0.01 – 0.60	Non-Acceptable
0.61 -0.70	Acceptable
0.71-0.80	Good and Acceptable
0.81-0.90	Good
0.91-1.00	Excellent

According to the findings of this study, the item's reliability value = .657, which is acceptable as shown in Table 3. Hence, this shows that the study has demonstrated and achieved the research objective.

Table 3. Reliability Statistics

Cronbach's Alpha	N of items
0.657	12

3.1 Socio-demographic

The sociodemographic characteristics of the 120 respondents who are from Muslim communities in Brunei and participated in the study are tabulated in Table 4. According to that, it can be seen that the majority of the respondents were female with 79.2%. The 36-45 age group was the biggest dominating respondents at 33.3%. More than half of the respondents 67.5% lived in the Brunei-Muara district. 40% of respondents were bachelor's degrees and 55.8% are working in the government sector.

Table 4. Socio-demographic Information

Description	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Gender</i>				
Female	95	79.2	79.2	79.2
Male	25	20.8	20.8	100.0
Total	120	100.0	100.0	
<i>Age</i>				
Below 18	1	0.8	0.8	0.8
18-25	29	24.2	24.2	25.0
26-35	15	12.5	12.5	37.5
36-45	40	33.3	33.3	70.8
46-55	23	19.2	19.2	90.0
56-59	9	7.5	7.5	97.5
60 above	3	2.5	2.5	100.0
Total	120	100.0	100.0	
<i>District</i>				
Belait	12	10.0	10.0	10.0
Brunei-Muara	81	67.5	67.5	77.5
Temburong	2	1.7	1.7	79.2
Tutong	25	20.8	20.8	100.0
Total	120	100.0	100.0	
<i>Education</i>				
Primary School	1	0.8	0.8	0.8
Secondary School	3	2.5	2.5	3.3
O-Level	30	25.0	25.0	28.3
A-Level	8	6.7	6.7	35.0
Certificate/ Foundation	1	0.8	0.8	35.8
Diploma	10	8.3	8.3	44.1
HND	6	5.0	5.0	49.1
Bachelor's Degree	48	40.0	40.0	89.1
Postgraduate	11	9.2	9.2	98.3
Other	2	1.7	1.7	100.0
Total	120	100.0	100.0	
<i>Occupation</i>				
Government Sector	67	55.8	55.8	55.8
Private Sector	5	4.2	4.2	60.0
Semi-Government	2	1.7	1.7	61.7
Retired	8	6.7	6.7	68.4
Unemployed	8	6.7	6.7	75.1

Student	28	23.3	23.3	98.4
Other	2	1.6	1.6	100.0
Total	120	100.0	100.0	

3.2.2 Knowledge of MSG

Table 5 provides insights into the respondents' knowledge of MSG. The data indicates that most of the respondents, 88.3 percent, are familiar with the term MSG. Family and friends serve as the primary source of information on MSG for most respondents, with 33.2 percent. The term E621, on the other hand, is only known by 15% of the respondents, with 37.5% knowing about it from books, magazines, articles, newspapers, TV, or radio. The primary function of MSG, which is to enhance food taste, is known by 86.7% of the respondents. Regarding brands or MSG products, more than half of the respondents, 61 percent, are familiar with Ajinomoto.

Table 5. Respondents' Knowledge on MSG

		Description	Frequency	Percent	Valid Percent	Cumulative Percent
2A	Do you know the term MSG?	Yes	106	88.3	88.3	88.3
		No	9	7.5	7.5	95.8
		Not Sure	5	4.2	4.2	100.0
		Total	120	100.0	100.0	
2B	If you answer 'Yes', how did you know the term MSG? (Can choose more than one)	Family and Friends	70	33.2	33.2	
		School or University	40	18.9	18.9	
		Social Media	38	18.0	18.0	
		Book, Magazine, Articles, Newspapers, TV, Radio	59	28.0	28.0	
		Other	4	1.9	1.9	
		Total	211	100.0	100.0	
2C	Do you know that in food labelling, MSG is denoted as E621?	Yes	18	15.0	15.0	15.0
		No	91	75.8	75.8	90.8
		Not Sure	11	9.2	9.2	100.0
		Total	120	100.0	100.0	
2D	If you answer Yes, how did you know about E621?	Family and Friends	5	15.6	15.6	
		School or University	5	15.6	15.6	
		Social Media	7	21.9	21.9	
		Book, Magazine, Articles, Newspapers, TV, Radio	12	37.5	37.5	
		Other	3	9.4	9.4	
		Total	28	23.3	23.3	
2E	Do you know that MSG is used to enhance the taste of food?	Yes	104	86.7	86.7	86.7
		No	10	8.3	8.3	95.0
		Not Sure	6	5.0	5.0	100.0
		Total	120	100.0	100.0	
2F	What brand or products of MSG do you know that are available in the market?	Ajinomoto	75	61.0	61.0	
		Knorr	10	8.1	8.1	
		Maggi	20	16.3	16.3	
		Other	18	14.6	14.6	
		Total	123	100.0	100.0	

3.2.3 Awareness on MSG

Table 6 below displays the level of awareness of respondents on MSG. From the data, the majority of the respondents are aware that MSG is safe for consumption (A=28.3%, SA=11%). Most respondents were unaware that MSG contains less sodium salt (D=18.3%, SDA=11.7%). A significant proportion of the respondents are aware that some food seasoning products contain MSG (A=34.2%, SA=42.5%), commonly associated with illnesses (A=32.5%, SA=23.3%), and safe if consumed in a limited manner (A=28.3%, SA=30.8%). Nonetheless, it can be observed that most of the respondents have chosen the option neutral, indicating the average awareness levels of MSG among the respondents.

Table 6. Respondents' Awareness Level on MSG

		SDA <i>f</i> %	D <i>f</i> %	NL <i>f</i> %	A <i>f</i> %	SA <i>f</i> %	N <i>f</i> %	Mean	Std. Deviation
3A	I am aware that MSG is regarded as safe for consumption	9 7.5	14 11.7	52 43.3	34 28.3	11 9.2	120 100	3.20	1.017
3B	I am aware that MSG contains less sodium salt (MSG contains one-third of sodium in salt)	14 11.7	22 18.3	64 53.3	15 12.5	5 4.2	120 100	2.79	0.952
3C	I am aware that some food seasoning products contain MSG.	2 1.7	5 4.2	21 17.5	41 34.2	51 42.5	120 100	4.12	0.954
3D	I am aware that MSG is commonly associated with various types of illnesses	4 3.3	13 10.8	36 30.0	39 32.5	28 23.3	120 100	3.62	1.063
3E	I am aware that MSG is safe if consumed in a limited manner	4 3.3	10 8.3	35 29.2	34 28.3	37 30.8	120 100	3.75	1.087

3.2.4 Attitude on MSG

Table 7 below shows the level of respondents' attitudes towards MSG. According to the data obtained, the majority of the respondents did not often buy MSG products (D=25%, SDA=15%), use MSG in cooking (D=27.5%, SDA=22.5%), and consume it in their daily meals (D=23.3%, SDA=19.2%). Most of the respondents did not feel that they need MSG in their cooking (D=22.5%, SDA=23.3%). The majority of the respondents agreed that MSG enhance the taste of their food (A=27.5%, SA=13.3%).

Table 7. Respondents' Attitude towards MSG

		SDA <i>f</i> %	D <i>f</i> %	NL <i>f</i> %	A <i>f</i> %	SA <i>f</i> %	N <i>f</i> %	Mean	Std. Deviation
4A	I often buy MSG products	18 15.0	30 25.0	40 33.3	22 18.3	10 8.3	120 100	2.80	1.157
4B	I often use MSG in my cooking	27 22.5	33 27.5	31 25.8	19 15.8	10 8.3	120 100	2.60	1.233
4C	I often consume MSG in my daily meal	23 19.2	28 23.3	44 26.7	16 13.3	9 7.5	120 100	2.67	1.155
4D	I feel MSG is needed in my cooking	28 23.3	27 22.5	40 33.3	16 13.3	9 7.5	120 100	2.59	1.199
4E	I feel MSG enhance the taste of my food	17 14.2	17 14.2	37 30.8	33 27.5	16 13.3	120 100	3.12	1.231
4F	I feel MSG can cause negative impacts on health when consumed	3 2.5	9 7.5	48 40.0	36 30.0	24 20.0	120 100	3.58	0.976
4G	Before purchasing, I often check the food labelling whether it contains MSG or not	23 19.2	23 19.2	41 34.2	22 18.3	11 9.2	120 100	2.79	1.215

3.2.5 Acquired Knowledge on MSG

This section will be discussing on respondents' perceptions on acquiring knowledge on MSG. Based on Table 8, More than half of the respondents, with 67.5 percent, agreed that it is important to acquire knowledge on MSG.

Table 8. Respondents' Perception on Acquiring Knowledge of MSG

	Description	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	81	67.5	67.5	67.5
	No	2	1.7	1.7	69.2
	Not Sure	37	30.8	30.8	100.0
	Total	120	100.0	100.0	

4. DISCUSSION

Based on the literature review and data collection, the knowledge, awareness and attitude toward MSG among Muslim consumers in Brunei were identified, which addresses (1) knowledge of MSG among Muslim Consumers in Brunei, (2) awareness level of MSG among Muslim consumers in Brunei, (3) attitude level on MSG among Muslim Consumers in Brunei, and (4) perception on the important knowledge on MSG. The study finds that the respondents generally demonstrated an awareness of MSG, but there were still some misunderstandings and information gaps regarding its use in food products. The findings are discussed in the sections below.

4.1 Knowledge on MSG among Muslim Consumers in Brunei

From the data collected, the researcher can deduce that the respondents have good basic knowledge of MSG. Regarding the term E621, most respondents were unfamiliar with that MSG referred to as E621 on food labels and packaging. This illustrates how the majority of respondents lack adequate knowledge of reading food ingredients and labels. As for the source of knowledge on the term MSG, it can be seen that out of all the options provided by the researcher, namely 'family and friends', 'school or university', 'play a significant role in educating the respondents in acquiring knowledge on MSG. On a side note, several respondents knew that MSG is labelled E621 in food, indicating they are familiar with E-codes.

A significant number of respondents also learn about MSG from product packaging and labelling, however, only about 27.5% of respondents will verify the food labelling to see if it contains MSG or not prior to purchasing. Unlike the Gezmen-Karadağ and Türközü (2018) study, which emphasised that female consumers used the information on the label to discover the product's energy content (79%), that they cared about their health (63%), and that they knew what was in the food (55%). Food labels undoubtedly play a significant role in promoting customers' appropriate and balanced nutrition and lowering their risk of illness through nutrition and health claims (Gezmen-Karadağ & Türközü, 2018). According to a study by Kim, et al. (2016), using nutrition labels to guide food selections was associated with a lower incidence of dyslipidaemia. Reading nutrition labels was linked to a lower incidence of metabolic syndrome, according to a different study (Kang, et al., 2013). Thereby, reading food labels and product packaging benefits customers.

Although food labels contain the necessary information for dietary modifications, they may not always lead to healthier decisions (Gezmen-Karadağ & Türközü, 2018). According to this study, roughly 76% of the respondents were unaware that MSG is listed on food labels as E621. This is because customers must first be familiar with some basic nutritional facts before using food labels (Taylor & Wilkening, 2008). For this reason, the responsible parties should increase and disseminate knowledge on interpreting food ingredients and E-codes like E621 to ensure that consumers can correctly use the

information on food labelling. I believe that in order to address this issue, projects or policies must be implemented in addition to a public statement.

Consumers who are aware of food labels are more worried and conscientious about the food they eat, according to Jacobs, De Beer, and Larney (2011). According to Miller and Cassady's (2015) research, consumers are more likely to use food label information successfully if they have prior knowledge, which suggests that they are more likely to concentrate on key information, understand it, and assess it in order to make a healthy decision. Unfortunately, not everyone has sufficient knowledge about the additives and components in food. For customers to comprehend food ingredients and MSG levels, food labelling education is crucial. Therefore, for food labels to be used more effectively, it is advised that the necessary nutrition education be provided by experts, that food law regulations be revised, and that policies be put into place.

4.2. Awareness Level on MSG among Muslim Consumers in Brunei

This section shows that respondents' awareness of MSG is average. Most respondents do not even know MSG is safe, according to data. Most respondents are unaware that MSG has one-third of the sodium in salt. Most respondents chose "neutral," suggesting uncertainty about these statements. The researchers claim that respondents' ignorance of these statements shows they need help understanding MSG's benefits. Nevertheless, most respondents acknowledged that MSG is linked to various illnesses and is safe in moderation. This backs up the Food and Drug Administration's (FDA) claim that MSG is safe when used in moderation while also listing a number of adverse effects that may result from consuming more MSG, such as cardiac, circulatory, gastrointestinal, muscular, and neurological issues (Kazmi, Fatima, Perveen, & Malik, 2017).

Besides, almost 77% of respondents strongly agreed and agreed that several food seasonings contain MSG. This indicates that the respondents are aware of its potential health risks. On the contrary, Sivaharini and Ganapathy (2020) found that most respondents were not regular MSG consumers and had low MSG awareness. The difference may be because MSG is widely used in Brunei. The study also discovered that a minority of respondents were unaware of MSG's health risks and unfamiliar with MSG products, which implies that awareness of MSG is still lacking. To eliminate these gaps, appropriate efforts should be taken.

4.3. Attitude Level on MSG among Muslim Consumers in Brunei Darussalam

The findings of this study demonstrate that Muslim consumers in Brunei Darussalam hold significant variations in attitudes towards MSG consumption. Some respondents had a negative attitude toward MSG and its use in food products, while others held a positive attitude. Many reasons may be responsible for this study's observed variation in attitudes. For example, respondents who indicated a negative attitude about MSG may have been affected by media reporting on its potential health hazards and knowledge and awareness preventing certain food additives' consumption.

In contrast, those with a positive attitude may have been affected by the perceived benefits of MSG in improving the flavour of food and a lack of knowledge or concern over its potential health hazards. Ajinomoto has vehemently refuted the idea that MSG is hazardous (Samuels, 1999). However, since 1968, a small number of studies have shown that MSG is an endocrine disruptor and can damage brain cells. Many people think that MSG is a safe food ingredient, providing that their use of scientists-for-hire, falsified research, infiltration of government organisations, control of major media, and ongoing propaganda effort has been successful (Samuels, 1999). MSG is a seasoning that is frequently added to food by housewives (Swan, 1982).

Despite only highlighting the majority of the responses, the researcher also wanted to address the minority of the respondents who also use and consume MSG regularly. According to the Islamic

legal maxim, "harm is to be removed as far as possible." As Muslims, we are required to avoid anything that may cause harm. That, measures need to be taken by all parties to ensure that consumers consume MSG in moderation to avoid opposing the Islamic legal maxim stated.

4.4. Perception on the Importance of Acquiring Knowledge on MSG

Based on the findings, the majority of the respondents 67.5% agreed that Muslims must acquire knowledge of MSG. As for the reasoning, the respondents give various insights, as shown in the findings. The first concerns the preservation of health, as it is of utmost importance. Although studies on the toxicity of glutamate have been conducted since 1980, there has not been much thought given to the possibility that eating MSG may contribute to the development of abnormalities (Samuels, 2020). Due to MSG's controversies, consumers must practice moderation and vigilance. Consumers must comprehend the pros and drawbacks of MSG, the safe consumption limit, and the healthy alternative. As Muslims, it is required for them to maintain good health. This is by consuming halal and thayyib foods to remain healthy and prevent harm. As such, MSG usage requires knowledge.

Next, consumers also expressed that they need to know if MSG is halal. This matter has already been addressed in the book "Isu-Isu Produk Halal" by Jabatan Mufti Kerajaan Negara Brunei Darussalam, which has asserted that MSG "Ajinamoto" is halal as it contains no animal derivatives. GIMDES, Turkey's Halal Certifying Board, declared 15 years ago that MSG was harmful to human health and should not be used in food production (Yonetici, 2018). Thus, GIMDES has never certified an MSG-containing food product. Furthermore, due to growing concerns about obesity, MSG was prohibited in some nations, including the United States, Mexico, and Canada (Kazmi, Fatima, Perveen, & Malik, 2017). Hence, this matter shows how halal does not merely means no non-halal materials but also needs to be safe for consumption and not detrimental to health.

In this section, the researcher has also asked the respondents about the role of consumers and authority when acquiring knowledge on MSG. As for the role of the authorities, there are plenty. First, it is to disseminate awareness on the good and bad of MSG and importance of controlled intake of MSG. According to a study by Sharma et al. (2009), consuming MSG at doses of 4 mg and 8 mg per gramme of body weight resulted in hyperhomocysteinemia, which may have contributed to the development of atherothrombosis. MSG will not increase the nutritional content of the food, thus rapid absorption and high serum levels may overload the blood-brain barrier, block glucose uptake by the brain, disrupt hormonal balance, or promote acetylcholine production (Swan, 1982). Thus, humans need to limit their MSG consumption. According to Swan (1982), each person should pay attention to how their body reacts to different foods. MSG may only be included in foods at a maximum of 10 g kg⁻¹, either separately or in combination, according to European Union Directives (European Commission, 2008). In addition, Rhodes et al. (1991) have produced estimates of potential weekly MSG intake for a variety of users, which are listed in Table 9 below.

Table 9. Weekly Intake of MSG

Population Group	Weekly intake of MSG (g)
Whole population	4.1
Households purchasing foods in each category	10.9
Extreme consumers	16.3
Schoolchildren 10-11 years	9.2
School children 14-15 years	9.2

Therefore, next, the authority also plays a significant role in consumers' education on using MSG by injecting the culture of intelligent consumers into the public. Other than that, authorities should regulate the use of MSG in food outlets, such as restaurants, hotels, and food stalls. It is suggested that laws be created requiring restaurants to post notices on their menus that read, "MSG

USED HERE," so that patrons who are aware of their susceptibility can take precautions (Swan, 1982). As for the role of consumers, they need to do their research and educate themselves. Instead of relying solely on the government, they should gather reliable information. Next, mass media and social media must be utilised for benefits, as technology makes independent research easier. Lastly, consumers also need to instil the concept of moderation within themselves and educate their family and friends.

Nevertheless, several respondents request an explanation and disagree that MSG knowledge is necessary. Their justifications were mainly that MSG was permitted for sale and consumption, and they believed MSG was not harmful. It must be noted that maintaining a healthy lifestyle requires more than just treating diseases. It also requires eliminating potential hazards. So, we must take precautions to preserve our and others' health. This includes learning how MSG affects our bodies. Hence, prioritising our health allows individuals to live well and serve our communities.

5. CONCLUSION

In conclusion, this study has provided valuable insights into the knowledge, awareness, and attitudes of Muslim consumers in Brunei towards MSG. While respondents generally demonstrated an awareness of MSG, there were still some misunderstandings and information gaps regarding its use in food products. Furthermore, there were significant differences in opinion among respondents, with some expressing a strong dislike towards MSG while others were more accepting. For example, some believed that MSG is safe to consume as long as it is approved by the government, while others raised concerns about its potential health effects. As a result, the study recommends raising awareness and knowledge of MSG among Muslim consumers in Brunei and ensuring that their health, safety, and preferences are adequately addressed. Ultimately, this research has achieved its goal of analysing the knowledge, awareness, and attitudes of Muslim consumers in Brunei Darussalam towards MSG and highlighting the importance of such knowledge.

Due to the fact that it solely focuses on Muslim customers in Brunei Darussalam, the current study has a number of limitations. Therefore, the future researcher may focus on a more specific study only on one element, either knowledge, awareness, or attitude toward MSG. Future researchers may also conduct a study on knowledge, awareness and attitude toward MSG, but it should be on a bigger scale. As there are only a few articles that are Brunei-based regarding MSG consumption, therefore future researchers should conduct more studies that are focusing solely on Brunei. This research study has only managed to conduct a survey questionnaire; hence, the future researcher is advised to conduct both qualitative and quantitative methods to maximise the reliability of the study.

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