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## Education on Diverse, Nutritious, Balanced, Safe, and Halal Diet Habits to Adolescents in Bandar Lampung

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### ABSTRACT

There are four health problems that are considered most often experienced by Indonesian adolescents, namely iron deficiency (anemia), disturbance of body growth (stunting), chronic energy deficiency (underweight), and obesity (overweight). This community services activity aims to provide information and education about diverse, nutritious, balanced, safe, and halal (*beragam, bergizi, seimbang, aman, dan halal/B2SAH*) diet habits and the impact of contemporary food and beverages on adolescents' health in Bandar Lampung City. This activity was carried out at Daarul 'Ilmi Integrated Islamic High School (SMA IT) in Bandar Lampung City. The target participants were the 11<sup>th</sup> and 12<sup>th</sup> grade students of Daarul 'Ilmi High School. The methods used were extension, discussion, and monitoring. The results showed that the implementation of community services activity in this school have succeeded in increasing the knowledge and understanding of the participants on the B2SAH eating habits, namely from the moderate category to the good category after participating in the activity, and resulted in changes in students' behavior in consuming contemporary food.

## 1. Introduction

Adolescence is a transitional period from childhood to adulthood, which is full of turmoil. Adolescence experiences rapid growth and development, both physically and mentally. According to [Sobur \(2003\)](#) in [Diananda \(2018\)](#), adolescence can be classified into three phases: (a) pre-adolescence (aged 11, 12–13, or 14 years old), (b) early Adolescence (aged 13 or 14–17 years old), and (c) advanced Adolescence (aged 17–20 or 21 years old).

According to Law of the Republic of Indonesia No. 35 of 2014 and Minister of Health Regulation No. 25 of 2014, adolescence is in the age range of 10–24 years old and is generally unmarried. According to the Child Protection Law, adolescence is in the age range of 10–18 years old. Adolescence is also known as generation Z because they were born in the year range of 1997–2012 and is currently estimated to be in the age range of 9–24 years old ([BPS, 2021](#)). Generation Z dominate the structure of Indonesian demography, because their percentage reaches 27.94% of the total Indonesian population, which until September 2020 amounted to 270,203,917 people ([BPS, 2021](#)).

Adolescence is a very valuable period when it is in good physical, psychological, and educational health conditions. Adolescence is often considered the healthiest period of life. However, physical growth in adolescents is not always accompanied by maturity in thinking and emotional abilities. In addition, adolescence is also a period of self-discovery, and failure in this process can lead to a variety of problems. If we pay attention, only a few adolescents seek treatment at health facilities compared to other age groups (infants, toddlers, or the elderly), despite the problems faced by adolescents are generally quite complex, one of which is health problems.

Currently, there are several health problems experienced by Indonesian adolescents and are considered the most threatening to their future. The four health problems in question are iron deficiency (anemia), disturbance of body growth (stunting), chronic energy deficiency (underweight), and obesity (overweight). Stunting is a chronic malnutrition problem caused by insufficient nutritional intake for a long time due to eating habits that is not in accordance with proper nutritional needs. Stunting can lead to diabetes mellitus, coronary heart disease, hypertension, and obesity. Poor eating habits of adolescents (rarely having breakfast, eating less fiber foods, often consuming flavored foods) can also lead to obesity ([Nazhifah, 2018](#)). Handling adolescent problems, including health problems, requires multi-disciplinary involvement, cross-program, cross-sector, and community's participation.

Based on data from the Global School Health Survey in 2015, adolescents' eating habits are described as follows: most adolescents do not regularly eat breakfast (65.2%), they consume less fiber vegetables and fruits (93.6%), and often consume flavored foods (75.7%). Many of them also lack physical activity (42.5%) ([CDC, WHO, 2015](#)). These habits, if carried out perpetually and become a fixed lifestyle for adolescents, will increase the risk of non-communicable diseases.

The Balanced Nutrition Guidelines in Indonesia have been introduced and socialized to the public for more than 15 years ([Ministry of Health, 2014](#)). However, until now, there are still many obstacles in socialization so that the hope of changing people's habits and mindset towards balanced nutritional behavior has not been fully achieved. The community's food consumption, both in quantity and quality, is not yet balanced, coupled with inadequate clean and healthy lifestyle. The results of the 2018 Basic Health Research (*Riskesdas*) show that the prevalence of non-communicable diseases (NCDs) has increased due to these habits ([Ministry of Health, 2018](#)). To deal with these conditions, attention to nutritional problems needs to be further improved, among others, through efforts to change people's habits and mindset towards balanced nutritional behavior, which is an important factor in preventing the emergence of nutritional problems and to maintain good nutritional status.

Daarul 'Ilmi Integrated Islamic Senior High School, located on Bukit Kemiling Permai Raya Street, Persada II Alley No. 37, Kemiling Raya Village, Kemiling Subdistrict, Bandar Lampung City, is one of

the relatively newly established integrated Islamic high schools, but has already made various achievements, both at the provincial and national levels. The school has the slogan "Today's Youth, Tomorrow's Leaders" with its vision "Preparing Prospective Leaders in All Fields to Welcome Golden Indonesia 2045". Currently, the school has 70 students, consisting of grades X, XI, and XII. The school is located in the city and adjacent to a housing complex, and is close to many mini markets, hawker stalls, and vendors of various types of contemporary food and beverages sold on carts along the road to the school.

Nowadays, many contemporary foods and beverages are not nutritious but are favored by teenagers, including Daarul 'Ilmi High School students. The habit of snacking on foods/beverages that are not nutritious, and may even be unsafe for health, will greatly endanger their health. Fast food available on the street is often high in salt and calorie from carbohydrates and fat content, but poor in protein, vitamins, and minerals content. Excessive intake of salt, calories, and fat during adolescence period will jeopardize their health in the long run, leading to degenerative diseases, such as diabetes, high blood pressure, coronary heart disease, and stroke. Therefore, it is very important that from an early age, students understand and have a healthy eating habits, namely consuming food that is diverse, nutritious, balanced, and safe (*beragam, bergizi, seimbang, dan aman/B2SA*). In addition, Muslim students must also understand and be able to select halal (H) food. For this reason, it is necessary to socialize the education on B2SAH eating habits to these school students. Furthermore, it is also necessary to teach them how to organize a good and healthy diet refer to as balanced menu. In general, this community service activity aims to provide information and education about diverse, nutritious, balanced, safe, and halal (B2SAH) eating habits for adolescents in Bandar Lampung City, especially at Daarul 'Ilmi High School.

## 2. Methods

This community services activity was carried out for six months. The targets of this activity are students of Daarul 'Ilmi Integrated Islamic High School (SMA IT) located on Bukit Kemiling Permai Raya Street, Persada II Alley No. 37, Kemiling Raya Village, Kemiling Subdistrict, Bandar Lampung City. The activity stages consisted of several methods, namely extension, discussion, monitoring, and evaluation. The schedule of services activity is presented in Table 1.

**Table 1.** Schedule of community services activity.

Activities	The ... <sup>th</sup> Month					
	I	II	III	IV	V	VI
Initial site survey	■					
Permit processing		■				
Coordination (visit) to the location		■	■			
Extension			■	■		
Monitoring and evaluation				■	■	
Preparation of seminar and publication					■	■
Preparation of final report						■

At the initial stage, the community service team prepared counseling materials related to B2SAH and the negative impact of contemporary food and beverages, as well as preparing presentation materials and videos. In the next stage, the team conducted an initial survey and coordination with Daarul 'Ilmi Integrated Islamic High School to determine the target of extension and the time of implementation. As a result of the coordination, an agreement was obtained that the participants targeted for counseling were 11<sup>th</sup> and 12<sup>th</sup> grade students and the activities were carried out on September 14, 2022 with the material presented consists of diverse, nutritious, balanced, safe, and halal eating habits; as well as the negative

impact of contemporary food and beverages on future health. The success of this activity was evaluated by comparing the pre-test and the post-test results to see the increase in knowledge and skills of target participants after the activity. The pre-test was conducted by the team before the extension activity to find out the students' initial knowledge related to the material presented. The post-test was conducted after the extension material was delivered to find out how much the students' knowledge increased after the extension. Furthermore, monitoring was carried out during and after extension to see students' behavior in consuming food. The success criteria for extension participants were determined based on the assessment standards presented in Table 2.

**Table 2.** Success criteria of extension activities.

<b>% Score Achievement</b>	<b>Success Interpretation</b>
85% – 100%	Very Good
75% –84%	Good
60% –74%	Fairly Good
<59%	Less Good

### 3. Results and discussion

People's food consumption is not yet balanced, both in quantity and quality, followed with inadequate clean and healthy lifestyle. The results of the 2018 Basic Health Research show that the prevalence of non-communicable diseases (NCDs) has increased (Ministry of Health, 2018). Under these conditions, attention to nutrition needs to be improved, among others, through efforts to change people's habits and mindset towards balanced nutritional behavior, which is an important factor in preventing the emergence of nutritional problems and to maintain good nutritional status. Therefore, it is very important to educate the public, especially adolescents, about the B2SAH eating habits and the negative impact of contemporary food and beverages on health.

This community services activity began with a visit and coordination with the Principal of Daarul Ilmi High School on September 8, 2022 (Figure 1). This visit aimed to convey the activity's plan, determine activity's participants, and ask for school approval to facilitate the implementation of this activity. The coordination results determined that the participants involved were the students in grade 11<sup>th</sup> and 12<sup>th</sup>, totaling 32 people. In addition, the school and students were ready to support all activities carried out by the community service team from Lampung University and agreed that the activity would be carried out on Wednesday, September 14, 2022. The results of the visit also decided that a training was required to deliver the educational topic on diverse, nutritious, balanced, safe, and halal eating habits, also on the dangers of contemporary food and beverages.

The counseling was conducted on September 14, 2022 in the 11<sup>th</sup> grade classroom of Daarul Ilmi High School, attended by the principal, teachers, 11<sup>th</sup> and 12<sup>th</sup> grade students, which totaling 36 people, and the community service team. The series of activities began with conditioning and pre-test, then opening at 10.00 WIB, followed by remarks from the principal of Daarul Ilmi High School and the team leader. Furthermore, the team presented the socialization materials, consisting of (a) The Importance of Diverse, Nutritious, Balanced, and Safe Eating Habits for adolescents (delivered by Dr. Ir. Ktut Murniati, M.T.A.); (b) Halal Food and the Basics of Islamic Law (delivered by Dr. Ir. Yaktiworo Indriani, M.Sc.); and (c) Negative Impacts of Consuming Contemporary Food/Beverage (delivered by Dewi Mulia Sari, S.P., M.Si.). The socialization activity ended with a post-test and group photo session.



**Figure 1.** Visit to Daarul 'Ilmi High School by the team from University of Lampung.

Pre-test and post-test were conducted using Google Form. The number of questions given was 25 questions, consisting of 10 questions related to understanding about B2SAH food, 10 questions related to understanding about halal food/beverages, and 5 questions related to understanding about the negative impact of consuming contemporary food/beverages. A total number of 32 students participated in this evaluation. The first socialization delivered by Dr. Ir. Ktut Murniati, M.T.A. (Figure 3) provide an understanding of diverse, nutritious, balanced, and safe food (B2SA), including what B2SA is, why B2SA eating habits is important, the principles of preparing B2SA menus, the requirements for preparing B2SA menus, and setting a balanced menu for the family.

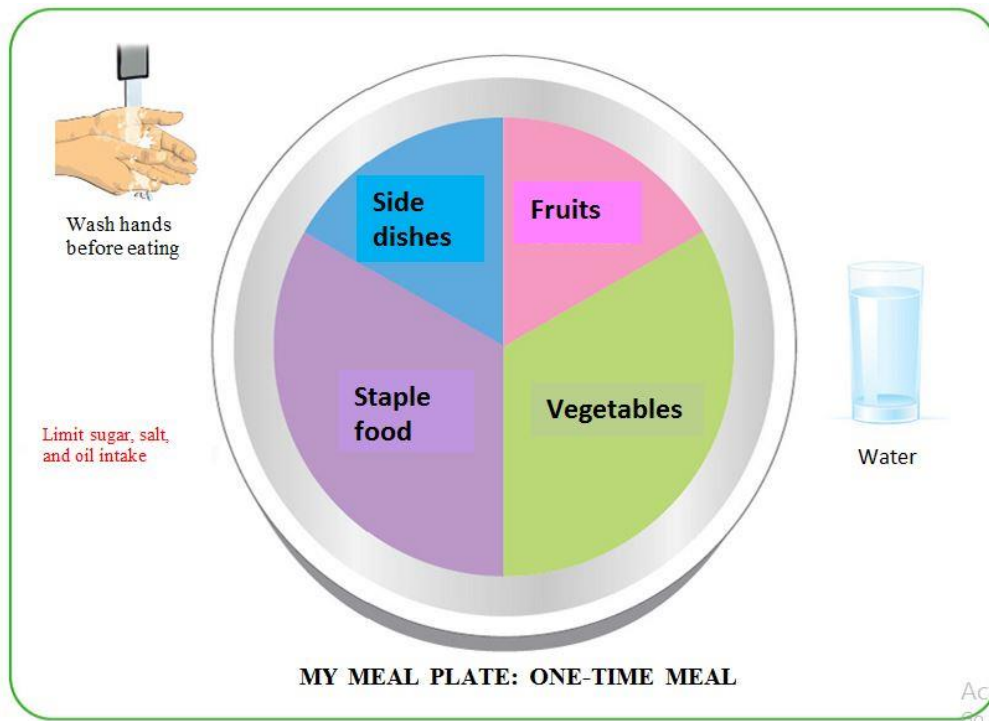
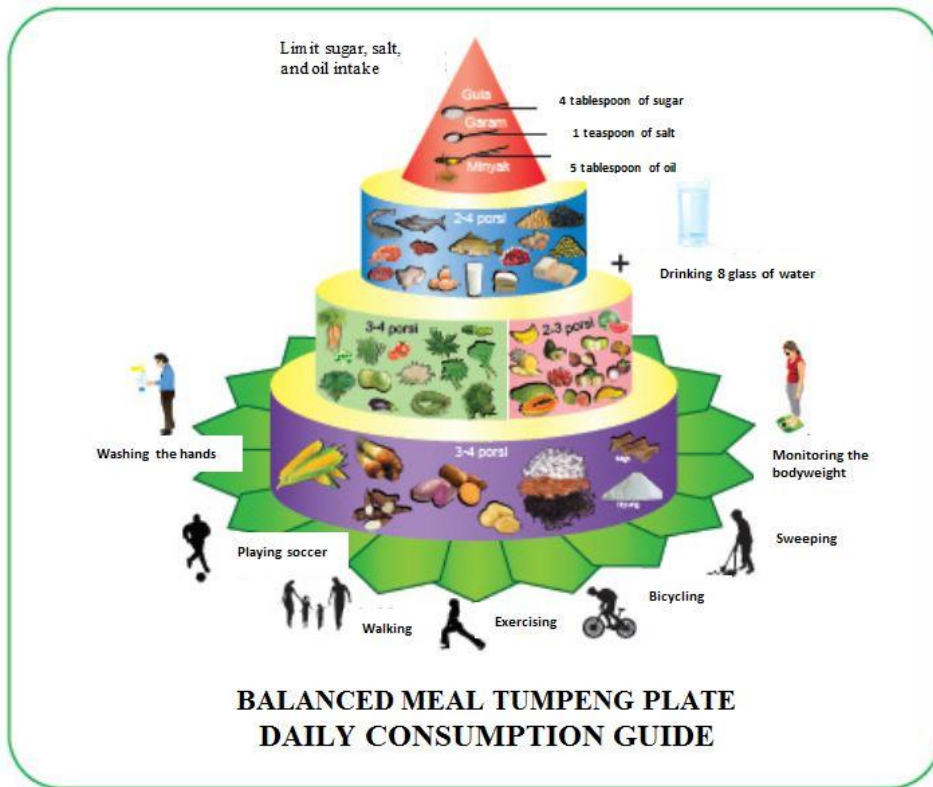
Ministry of Health of the Republic of Indonesia (2014) has established the Balanced Nutrition Guidelines (*Pedoman Gizi Seimbang*/PGS) that aims to provide guidelines for healthy diet and behavior for all levels of society based on the principles of consumption of diverse food, clean and healthy lifestyle, physical activity, and maintaining normal body weight. The B2SA menu is compiled based on portions of the general guidelines for balanced nutrition, which looks like a one-time meal plate (Figure 4).



**Figure 2.** Participants took part in a pre-test before the presentation of the material.



**Figure 3.** Delivery of B2SA material by Dr. Ir. Ktut Murniati, M.T.A.



**Figure 4.** Visuals of the General Guidelines for Balanced Nutrition in the form of Balanced Nutrition Tumpeng Plate (daily consumption guide) and My Meal Plate (one-time meal plate) (Ministry of Health, 2014).

A crucial thing in the delivery of B2SAH material is the importance of eating habits based on the B2SA principle, namely eating food in sufficient quantities according to the nutritional adequacy number (*angka kecukupan gizi/AKG*), diverse the food to meet all three needs, balance among various food groups, and safety for consumption. According to [Minister of Health \(2019\)](#), the recommended AKG for adolescents in Indonesia is presented in Table 3. The calculation of AKG for adolescents should consider the following factors ([Indriani, 2015](#)):

- a. Adolescence, characterized by sexual growth (puberty) and rapid bone growth. The growth of female adolescents is usually faster than male adolescents.
- b. Healthy growing adolescents are characterized by a well-developed body, straight body bones, strong muscles, have sufficient fat stores, healthy looking skin, shiny hair, and hard teeth that free from decay. All of this features require adequate nutritional intake.

The participants were very enthusiastic in listening to the material presented, as evidenced by a questions from the participants, namely how to measure the ideal body weight. Based on the evaluation results, the average knowledge of participants about B2SA material increased by 9.37%, from 53.52% to 62.89% after the presentation of the material. Detailed pre-test and post-test results of the material are presented in Table 4.

**Table 3.** Nutritional adequacy number for adolescents in Indonesia.

Age Group (years old)	Body Weight (kg)	Energy (kcal)	Protein (g)	Fat (g)	Carbohydrate (g)	Vit. A (RE)	Vit. C (mg)	Fe (mg)	Ca (mg)
<b>Male</b>									
10–12	36	2,000	50	65	300	600	50	8	1,200
13–15	40	2,400	70	80	350	600	75	11	1,200
16–18	50	2,650	75	85	400	700	90	11	1,200
19–29	60	2,650	65	75	430	650	90	9	1,200
<b>Female</b>									
10–12	38	1,900	55	65	280	600	50	8	1,200
13–15	48	2,050	65	70	300	600	65	15	1,200
16–18	52	2,100	65	70	300	600	75	15	1,200
19–29	55	2,250	65	65	300	600	75	18	1,000

**Table 4.** Students' pre-test and post-test results of material on B2SA eating habits.

No.	Materials	Pre-test (%)	Post-test (%)
1.	A diverse, nutritious, and balanced eating habits	47.66	66.41
2.	Safe food	59.37	59.37
Average Score (%)		53.52	62.89

The data in Table 4 shows that the participants' knowledge of diverse, nutritious, and balanced eating habits increased by 18.81% after the extension, but there was no increase resulted in knowledge on safe food material. Although there was no increase, participants already had sufficient knowledge in selecting safe food for consumption, as indicated from their knowledge level, which exceeded 50%.

The second material on Halal Food and the Basics of Islamic Law was delivered by Dr. Ir. Yaktiworo Indriani, M.Sc. (Figure 5). This material conveyed the importance of halal food for Muslims and its legal basis. Participants were very enthusiastic in listening to the material presented, this can be seen from a question by a participant, namely whether cosmetics that have obtained BPOM numbers can be considered halal.

The evaluation by comparing the pre-test and post-test score showed an increase in the participants' knowledge by 11.85%, from 58.44% to 70.29% after extension was given. In detail, the results of the pre-test and post-test of students' knowledge of halal food material are presented in Table 5. Based on Table 5, it can be seen that the highest increase in participants' knowledge was resulted in this second material, which amounted to 28.12%. This is because the students have never been given education previously about the basics of halal and haram food laws, as well as about the institutions that certify halal products.



**Figure 5.** Delivery of material on halal food by Dr. Ir. Yaktiworo Indriani, M.Sc.

**Table 5.** Students' pre-test and post-test results of material on halal food.

No.	Materials	Pre-test (%)	Post-test (%)
1.	Halal and haram food	75.33	76.50
2.	Thoyib food	87.50	93.75
3.	Legal basis of halal and haram food	12.50	40.62
Average Score (%)		58.44	70.29

Nowadays, food/beverages are made with a wide variety of types and flavors, but the majority of them are high in calorie, sugar, salt, and fat content, but poor in vitamins, protein, and minerals content. This is what makes contemporary food to negatively impact society's future health. Therefore, the team also provided educational materials related to the negative impact of consuming these contemporary foods/beverages to the students. The socialization material was delivered using quite a lot of interesting visualizations and infographics. The third material on the negative impact of contemporary food and beverages on future health was delivered by Dewi Mulia Sari, S.P., M.Si. (Figure 6). This material conveys an understanding of the content of contemporary food and beverages and their negative impact on adolescents' health in the long run. Participants seemed enthusiastic in listening to the material presented.





**Figure 6.** Delivery of material on the negative impact of contemporary food/beverages by Mrs. Dewi Mulia Sari, S.P., M.Si.

A pre-test and post-test were conducted to determine students' understanding of this third material. The results are presented in Table 6.

**Table 6.** Students' pre-test and post-test results of material on the negative impact of contemporary food/beverages.

No.	Materials	Pre-test (%)	Post-test (%)
1.	Content of contemporary food/beverage	81.25	96.875
2.	Negative impact of contemporary food/beverages on future health	83.59	84.03
Average Score (%)		82.42	90.45

Based on Table 6, it can be seen that the average knowledge of students has increased by 8.03%, from the initial knowledge of 82.42% to 90.45 after the material was delivered. This indicates that students' understanding of the negative impact of contemporary food/beverages was already in the very good category. The monitoring results also obtained information that Daarul 'Ilmi High School has prepared a canteen that sells healthy food (food that is cooked on the spot) and does not provide instant or packaged food, and students no longer buy snacks outside the school area. At the end, the activity was closed with a group photo session between Daarul 'Ilmi High School students, the principal, and activity organizers (Figure 7).

Overall, this community service activity has been able to increase students' understanding of a diverse, nutritious, balanced, safe, and halal eating habits, as well as the impact of contemporary food/beverages on their future health, also resulted in changes in students' behavior in consuming contemporary food.



**Figure 7.** Group photo session: Daarul 'Ilmi High School students, principal, and activity organizers.

#### 4. Conclusions

Based on the results of community service activities that have been carried out, it can be concluded that the target participants in Daarul 'Ilmi High School have been able to increase their knowledge and understanding related to diverse, nutritious, balanced, safe, and halal (B2SAH) eating habits and the negative impact of contemporary food/beverages on their future health. The average knowledge of students after receiving socialization in this activity is considered in good criteria.

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