

CONSUMER EDUCATION | RESEARCH ARTICLE

The Influence of Knowledge and Risk Perception on Food Label Reading Behavior among Adolescents in Rural and Urban Areas of Bogor

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Abstract: Reading food labels is one way consumers learn about the products they buy. This study determined the influence of knowledge and risk perception on food label reading behavior among adolescents in rural and urban Bogor. This study had a cross-sectional design. Purposive sampling was used to gather 132 participants, including 66 adolescents in rural areas and 66 adolescents in urban areas. The results showed that more than half of the participants had moderate knowledge of food labeling. The knowledge of the rural and urban samples was the same. Operational risk was the most perceived risk for both the rural and urban samples. There were no significant differences in all dimensions of risk perception between rural and urban youths. The average food label reading behavior score in rural areas was higher than that in urban areas. Psychological risk perception influences food label-reading behavior in rural areas. Overall, functional risk perception influenced food label-reading behavior. Based on these results, it is necessary to increase education on the importance of food labels to build good risk perception so that food label reading behavior increases.

Keywords: food label reading behavior, knowledge of food labeling, risk perception

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PUBLIC INTEREST STATEMENT

The development of food products in Indonesia occurs in line with globalization. Problems also occur, such as the discovery of expired food products on the market, the absence of halal labels, and the existence of food products that do not include nutritional information. These conditions are increasingly dangerous if not accompanied by the behavior of reading food labels on product packaging.

Previous research found a lack of concern for adolescents in reading the products to be purchased. Therefore, this study was designed to analyze adolescents' knowledge of food labels, identify adolescents' risk perception about food safety, and identify adolescents' food label reading behavior. This study also compared these variables in rural and urban adolescents.



1. Introduction

Rapid technological development has led to an increasing variety of food types on the market. Based on a study by the National Consumer Protection Agency (BPKN) in the food sector related to consumer protection, packaged food products that had expired were still found, not only in traditional markets but also in supermarkets. These products include canned and frozen foods (meat, meatballs, fish, and nuggets). Food products can be declared damaged (expired) if undesirable changes occur from their original nature. Food spoilage can occur due to physical, chemical, or enzymatic damage. Food that has passed the time limit for consumption is no longer suitable because it is allegedly contaminated with several free radicals and contains diseased seeds in the form of fungi and bacteria that can interfere with human health (Taufiq & Mutimatum, 2017). Therefore, following the message contained in the General Guidelines for Balanced Nutrition (PUGS), "read the label on packaged food" (Ministry of Health Republic of Indonesia, 2014).

Resmi and Wismiarsih (2015) find that packaging (shape, size, and material) and price affect purchasing decisions. Clear and correct information in packaging helps consumers understand the halalness of the product, its composition, and nutritional information before purchasing the product (Yunitasari & Anwar, 2019). Therefore, food-product labels make it easier for consumers to choose the necessary products. Additionally, the label acts as a means of public education and can add value to a product (Devi et al., 2013). Based on a study conducted by Saha et al. (2013) on 316 adolescents in India, 297 adolescents purchased and/or consumed packaged food. Kansal et al. (2023) found that adolescents have difficulty understanding food label information and tend not to pay attention to the adverse effects of consuming unhealthy packaged foods. Failure to read information on food product labels may occur because adolescents do not understand the purpose of the information provided. Several factors influence consumers to read food labels, such as education and employment; the higher the education and employment of consumers, the higher the frequency of consumers reading food labels (Fadlillah et al., 2015).

Food label reading behavior is consumer behavior that is carried out before purchase. Consumer behavior refers to all activities and psychological processes incorporated into evaluation activities before buying, when buying, when using, and spending products and services (Sumarwan, 2017). Based on research conducted by Setianingrum (2017), adolescents, especially junior high school students, have obtained consumer education materials, especially in Indonesian language subjects, based on the Education Unit Level Curriculum (KTSP) and teaching materials from electronic schoolbooks (BSE) published by the Center for Bookkeeping of the Ministry of National Education. The Ministry of Education Regulation No. 22/2006 on Education Content Standards (and No. 23/2006 on Graduate Competency Standards) initiated the implementation of the Education Unit Level Curriculum (KTSP) in Indonesia (Ministry of Education Republic of Indonesia, 2006).

Therefore, the KTSP curriculum and BSE teaching materials contain content on consumer rights and obligations. Setianingrum (2017) mentions that this integration is an effort to protect consumers from harmful buying and selling practices. Through consumer education in the curriculum, adolescents' knowledge has increased. Consumer knowledge comprises information about products, services, and other knowledge related to their function as consumers (Sumarwan, 2017). Furthermore, Sumarwan (2017) explains that knowledge, perceptions, and beliefs as consumer attitudes are interrelated in the decision-making process. Kotler and Keller (2012) stated that consumer behavior is formed by psychological, social, cultural, and

personal factors. Sumarwan's (2017) theory of consumer behavior also mentions internal and external factors that influence consumer behavior. In this study, food label reading behavior is consumer behavior formed by knowledge and risk perception.

Fadlillah et al. (2015) studied 210 adolescents in Bogor City and found that education and income factors affect concern for food labels. However, in this study, there was no analysis of the knowledge factors or risk perceptions among adolescents. Riyanti et al. (2020) conducted a different test on the factors of nutrition and non-nutrition study programs and found no significant effects. Furthermore, previous studies have rarely analyzed demographic factors (rural and urban) as factors of food label reading behavior in adolescents. Therefore, an analysis of demographic factors is one of the novelties of this study.

One of the problems related to adolescents' behavior in reading food labels is nutritional problems. As mentioned in research by Fauziyah et al. (2022), nutritional problems in schools that often occur are the habit of consuming packaged snacks. Consumers do not usually utilize nutritional information in packaged foods (Miller & Cassady, 2015). Based on previous studies, researchers are interested in researching the influence of knowledge and risk perception on food label reading behavior among adolescents in rural and urban bogors. Furthermore, this study aims to analyze the influence of knowledge and risk perception on food label reading behavior among adolescents in rural and urban bogors.

2. Literature Review

2.1 Food Labels

Martini and Menozzi (2021) state that food labels are the first information consumers access when shopping, and contain information such as ingredients, nutritional content, and allergen information on the product. The Processed Food Labeling Guidelines prepared by the Food and Drug Administration (BPOM) (2020) defines processed food labeling as "Information about processed food in the form of pictures, writings, a combination of both, or other forms that are included in processed food, inserted into, attached to, or are part of food packaging." Government Regulation No. 69/1999 specifically regulates food-labeling regulations in Indonesia (Indonesia Government, 1999). Chapter II of Food Labeling has 15 sections and consists of 42 articles containing the minimum standards for packaged food labels. Processed food labels contain the product name, list of ingredients used, net weight or content, complete weight, name and address of the producing company, halal information for those required, production date and code, expiration information, distribution permit number, and origin of certain food ingredients (The Food and Drug Administration, 2020). Melinda and Farida (2021) found that knowledge is an influencing factor for individuals to read packaged food labels. Food labeling on packaging helps consumers distinguish between healthy and unhealthy foods (Temple, 2020).

2.2 Knowledge

Product knowledge is a condition of how much and deeply consumers know product characteristics before buying them, and is generally related to attributes, benefits, and satisfaction values (Peter & Olson, 2008). According to Dewi and Aminah (2016), knowledge is everything received through one's senses that triggers changes and behavior. Ateke and Didia (2018) explain that consumer knowledge describes product-related information accumulated over time due to exposure to advertisements,

salespeople, or product use. Consumer knowledge is a multidimensional concept of experience, expertise, and familiarity (Ateke & Didia, 2018). Research by Sousa et al. (2023) states that knowledge is a predictor of building consumer interest in reading food labels and choosing healthier food.

2.3 Risk Perception

Schiffman and Wisenblit (2015) explained that the perception of each individual who sees the surrounding environment is similar to that of two people who receive the same stimuli but will interpret these stimuli individually based on each individual's needs, values, and expectations. Furthermore, risk perception is a form of uncertainty individuals face when they cannot predict the consequences of their decisions. Two things are considered in this definition: uncertainty and consequences (Schiffman & Wisenblit, 2015). Sumarwan et al. (2011) state that there are six components of risk perception: 1) financial risk related to concerns and financial losses that may occur from purchasing decisions, 2) social risk is a concern about other people's opinions or negative assessments of purchasing decisions, 3) perceived performance is a concern about product performance that may not be as expected, 4) psychological perception is a concern about other people's perceptions of them, 5) physical perception is a concern about product safety and the possibility of harming oneself because of product use, and 6) perceived time is a concern about the loss of time that has been used when purchasing goods that do not match expectations.

2.4 Consumer Behavior

In this study, food label reading behavior refers to consumer behavior. Consumer behavior refers to all activities, actions, and psychological processes integrated into the evaluation before buying, using, and spending products and services (Sumarwan, 2017). According to Kotler and Keller (2012), consumer behavior is influenced by psychological, social, cultural, and personal factors. Psychological factors include motivation, perception, learning, beliefs, and attitudes. Social factors include family, friends, reference groups, and social status. Cultural factors include values, norms and traditions. The personal factors included age, sex, education, income, and personality. The factors mentioned by Kotler and Keller (2012) can also influence consumer behavior in terms of reading food labels on product packaging. Consumer behavior when reading food labels is essential because, based on research by Mhurchu et al. (2018), the presence of food labels helps increase the purchase of healthier food.

According to Sumarwan (2017), consumer behavior theory states that internal and external factors influence consumer behavior. Individual differences describe the individual characteristic factors and psychological processes of consumers when making decisions. These factors include religion, needs, motivation, personality, information processing and perception, learning processes, knowledge, and consumer attitudes (Sumarwan, 2017). External factors include culture, demographic characteristics, socioeconomic status, family, reference groups, technology, environment, and consumer situations (Sumarwan, 2017). Previous research related to the behavior of using Personal Protective Equipment (PPE), knowledge and risk perception affects the behavior (Chotimah et al., 2019). This study analyzes the factors that shape adolescents' behavior in reading food labels through knowledge and risk perception factors in rural and urban areas.

2.5 Relationship between Knowledge of Food Labels and Food Label Reading Behavior

Knowledge is information raised due to individual needs, which plays a role in shaping beliefs (Liu et al., 2020). In their research results, Melinda and Farida (2021) showed a significant relationship between gender and knowledge with the behavior of reading nutritional value information labels. Maemunah and Sjaaf (2020) found that knowledge influences the use of nutritional information labels on packaged food products. The use of these information labels can reduce the purchase of unhealthy food.

H1: Knowledge of food labeling has a significant effect on food label reading behavior

2.6 Relationship between Risk Perception and Food Label Reading Behavior

Mardikaningsih (2019) shows that risk perception significantly affects purchasing decisions. In connection with the results of this study, food label reading behavior is a form of consumer behavior related to decision-making. Reading behavior results from the dynamics of habits, attitudes, emotions, values, ethics, persuasion, and genetics (Andina, 2019). Specifically, this study analyzed the label-reading behavior of packaged food. Previous research has found a relationship between price perception and one's habit of reading food labels (Nurbani et al., 2020). Consumer views on the perceived properties of a product (taste, price, and nutrients) are related to food label-reading behavior because of the importance of these product properties (Borgogno et al., 2015).

H2: Risk perception has a significant effect on food label reading behavior

3. Conceptual Framework

Purnamasari and Raharyani (2020) found a positive relationship between knowledge level and behavior. Continuous exposure of students to information contributes to changes in their behavior. Moreira et al. (2019) found that consumers tend not to read food labels because of too much information and lack of time to read. The effectiveness of label utilization as a source of product information and quality depends on consumer awareness and understanding of the information (Damayanti & Rimbawan, 2016). Research conducted by Fathimah (2017) showed a significant relationship between knowledge and the habit of checking packaging labels in grade VI Santriawati. The research results by Melinda and Farida (2021) also show a relationship between knowledge and the behavior of reading information on packaging.

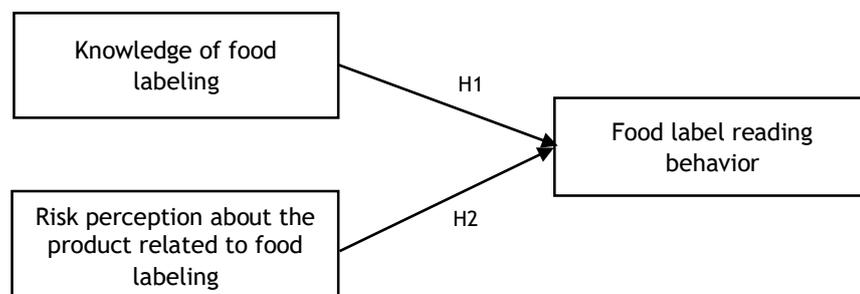


Figure 1. Conceptual framework for knowledge and risk perception affects on food label reading behavior

Knowledge positively influences a product's purchasing decisions (Muflikhati et al., 2011). One of the stages consumers perform before buying a product is to look for information related to the product to be purchased. A meta-analysis by Sumarwan et al. (2017) found that consumers tend to read packaging labels before deciding to buy a product. One information search process involves reading food labels on the packaging of the product to be purchased. Therefore, the level of consumer perception can positively and significantly influence consumer behavior (Zheng et al., 2011; Ardiansyah et al., 2012). According to Kotler and Keller (2009), several factors influence consumer behavior, including psychological factors such as perception. Based on the description above, the hypotheses in this study include H1: knowledge about food labels affects food label reading behavior and H2: risk perception affects food label reading behavior in students.

4. Methods

4.1 Research Design

This study used a cross-sectional design, an approach intended to examine aspects of consumer behavior over a relatively short period (Setiadi, 2010). The selection of research locations was carried out purposively considering that SMPN X Pamijahan and SMPN X Bogor used the Education Unit Level Curriculum (KTSP) and teaching materials from Electronic School Books (BSE) because they contain consumer education content.

4.2 Sampling

A total of 132 samples were purposively selected, including 66 adolescents in rural areas (SMPN × Pamijahan) and 66 in urban areas (SMPN × Bogor). Public junior high schools were chosen so that the samples could represent the population of junior high school students in bogors. Grade 8 were chosen because they had obtained consumer education materials, especially in Indonesian, from Grades 7 and 8.

4.3 Measurement

The knowledge in this study includes information about food labeling that is owned, for example, regarding a product's origin, safety, quality, and nutritional content. Knowledge was measured using an instrument developed by the researcher based on the Consumer Protection Law, the Law on Food Labeling, and the development of instruments from Setianingrum (2017). Consisting of 12 questions, the reliability of the knowledge instrument had a Cronbach's alpha value of 0.660. Risk perception is an example of the functional, physical, financial, social, psychological, and time risks involved in purchasing food products. Risk perception was also measured using an instrument developed by the researcher based on the Consumer Protection Law, Law on Food Labeling, and the development of instruments from Setianingrum (2017). Consisting of 13 questions, the reliability of the risk perception instrument had a Cronbach's alpha value of 0.687.

Food label reading behavior is an example of an action that reads various aspects of food labels on packaged food products. Food label-reading behavior was measured using Law No.69/1999 on Food Labels (Indonesia Government, 1999). The instrument consisted of nine questions, with a Cronbach's alpha value of 0.766. The knowledge variables were scored as 1 for correct answers and 0 for incorrect answers. The risk perception variable was assessed using a Likert scale with four ratings: "strongly agree, agree, disagree, and strongly disagree." The food label reading behavior

variable was assessed using a Likert scale with four ratings: "always, often, rarely, and never." Based on the reliability test results, the three measuring instruments had a Cronbach's alpha value > 0.6 , so they were reliable.

4.4 Data Collection

The population in this study was 8th-grade students of SMPN X Pamijahan and Bogor. Grade eight students were selected because they had obtained consumer education materials since grade 7, especially in the Indonesian language, which contained information about food labeling. Data were collected by filling out a questionnaire. The sample was selected based on the sampling framework shown in Figure 2.

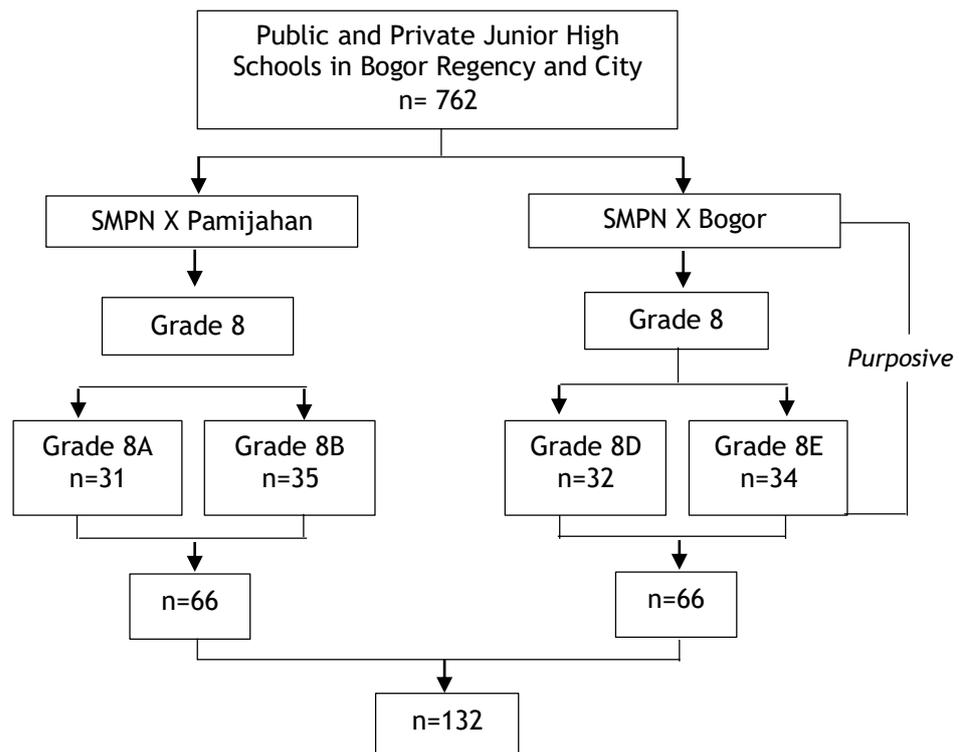


Figure 2. Sampling technique

4.5 Analysis

The collected data were then processed through editing, coding, scoring, data entry, data cleaning, and data analysis using Microsoft Excel and SPSS. The analysis conducted in this study is descriptive and inferential. Descriptive analysis was used to describe knowledge, risk perception, and food label reading behavior. Descriptive statistics included frequency, mean, standard deviation, and maximum and minimum values. The inferential analysis used was (1) a t-test to determine the difference between each variable in rural and urban areas and (2) a multiple linear regression test to determine the influence of knowledge, risk perception, and food label reading behavior. The total scores for the knowledge and reading behavior variables were then summed and converted into an index. Simultaneously, the total risk perception score was grouped based on its dimensions and converted to an average value. The index of the variables of knowledge and reading behavior obtained was categorized into three categories: low (score < 60), moderate (score $60-80$), and high (score > 80).

5. Findings

5.1 Characteristics of Adolescents

The number of females in rural and urban areas was higher than that of males. There was no significant difference between the sexes of the samples in the rural and urban areas. Almost all the samples from rural and urban areas were in the early adolescent age category of 12-15 years. This is because adolescents are at the same level of education, namely grade 8 Junior High School (SMP). The average age of the participants in rural areas was 14.3 years, while the average age in urban areas was 13.9 years. The average sample in rural areas received an allowance of IDR 10,787 per day, whereas that in urban areas received an allowance of IDR 14,424 per day.

5.2 Adolescents' Knowledge of Food Labels

There were differences in knowledge of the definition of food labeling, including the producer's name and address, and expiry labeling among rural and urban samples. The average knowledge scores of the adolescents in rural areas were 65.5% and 62.5%, respectively. This shows that adolescents' knowledge levels tend to be higher in rural areas than in urban areas. The t-test results showed no significant differences between adolescents' knowledge levels in the rural and urban areas ($p=0.198$) (Table 1).

Table 1. Percentage who answered correctly regarding food labeling in rural and urban areas

No	Knowledge of food labeling	Rural	Urban	T-test (p-value)
1	Definition of food label	100.0	89.4	0.007**
2	Regulation on food labeling in the Law	84.8	81.8	0.643
3	Inclusion of food labeling	86.4	92.4	0.262
4	Use of Indonesian language on products from abroad	68.2	62.1	0.469
5	List of ingredients used in the product	10.6	7.6	0.548
6	Expiry time	53.0	74.2	0.011*
7	Equation of expiry time with "use before"	54.5	45.5	0.300
8	Inclusion of the name and address of the manufacturer	87.9	74.2	0.046*
9	Inclusion of nutritional value information	0.0	3.0	0.159
10	Inclusion of additional ingredients in food products	78.8	74.2	0.541
11	Inclusion of food labels on certain products	68.2	51.5	0.051
12	The necessity of reading food labels	90.9	93.9	1.000
Min-Max		0.0-100.0	3.0-93.9	
Average \pm SD		65.3 \pm 31.51	62.5 \pm 30.67	

*Significant $p<0.05$; **significant $p<0.01$

Table 2 shows that the distribution of samples based on knowledge about food labeling shows that more than half of the samples in rural and urban areas have moderate knowledge about food labeling. Referring to Table 2, the average knowledge score of adolescents in rural areas is 65.5 points, and in urban areas, it is 62.5 points. The t-test results show no significant difference between the knowledge levels of adolescents in rural and urban areas ($p=0.198$).

Table 2. Sample distribution based on knowledge of food labeling

Categories of knowledge level	Rural (n= 66)		Urban (n= 66)	
	n	%	n	%
Low (score <60)	23	34.8	18	27.3
Moderate (score 60 to 80)	37	56.1	29	43.9
High (score >80)	6	9.1	19	28.8
Min-Max	25.0-100.0		16.7-83.3	
Average ± SD	65.5±12.3		62.5±14.5	
T-test (<i>p-value</i>)	0.198			

*Significant $p < 0.05$; **significant $p < 0.01$

5.3 Adolescents' Risk Perception of Food Labels

Effective use of information on food labels is highly dependent on consumer perceptions and trust. The higher the perceived risk of a product, the stronger the impact of consumers' perceptions of the product's label (Jeddi & Zaiem, 2010). The highest average score in the risk perception category in rural and urban areas was for statement 6, "I buy packaged food that is cheaper even though it does not have food labeling on the package." The lowest average score for rural areas was for the statements "Not paying attention to food labels on product packaging makes me feel guilty about myself" and "I feel a loss when buying food products that do not have labels on the packaging" for urban areas. The t-test results showed no significant differences between the samples' average risk perception scores in rural and urban areas (Table 3).

Table 3. Mean risk perception score of samples by region

No	Indicators	Rural	Urban	T-test (<i>p-value</i>)
Functional risk				
1	I can use food labels to determine the safety of food products.	3.29	3.46	0.132
2	Food labels provide the information I need when buying food products	3.41	3.42	0.902
Physical risk				
3	Food labels are difficult to understand	3.08	2.91	0.148
4	Food labels are difficult to find on product packaging	3.09	3.06	0.817
Social risk				
5	I feel embarrassed if other people know that I did not read the food labels on the products I buy	3.32	3.35	0.803
Financial risk				
6	I buy cheaper packaged food even though it does not have a food label on the package.	3.53	3.49	0.665
7	I feel at a loss when buying food products that are not labeled on the packaging	3.00	2.86	0.431
Psychological risk				
8	Not paying attention to food labels on product packaging makes me feel guilty about myself.	2.95	3.15	0.107
9	I feel afraid to buy food products that are not labeled on the packaging.	3.26	3.26	1.000
10	I feel worried about myself if I do not read the food label of the product before buying it.	3.21	3.20	0.892

Table 3. Mean risk perception score of samples by region (Continue)

No	Indicators	Rural	Urban	T-test (p-value)
Time risk				
11	I will set aside time to pay attention to food labeling before buying food products.	3.02	3.12	0.394
12	I do not pay attention to product food labels because I am in a hurry when shopping.	3.12	3.26	0.207
13	Reading product food labels takes up my time	3.12	3.14	0.905
Min-Max		3.0-3.5	2.9-3.5	
Average ± SD		3.2 ± 0.171	3.2 ± 0.196	

*Significant p<0.05; **significant p<0.01

The results showed that functional risk was the most perceived risk in both rural and urban samples. The average score of functional risk perceived by the urban samples was greater than that of the rural samples, and there were no significant differences in all dimensions of risk perception between the rural and urban youths. Table 4 presents the results.

Table 4. Distribution of samples by risk perception dimension score and region

Dimensions of risk perception	Rural	Urban	T-test (p-value)
Functional risk	3.35	3.44	0.362
Physical risk	3.08	2.98	0.447
Social risk	3.32	3.35	0.803
Financial risk	3.27	3.17	0.309
Psychological risk	3.14	3.20	0.497
Time risk	3.09	3.17	0.323

5.4 Food Label Reading Behavior

The most widely read food label in rural areas was the expiry label, whereas the most widely read label in urban areas was the halal label. This result indicates that product safety is the highest priority when purchasing. There was a highly significant difference between reading the product name, product composition, expiration date, and origin of certain food ingredients in the rural and urban samples (p<0.01). There was also a significant difference in the production date and code in the rural and urban samples (p<0.05) (Table 5).

The results showed that food label reading behavior in rural and urban areas was in the moderate category (score 60-80). The average score of reading behavior in rural areas (73.8) is higher than the score of reading behavior in urban areas (65.8). There was a significant difference between reading behavior in rural and urban areas, which shows a tendency for reading behavior in rural areas to be higher than that in urban areas. The most common types of food products whose labels were read were milk (77.3%) in rural areas and bread (75.8%) in urban areas. The least common types of food products whose labels were read were processed food products (59.6%) in rural areas and instant food (67.7%) in urban areas. There was a significant difference in the label-reading behavior of processed food products (p=0.003) between the rural and urban samples.

Table 5. Percentage of samples that read food labels in different aspects and regions

No	Aspects of food labeling	Rural	Urban	T-test (p-value)
1	Product name	91.4	80.8	0.004**
2	Product Composition	78.8	66.2	0.005**
3	Net weight	69.7	65.7	0.386
4	Manufacturer's name and address	55.1	56.1	0.838
5	Halal label	79.8	81.3	0.737
6	Production date and code	80.3	69.7	0.024*
7	Expiry date	91.9	79.8	0.003**
8	Distribution permit number	51.0	42.4	0.074
9	Origin of certain food ingredients	66.2	50.0	0.006**

*Significant p<0.05; **significant p<0.01

5.5 Factors Affect the Research Variables

Based on the results in Table 6, the hypotheses of this study were rejected. However, the regression test results show that psychological risk perception significantly affects the food label-reading behavior of the rural samples. At the same time, overall food label reading behavior was influenced by the perceived risk function.

Table 6. Effect of sample characteristics, family characteristics, and reading behavior

Variables	Reading behavior		
	Rural	Urban	Total
	Standardized coefficient (β)		
Knowledge	0.087	-0.048	0.052
Risk perception	-0.937	0.289	-0.119
Perceived risk of function	0.307	0.258	0.268*
Perceived physical risk	0.252	-0.001	0.035
Social risk perception	0.248	-0.343	-0.179
Financial risk perception	-0.209	0.037	0.016
Perception of psychological risk	0.690*	-0.017	0.177
Perceived time risk	0.295	-0.039	0.028
F	1.221	1.924	2.354
Adjusted R ²	0.042	0.156	0.118
Sig.	0.292	0.049*	0.008**

*Significant p<0.05; **significant p<0.01

6. Discussion

6.1 The effect of knowledge on food label reading behavior Adolescents in Rural and Urban Bogor (H1)

The expiry date describes the final limit of food quality guaranteed by the manufacturer, as long as the storage follows the instructions given by the manufacturer listed on the label (The Food and Drug Administration, 2020). Fifty percent of the samples did not understand that the expiry time is the same as the phrase "use before." In addition, more than one-third of the samples did not know that products of foreign origin must use Indonesian in their labeling. Respondents in the study by Kansal et al. (2023) mentioned the need for food labels written in local languages to make it easier for readers.

Good consumer behavior is related to exposure to information, product advertisements, environmental influences, and individual characteristics (Fadliyah et al., 2021). Clear and correct information on food packaging labels makes it easier for consumers to choose a food product, which is usually based on their knowledge of packaged food labels (Devi et al., 2013). Information about products is generally stated on the label. According to the Law of the Republic of Indonesia No. 7 of 1996 on Food Article 30 paragraph 1, "Every person who produces or imports into the territory of Indonesia food packaged for trade is obliged to include a label on, in, and/or on food packaging." In the same article, paragraph 2, "The label contains at least information regarding the name of the product, list of ingredients used, net weight or net contents, name and address of the party producing or entering food into Indonesian territory; information about halal; expiration date, month, and year." Paying attention to food packaging labels is one way for consumers, especially teenagers, to understand the safety of the food that they buy.

Food label-reading behavior in both the rural and urban samples was moderate. However, there was a tendency toward higher reading behavior in rural areas than in urban areas. Consuming food in Islam is not just to eliminate hunger or physical needs but also to consider whether it contains halal or haram things (Fathimah, 2017). Of course, the halal label is very important to pay attention to because it is related to the guarantee for Muslims that certain products are suitable for consumption. The distribution license number is the least-read food label item for both rural and urban samples. Based on Government Regulation No. 69/1999 on Food Labels and Advertisements, the distribution permit number is an important part to be considered by consumers, as it relates to food registration following prevailing laws and regulations (Indonesia Government, 1999).

Based on the results of the effect test, knowledge does not significantly affect adolescents' behavior when reading food labels. This is the case for both rural and urban areas. This result is supported by Mahfudin and Kurnia (2021), who found no relationship between knowledge and food-label reading behavior. Other studies also state that there is no significant relationship between knowledge and food label reading behavior (Imansari & Dini, 2023; Sinaga & Simanungkalit, 2019). In addition, Perera et al. (2022) found that age is significantly associated with the use of nutritional information on food labels.

6.2 The Effect of Risk Perception on Food Label Reading Behavior among Adolescents in Rural and Urban Bogor (H2)

The negative benefits consumers feel are referred to as the risks that they face from consuming or not consuming a product (Yuliati & Simanjuntak, 2011). The higher the perceived risk of a product, the stronger the impact of consumers' perceptions of the product's label (Jeddi & Zaiem, 2010). Consumers feel six perceived risks: social, time, psychological, performance, physical, and financial (Mahon & Cowan, 2004). The results showed a tendency toward a higher level of risk perception in urban samples than in rural samples, with an average score of 73.5 for urban areas and 72.69 for rural areas. Uruchima et al. (2023) mentioned that the perception of food safety is one of the factors influencing urban consumers' decision-making regarding food.

Functional risk was the most perceived risk in rural and urban areas, whereas physical risk had the lowest score in rural and urban areas. This means that adolescents tend to think that food labels are used for product safety and to provide information that buyers need. Shiffman and Wisenblit (2015) show that perceptions of financial, functional, and psychological dimensions influence consumer decision-making. This

study's perception of physical risk relates to the sample's views regarding food labeling, which impacts health and safety.

Most participants felt that food labels were difficult to understand. This is in line with the research by Saha et al. (2013), who found that adolescents in India consider that information on food labels needs to be simplified and easier to understand. Most of the considered food labels are very useful for food selection, but there are still instances in which reading food labels cannot help them choose food. Food label design is said to increase consumers' attractiveness to read food labels on packaging (Pettigrew et al., 2024). This shows that a person's perception of a food product affects their behavior while reading the label. Fadlillah et al. (2015) found an influence of education on food label reading behavior. Education indirectly shapes a person's perception; therefore, perception affects a person's behavior when reading food labels.

The regression test results show that psychological risk perception significantly affects the food label-reading behavior of the rural samples. This means that the higher the perception of adolescent psychology in reading food labels, the higher the adolescent behavior toward reading food labels. Psychological risk causes annoyance and regret in consumers because their product purchase objectives are not fulfilled or the product purchased does not meet expectations (Almoussa, 2011). The contribution of the most significant psychological risk perception indicator in this study is the concern of rural adolescents about buying food products that do not include packaging labels. Al-Ansi et al. (2019) explained that psychological factors are influenced by satisfaction and trust in the halal claims of food products. Halal labeling is information that must be used in packaging. Idztiyar et al. (2023) state that halal label certification can create a sense of security for consumers to buy packaged food products.

At the same time, food label reading behavior is influenced by perceived risk function. Functional risk is also associated with product performance. The indicator of the perceived risk function is "food labeling provides the information I need when buying food products." In this study, rural and urban adolescents read the most information on food labels in the expiration date, product name, and halal label sections. Barone's research (2022) supports this result, which states that consumers rely heavily on expiration date information when deciding on food products. Another study cited the ingredients list, health claims, energy, and sugar components as the food label information that young consumers see the most (Joseph & Tan, 2023).

6.3 Managerial implications

The results showed that knowledge did not significantly affect food label reading behavior. Meanwhile, perceived risk of function influences adolescents' food label-reading behavior in rural and urban areas. Based on these results, the crucial role of education in understanding the function of each aspect of food labeling and related regulations is evident. Through education on the importance of food labels in packaging, adolescents' risk perceptions regarding food labels are well formed. This can encourage the behavior of reading food labels before purchasing products. The education process, integral to shaping these behaviors, can be effectively incorporated into the curriculum through the social media of relevant government agencies, consumer protection institutions, and school educational activities.

6.4 Theoretical Contribution

The theory of consumer behavior forms the basis of this study. Sumarwan (2017) explains that consumer behavior includes all activities, actions, and psychological processes in product and service evaluation activities before buying, when using, and spending on products. One of the pre-purchase consumer behaviors shown in this study was reading food labels among adolescents. Consumer behavior includes a consumer decision model. The consumer decision-making process is carried out in various ways based on the background and desires of each of them (Wulandari & Sampouw, 2020). The internal factors examined in this study were adolescents' knowledge of and risk perceptions of packaged food labels. Geographical location is an external factor affecting adolescents' behavior.

6.5 Limitations

Some of the limitations of this study include the homogeneity of respondents, causing data to be centered on specific characteristics so that bias occurs during data processing. Data collection methods using self-administered techniques cannot control respondents when answering statements based on their knowledge, looking for alternative answers via the Internet, or asking other people.

7. Conclusion

More than half of the rural and urban samples had moderate knowledge of food labeling. The average level of knowledge in rural areas was higher than that in urban areas, but similar. Functional risk was the most perceived risk for rural and urban samples, whereas physical risk had the lowest score for rural and urban areas. There were no significant differences in any dimension of risk perception between rural and urban samples.

The most labeled food products were milk in rural areas and bread in urban areas, whereas the least labeled food products were processed food products in rural areas and instant food in urban areas. The most widely read aspect of food labeling in rural areas is the expiry label, whereas the most widely read label in urban areas is the halal label. The distribution license number is the sample's least-read aspect of the food label. The average food label reading behavior score in rural areas was higher than that in urban areas. The food label reading behavior of rural samples was influenced by psychological risk perception. Overall, age and perceived risk function influenced food label-reading behavior.

8. Recommendation

There is still a need for efforts to increase adolescents' knowledge of food labels by socializing the usefulness of food labels. Teenagers must read food labels carefully before buying and consuming products. In addition, producers are expected to include food labels following applicable laws and regulations to reduce consumer losses because of the absence of information that can be used as a reference for food safety. Further research is needed to determine adolescents' understanding of non-food product labels.

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