

Knowledge on Nutrition Labels for Processed Food: Effect on Purchase Decision among Indonesian Consumers

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ABSTRACT

This study was conducted to observe the relationship between consumers' knowledge on nutrition labels and the purchasing behavior for processed food products among Indonesian consumers. A cross-sectional study was conducted in August–September 2018 in five different cities of three provinces (Jakarta, Bogor, Depok, Tangerang, and Bekasi). Data were obtained from 400 adult consumers by self-administered questionnaires. The results showed that almost 70% of consumers in Indonesia check food labels; however, from that number only 37.5% paid attention to the nutrition label of a food product prior to making a purchase decision; this was most probably due to their knowledge on nutrition labels that was still poor, as shown by the mean score of 7.7 out of 14 questions (55%). In terms of food groups, milk and dairy products were deemed important by the consumers and the nutrition labels were often checked. When it comes to making a purchase decision, almost all of the consumers (96.0%) had decided to buy food products with nutrition labels as compared to those without. Furthermore, when compared to similar products also bearing nutrition labels, consumers deemed the claims of low fat (28.7%) and low sugar (22.6%) as a sign that the products are healthier and have a better nutrition profile. Knowledge on nutrition labels (OR=1.139; 95% CI:1.016–1.276; p=0.025) and purchase decision on products with nutrition labels (OR=3.426; 95% CI:1.220–9.623; p=0.019) were significantly associated with purchase decision for healthier processed food. This study has shown the importance of increasing consumers' knowledge on nutrition labels in order to achieve a larger impact on food selection, nutrition, and health.

Keywords: consumers knowledge, food label, nutrition claim, nutrition label, purchase behavior

INTRODUCTION

A consumer's decision to purchase a packaged food product is affected by many aspects i.e. taste, quality, convenience and ease of use. Several other factors have been listed as having the potential to increase the likelihood of purchase i.e. price, perceived healthiness, and tastiness of the product (Steinhauser *et al.* 2019). One of the aspects that could affect consumer purchase decision are food labels. A food label is an important tool for consumers to get information on the food product that is contained within the package, which eventually might affect their decision in purchasing the product. A study found that some consumers actually put importance on food labels and read them before making final purchase decisions, where the level of importance varied significantly based on

gender, age, food habit, and location (Kumar & Kapoor 2017). However, although 90% of consumers read food labels, the majority only checked for the manufacturing date or expiry/best before date (Vemula *et al.* 2014).

One of the aspects of a food label is nutrition information, which can come in the form of nutrition labels and nutrition and health claims. Of the 90% of consumers who read food labels, only one-third actually checked nutrition information and ingredients; while those who did not often read nutrition information was due to most consumers either lacking nutrition knowledge or that they found the information to be too technical to understand (Vemula *et al.* 2014). Similarly, a study found that nutrition information on food labels is often underutilized by consumers and having prior nutrition knowledge would actually help consumers to

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know how to use the information on nutrition labels appropriately, to understand them, and to eventually make healthy decisions based on the information (Miller & Cassady 2015). Interestingly, another study reported that younger consumers considered that product attributes that had implications on health were important (Kumar & Kapoor 2017). Among consumers who do read nutrition labels, they would tend to pay more attention to food products with health claims on the label and were more likely to purchase that particular product (Steinhauser *et al.* 2019).

A study reported a strong relationship between nutrition label viewing and food purchase decisions. Nutrition labels were viewed more when the healthfulness of a product is 'ambiguous'; therefore, consumers spent more time viewing nutrition labels on 'meal' items such as soup, pizza and yogurt. It was also observed that consumers spent more time in viewing nutrition labels on food products they eventually purchased compared to foods that they decided not to purchase (Graham & Jeffery 2011). Meanwhile, consumers who were pursuing specific dietary goals were seen to make more comparisons of nutrition labels before making purchase decisions. The more nutrition knowledge these consumers had and the more motivated they were in terms of their dietary goals, the more detailed they were in reading nutrition labels. Interestingly, knowledge on nutrition was found to be the middle agent that mediated between motivation of a healthier life and accuracy in the decision making process in terms of purchasing packaged food products (Miller & Cassady 2012).

In Indonesia, interestingly, decision-making at the household level when it came to purchasing a food product was found to be dominated by non-nutrition aspects, such as socioeconomic status, family member requests, feelings about the food product, and the halal issue (Rachmi *et al.* 2018). Unfortunately, there is a lack of attention given to nutrition information on food labels, which was mostly due to the lack of good knowledge on nutrition (Kurnia *et al.* 2016). Stronger consumer attention has been placed on the halal logo and it has been identified as a major influence in purchase decision, especially among the younger generation (Siregar & Alam 2018). Interestingly, the halal logo is actually not mandatory for all processed food products marketed in Indonesia as it is only required for

certain products; whereas the items mandatory to be displayed on a food label are product name, ingredients list, net weight, name and address of manufacturer or importer, manufacturing date and code, expiry date, and permit number (Indonesia Food and Drug Authority 2018). And since 2019, it has actually been mandatory for all processed food products marketed in Indonesia to have a nutrition information panel or nutrition label containing total energy, total fat, saturated fat, sugar and salt (sodium) content of the food product (Indonesia Food and Drug Authority 2019). However, there has been a lack of published reports that have addressed the issue of nutrition knowledge, nutrition label viewing, and purchase decision among consumers in Indonesia in order to get a better picture of the factors affecting their purchase behavior. Therefore, this study was conducted to investigate the relationship between the knowledge on nutrition labels and purchase behavior for packaged food products among consumers in Indonesia.

METHODS

Design, location, and time

This cross-sectional study was conducted in August–September 2018. The study was conducted in five different cities of three provinces (Jakarta, Bogor, Depok, Tangerang, Bekasi).

Sampling

400 male and female subjects from five different cities (Jakarta, Bogor, Depok, Tangerang, Bekasi) were selected to participate in this research. The number of subjects was calculated using the Slovin Formula based on the population of the five cities, which was 31,689,592 people (Citisabc 2018) with a confidence level of 95% ($\alpha=0.05$). In each city, 80 subjects were selected in supermarkets and public places using quota sampling. Subjects who were within the age range of 18–60 years, literate, and willing to participate in the study in these locations were included until a pre-determined number (80 subjects) was reached.

Data collection

Data were collected using a self-administered questionnaire. There were four parts in the questionnaire, namely characteristics of subject (sex, age, occupation, education level,

income), label reading behavior, knowledge on nutrition labels, and consumer purchase decision. Data on the frequency of reading labels and categories of food product labels checked were obtained to assess label reading behavior. There were 14 true-false questions on the components of food labels to assess knowledge on nutrition labels. Purchase decision was assessed through questions on concerns for purchasing, purchase decision for product with nutrition labels, and purchase decision for healthier products. Content validity of the questionnaire was approved by a panel of experts from the academia of IPB University and professionals from the Indonesia Food and Drug Authority and the WHO Country Office of Indonesia. The questionnaire was also tested for reliability, resulting in a Cronbach's-Alpha of 0.6 after it was pre-tested on 30 subjects with similar characteristics.

Data analysis

Data from the questionnaires were collected in accordance with the manual for data entry. With regards to knowledge on nutrition labels, each correct answer was scored as 1; while a wrong answer was scored as 0, resulting

in a total score of 0–14. Bivariate analyses using Spearman's Rank Correlation were conducted to correlate the characteristics of the subject on both knowledge on nutrition labels and purchase decision. Univariate, bivariate and multivariate (logistic regression) analyses were conducted using IBM SPSS Statistics Version 22.

RESULTS AND DISCUSSION

Characteristics of subjects

Among 400 subjects who participated in this study, 314 of them (78.50%) were female. Furthermore, more than one-third were university students and employees (37.5% and 36.0%, respectively), while 59.8% of them were university graduates. Almost half of the respondents (49.3%) had an income between IDR 500,000 and 2 million. The characteristics of the subjects are shown in Table 1.

Label reading behavior

According to Sumarwan (2011), the behavior of reading product labels is part of consumer behavior that will encourage them to buy, use, and evaluate a product. Previous studies

Table 1. Characteristics of subjects

Characteristics of subjects	n	%
Sex		
Male	86	21.5
Female	314	78.5
Age (mean±SD)	27.8±9.8	
Occupation		
University student	150	37.5
Housewife	102	25.5
Employee	144	36.0
Unemployed	4	1.0
Education level		
Elementary school	5	1.2
Junior high school	26	6.5
Senior high school	130	32.5
University	239	59.8
Monthly income		
<IDR 500,000	26	6.5
IDR 500,000–2 millions	197	49.3
>IDR 2–5 millions	101	25.3
>IDR 5–10 millions	51	12.7
>IDR 10 millions	25	6.2

show that the majority of consumers perform this activity before they buy or use a product/service (Kumalasari & Sjafei 2013; Ruwani *et al.* 2014).

As shown in Table 2, results of this study showed that the majority of subjects rarely read food labels and only 25.3% stated that they read food labels frequently. This number is near to the result of a meta-analysis (Sumarwan *et al.* 2017), which reported that only about 30% of consumers frequently or often read product labels.

The type of food product also seemed to influence the consumer's label reading behavior. It is known from a previous study that people only commonly read the labels of certain food products (Ruwani *et al.* 2014). In this study, the types of food product nutrition labels that people commonly read and checked were milk and dairy products, beverages, and ready-to-eat savories. The labels of these three types of products were commonly read and checked by 45 to 73% of subjects. The least read label was that

of composite foods. Similarly, Sumarwan *et al.* (2017) reported that the labels of milk products were the most read label by the consumers, where the decision to read and check food labels was determined by exposure to advertisements, the internet, and knowledge gained from school.

Knowledge on food and nutrition label

As shown in Table 3, most (74.8% and 63.0%) of the subjects mentioned the halal logo and expiry date as components of a food label. More than half (53.3%) of them were also familiar with list of ingredients. However, other components of a food label were less known by the subjects.

Among all the statements regarding food labels, the statement with the least number of correct answers was "all processed food products must have a nutrition label". The Indonesian Food and Drug Authority has recently made nutrition labels mandatory for all packaged food products

Table 2. Label reading behavior

Label reading behavior	n	%
Frequency of reading food labels		
Always	21	5.3
Often	101	25.3
Rarely	277	69.4
Product category of nutrition label checked		
Milk and dairy products	294	73.5
Beverages	194	48.5
Ready-to-eat savories	183	45.8
Cereals and cereal products	150	37.5
Bakery products	109	27.3
Confectionery	82	20.5
Meat and meat products	62	15.5
Sweeteners	42	10.5
Fats, oils and emulsions	38	9.5
Fish and seafood products	37	9.3
Salts, spices, soups, sauces, salads, protein products	37	9.3
Edible ices	23	5.8
Fruits and vegetables, seaweed, nuts and seeds	19	4.8
Eggs and egg products	17	4.3
Composite foods	7	1.8

Table 3. Knowledge on the components of a food label

Components of food label	n	%
Halal logo	299	74.8
Expiry date	252	63.0
List of ingredients	213	53.3
Name of the product	121	30.3
Net weight or net content	56	14.0
Name and address of the manufacturer or importer	56	14.0
Distribution permit number	20	5.0
Date and code of production	17	4.3
Origins of certain food ingredients	9	2.3

since 2019, while this study was conducted prior to when the regulation was enacted.

Almost all subjects (95.8% and 92.0%, respectively) understood the purpose of a nutrition label, which is to give information about the nutrient content of a product, and that sodium is essentially table salt. On the contrary, only about one-fourth of subjects had specific knowledge on the cut-off points for claims of specific nutrients, such as in the following statements: “a low fat product can only contain less than 3 g/100 g of fat” and “sugar content may not be included in the nutrition label of a food product if the amount is less than 1 g/serving size”. Similarly, only a low proportion of the subjects were aware that the statement “high fiber” is a nutrition claim (Table 4).

Table 5 shows that higher age ($r=0.272$; $p<0.001$) and income ($r=0.165$; $p=0.001$) of subjects was associated with better knowledge of nutrition labels. Similar results were found in Jackey *et al.* (2017) and Cannoosamy *et al.* (2014). This implies that older and wealthier subjects are more likely to be exposed to health or nutrition-related news.

Purchase decision

Table 6 shows that most (69.5%) Indonesian consumers considered product price as the main determinant for purchase decision. This was also found in Indian and Hispanic consumers (Campbell 2013; Vemula *et al.* 2014; Kumar & Kapoor 2017). More than one-third were also concerned about expiry date (41.8%) and the halal logo (38.8%). Among all

the components of a food label, the expiry date was always checked by most of the consumers (Davies *et al.* 2010). Awareness of the halal logo was also seen in other Muslim countries, such as Malaysia (Muhamad *et al.* 2017). This study also found that about a third of Indonesian consumers were also concerned about the product’s nutrition profile (37.5%) prior to making a purchase. This number was quite similar to another study in India (Vemula *et al.* 2014). Nutrition awareness motivates consumers to read the nutrition profile before purchasing. This finding was not only seen among older adults who have to manage their diet in relation with the chronic diseases they have, such as hypertension and diabetes, but also among youths (Miller & Cassady 2012; Kumar & Anand 2016).

Most of the respondents (69.4%) stated that they rarely read food labels, which is similar to the results of another study by Graham and Laska in 2012. Among the nutrition information provided on the label, Indonesian consumers were mostly concerned about fat, sugar, and protein. Similarly, Indian consumers were more concerned with information regarding fat and sugar (Vemula *et al.* 2014; Kumar & Kapoor 2017). Among all food groups, most of the consumers (73.5%) checked the nutrition profile of dairy products and analogues. The nutrition profile of beverages and ready-to-eat savories were also checked by almost half of consumers (48.5% and 45.8%, respectively).

Almost all of the consumers (96.0%) had decided to buy food products with nutrition labels because they considered them better than

Table 4. Knowledge on nutrition labels

No.	Knowledge on nutrition labels	n	%
1	The purpose of a nutrition label is to give information about the nutrient content of a product (T)	383	95.8
2	Sodium content represents the salt contained in a food product (T)	368	92.0
3	Energy, carbohydrate, protein, fat, and sodium are nutrients that are required to be included on a nutrition label (T)	354	88.5
4	Nutrition claims on a food product must be in accordance with the nutrient content of the product (T)	320	80.0
5	Serving size is the amount of food normally consumed in one meal (T)	290	72.5
6	The reference for nutrition labels in Indonesia is the Recommended Dietary Allowance (RDA) (T)	275	68.8
7	The level of adequacy of daily nutritional needs is indicated by the percentage of RDA (T)	260	65.0
8	The RDA has a similar value for all individuals (F)	236	59.0
9	There are differences between nutrition claims and health claims (T)	223	55.8
10	The statement “low fat” is a nutrition claim (T)	214	53.5
11	Sugar content may not be included in the nutrition label if it is less than 1 g per serving size (T)	110	27.5
12	A food product can be claimed as a low fat product if the fat content is less than 3 g per 100 g (T)	100	25.0
13	The statement “high fiber” is not a nutrition claim (F)	99	24.8
14	All processed food products must have a nutrition label (F)	7	1.8
Total score (mean±SD)		7.7 ± 2.3	

T: True as correct answer; F: False as correct answer

similar products without nutrition labels. Most of them (78.8%) also decided to buy more healthy products within a similar group of products. Nutrient claims of low fat (28.7%) and low sugar (22.6%) were considered healthier by consumers. Jacobs *et al.* 2011 also found that ‘low in fat’ was considered most important by about 70% of supermarket consumers in South Africa, which might indicate poor knowledge on nutrients in general.

Table 7 shows that knowledge of nutrition labels (OR=1.139; 95% CI:1.016–1.276; p=0.025) and purchase decision on products with nutrition labels (OR=3.426; 95% CI:1.220–9.623; p=0.019) were significantly associated with pur-

chase decision for more healthy processed foods. Subjects with better knowledge on nutrition labels had higher awareness to choose products with nutrition labels compared to those without. Furthermore, based on their perceptions, they were able to select which products are considered healthier compared to other similar products. Subjects with better nutrition knowledge saw beyond the nutrition and health claims which later allowed them to make purchasing decisions (Steinhauser *et al.* 2019). Similar results were found in previous studies regarding maternal milk products (Damayanti & Rimbawan 2016) and other various food products (Mhurchu *et al.* 2018).

Table 5. Association between the characteristics of subjects and knowledge on nutrition labels

Characteristics of subjects	r	p
Age	0.272	<0.001*
Education level	0.044	0.383
Income	0.165	0.001*

*Spearman’s rank correlation p<0.05

Table 6. Concerns related to purchase decision, nutrition label and healthier products

Purchase decision	n	%
Concerns in making purchase decision		
Price	278	69.5
Expiry date	167	41.8
Halal logo	155	38.8
Nutrition profile	150	37.5
Packaging	119	29.8
Name of brand	112	28.0
Taste	94	23.5
Ingredients	40	10.0
Preference	38	9.5
Net weight	26	6.5
Past experience	13	3.3
B POM logo	8	2.0
Concern on components in a nutrition label		
Fat	221	55.3
Sugar	179	44.8
Protein	173	43.3
Carbohydrate	130	32.5
Vitamin C	85	21.3
Vitamin A	84	21.0
Energy	67	16.8
Sodium	53	13.3
Calcium	32	8.0
Iron	12	3.0
Saturated fat	7	1.8
Cholesterol	4	1.0
Dietary fiber	3	0.8
Purchase decision for product with nutrition label	384	96.0
Purchase decision for healthier products with a better nutrition profile compared to other similar products	314	78.5
Perception on what constitutes a healthier product		
Low fat	90	28.7
Low sugar	71	22.6
High protein	39	12.4
Balanced nutrition	35	11.1
High calcium	28	8.9
High vitamin	16	5.1
Low sodium	12	3.8

B POM: *Badan pengawasan obat dan makanan* (National agency of drug and food control)

Table 7. Factors associated with purchase decision for healthier food

Factors	OR	95% CI	p
Sex-female	1.440	0.807–2.572	0.218
Age	0.997	0.968–1.027	0.841
Education level-university	0.884	0.520–1.501	0.647
Income >IDR 2 millions	0.895	0.509–1.575	0.702
Frequent label reading	0.894	0.270–2.965	0.855
Knowledge on nutrition label	1.139	1.016–1.276	0.025*
Concerned about nutrition labels for purchase decision	1.238	0.717–2.138	0.443
Concerned about fat in nutrition profile	1.231	0.748–2.026	0.414
Concerned about sugar in nutrition profile	0.813	0.487–1.356	0.427
Concerned about sodium in nutrition profile	1.159	0.558–2.407	0.691
Purchase decision on products with nutrition labels	3.426	1.220–9.623	0.019*

*Logistic regression $p < 0.05$; $r^2 = 0.427$

CONCLUSION

The knowledge on food and nutrition labels of Indonesian consumers was still poor. Most consumers considered product price prior to making a purchase decision. Consumers were also concerned about expiry date, the halal logo and nutrition facts presented on the label. In terms of nutrition labels, consumers in Indonesia were mostly concerned about fat, sugar, and protein. Almost all of the consumers chose products with nutrition labels than products without. Most had also decided to buy more healthy products, which was deemed as low in fat and sugar. Higher knowledge regarding nutrition labels and purchase decision on products with nutrition labels was significantly associated with purchase decision for more healthy processed food. This study suggests the importance of programs aimed at increasing the awareness of consumers relating to nutrition labels and claims in order to have an optimum impact in achieving the objective of public policy related to food, nutrition, and health.

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AUTHOR DISCLOSURES

The authors declare that there is no conflict of interest with other person or institution.

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