Associations between knowledge, attitudes, junk food consumption, and obesity risk among productive age adults in Aceh, Indonesia

Analisis hubungan pengetahuan, sikap, konsumsi makanan cepat saji, dan risiko obesitas pada orang dewasa usia produktif di Aceh, Indonesia

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Abstract

Obesity has become a global public health problem with increasing prevalence. In Indonesia, Aceh ranks 10th out of 38 provinces, with an obesity prevalence of 24.4%. The number of obesity cases in Aceh Besar Regency among individuals of productive age has increased, despite an overall decline in patient visits between 2022 and 2024. This study aimed to analyze the relationship between knowledge, attitudes, and consumption habits of junk food and the risk of obesity in individuals of productive age. This observational analytical study with a case-control design was conducted in Aceh Besar between May and June 2025. The sample consisted of 120 productive-age adults (15–64 years) selected through proportional sampling methods. Knowledge, attitudes, and junk food consumption were measured using a structured questionnaire that had been tested for validity, and data analysis was performed using the chi-square test. The results showed a significant relationship between knowledge (p=0.017; OR=0.375) and junk food consumption habits (p=0.001; OR=0.269) and the incidence of obesity. Conversely, attitudes did not show a statistically significant relationship with the risk of obesity (p=0.083; OR=0.509). In conclusion, nutritional knowledge and junk food consumption habits are important factors in the risk of obesity in individuals of productive ages. Strengthening nutrition education and reducing fast-food consumption are recommended community-based obesity prevention measures.

Keywords: Attitudes, junk food consumption, nutritional knowledge, obesity

Abstrak

Obesitas telah menjadi masalah kesehatan masyarakat secara global dengan prevalensi yang terus meningkat. Di Indonesia, Aceh menempati peringkat ke-10 dari 38 provinsi dengan prevalensi obesitas sebesar 24.4%. Kasus obesitas di Kabupaten Aceh Besar pada usia produktif mengalami peningkatan meskipun kunjungan pasien secara keseluruhan menurun antara tahun 2022 hingga 2024. Penelitian bertujuan untuk menganalisis hubungan antara pengetahuan, sikap, dan kebiasaan konsumsi makanan cepat saji (junk food) dengan risiko obesitas pada individu usia produktif. Penelitian ini merupakan studi analitik observasional dengan desain kasus–kontrol, dilakukan di Aceh Besar pada Mei-Juni 2025. Sampel adalah 120 orang dewasa usia produktif (15–64 tahun) yang dipilih melalui proportional sampling sebanyak 120 orang. Pengetahuan, sikap, dan konsumsi junk food diukur menggunakan kuesioner terstruktur yang telah diuji validitasnya, sedangkan analisis data dilakukan menggunakan uji Chi-square. Hasil, menunjukkan adanya hubungan yang signifikan antara pengetahuan (p=0.017; OR=0.375), dan kebiasaan konsumsi junk food (p=0.001; OR=0.269) dengan kejadian obesitasi pada orang dewasa. Sebaliknya, sikap tidak menunjukkan

hubungan yang signifikan secara statistik dengan risiko obesitas (p=0.083; OR=0.509). Kesimpulannya, pengetahuan gizi dan kebiasaan konsumsi junk food merupakan faktor yang berperan penting terhadap risiko obesitas pada individu usia produktif. Penguatan edukasi gizi dan pengurangan konsumsi makanan cepat saji direkomendasikan sebagai upaya pencegahan obesitas berbasis masyarakat.

Kata Kunci: Konsumsi junk food, obesitas, pengetahuan gizi, sikap

Introduction

Obesity is a complex metabolic disorder characterized by excessive fat accumulation, which increases the risk of type 2 diabetes, cardiovascular diseases, and metabolic syndrome (Klein et al., 2022). Excess adiposity promotes insulin resistance, reduces glucose uptake, and leads to hyperglycemia. The Global Burden of Disease Study 2021 estimated that more than 2 billion adults worldwide are overweight or obese, contributing substantially to global morbidity and mortality (Brauer et al., 2024). The World Health Organization (2023) similarly reported that over 1.9 billion adults are overweight, with 650 million classified as obese, resulting in an estimated economic burden of USD 2.2 trillion annually, equivalent to 2.8% of the world's gross domestic product (World Obesity Federation, 2022).

In Indonesia, Basic Health Research data, indicate that 21.8% of adults are obese, with a higher prevalence among women (26%) than men (13%). Therefore, obesity has emerged as a major public health concern because of its association with degenerative diseases, decreased work productivity, and increased healthcare expenditures (Ayuningtyas et al., 2022). In Aceh Province, the prevalence of obesity is 24.4%, ranking tenth among 38 provinces, with the highest rates observed in Langsa (32%) and Banda Aceh (30%) (Balitbangkes RI, 2018).

Individuals of productive age (15–64 years) are particularly vulnerable to obesity due to unhealthy dietary patterns, high consumption of energy-dense foods, and low levels of physical activity (Moschonis & Trakman, 2023; Labatjo et al., 2023). These behavioral risk factors increase the likelihood of obesity and related comorbidities, including hypertension and diabetes (Annisa et al., 2022). Among Indonesian adults, 69.3% were reported to have abdominal obesity, and those with low physical activity exhibited a sevenfold greater risk than individuals who were physically active (Mulia et al., 2021). Similarly, Putra (2017) showed that excessive food intake increased the risk of obesity by 2.6 times among high school students in Surabaya.

Frequent consumption of junk food is a major behavioral determinant of obesity. Junk foods that are high in calories, sugar, salt, and fat but low in fiber and micronutrients can disrupt metabolic processes and elevate total caloric intake, leading to fat accumulation (Asmarani et al., 2018). Changes in modern dietary practices have contributed to increased junk food consumption among adolescents and adults (Hadi et al., 2025). Consuming fast food more than thrice a week has been shown to significantly increase the risk of obesity (Putra et al., 2025; Asmarani et al., 2018).

Knowledge and attitudes are essential behavioral predictors that influence dietary choices. Individuals with better nutritional knowledge are more likely to adopt healthier eating habits and limit their junk food intake (Lukmana et al., 2023; Maulina et al., 2022). However, awareness does not always translate into healthy behaviors. Zaim (2019) found that 55.1% of students continued to exhibit positive attitudes toward fast food despite understanding its associated health risks. These findings suggest that both knowledge and attitudes must be examined collectively to understand their influence on dietary behavior and obesity outcomes.

Local data from the Baitussalam Health Center in Aceh Besar District recorded 102 obese productive-age individuals (15.76%) out of 647 visitors in 2022, 89 individuals (13.16%) out of 676 visitors in 2023, and 60 individuals (6.09%) out of 985 visitors in 2024. Although the total number of patient visits fluctuated, the proportion of obesity cases remained relatively high, indicating persistent behavioral risk factors such as junk food consumption and sedentary lifestyle patterns. Preliminary observations among 10 respondents of productive age also revealed variability in knowledge, attitudes, and eating habits,

suggesting differences in behavioral influences. While previous studies in Indonesia have explored the relationships between knowledge, attitudes, and obesity, evidence among productive-age adults in Aceh remains limited. Little is known about whether nutritional knowledge, attitudes, and junk food consumption independently predict obesity risk in this population.

Therefore, this study aimed to examine whether knowledge, attitudes, and junk food consumption habits are associated with and independently predict obesity risk among productive-age adults in the working area of Baitussalam Health Center, Aceh Besar District.

Methods

This study employed an analytical observational approach with a case–control design. Data collection began with the outcome (obesity status) and was traced backward to identify associated risk factors, including nutritional knowledge, attitudes, and junk food consumption (Setia, 2016). The study was conducted in the working area of the Baitussalam Health Center in the Aceh Besar District. Data collection was conducted from May 26 to June 4, 2025.

The sample size of 120 participants provided a minimum statistical power of 80% at $\alpha = 0.05$ to detect associations with odds ratios $\geq$ 2.0, consistent with the recommended sample estimation guidelines for case–control studies. The study population consisted of all productive-age adults (15–64 years) living in the Baitussalam Health Center's catchment area. A total of 120 participants (60 cases and 60 controls) were selected using proportional sampling based on the village population distribution. Participants were divided into two groups: cases (individuals classified as obese [BMI ≥ 25 kg/m^2]) and controls (individuals with a normal BMI [18.5–24.9 kg/m^2]). All participants resided within the same service area and had comparable age distribution. The inclusion criteria were productive-age adults (15–64 years), residents of the study area for ≥ 6 months, and those willing to participate and complete the questionnaire. The additional case criteria were a BMI ≥ 25 kg/m^2 (measured directly). Control criteria: BMI 18.5–24.9 kg/m^2.

The exclusion criteria were as follows: pregnant women, individuals with diagnosed metabolic disorders (e.g., thyroid disease, Cushing syndrome), and individuals with severe illness affecting dietary intake or weight status.

Primary data were collected using structured questionnaires assessing nutritional knowledge, attitudes, and junk food consumption habits, as well as anthropometric measurements (weight and height). Junk food consumption was measured using a Food Frequency Questionnaire (FFQ). Secondary data were obtained from the existing reports and relevant literature. All instruments were adapted from previous studies (Swarjana, 2022; Billah, 2021). Weight and height were measured using calibrated digital scales and stadiometers, respectively.

Obesity was defined as a body mass index (BMI) ≥ 25 kg/m^2 for the case group and < 25 kg/m^2 for the control group. Knowledge referred to participants' understanding of junk food and its associated health risks and was classified as good when respondents answered more than 75% of the items correctly and poor when their score was below 75%. Attitudes toward junk food consumption were measured using a structured attitude scale, with responses categorized as positive if the total score exceeded the mean and negative if it fell below the mean. Junk food consumption was evaluated using a weekly Food Frequency Questionnaire (FFQ), and participants were categorized as having either frequent or rare consumption based on their reported weekly intakes.

The data were systematically coded, tabulated, and subjected to quantitative analysis. The relationships between participants' nutritional knowledge, attitudes, junk food consumption habits, and obesity status were examined using the chi-square (χ^2) test, with statistical significance set at $p < 0.05$. All analytical procedures were performed using IBM SPSS Statistics version 26 to ensure the accuracy and reliability of the results.

This study was approved by the Health Research Ethics Committee of Universitas Ubudiyah Indonesia (Ethical Clearance No. 058/EC/KEPK-UUI/X/2024) and conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants before data collection.

Result and Discussion

This study included 120 respondents, comprising 60 obese individuals and 60 controls. The majority were female (55.0%) and between 31 and 40 years of age (50.8%). Most respondents demonstrated good obesity-related knowledge (70.0%), while 65.8% exhibited negative attitudes toward healthy lifestyle practices. Junk food consumption was almost evenly distributed, with 49.2% and 50.8% of the participants classified as rare and frequent consumers, respectively.

Table 1. Frequency distribution of respondents by age, gender, knowledge, attitude, junk food consumption, and obesity status at Baitussalam Health Center, Aceh Besar

Variable	Category	n	%
Age (years)	20–30	5	4.2
	31–40	61	50.8
	41–50	30	25.0
	51–60	24	20.0
Sex	Female	66	55.0
	Male	54	45.0
Obesity Risk	Obese	60	50.0
	Normal	60	50.0
Knowledge	Good	83	70.0
	Poor	37	30.0
Attitude	Negative	79	65.8
	Positive	41	34.2
Junk Food Consumption Habit	Rare	59	49.2
	Frequent	61	50.8

Table 1 presents the demographic and behavioral characteristics of the 120 respondents of productive age in Baitussalam, Aceh Besar. The largest age group was 31–40 years (50.8%), followed by 41–50 years (25.0%) and 51–60 years (20.0%), with only 4.2% of the participants aged 20–30 years. Females comprised 55.0% of the total sample size. The prevalence of obesity and normal weight was evenly distributed (50% each). Most respondents demonstrated good nutritional knowledge (70.0%); however, 65.8% exhibited negative attitudes toward healthy living. Junk food consumption habits were nearly balanced, with 49.2% and 50.8% of the participants reporting rare and frequent consumption, respectively.

Bivariate analysis was employed to examine the associations between the independent variables (knowledge, attitude, junk food consumption) and obesity. Significance was determined at $p < 0.05$ and OR > 1. Among respondents with good knowledge, 42.9% were obese, compared to 66.7% among those with poor knowledge of obesity. The OR of 0.37 (indicating a 62.5% reduction in obesity risk) suggests that good knowledge is protective against obesity. Chi-square analysis confirmed a significant association ($p = 0.017$). Although negative attitudes were more common (65.8%), the odds ratio (OR) of 0.509 and $p = 0.083$ indicated no statistically significant association between attitude and obesity risk. In contrast, respondents with frequent junk food consumption had a much higher proportion of obesity (65.6% vs. 33.9%). An OR of 0.27 (73.1% reduced risk with rare consumption) and $p = 0.001$ confirmed a strong and significant association (Table 2).

Table 2. Association of knowledge, attitude, and junk food consumption with obesity risk in productive-age adults

Variable	Category	Obese (%)	Normal (%)	Total (%)	OR (95% CI)	p-value
Knowledge	Good	36 (42.9)	48 (57.1)	84 (100)	0.37	0.017
	Poor	24 (66.7)	12 (33.3)	36 (100)	(0.16–0.85)	
Attitude	Negative	35 (44.3)	44 (55.7)	79 (100)	0.51	0.083
	Positive	25 (61.0)	16 (39.0)	41 (100)	(0.23–1.11)	

Junk Food Consumption	Rare	20 (33.9)	39 (66.1)	59 (100)	0.27 (0.12–0.59)	0.001
	Frequent	40 (65.6)	21 (34.4)	61 (100)		

Good nutritional knowledge was significantly associated with a lower risk of obesity (p = 0.017; OR < 1), reducing the likelihood of obesity by approximately 62.5%. This aligns with recent evidence showing that higher nutrition literacy is linked to lower odds of obesity, such as the findings of Cui et al. (2025), who reported an OR of 0.66 (95% CI: 0.43–0.99) for general obesity among individuals with strong nutrition literacy. Knowledge influences behavior by enhancing one's ability to plan balanced meals, interpret food labels, understand the importance of portion sizes, and choose nutrient-dense foods. Conversely, inadequate knowledge may lead to decisions driven by convenience, cost, or taste, contributing to excessive calorie intake and fat accumulation. Similar findings were reported by Damayanti et al. (2024), who found that workers with good nutritional knowledge demonstrated healthier dietary patterns and lower prevalence of obesity.

No significant relationship was found between attitude and obesity (p = 0.083; OR < 1). Although a positive attitude may have a protective effect, attitudes alone do not necessarily result in healthy dietary practices. The implementation of healthy behaviors is influenced by environmental, social, and structural factors. This is consistent with knowledge–attitude–practice (KAP) studies, which often reveal weak or inconsistent associations between attitudes and actual dietary behavior (O'Leary et al., 2025). Attitudes may reflect perception rather than practice; therefore, they do not guarantee behavior change without supportive environments and practical skills.

Nutrition knowledge and junk food consumption emerged as significant determinants of obesity risk among productive-age adults in this study. These results support international evidence showing that nutrition literacy predicts healthier dietary behavior and lower obesity risk in populations from China, Korea, and Malaysia (Cui et al., 2025b; Al Rahmad & Annisa, 2025). Knowledge enhances individuals' capacity to make informed dietary choices, avoid energy-dense foods, and reduce their excessive caloric intake.

Frequent consumption of junk food showed a strong relationship with obesity, reinforcing the findings of previous studies demonstrating that a high intake of ultra-processed foods increases body fat percentage, waist circumference, and triglyceride levels (Alomari & Almoraie, 2025; Lu et al., 2025). The Global Burden of Disease Nutrition Report (2024) similarly found that diets high in saturated fat, refined carbohydrates, and added sugars elevate the risk of obesity by promoting chronic energy excess. Therefore, the food environment and accessibility may strongly influence consumption patterns, particularly in settings where fast food is inexpensive and readily available.

The non-significant association between attitude and obesity mirrors the findings of other studies, where positive attitudes toward healthy eating do not always translate into healthier dietary behaviors. Individuals may possess favorable attitudes but continue to consume unhealthy foods due to cost, convenience, taste preference, or cultural norms (Huo et al., 2024; Nguyen et al., 2024). This suggests that improving attitudes alone may be insufficient without modifying the broader food environment and providing the necessary behavioral support.

These findings highlight the importance of prioritizing behavior-based interventions, including structured nutrition literacy programs, regulation of the food environment, and strategies to reduce junk food availability. Public health initiatives should shift from awareness-only approaches to behavior-driven models involving community-based nutrition classes, taxation of unhealthy foods, and improving the availability of healthy options in workplaces and public institutions. Future research should incorporate variables such as physical activity, socioeconomic status, and neighborhood food environments to develop a more comprehensive framework for obesity prevention.

Biologically, obesity reflects a chronic imbalance between energy intake and the energy expenditure. Junk foods are often energy dense and nutrient poor, contributing to adiposity and metabolic dysregulation. Sedentary behavior and genetic factors may further exacerbate this imbalance. Excess adiposity increases the risk of non-communicable diseases, such as type 2 diabetes, hypertension, and cardiovascular

disorders (WHO, 2023). From a public health standpoint, reducing junk food intake to occasional consumption (e.g., once or twice monthly), alongside nutritional education and lifestyle modification, is recommended to maintain a healthy body weight and prevent metabolic complications.

These findings are consistent with the broader international evidence. A large-scale study in China demonstrated that higher nutritional literacy was associated with lower odds of general obesity, abdominal obesity, and elevated body fat percentage among adults (Cui et al., 2025c). Research on food consumption patterns has also shown that individuals with higher education or health awareness tend to consume healthier foods and fewer ultra-processed items. This supports the conclusion that nutritional knowledge plays a protective role in preventing obesity.

Conclusion

This study demonstrated that nutritional knowledge and junk food consumption habits are significantly associated with obesity risk among productive-age adults in the Baitussalam Health Center area of Aceh Besar. Individuals with good nutritional knowledge and lower junk food intake were less likely to be obese, whereas frequent consumption exhibited a strong association with an increased risk of obesity. Although attitudes showed a protective trend, the relationship was not significant.

The study's case–control design limits causal inference; therefore, future research should employ longitudinal or intervention-based methods, expand the sample size, and incorporate variables such as physical activity, socioeconomic status, and food environment exposure to improve generalizability and causal understanding.

Acknowledgments

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