

Factors Relating to Food Safety Practices Among Indonesian Adolescents: A Descriptive Literature Review

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ABSTRACT

Background: Food safety is a major public health concern, especially for adolescents who are experiencing significant physical and physiological changes. Ensuring proper food handling, storage, and preparation is crucial to prevent foodborne disease, which can have serious impacts on the health and development of young individuals. This review aimed to identify key Socio-demographic determinants that impact how Indonesian adolescent's food safety practice.

Methods: The literature review involved a comprehensive search of academic databases such as PubMed, Google Scholar, and JSTOR using keywords factors relating to food safety practice among Indonesian adolescents. Selected studies (13 articles) were evaluated using Data extraction was conducted using the Joanna Briggs Institute (JBI) form to identify key factors related, and the results were synthesized to uncover common themes and patterns affecting food safety practice.

Results: The findings emphasize the interplay of socioeconomic status, education, and environment on food safety practice among adolescents.

Conclusion: This study shows that it is very important to implement targeted interventions that encourage safer food handling behaviors, thus the need for targeted interventions to promote safer food handling behaviors. Strengthening food that requires integrating education system, enforcing stricter regulations, increasing safe food access, and using AI technology for awareness.

BACKGROUND

Food safety is a critical public health issue, particularly for adolescents who are undergoing significant physical and physiological changes (Kansra et al., 2021). Proper food handling, storage, and preparation are essential to prevent foodborne disease, which can have severe consequences for young people's health and development (Mkangara, 2023). In Indonesia, a country with diverse ethnic groups and cultural practices, food safety practice among adolescents are shaped by a variety of socio-demographic factors (Suryani et al., 2022). Understanding these factors is vital for developing effective educational programs and policies aimed at improving food safety practices in this population (Elobeid et al., 2019).

Indonesia is characterized by its rich cultural heritage and diverse traditions, which significantly influence dietary habits and food safety practices (Wijaya, 2019). Traditional food preparation methods, cultural beliefs, and religious dietary laws play a substantial role in how food is handled and consumed (Suyitno et al., 2023). For instance, Indonesian cuisine often involves unique cooking techniques and communal eating practices that can impact food safety (MacRae & Reuter, 2020). The interplay between these cultural practices and modern food safety standards presents both challenges and opportunities for improving food safety practice among adolescents (Aluh et al., 2021). In addition, globalization has introduced new food and beverage trends among Indonesian adolescents. Popular items such as boba drinks, sushi, and Korean cuisine have gained significant traction. However, the widespread adoption of these food products raises concerns about food safety, particularly regarding processing standards and hygiene practices.

Family dynamics also play a crucial role in shaping food safety practice. Parents and guardians are primary influencers of adolescents' food handling practices (Wang et al., 2020). Family attitudes towards food safety practice, including the emphasis placed on hygiene and safe food preparation, are often mirrored by adolescents (Gkintoni et al., 2024). Additionally, the home environment, including access to safe food storage facilities and the presence of role models who practice good food safety practice, can significantly influence adolescents' behaviors (Annan et al., 2024).

Peer influence and social norms among adolescents are also significant factors affecting food safety practices (Islam et al., 2019). The behavior of peers can either reinforce or undermine safe food handling practices (Bulochova et al., 2024). For example, during school hours or social gatherings, adolescents may conform to the practices of their peers, which may not always align with safe food handling guidelines (Devine et al., 2023). School environments and peer interactions, therefore, play a critical role in shaping adolescents' food safety practice (Neufeld et al., 2022).

Educational interventions and awareness programs are essential for enhancing food safety practices among adolescents (Ruby et al., 2019). Schools and community organizations have the opportunity to educate young people about proper food handling techniques and the importance of food safety (Birke & Zawide, 2019). However, the effectiveness of these programs can vary depending on their cultural relevance and the level of engagement from students, parents, and the community (Michael et al., 2023). Addressing socio-demographic factors and integrating them into educational initiatives can help bridge gaps in food safety knowledge and practice among Indonesian adolescents. Therefore, this literature review aims to identify factors related of influence adolescent food safety practice in Indonesia.

METHODS

A comprehensive literature search was conducted to gather relevant studies and articles on the socio-demographic factors affecting food safety practices among adolescents in Indonesia. The search strategy included querying multiple academic databases, such as PubMed, Google Scholar, and JSTOR, with keywords such as "food safety," "adolescents," "socio-demographic factors," and "Indonesia." The focus was on identifying peer-reviewed journal articles, conference papers, and reports published in the past decade to ensure the inclusion of recent and relevant research. In this study, inclusion criteria ensured that selected articles were relevant to socio-demographic factors affecting food safety practice among adolescents in Indonesia, while exclusion criteria removed studies that did not focus on the target population or lacked methodological rigor. As shown in the table below:

Table 1. Inclusion and Exclusion Criteria

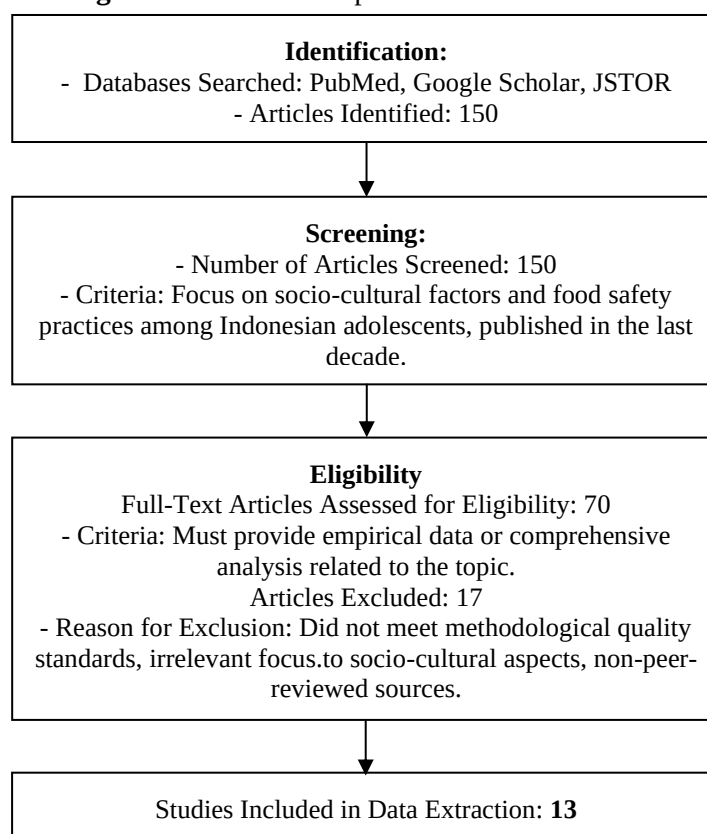
No	Inclusion Criteria
1	Studies focusing on Indonesian adolescents and their food safety practices.
2	Research addressing socio-demographic factors influencing food safety practice.
3	Articles published in peer-reviewed journals or reputable academic sources within the last ten years.
4	Studies providing empirical data, theoretical analysis, or comprehensive reviews related to the topic.
Exclusion Criteria	
1	Articles not specific to adolescents or not related to socio-demographic aspects
2	Publications focusing on food safety in adult populations or unrelated geographical regions
3	Non-peer-reviewed sources, opinion pieces, or articles without substantial data or analysis.

In this study, the PRISMA framework model and inclusion–exclusion criteria will be employed to systematically filter and select relevant articles focusing on socio-demographic factors influencing food safety practice among adolescents in Indonesia. Subsequently, the Joanna Briggs Institute (JBI) data extraction form will be used to rigorously analyze each selected article, extracting key data to identify and synthesize common themes and patterns affecting food safety practices within this demographic.

RESULTS

Result of the utilizing the PRISMA model

In this study on factors related of food safety practice among adolescents in Indonesia, the PRISMA model systematically identified and selected 13 relevant articles by guiding a thorough search strategy, applying eligibility criteria specific to the topic, and using the PRISMA flow diagram to document and refine the selection process. As shown in the figure 1 bellow:

Figure 1. The selection process for literature selected**Analysis the result using JBI Data Extraction Form**

The JBI Data Extraction Form has been used to systematically extract key data from the included studies. This includes details on study design, sample characteristics, data collection methods (methodology), key findings and outcome related to socio-demographic factors affecting food safety practices among Indonesian adolescents. The data extracted using the JBI methodology will be represented through a visual correlation diagram for enhanced visualization and analysis.

Table 2. The analysis of characteristic articles

Study Identification		Methodology	Key Findings and outcomes
Author(s)	Year		
Nurwulan Purnasari, Ilzamha Hadijah Rusdan (Purnasari & Rusdan, 2021)	2021	The study involved 222 Central Java college students, using a cross-sectional survey design to assess sociodemographic information, food safety perceptions, hygiene practices, and health profiles, and analyzed using Microsoft Excel and SPSS software.	The study found that while 90% of college students follow food safety guidelines, 80% consume potentially hazardous foods, leading to fever and diarrhea, suggesting that certain student groups are more likely to follow safety guidelines.
R. Agustina, T. P. Sari, Soemilah Satroamidjojo, I. Bovee-Oudenhoven, E. Feskens, F.	2013	The study involved 274 children aged 12-59 months from East Jakarta, assessing diarrhea prevalence through defecation patterns and food hygiene practices through home visits, interviews, and observations. Nutritional status was measured through height and weight, with the median score indicating poor or better practices.	The study found that less dirty sewage in homes reduces diarrhea prevalence in children. Poor food hygiene practices were linked to higher diarrhea prevalence in children under 2 years old, while overall food hygiene scores were not associated with diarrhea in the full sample.

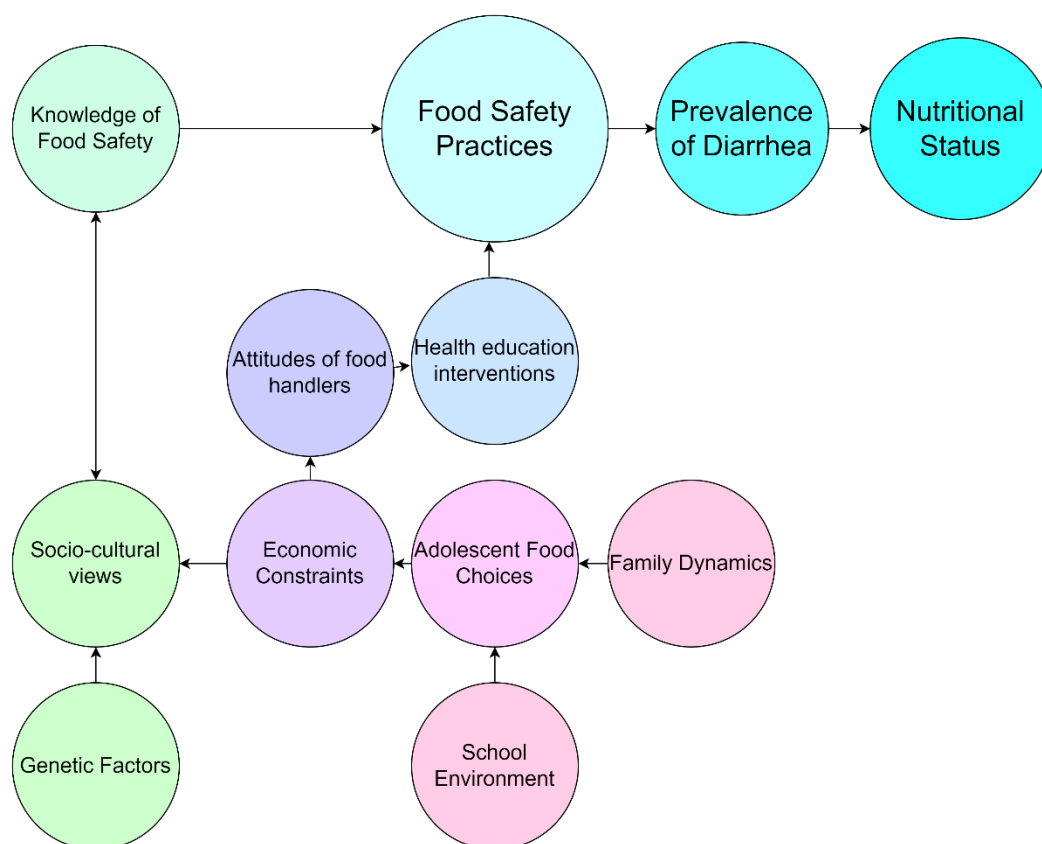
Kok (Agustina et al., 2013)			
Dyah Suryani, A. H. Sutomo, A. T. Aman (Suryani et al., 2019)	2019	This study utilized a cross-sectional observational design with a sample of 109 food handlers from 60 primary schools in Yogyakarta City.	Food handlers' attitudes, rather than demographic and background factors like gender, age, education, experience, training, and knowledge, significantly influence their food safety practices.
Nita Aprilia, Didik Tantomo, P. Pawito, Bhisma Murti (Aprilia et al., 2019)	2019	The study, conducted at 25 senior high schools in Banyuwangi, East Java, analyzed data on obesity, water consumption, fruit and vegetable consumption, and socio-cultural views among 225 students. The questionnaires were validated and reliability tested, and the data was analyzed using univariate, bivariate, and multilevel logistic regression analyses.	Adolescent obesity risk is influenced by water, fruit, and vegetable consumption, socio-cultural views, genetic factors, and high school environment, with genetic differences accounting for 9.89% of variation in obesity.
R. Maulida, Keiko Nanishi, Joseph Green, A. Shibanuma, M. Jimba (Maulida et al., 2016)	2016	The study, conducted across 14 public junior high schools in East Jakarta, Indonesia, involved 681 students aged 13-14, with trained research personnel, using self-administered questionnaires and height and weight measurements.	Adolescent food choices are influenced by comfort, convenience, price, and health, with health being the most important factor. Less affluent students prioritize convenience but not healthier choices. Male students prioritize health more than females.
Rizqi Amalia Rohmah, Y. Prabandari, L. Lestari (Amalia Rohmah et al., 2020)	2020	The study used a qualitative evaluation method in three villages in Yogyakarta, Indonesia, involving 73 informants. Data was collected through focus group discussions, interviews, document reviews, and observations, and analyzed using qualitative content analysis.	The GKPD program faced challenges in promoting food safety practices among food vendors due to economic and human resource constraints, and its effectiveness was not fully realized. Regular follow-up and monitoring were also lacking, and limited resources hindered its sustainability.
Iqbal Muhammad, Choiriyah Nurul Aziz, Setyorini Inma Yunit (Muhammad et al., 2018)	2018	This cross-sectional study employed random cluster sampling of 482 nutrition students across three educational levels (D3, D4, S1) and six major regions in Indonesia. Data collection was conducted using a validated food safety knowledge questionnaire.	Bachelor's degree (S1) students had the highest food safety knowledge scores compared to associate degree (D3) and bachelor's degree (D4) students, with mean scores of 5.46, 5.52, and 5.84, respectively. However, the differences in food safety knowledge among these three groups were not statistically significant.
A. Riyanto, R. Murwani, S. Sulistiyani, M. Rahfiludin (Riyanto et al., 2017)	2017	The study used a quasi-experimental design with a pretest-posttest control group, with 224 students in two groups. The 6-month intervention included weekly food safety content explanations using book covers and three video showings.	The study found that a 6-month food safety education intervention using book covers and videos significantly improved the knowledge, attitude, and practices of elementary school students regarding street food safety. The intervention increased knowledge from 5.4% to 91.1%, attitude from 69.6% to 97.3%, and practices from 21.4% to 59.8%.

Ainun Muthoharoh, Herni Fortune, Dwi Bagus Pambudi, Siti Khuzaiyah, M. Ab (Muthoharoh et al., 2023)	2023	The study utilized KIE counseling methods, focusing on food safety for pregnant women, infants, toddlers, children, adolescents, and the elderly, with participants including religious and community leaders from Pekalongan organizations, and assessed knowledge improvement through pre-test and post-test questionnaires.	The food safety education intervention led to a 3.21% increase in participants' knowledge. The participants showed interest and cooperation throughout the activities. Overall, the community service activities were successfully implemented with the target audience, which included religious and community leaders.
Manarul Hidayat, Tio Kurnia Priambodo (Hidayat & Kurnia Priambodo, 2023)	2023	The study utilized a qualitative research method to analyze texts, aiming to examine relationships and dependencies between aspects, while also developing intellectually stimulating theories and hypotheses without focusing on practical applications.	Indonesian cuisine is diverse, utilizing various spices in preparation. The main ingredients are fish, coconut, and chili. The environment and natural conditions of a region significantly influence its cultural aspects, including its food culture.
F. Damayanti, E. Wahyati (Damayanti & Wahyati, 2019)	2019	The study involved a literature review of relevant theories, findings, and research materials. It employed descriptive analysis to present a detailed description of the research subject and variables.	Indonesia's food safety is inadequate, with high food poisoning outbreaks and inadequate protection under Health Law. Unsafe food products in the market indicate the lack of food safety as a right to health. Stricter regulations are needed to improve community health.
P. Januraga, D. Izwardi, Yessi Crosita, P. Indrayathi, Eny Kurniasari, A. Sutrisna, A. Tumilowicz (Januraga et al., 2021)	2021	The study employed in-depth interviews using semi-structured guidelines and focus group discussions. Data were analyzed using a general inductive approach. The research was conducted in two urban areas of Indonesia, Jakarta and Jogjakarta, with participants consisting of adolescent girls aged 16-19 years.	The social media campaign effectively increased participants' knowledge, awareness, and motivation to adopt healthier eating habits, despite challenges such as taste perceptions, limited availability of affordable healthy ingredients, and family-related factors, despite varying platforms' ease of use.
C. Rachmi, H. Jusril, I. Ariawan, Ty Beal, A. Sutrisna (Rachmi et al., 2021)	2021	The study conducted a systematic literature review in six international and one local electronic databases from 2000 to 2018, assessing articles using a critical appraisal tool, focusing on single cities, smaller areas, or multiple cities in Indonesia.	The review reveals that Indonesian adolescents are undernourished in protein, fruits, and vegetables, and consume excessive sodium and fast food. It suggests measures to improve nutrient adequacy, fruit and vegetable intake, beverage consumption, breakfast habits, and snacking frequency.

These studies reveal diverse findings related to food safety practices and eating habits across various population groups in Indonesia. Most research identifies that despite a high level of awareness regarding the importance of food safety, many individuals continue to consume potentially hazardous foods, resulting in health issues such as diarrhea and fever. Factors such as socioeconomic status, education, and environment (socio-demographic) significantly influence food safety practices. Educational interventions and social media campaigns have proven effective in enhancing knowledge and attitudes towards healthier and safer food practices. However, challenges such as limited resources

and varying taste preferences remain substantial barriers. Furthermore, stricter regulations and improved policies are necessary to enhance food safety practice and reduce the incidence of foodborne disease in Indonesia.

Figure 2. Visual correlation of literature review food safety practice



The visual correlation illustrates the interrelationships between various factors influencing food safety practices and nutritional status. Knowledge about food safety enhances food safety practices, which directly impacts the prevalence of diarrhea and overall nutritional status. Food hygiene practices also contribute significantly to the prevalence of diarrhea. Health education interventions improve knowledge and attitudes towards food safety, thereby fostering better practices. Socio-cultural views and economic constraints shape adolescents' food choices, which affect their nutritional status. Furthermore, the school environment influences students' dietary habits and nutritional health. This diagram highlights the complex interplay between knowledge, education, socio-cultural, economic, and environmental factors in determining food safety practices and nutritional outcomes.

DISCUSSION

The research findings indicate a variety of practices related to food safety across different demographic groups in Indonesia. The socio-demographic factors influencing food safety practices among Indonesian adolescents are deeply interconnected, creating a complex web of influences that shape behaviors (Islam et al., 2019). Cultural norms and traditions play a foundational role in determining how food is prepared, stored, and consumed (Feldman & Wunderlich, 2023). Despite a high level of awareness among adolescents regarding the importance of food safety, real-world data indicates that many individuals continue to face health risks due to the consumption of potentially hazardous foods, leading to issues such as diarrhea and fever (Suryani et al., 2023). This observation points to a disconnect between theoretical knowledge and practical application in daily food safety practices (Monterrosa et al., 2020). Socio-demographic factors, including socioeconomic status, educational attainment, and social environment, play a significant role in shaping food safety practices (Spagnoli et al., 2023).

Socioeconomic status significantly impacts food safety behaviors among adolescents (Bulut et al., 2020). Lower-income families may face barriers such as limited access to safe food storage facilities or education on food safety. Economic constraints can lead to prioritizing cost over safety, potentially increasing the risk of foodborne disease (Rocha et al., 2023). Additionally, socioeconomic disparities can affect access to resources and information necessary for maintaining food safety (Luu et al., 2023). Addressing these disparities through targeted interventions and support programs can help ensure that all adolescents, regardless of their socioeconomic background, have the knowledge and resources needed to practice safe food handling (Irwin, 2019).

Educational initiatives and social media campaigns have been shown to effectively improve knowledge and attitudes towards safer and healthier food practices. However, their practical application is often constrained by resource limitations, including inadequate funding and facilities. Moreover, cultural differences and local food preferences further complicate the uniform implementation of food safety standards across various regions in Indonesia. Family influence remains a pivotal factor in adolescents' food safety behaviors. Parents and guardians serve as primary role models for food handling and hygiene practices (Liu et al., 2021). Studies have shown that adolescents are likely to adopt food safety practices modeled by their family members (Fismen et al., 2022). Families that prioritize food safety tend to instill similar values in their children, leading to safer food handling at home (Ardakani et al., 2023). However, inconsistent practices within families or a lack of emphasis on food safety can contribute to poor food handling behaviors among adolescents. Enhancing parental education on food safety and providing resources to support safe food practices at home can bridge gaps in adolescents' food safety knowledge (Ali et al., 2023).

Peer influence and the school environment significantly affect adolescents' food safety practices. Peer pressure can lead adolescents to conform to behaviors that may not align with safe food handling practices, particularly in social settings such as school canteens or during social gatherings (J.-T. Chen et al., 2022). Schools play a crucial role in shaping these behaviors by implementing food safety education and creating environments that reinforce safe food practices (Harris et al., 2020). However, the effectiveness of school-based interventions can vary based on how well they resonate with students' cultural and social contexts (Wilson et al., 2022). Tailoring food safety education to address the specific needs and preferences of adolescents can enhance its impact and promote better food safety practices (B. Chen et al., 2020).

There are several opportunities to improve food safety practices among Indonesian adolescents by leveraging the identified socio-demographic factors (Kim et al., 2020). Culturally sensitive educational programs that incorporate traditional food practices and address local beliefs can enhance the relevance and effectiveness of food safety initiatives (Berchtold, 2022). Engaging families, schools, and communities in food safety education and creating collaborative programs can reinforce positive behaviors and address gaps in knowledge (Domingo et al., 2023). Moreover, addressing socioeconomic barriers through policy initiatives and community support can help ensure equitable access to food safety resources (Ballard et al., 2020). By taking a comprehensive approach that considers socio-demographic dynamics, it is possible to promote safer food practices and improve public health outcomes for Indonesian adolescents.

CONCLUSION

Socio-demographic factors significantly impact food safety practices among Indonesian adolescents. Socioeconomic status, education, and environment are key determinants. Understanding these factors is crucial for developing targeted interventions. Improving food safety among adolescents requires integrating comprehensive food safety education into school curricula and community-based programs, along with advocating for stricter food safety regulations and enhanced policy enforcement. Additionally, increasing access to safe food and utilizing technology for awareness campaigns will help address socio-demographic factors and promote healthier food practices.

CONFLICTS OF INTEREST

No conflict of interest was found during the research

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