



Adolescent Eating Behavior in Depok City, West Java, Indonesia: Association between Eating Behavior to Availability, Affordability, and Convenience with Desire as an Intermediate Variable

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Abstract

Background: Eating behavior plays an important role in health during adolescence. Previous research explains that teenagers have the freedom to decide what to consume and do not always depend on parents or caregivers. While their diet is characterized by snacks and high-energy drinks and is largely cereal-based with limited fruit and vegetable intake. This research aims to analyze eating behavior among adolescents using the Theory of Reasoned Action approach. In TRA, eating behavior is related to beliefs about external factors namely the availability of selling outlets, food affordability, and convenience when buying at outlets that sell various foods, and the convenience while consuming popular/trending foods, and is also related to internal intentions in the form of the desire to consume.

Method: Using a cross-sectional design, this research involved 860 teenagers aged 16-18 years from 11 sub-districts in Depok City, Indonesia in 2023. Data was collected using a self-administered questionnaire.

Results: The desire to eat at a fast-food restaurant with siblings and close friends is the strongest and most consistent internal factor that mediates eating behavior with external factors.

Discussion: Fast food is sold in many outlets around teenagers at affordable prices. The desire to consume often appears when teenagers are hanging around with siblings or close friends. With these two subjects, teenagers bought popular/trending foods at outlets that sold a variety of foods. The popularity of food was then proven to have a significant association with the choice of food type and consumption intensity of adolescents.

Keywords: *Adolescent; Eating Behavior; Theory of Reasoned Action; Food Availability; Food Affordability; Convenience in Consumption; Desire to Consume*

1. Introduction

Adolescent’s diets are characterized by limited food diversity (snacks and high-energy drinks), and are mostly cereal-based, with limited fruit and vegetable intake (Herforth & Ahmed, 2015). In Indonesia, the eating patterns and behavior of school-age children have obesogenic characteristics (Kementerian Kesehatan RI, 2012). Most of the food consumed is commonly cooked by frying (Yussac et al., 2007), easy to prepare, and affordable (Amalia et al., 2016). Meanwhile, for sellers, serving traditional food is more costly compared to practical menus (Kartika & Hendarmin, 2018).

This research uses the approach of the Theory of Reasoned Action (TRA) to examine the association between adolescent eating behavior and their beliefs and intentions. In TRA, behavior involves the variables of belief, attitude, and intention (Azizi & Sanaji, 2018; Haris et al., 2019; Lin et al., 2020; Magdalena et al., 2018; Maichum et al., 2016; Terry et al., 1993). Perceived behavioral control is assumed to consider the availability of information, skills, opportunities, and other resources required to perform the behavior as well as possible barriers or obstacles that may have to be overcome (Fishbein & Ajzen, 2010).

According to the TRA framework, belief is related to individual external factors which include the availability of fast food, the affordability of food types, and the convenience in consuming them. Meanwhile, intention is an individual’s internal factor in the form of the desire to consume. This research does not include attitude variables because there is little doubt that social behaviors can indeed be predicted, often with considerable accuracy, and there is even less doubt about the importance and utility of the attitude construct (Fishbein & Ajzen, 2010).

The research hypothesizes that internal factors moderate eating behavior with external factors. External factors are considered as predictors of internal factors. Furthermore, internal factors become predictors of adolescent eating behavior. The hypothesized relationship between eating behavior and external factor beliefs moderated by internal factors of intention is schematically depicted in Figure 1. The concept of belief and intention are referred to

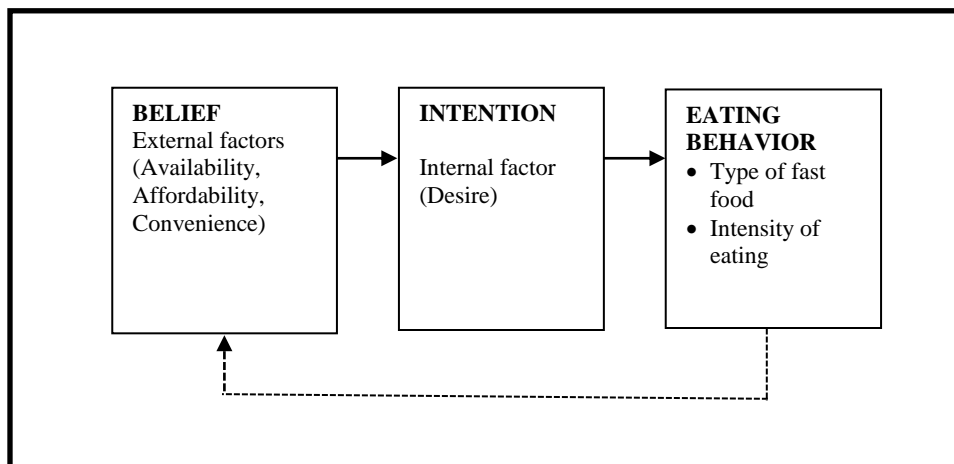


Figure 1. Research mindset

Previous research explains that eating behavior is influenced by (1) individual factors (Gorin & Crane, 2008; Hagger & Hamilton, 2021; Kowaleski-Jones et al., 2017; Seidell & Rissanen, 2013; Stang & Bonilla, 2018), and (2) social influence (Azizi & Sanaji, 2018; Callahan, 2016; de la Haye et al., 2010; Trübswasser et al., 2021). Other studies reveal the influence of availability and an individual’s ability to consume (Aggarwal et al., 2014; Constantinides et al., 2021; Hooi et al., 2021; Sobal et al., 2006).

At a very basic level availability must precede consumption; a food cannot be consumed if it is not available at all (Herforth & Ahmed, 2015). We live in an obesogenic environment which provides a host of cheap and unhealthy foods and drinks heavily marketed by the respective industries (Lindelof, 2006). Price and costs are the most important factors in eating behavior because it takes part of income (Lee et al., 2013). So, increasing costs have an impact on reducing the quality of food that can be consumed (Cummins & Macintyre, 2002; Herforth & Ahmed, 2015; Miller et al., 2016; Tulp et al., 2018). Convenience includes the comfort felt when enjoying food, because of the condition of the outlet and the services provided, as well as social encouragement (Albritton, 2009; Bailey et al., 2018; Candra et al., 2021; Constantinides et al., 2021; Daivadanam et al., 2015; Herforth & Ahmed, 2015; UNICEF & GAIN, 2019). Meanwhile, the desire to consume is related to many things. First of all, the desire comes from the food product itself (Sari et al., 2022), also preferences, tastes, desires, attitudes, and culture (Thakwalakwa et al., 2020), information (Bailey et al., 2018; Turner et al., 2018), as well as happiness and expression (Falguera et al., 2012).

The aim of this study was to assess the association between eating behavior, food availability, affordability, and convenience, and intention in adolescent. In line with previous studies, we hypothesized that availability, affordability, and convenience would be positively associated with intention. So is the association between intention and eating behavior. Moreover, to the best of our knowledge, no study explored the eating behavior without take the attitude into account in adolescents. The main reason is, what we learned from most of the studies, that attitude have positive association with certain behavior. Someone will behave after having suitable attitude, vice versa. The hypothesized associations between eating behavior, intention, food availability, affordability, and convenience in consuming are schematically depicted in Figure 1 above.

2. Method

This research uses a cross-sectional correlational research design. This research was approved by the Ethics Commission of the Department of Social Welfare Sciences, FISIP UI. Data collection uses an online questionnaire that uses a Likert scale which has a good internal consistency ($\alpha = .908$). Participants came from 11 sub-districts in Depok City based on data from the Depok City Education Office, West Java, Indonesia. This research randomly selected several high schools as clusters, so 860 students were randomly selected, consisting of 384 boys (44.8%), and 476 girls (55.2%).

2.1. Measures

2.1.1. Eating Behavior

Eating behavior is a consumption practice that reflects what and how a person eats (UNICEF & GAIN, 2019). Fast food is type the of food which is quickly processed or served by sellers or restaurants (Kementerian Kesehatan RI, 2012). Meanwhile, consumption frequency is related to eating habits (Shepherd, 1999). Based on this explanation, eating behavior is defined as consumption practices shown by food objects and how a person eats. From this conceptual definition, 2 (two) research indicators are obtained, namely: (1) Type of fast food consumed, and (2) intensity of consumption.

2.1.2. Availability

Availability refers to the presence (or absence) of a food source or product within a given context, whilst accessibility is relative to individuals and concerned with distance and time-based aspects, including transportation opportunities. Availability precedes accessibility, in that a portion of food cannot be accessible to an individual if it is not available (Turner et al., 2018).

2.1.3. Affordability

Price influences a person's belief in consuming (Rozin, 1996). Food costs are the costs incurred by households for procuring food or food ingredients relative to household income (The High Level Panel of Experts on food security and nutrition, 2017). In this study, food costs were relative to income or all the money the teenager had. Based on this, affordability is defined as the ability to pay for food costs

2.1.4. Convenience

Convenience is one of the factors that shapes a person's belief in consuming (Rozin, 1996). Consumers feel comfortable because their efforts to meet their needs coincide with the type of food provided, outlet opening hours, and services provided by sellers, as well as appropriate composition in terms of quality, safety, level of processing, shelf-life and packaging (UNICEF & GAIN, 2019). Convenience is influenced by several aspects including aspects of food products, food outlets and sellers, and social incentives (Constantinides et al., 2021). From this definition, the Comfort variable is broken down into two elements, namely food and outlet.

2.1.5. Desire

Intention or desire is an indication of readiness to act (Fishbein & Ajzen, 1975). Based on this thought, desire is defined as readiness to carry out the act of consumption. Hereafter, desire is represented by two elements, namely the desire to visit outlets and the desire to consume the elements of food.

2.2. Statistical Analysis

The analysis was carried out using IBM SPSS Statistics Version 25. Using the Chi-square test (χ^2) to measure the association between indicators of desirability and indicators of availability, affordability, and convenience. Further, to measure the association between indicators of desire and indicators of eating behavior. The alpha level was set at $p < 0.05$. p value between 0.00 and 0.05 was declared significant.

3. Result

3.1. Descriptive Analysis

Table 1 presents the score and percentages of the frequency of eating behavior variables which include the types of food that were most frequently consumed, and the intensity of consumption in the last week.

Tabel 1. Number of Respondents by Tpe of Fast Food and the Intensity of Consumption

Type of food		Intensity of consumption in the last week					Total
		> 1 time/day	1 time/day	almost every day	1 time/week	Never	
Instant noodle	Count	76	69	104	105	3	357
	% within Type	21.3%	19.3%	29.1%	29.4%	0.8%	100.0
	% within Intensity	44.4%	35.2%	44.6%	42.7%	21.4%	41.5
	% of Total	8.8%	8.0%	12.1%	12.2%	0.3%	41.5
Fried chicken	Count	59	65	50	71	4	249
	% within Type	23.7%	26.1%	20.1%	28.5%	1.6%	100.0

	% within Intensity	34.5%	33.2%	21.5%	28.9%	28.6%	29.0
	% of Total	6.9%	7.6%	5.8%	8.3%	0.5%	29.0
Fried snack	Count	12	25	28	20	0	85
	% within Type	14.1%	29.4%	32.9%	23.5%	0.0%	100.0
	% within Intensity	7.0%	12.8%	12.0%	8.1%	0.0%	9.9
	% of Total	1.4%	2.9%	3.3%	2.3%	0.0%	9.9
Chicken noodles/ Meatball/ Siomay	Count	14	17	27	23	1	82
	% within Type	17.1%	20.7%	32.9%	28.0%	1.2%	100.0
	% within Intensity	8.2%	8.7%	11.6%	9.3%	7.1%	9.5
	% of Total	1.6%	2.0%	3.1%	2.7%	0.1%	9.5
Pizza/ Spaghetti/ Burger/ and the like	Count	8	16	22	20	0	66
	% within Type	12.1%	24.2%	33.3%	30.3%	0.0%	100.0
	% within Intensity	4.7%	8.2%	9.4%	8.1%	0.0%	7.7
	% of Total	0.9%	1.9%	2.6%	2.3%	0.0%	7.7
Not consuming	Count	2	4	2	7	6	21
	% within Type	9.5%	19.0%	9.5%	33.3%	28.6%	100.0
	% within Intensity	1.2%	2.0%	0.9%	2.8%	42.9%	2.4
	% of Total	0.2%	0.5%	0.2%	0.8%	0.7%	2.4
Total	Count	171	196	233	246	14	860
	% within Type	19.9%	22.8%	27.1%	28.6%	1.6%	100.0
	% of Total	19.9%	22.8%	27.1%	28.6%	1.6%	100.0

The data in Table 1 show that instant noodles are the type of food most consumed by teenagers, namely 357 teenagers (41.5%). 104 of them consume it almost every day, and 105 teenagers consume it once every week. Fried chicken is in second place, consumed by 249 teenagers (29.0%), 71 of whom consume it once every week, and 65 of them consume it once every day. Fried snacks were consumed by 85 teenagers (9.9%), with the range of intensity from almost every day (28 teenagers), once per day (25 teenagers), to once per week (20 teenagers).

They get it at outlets around them, such as mini markets, outlets that sell various foods, street vendors, outlets that sell certain types of food, and school canteens. All of these outlets are easy to access because they are relatively available and spread out in residential areas and locations of their routine activity.

3.2. Association Analysis

Analysis

Table 2 contains a summary of the result of analysis which includes the indicators that have a significant association only. The indicator which has the most association with other indicators from different variables is defined as the main indicator.

Tabel 2. The Result of Test of Association

Indicator of availability and indicators of desire which have significant association			
	Indikator	Value	Asymptotic Significance (2-sided)
Mini-market	Desire to eat at fast food restaurant while along with close friend	21,384	0,002
	Desire to eat at fast food restaurant while along with sibling	17,231	0,008
Indicators of affordability and indicators of desire which have significant association			
Affordability of fried chicken	Desire to eat at fast food restaurant while along with close friend	23,831	0,001
	Desire to eat at fast food restaurant while along with sibling	12,622	0,049
Affordability of Pizza / Burger / spaghetti / and the like	Desire to eat at fast food restaurant while along with close friend	35,021	0,000
	Desire to eat at fast food restaurant while along with sibling	14,173	0,028
Affordability of fried snack	Desire to eat at fast food restaurant while along with close friend	26,431	0,000
	Desire to eat at fast food restaurant while along with sibling	14,636	0,023
Indicators of convenience and indicators of desire which have significant association			
Convenience when buying at outlets selling various food	Desire to eat at fast food restaurant while along with school friend	12,57	0,006
	Desire to eat at fast food restaurant while along with sibling	9,006	0,029
Convenience when consuming popular food	Desire to eat at fast food restaurant while along with close friend	11,185	0,011
	Desire to eat at fast food restaurant while along with sibling	8,179	0,042
Indicators of desire and indicators of eating behavior which have significant association			
Desire to eat at fast food restaurant while along with close friend	Type of food	34,142	0,003
	Intensity of consumption	40,394	0,000
Desire to eat at fast food restaurant while along with sibling	Type of food	29,325	0,015
	Intensity of consumption	21,878	0,039

The analysis found some external indicators. The main indicator of variable of availability is the availability of mini-market. The main indicators of variable of affordability are the affordability of fried chicken, the affordability of pizza/burger/spaghetti and the like, and the affordability of fried snacks. From the convenience variable, the main indicators of the are the convenience when buying at outlets that sell various foods, and the convenience while consuming popular/trending foods.

As an internal factor, the variable of desire is stated as mediating variable. The main indicators from this variable are the desire to consume at fast food restaurant along with siblings, and the desire to consume at fast food restaurants along with close friends. These two indicators have an association with

the main indicators of the eating behavior variable as well, which are type of food and intensity of consumption.

In the context of an association between variables, no significant association was found between indicators of external factors (availability, affordability, and convenience) and indicators of eating behavior (type of food and intensity of consumption). However, the main indicators of external factors have a significant association with the main indicators of internal factors (desires).

The availability of mini-market has significant associations with the desire to consume when with close friends ($p= 0.002$) and when with siblings ($p= 0.008$). From the variable of affordability, the affordability of fried chicken has significant associations with the desire to consume it when with close friends ($p= 0.001$) and siblings ($p= 0.049$). The affordability of pizza/burgers/and the like has significant associations with the desire to consume when with close friends ($p= 0.000$) and siblings ($p= 0.028$). Meanwhile, the affordability of fried foods has significant associations with the desire to consume them when with close friends ($p= 0.000$) and siblings ($p= 0.023$). From the convenience variable, the element indicator of outlets selling a variety of foods has significant associations with the desire to consume variable when with school friends, $p= 0.006$) and with siblings ($p= 0.029$). From the food element, consuming popular/trending foods has significant associations with the desire to consume when with close friends ($p= 0.011$) and siblings ($p= 0.042$).

In the context of the association between internal factors and eating behavior, the desire to consume with close friends has significant associations with the type of food consumed ($p= 0.003$) and intensity of consumption ($p= 0.000$). Meanwhile, siblings have significant associations with type of food ($p= 0.015$) and intensity of consumption ($p= 0.039$).

4. Discussion

Within the TRA framework, a person forms beliefs about personal and environmental factors that can help or hinder their efforts to perform a behavior. If beliefs of control identify more facilitating factors than inhibiting ones, then perceived behavioral control is high (Fishbein & Ajzen, 2010).

The results of the analysis prove that there are significant associations between desire and availability, affordability, and convenience. These associations show that eating behavior among teenagers is enabled by the presence of three kinds of beliefs. First, teenagers have beliefs of control when they know that food can be found in outlets close to them and believe that the foods are affordable. Previous studies found that the belief of control in adolescents is the belief that they can provide food based on the availability and affordability of the desired food (Herforth & Ahmed, 2015; The High Level Panel of Experts on food security and nutrition, 2017; Turner et al., 2018).

The second belief that teenagers have is the belief in consequences, namely knowing that their actions will result good consequences. Teenagers believe they will feel comfortable if they buy at outlets and consume food that suits their needs. The results of the analysis prove that the desire to consume has significant associations with convenience because of buying at outlets that sell a variety of foods and because of consuming popular/trending foods. It has been proven that convenience can be obtained or influenced by aspects of food products, aspects of food outlets and sellers, and aspects of social encouragement so that consumers believe that food from these outlets is safer to consume (Constantinides et al., 2021). For teenagers, consuming fast food gives more positive results and will be profitable (Fishbein & Ajzen, 2010).

There is an interrelationship between convenience and the desire to visit fast-food outlets (Herforth & Ahmed, 2015). For teenagers, fast food outlets are a preferred place to socialize with other

people of the same age. Fast food outlets have become a preferred place to socialize, because peers and family empower adolescents to complete their life experiences (Terry et al., 1993).

It has been proven that the presence of outlets that sell food that teenagers want is a factor that influences their eating behavior. This fact explains why fast food outlets are clustered around schools (Jamie & Witten, 2010). This is partly because the industry places its outlets in locations where there are many potential buyers of their products, for example around schools (Jamie & Witten, 2010).

Furthermore, a person's desire for certain foods is associated with their beliefs and attitudes which are based on information about that product (Turner et al., 2018). Information about food products is an important factor for consumer satisfaction which will have an impact on their desire to purchase (Candra et al., 2021). In this research, siblings and close friends are important subjects who act as sources of information and have an impact on the desire to consume among teenagers.

In addition to being a source of information, the presence of siblings and close friends is the provider of the third type of belief also, namely belief of support. This proves that the belief to buy fast food is formed when teenagers believe that significant individuals are agree, and if the majority of other individuals who are considered important carry out that behavior (Fishbein & Ajzen, 2010).

Teenagers' desire to consume is encouraged by the social environment. Siblings and close friends are important individuals for adolescents which have been proven to be associated with eating behavior. It has previously been proven that the desire to consume due to the presence of these two subjects has a significant association with external factors (availability, affordability, convenience). Emotional contagion occurs, when the mood of another person influences a person's mood, and therefore influence food choices (Rozin, 1996). Teenagers consume fast food because it is permissible. This fact shows that the reference group directs individuals to a behavior (Azizi & Sanaji, 2018). So that teenagers feel happy because they eat food suggested by subjects that are important to them.

5. Conclusion

This research aims to measure the association between eating behavior with availability, affordability, and convenience which is moderated by desire. The results of the analysis show that the desire to consume when with siblings and close friends are the factors that has the most associated with eating behavior. Fast food is easy to find, widely available with affordable prices and gives comfort when consuming it. These factors are implemented into behavior, after being reinforced by internal factors in the form of desire.

In short, the eating behavior among adolescents can be implemented because they believe in consuming fast food, namely the belief in control which are related to the availability and affordability of food prices, belief of consequence which are related to the convenience that will be felt, and belief of support from important individuals.

The findings of this research can be a basis for revealing potential belief and intention factors that may explain the eating behavior among teenagers. Furthermore, the three types of beliefs and intentions can be studied more widely for the development of intervention methods as part of an effort to develop positive eating behavior. The research may focus on factors that are statistically proven to correlate and influence behavior.

Limitation

The sample includes children aged 16-18 years only, so the research results cannot be generalized to teenagers from all groups of age. Furthermore, errors may occur while filling out the self-administered questionnaire.

The information obtained reflects the conditions of individual teenagers and does not adequately reflect the conditions at the family level such as parents' consumption patterns. In addition, decisions made in data processing may influence the formation of categories in each variable. Ultimately, because this study was cross-sectional, a bidirectional association, or the opposite direction of the relationship, may have occurred.

Ethics Statement

This research has been approved by the Ethics Commission of the Department of Social Welfare Sciences, FISIP UI. Respondents involved in this research have expressed their consent stated at the beginning of the research questionnaire. All authors have expressed willingness for publication of this manuscript.

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