



## The Correlation between the Knowledge and Understanding of Eating Behavior Appropriate for each Blood Type and its Impact on Obesity among the Population in Bangkok

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**ABSTRACT:** Obesity is now a major concern among Thai citizens and the world population, as the proportion of people who are obese has been rising for decades. Obesity can lead to many health issues, such as heart disease, stroke, hypertension, and diabetes, and therefore is a problem that should be addressed. As various studies have suggested, there is an association between blood types and certain diseases including obesity. Eating behaviors appropriate for each blood type is one of the suggested ways to lose weight and be healthy. Accordingly, we conducted a survey on the Bangkok citizens to find the correlation between their knowledge and understanding of eating behaviors appropriate for each blood type and their impact on obesity, with a total of 301 responses obtained from Google Forms. The questionnaires include general information and questions about blood type diets. The results showed no significant correlation between knowledge and understanding of blood type diets and the body mass index (BMI). However, there is a significant correlation between gender and knowledge of the blood type diet. As a result, this study has revealed a lack of awareness on blood type diets among the population in Bangkok, which has a knowledge score of 7.99 out of 20, and showed that there is no significant correlation between the score and obesity.

**KEYWORDS:** Blood type, Blood type diets, Body mass index, Eating behavior, Obesity.

### INTRODUCTION

Nowadays, there are a lot of people dealing with obesity. This obesity problem is also a major concern in Thailand. Thailand has a total population of approximately 71.8 million people. Surprisingly, in 2022, the prevalence of being overweight and obese was 47.8% among adults, which had increased from 34.7% in 2016 (Limited, 2023b). Corpulence is commonly characterized as unusual or intemperate fat collection that presents a hazard to wellbeing calculated utilizing the body mass record (BMI); over 25 is considered overweight, and over 30 is obese. Obesity occurs when there is an excessive amount of fat in the body. This can cause other diseases and health problems, such as type 2 diabetes, heart disease, and hypertension (Klein et al., 2022). The study from Healthline in 2022 showed that there are more than 380 million people around the world with obesity who also face type 2 diabetes at a rate as high as 90-95% (Healthline, 2022). Excess weight can lead to fatty plaque building up in your arteries, the blood vessels that carry blood to body organs. Compromised coronary arteries, the heart's lifelines, can cause a devastating heart attack if clogged. (British Heart Foundation, 2019). Moreover, obesity can occur from other causes, such as daily routine management, sleep quality, health conditions, diet, and the blood group of each individual.

Many studies have supported a number of associations between ABO blood type and certain diseases, including cancer, infections, diabetes, cardiovascular diseases, hypertension, and obesity (Ahmed et al., 2019). In 1996, Peter J. D'Adamo, a naturopathic physician, published a book called "Eat Right for Your Type" which delved into the concept that individuals could enhance their well-being, extend their lifespan, and attain their desired weight by blood type. The condiments, spices, and even exercise routines one chooses should supposedly align with their blood type. Shortly after its release, the book became a top seller, prompting individuals worldwide to discover their blood, aligning their dietary choices with their blood type, modify their shopping preferences, and alter their approach to diet, exercise, and overall health. There has been research concluding that the blood group O shows a significant positive association with obesity, however, there are many contradictory findings as well. An example of this is between two studies from Jawed and Ahmed, where they studied a different population group. The study by Jawed revealed that blood group O showed the greatest susceptibility to being obese in the population (Jawed et al., 2018). On the other hand, the other study by Ahmed suggested that blood group AB was more susceptible to developing obesity in the Kurd race (Ahmed et al., 2019).



Even though obesity is often considered the root cause of many health problems, it can be prevented. By aligning dietary habits with one's blood type, individuals can maintain a healthy BMI and reduce the risk of health issues. This is evidenced in a study by the Allwell Healthcare website, where they showed a reduction in the risk of various diseases, such as obesity when the individuals ate the suggested food (Goodwin, 2022). To gauge the understanding of appropriate dietary habits based on blood type among the population of Bangkok, we conducted a research study titled 'The correlation between the knowledge and understanding of eating behavior appropriate for each blood type and its impact on obesity among the population in Bangkok.' This research aims to provide insights into the public's awareness of this topic, which can be utilized for further awareness campaigns, educational initiatives, and advertising efforts.

## METHODOLOGY

The survey research was conducted to reveal the correlation between the knowledge and understanding of eating behavior appropriate for each blood type and its impact on obesity among the population in Bangkok. We collected a total of 331 responses, including 30 pilot samples. The online questionnaires on Google Forms were used to collect the data as it gave us a chance to accumulate the data from the population around the area of Bangkok. The questionnaires consisted of 26 questions in total, which were divided into 5 sections, including general information and knowledge of the appropriate diet for each blood type (A, B, AB, and O). The sampling method used was convenience sampling. The questionnaires contained 20 multiple-choice questions about the blood type diets, in which the correct answer for each question could be defined as 1, and the incorrect answers could be defined as 0. The Index of Item Objective Congruence (IOC) was verified by 3 specialists, and the evaluated score was higher or equal to 0.5. The reliability of the questionnaires was determined using Cronbach's alpha on the pilot study group, and the reliability score was 0.807, which is acceptable. The Statistical Package for Social Sciences Version 29.0.2.0 (20) (SPSS) was used for the analysis of the research's statistical data.

## INSTRUMENT

### Part1 General Information

1. Age
2. Gender
3. Blood group
4. Underlying condition
5. Weight
6. Height

### Part2 Questionnaire of knowledge about diet of blood type A

1. Which meat is most suitable for blood type A? (Answer: Chicken)
2. Which menu should people with blood type A eat the most? (Answer: Grilled Salmon with teriyaki sauce)
3. If people with blood type A want to lose weight, which fruits should they eat the most? (Answer: Strawberry)
4. Should people with blood type A drink soy milk more than cow's milk? (Answer: Yes, because people with blood type A can't digest meat well)
5. People with blood type A should eat food that is cooked with coconut oil more than olive oil (Answer: No, because olive oil has higher density lipoproteins than coconut oil)

### Part3 Questionnaire of knowledge about diet of blood type B

1. Which meat should people with type B blood eat? (Answer: Goat )
2. Which oil is good for people with type B blood? (Answer: Olive oil)
3. Which fruit should people with type B blood avoid? (Answer: Tomato)
4. Which bread or muffin is beneficial for people with type B blood? (Answer: Brown rice bread)
5. Which flour is highly beneficial for people with type B blood? (Answer: Oat flour)



Part4 Questionnaire of knowledge about diet of blood type AB

1. Which of the following is least likely to cause digestive issues for someone with AB blood type (Answer: Tofu stir-fry with vegetables)
2. Which of the following supplements would be beneficial for AB individual with a low stomach acid level (Answer: Betaine HCl capsules)
3. Which beverage should be avoided for AB individuals (Answer: Energy drink)
4. What is the impact of caffeine on AB individuals (Answer: Increased nervousness and jitteriness)
5. Why is tofu recommended for AB individuals with low stomach acid (Answer: It provides plant-based protein without requiring high stomach acid )

Part5 Questionnaire of knowledge about diet of blood type O

1. Which food group should people with type O blood eat the most? (Answer: Protein )
2. People with type O blood should eat (Answer: Beef steak)
3. People with type O blood should eat seafood (Answer: True, because eating seafood on a regular basis can help with thyroid)
4. Which berry should people with type O blood avoid? (Answer: Strawberry)
5. People with type O blood don't need to avoid which beverage? (Answer: Wine)

**RESULTS**

**Table 1: General information**

(N=301)

General information	Frequency	Valid Percent
<b>Gender</b>		
Male	131	43.5
Female	169	56.1
Others	1	0.3
<b>Age</b>		
Under 18	164	54.5
18 or over	137	45.5
<b>Blood type</b>		
A	21	7.0
B	96	31.9
AB	64	21.3
O	120	39.9
<b>Underlying condition</b>		
None	197	65.4
Obesity	10	3.3



Heart disease	2	0.7
Cancer	1	0.3
High blood pressure	10	3.3
Diabetes	3	1
Allergies	68	22.6
G6PD	4	1.3
Vitiligo	1	0.3
Depression	1	0.3
Kidney disease	1	0.3
Dyslipidemia	1	0.3
Chronic Urticaria	1	0.3
Psoriasis	1	0.3

Table 2: Descriptive statistic (Mean and Standard Deviation)

	N	Mean	Std. Deviation
<b>BMI</b>	301	21.6404	4.52550
<b>Score</b>	301	7.99	3.491

Table 3: The pearson correlation; Relationship between knowledge and understanding of eating behavior appropriate for each blood type to BMI among the population in Bangkok

	Score	BMI
<b>Pearson Correlation</b>	1	0.73
<b>Sig. (2-tailed)</b>		0.208
<b>N</b>	301	301

Table 4: One-way ANOVA table; Comparing mean knowledge between blood groups

	SS	df	MS	F	P-value
<b>Between Groups</b>	32.971	3	10.99	0.901	0.441
<b>Within Groups</b>	3622.976	297	12.199		



**Table 5: One-way ANOVA table; Comparing mean knowledge between genders**

	SS	df	MS	F	P-value
<b>Between Groups</b>	96.289	2	48.145	4.03*	0.019
<b>Within Groups</b>	3622.976	297	12.199		

**Table 6: Independent sample t-test; difference in knowledge between age groups**

	Age group	N	Mean	Std. Deviation	t	p
<b>Score</b>	<b>Under 18</b>	164	7.48	3.713	-2.777	0.114
	<b>18 and above</b>	137	8.59	3.112		

Table 1 shows the general information about our participants. There are more female participants (56.1 percent) than male participants (43.5 percent), followed by 0.3 percent identifying as others. The majority of participants are under 18 years old, which represents 164 people, or 54.5 percent. The most common participant's blood type is O with 120 participants, and the least common is A with 21 participants in total. 65.4 percent of participants do not have an underlying condition, with the most common underlying condition being allergies, with 68 participants accounting for 22.6 percent of participants in the category.

Referring to Table 2, this table shows the impact of exposure to information about the appropriate diet according to blood type on the body mass index. The average BMI for the population of Bangkok is rounded down to 21.64, which is in the healthy range. Its standard deviation is rounded down to 4.5. On the other hand, the mean score of participants is 7.99, suggesting that the majority is unaware of their appropriate diet according to their blood type. Its standard deviation is 3.49.

Table 3 illustrates Pearson's correlation analysis on the relationship between knowledge and understanding of eating behaviors appropriate for each blood type and BMI among the Bangkok population. The analysis of 301 participants showed no significant correlation (p-value = 0.208). This contradicts the hypothesis that having knowledge about suitable diets based on blood type easily facilitates maintaining a healthy BMI range.

Drawing from the data presented in Table 4, the analysis reveals no significant differences in mean knowledge levels across individual blood groups. This means that, based on this study, individuals with different blood types do not demonstrate significant variation in levels of knowledge on the topic of an appropriate diet for each blood type. The result of the one way ANOVA obtained a p-value rounded down to 0.44, a mean square between groups rounded down to 32.97, and a mean square within groups rounded up to 3622.98.

Table 5 demonstrates a significant difference in mean knowledge between genders. The p-value obtained is 0.019, which indicates significance at the 0.05 level. Additionally, the mean square between groups is calculated as 48.15, and the mean square within groups is 12.199.

In Table 6, a t-test was used to determine the difference in knowledge between age groups. The results show that there are no significant differences in the mean knowledge of the two age groups, indicating that the population of Bangkok has around the same level of knowledge on the topic of eating behavior appropriate for each blood type. The obtained t-value is rounded up to -2.78, and the p-value is rounded down to 0.11.

**DISCUSSION**

Currently, there are many people with obesity in Bangkok. There are many studies that have supported a number of associations between ABO blood type and certain diseases, including cancer, infections, diabetes, cardiovascular diseases, hypertension, and obesity. Hence, this research aims to provide insights into the public's awareness of this topic, which can be utilized for further awareness campaigns, educational initiatives, and advertising efforts. The evidence for the correlation between blood type and



health risk have been shown as follows. Blood type A has been reported to be associated with developing certain stomach cancers, and in particular, people with AB blood appear to have the highest risk (Goodwin, 2022). Blood type B has been shown to positively correlate with starchy food in the Thai population (Chinnapongse, 2024). Contrarily, our Pearson correlations (Table 3) found that there was no significant relationship between knowledge of an appropriate blood type diet and BMI. This is likely because the population of Bangkok is not well-versed about the correlation between the knowledge and understanding of eating behavior appropriate for each blood type and their impact on obesity as revealed in Table 2 (7.99 out of 20). This contradicts the hypothesis that having knowledge about suitable diets based on blood type easily facilitates maintaining a healthy BMI range. Moreover, obesity can be caused by multiple factors, not just blood type. Thus, our results are more likely to be influenced by age, gender, and underlying conditions. In addition, some studies also showed no correlation between blood type and obesity (Rabelo Flor, 2020). Despite the lack of awareness about blood type diets, the average BMI for the population of Bangkok in this study revealed a healthy score of 21.64, which is considered a normal BMI range. We then tried to compare the difference in knowledge of blood type diet among the 301 participants by grouping them into blood group, gender, and age. The majority of participants have no underlying conditions and have a similar proportion in gender (male = 43.5% and female = 56.1%) and age (under 18 = 54.5% and 18 or above = 45.5%) (Table 1). Surprisingly, the survey found that gender affects knowledge of eating behaviors appropriate for each blood type. Result shows females have higher mean knowledge than males, (Table 5); this higher awareness in females is likely due to women being more concerned with their figures than men (amornvit, 2018).

## CONCLUSION

We hypothesized that a proper eating diet according to your blood type can help one maintain their BMI within a healthy range easier. We had collected a total of 301 responses from the population of Bangkok on the research topic “The correlation between the knowledge and understanding of eating behavior appropriate for each blood type and its impact on obesity among the population in Bangkok” on their understanding of their proper diet according to their blood type and their BMI status. The variables tested were gender, age, blood group, underlying condition, weight, and height on the first part, and their understanding of a proper diet according to blood types on the second part. Descriptive statistics demonstrate that the population of Bangkok is not well-versed in the topic. Using the Pearson correlation, the result shows that there is no correlation between knowledge on the topic and obesity. However, surprisingly, one-way ANOVA analysis demonstrates a statistically significant difference in knowledge level based on gender.

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