

## Nutrition label knowledge among culinary and health students in Indonesia

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### Abstract

Many students in the world believed that the nutrition label was too difficult to understand. There is no previous research on nutrition label knowledge among Indonesian students in the field of health and culinary. This study was aimed to evaluate nutritional label knowledge among culinary and health students in Indonesia. A total of 252 students were recruited from 62 universities in Indonesia. The selection was carried out using the cluster sampling method. Sample respondents were asked to answer a validated nutrition label knowledge questionnaire. Nutrition label knowledge differences among culinary and health students were analyzed using Fisher exact tests. The percentage of wrong answers was mostly in questions about food ingredients containing high protein and fibre. The second and third most wrong answer was on the number of carbohydrates and fat consumed when consuming 2 servings. The total number of health students that answered incorrectly were significantly greater than culinary students on whether or not one serving of packaged processed products can meet daily nutrition need. The majority of the culinary and health students contributed correctly to the nutrients expected to be included on the nutrition label. The food nutrition label knowledge score for students in the culinary field is 5.40 and was categorized as good, whereas, the score in the health sector was 4.90 (moderately good). Health students need to get additional education about food nutrition labels.

## 1. Introduction

The nutrition label is an important health tool used to support a balanced diet. It enables consumers to compare the nutritional values of similar food products, choose food products based on the nutritional information, and to better understand the daily nutritional value of food. Meanwhile, this information is useful for diabetic and obese patients suffering from high blood lipids, high blood glucose and cardiovascular disease. Although, the utilization of this tool not always results in healthier consumption of food, however, it is capable of changing consumption patterns and is useful for better dietary intake and to reduce the intake of unhealthy food, beverages and snacks (Cannoosamy *et al.*, 2014).

Meanwhile, the effective use of the nutritional label is not fully achieved until consumers are enlightened on its proper use (Cannoosamy *et al.*, 2014). According to previous studies, knowledge was related to individual educational level especially the level of strata in university (Muhammad *et al.*, 2018). Washi (2012) also found that knowledge and attitudes were related to

educational level, hence, consumers with higher education are usually more receptive to nutrition label information. The amount of fat and sugar was the nutrition content to be read when the consumers buy a product for the first time (Wahab, 2018). In addition, a cross-sectional study by Saha *et al.* (2013) reported that only 20% of 316 students from Kolkata, India tends to read nutrition information. Many of these students believed that the nutrition label was too difficult to understand. In another study, the nutrition fact labels were not read due to confusing nutrition fact label content, time consideration, and difficulty in following food information Çalbayram *et al.* (2017). Although tertiary education students in Ghana read and attach importance to nutrition information, the individuals had limited knowledge about the information on the food package Madilo *et al.* (2013).

There is no previous research on nutrition label knowledge among Indonesian students, especially in relation to the culinary and health field. Students related to culinary and students related to the health field should

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implement a healthy life, as their academic program provides competencies for this purpose. Healthy eating habits are the implementation of healthy life. Healthy eating habits are affected by nutrition knowledge (Medina *et al.*, 2020) and nutrition information label knowledge (Murimi *et al.*, 2013).

Culinary students are required to understand how to read correctly read nutrition facts labels as these students are meant to work in the foodservice, food and beverage industry, catering industry, and nutrition educators in school or government sectors. Health students also use nutrition fact labels as tools in discharging respective duties at the hospital or clinic. In addition, these individuals are expected to be sensitive to nutritional issues, health and diseases, and cases, capable of positively or negatively affecting good health.

The information obtained from this research is useful for the development of nutrition science courses, information for BPOM, and the Indonesian nutrition and food experts' association regarding food and nutrition label education. This study aimed to evaluate nutritional label knowledge among culinary and health students in Indonesia.

## 2. Materials and methods

### 2.1 Sample size and selection

A total of 252 students were recruited from 62 universities in Java, Sumatra, Kalimantan, Riau Islands, Nusa Tenggara and Sulawesi. The students selected were of the culinary field (culinary arts, food science, culinary education, culinary business and management, culinary technology) as well as health (pharmacy, nursing, midwifery, public health and physiotherapy). Besides, the selection was carried out using the cluster sampling method.

### 2.2 Questionnaire administration

The questionnaire used was initially validated. The questionnaire was distributed through a google form. The researchers asked for help from lecturers and students association related culinary and health fields to distribute the questionnaire. The questionnaire is divided into two parts, namely demographics which include name, gender, age, study program, and university name, as well as questions regarding knowledge of food nutrition labels. The inclusion criteria of the respondents were active students related to the culinary and health field. The exclusion criteria of the respondents were non-active students related to the culinary and health field.

The latter consisted of 6 questions based on the nutrition labels of food circulating in the Indonesian

market. Furthermore, the question was centred on the understanding of food ingredients containing high protein and fibre, the number of packages recommended for consumption to meet the daily nutritional requirement, amount of carbohydrates consumed when consuming 2 packages, criteria for products with high vitamin B12, folic acid, and vitamin A, the amount of fat intake when as much as 2 packages are consumed and nutritional substances that expected to be listed.

Each correct question is scored 1 with a maximum score of 6. The higher the scores, the better the knowledge of food nutritional labels. The categories are as follows 0-1 = very bad, 1.1-2 = bad, 2.1-3 = poor, 3.1-4 = good enough, 4.1-5 = moderately good, 5.1- 6 = good. In addition, data collection was carried out from May to November 2020.

### 2.3 Statistical analysis

Data were analyzed using the Statistical package for social science (SPSS), Windows (version 16). Difference in means were considered statistically significant at  $p < 0.05$ . Furthermore, mean scores of responses were converted into percentages for easy interpretation of results. The Mann Whitney and Fisher exact tests were applied to test the differences between categories.

## 3. Results

The characteristics of the respondents are presented in Table 1. In all, the total of respondents was 252 students, 216 (85.71%) of the respondents were female and 36 (14.29%) of the respondents were male. The age of the respondents was  $\leq 20$  years (47.62%), 21-30 years (51.19%) and 31-40 years (1.19%). The respondents' origin included institutions from Java, Sumatera, Sulawesi, Kalimantan, Nusa Tenggara, Riau Islands.

The proportion of correct answers for the nutrition label question was presented in Table 2. There are many differences between culinary student's knowledge and health student's knowledge of the question about one serving of the food product is unable to meet the daily nutrients needs ( $p < 0.001$ ) and question about the amount of fat consumed when consuming 2 servings ( $p < 0.001$ ). The score of food packaging nutrition labels knowledge was presented in Table 3. Based on Table 3, culinary students have a higher score in nutrition label knowledge than health students' knowledge.

## 4. Discussion

Based on Table 2, the percentage of wrong answers was mostly in questions about food ingredients containing high protein and fibre. However, on the criteria for products containing high vitamin B12, folic

Table 1. Demographic and individual characteristic

Characteristic	Total (n = 252)	Percentage
Age (years old)		
≤20	120	47.62
21-30	129	51.19
31-40	3	1.19
Sex		
Women	216	85.71
Men	36	14.29
Study Program		
Related culinary field		
Culinary art	21	8.33
Culinary education	33	13.10
Culinary business	16	6.35
Food service management	1	0.40
Culinary management	2	0.79
Culinary technology	1	0.40
Food science and technology	52	20.64
Related health field		
Nursing	12	4.76
Midwifery	23	9.13
Pharmacy	70	27.78
Public health	18	7.14
Physiotherapy	3	1.19
Origin institution		
Java	205	80.39
Sumatera	30	11.91
Sulawesi	3	1.19
Kalimantan	11	4.37
Nusa Tenggara	1	0.40
Riau Islands	2	0.79

Table 2. Correct answers proportion to each questions

No	Question	Related culinary field	Related health field	P <sup>a</sup>
		Correct answer (%)	Correct answer (%)	
1	An understanding of food ingredients containing high protein and fiber	73.81	62.70	0.059
2	One serving of the food product is unable to meet the daily nutrients needs	92.86	73.81	0.000
3	The amount of carbohydrates consumed when consuming 2 servings	89.68	85.71	0.280
4	Criteria for products containing high vitamin B12, folic acid, and vitamin A.	96.83	96.83	0.639
5	The amount of fat consumed when consuming 2 servings	90.48	73.02	0.000
6	Nutritional substances expected to be included in the nutrition label	96.03	97.62	0.722

Table 3. Score of nutrition labels knowledge

Field study	Nutrition label knowledge score	Sig. 2 tailed <sup>a</sup>
Culinary	5.40	0.000
Health	4.90	

<sup>a</sup>Mann-Whitney test applied

acid, and vitamin A, the percentage of incorrect answers was relatively low. This indicates that respondents are still confused about the criteria for a product with a high content of certain nutrients. Meanwhile, based on the Regulation of the Food and Drug Administration PerKaBPOM (2012), solid products with high-fibre claims are expected to contain at least 6 g of fibre per 100 g while similar products with high protein claims are expected to contain at least 35% per 100g. Therefore, the high-fibre and protein requirement in products need to be properly understood. Nutritional label users reported a healthier consumption level of dietary fibre (Darkwa, 2014). One example of healthy lifestyles is to choose packaged products with high fibre and low salt information on food nutrition labels (Gebski *et al.*, 2019).

The second and third most wrong answer was on the amount of carbohydrates and fat consumed when consuming 2 servings. This indicates that the respondents are still confused concerning the contribution of 2 servings consumption of the total carbohydrate and fat intake. Culinary field students had more understanding about the amount of fat consumed when consuming 2 servings compared to health students. Based on a study by Campos *et al.* (2011) and Cowburn *et al.* (2005), nutrient content per serving is the element reported to cause difficulties for consumers, amounting to barriers to understanding.

The total number of health students that answered incorrectly were significantly greater than culinary students on whether or not one serving of packaged processed products is able to meet daily nutrition need. Meanwhile, the health students from study programs of pharmacy, nursing, midwifery, public health and physiotherapy were not aware that to fulfil the daily nutrition need, it is necessary to consume a variety of foods and not just one food product.

The majority of the culinary and health students contributed correctly to the nutrients expected to be included on the nutrition label. The labelling of protein, fats, carbohydrates, calories, trans fat, and cholesterol content of packaged food is mandated (Cannoosamy *et al.*, 2014).

Based on Table 3, the food nutrition label knowledge score for students in the culinary field is 5.40 and was categorised as good, whereas, the score in the health sector was 4.90 (moderately good). In addition, the score of culinary students was significantly higher than health students. This is because the curriculum for the culinary study program contains more courses related to nutrition compared to the health sector. Besides, the majority of health students in this research were from the pharmacy study program. Grunert *et al.* (2010) reported that the

factor that affects nutrition label information knowledge is nutrition knowledge. Individuals with high nutritional knowledge tend to have a better understanding of the use of food nutrition labels. Furthermore, consumers with an adequate understanding of nutrition labels often tend to use them as a consideration in the selection of food to buy (Cannoosamy *et al.*, 2014).

The knowledge level in reading nutrition labels is also influenced by health literacy (Malloy-weir *et al.*, 2016) and individual characteristics, for example, an obese patient has a lower knowledge level in reading nutrition labels compared to people with normal nutritional status (Anggraini *et al.*, 2018). Studies have also shown that women read label information more than men (Ollberding *et al.*, 2011; Besler *et al.*, 2012; Çalbayram *et al.*, 2017).

Health students need to get additional education about food nutrition labels. Meanwhile, the population of patients with non-communicable diseases such as obesity and diabetes around the world are high, these conditions are potentially suppressed when every individual is willing to read and fully understand food nutrition labels Song *et al.* (2015), Moore *et al.* (2018). Education tends to promote the reading of nutrition label information. This is achieved by including topics on food nutrition labels in courses related to nutrition and non-communicable diseases and also by attaching a guide to reading food nutrition labels placed in several areas of the campuses.

The Food and Drug Administration in Indonesia has a role in increasing the knowledge of food nutrition labels to consumers. This is carried out by instructing the food industries to include the Guideline daily amount (GDA) and a warning label on the front of each package (Nieto *et al.*, 2017). To increase the knowledge of nutrition labels, the industry is expected to provide information, that is easily readable and understood by consumers in the packaging section.

#### 4. Conclusion

The percentage of wrong answers was mostly in questions about food ingredients containing high protein and fibre. The second and third most wrong answer was on the amount of carbohydrates and fat consumed when consuming 2 servings. The food nutrition label knowledge score for students in the culinary field is 5.40 and was categorized as good, whereas, the score in the health sector was 4.90 (moderately good). In addition, the score of culinary students was significantly higher than health students. Health students need to get additional education about food nutrition labels. This is achieved by including topics on food nutrition labels in

courses related to nutrition and non-communicable diseases. The university curriculum could emerge as an ideal setting to provide nutrition label knowledge and deliver reinforced nutrition label messages, especially for future health professionals. The improvement of nutrition label knowledge can also be done by attaching a guide to reading food nutrition labels placed in several areas of the campuses.

### Conflict of interest

The authors declare no conflict of interest.

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