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The Nutritional Problems of Adolescents among the Traditional Community of Suku Anak Dalam in the Working Area of Pematang Kabau Health Center, Sarolangun

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Abstract

BACKGROUND: Adolescents in traditional community of Suku Anak Dalam (SAD) are a group that is susceptible to experiencing nutritional problems and their nutritional status needs to be considered, because it is a transitional period from childhood to adulthood who live as marginalized.

AIM: This study aims to know the nutritional problems of adolescents among the traditional community of SAD in the working area of the Pematang Kabau Health Center, Sarolangun District.

METHODS: This study used a cross-sectional study design which was conducted in the working area of Pematang Kabau Health Center in July until August 2020. The sample in this study was 30 adolescents with a purposive sampling. Measuring instruments used include microtome, scales, and 2 times 24-h food recall questionnaire. Data were collected by conducting guided interviews using a questionnaire and direct measurement of nutritional status. The data analysis used univariate analysis.

RESULTS: The results showed that most of the SAD adolescents had normal nutritional status (83.4%), poor eating habits (56.7%), macronutrient levels were classified as deficit. SAD adolescents have no taboos (76.7%), and their parents' education is low (100%).

CONCLUSIONS: Based on the results of the study, it can be concluded that there are still nutritional problems in adolescents with SAD, especially in the aspects of consumption and eating habits. Therefore, it is hoped that nutrition and health workers will be active in providing regular education to SAD adolescents so as not to cause nutritional problems.

Introduction

Human resources is an important component in achieving health development goals. The goal of health development toward Healthy Indonesia 2025 is to increase awareness, willingness, and ability to live a healthy life. Excellent human resources are needed to improve the health status of the community. Nutrition is an important part of the health sector and gets serious attention from the government. The influence of nutritional problems on growth, development, intellectual, and productivity shows the magnitude of the role of nutrition for human life. If there is a nutritional disorder, both undernutrition and overnutrition will have an effect in future.

Based on the results of the Indonesian Basic Health Research Report (Riskesdas) in 2018, the prevalence of nutritional status of adolescents aged 16–18 years was 1.4% very thin, and 6.7% thin. While, in Jambi Province in 2018, the prevalence of nutritional status of adolescents aged 16–18 years was very thin reaching 1.5% and underweight reached 6.5% [1]. This indicates that the problem of poor nutritional status is still a health problem in Indonesia and Jambi Province.

Adolescent is someone who has reached the age of 10–19 years for girls and 12–20 years for boys. Adolescents are vulnerable to nutritional problems because it is a period of transition from childhood to adulthood which is marked by a growth spurt, secondary sex characteristics arise, fertility is achieved, and psychological and cognitive changes occur [2].

Adolescents are a group that needs to be considered for their nutritional status, considering that the accelerated growth and development of the adolescent body requires more energy and other nutrients [3]. Several previous studies have shown that there is a significant relationship between macronutrient levels and nutritional status [4], [5], [6].

In Jambi Province, there is the Suku Anak Dalam (SAD) or jungle people who are an isolated tribe who live marginalized or left behind. According to the Central Statistics Agency of Sarolangun in 2010, the

number of SAD communities in Air Hitam Subdistrict, Sarolangun Regency, is 1095 people with 537 males and 558 females. According to data from the Pematang Kabau Health Center Profile in 2019, it is known that as many as 30 adolescents in the working area of the Pematang Kabau Health Center live in the village community. The results of a survey in the working area of the Pematang Kabau Health Center on 5 adolescents showed that there were 40% of SAD adolescents who had poor nutritional status and eating habits. This is because of the limited availability of food, they only use garden produce and buy food at the nearby market once a week. In addition, the level of adequacy of macronutrients is known to be mostly classified as a severe deficit with a percentage of 80%. This can cause nutritional problems in SAD adolescents. Therefore, this study aims to analyze the nutritional problems of adolescents among the traditional community of SAD in the work area of the Pematang Kabau Health Center, Sarolangun District.

Methods

This research has been granted ethical approval by the Health Research Ethics Committee of the Faculty of Medicine and Health Sciences of Jambi University with the number 1589/UN21.8/PG/2020. This study used a cross-sectional study design which was conducted in the working area of Pematang Kabau Health Center in July to August 2020. The population in this study was all of adolescents in the working area of Pematang Kabau Health Center and as much as 30 adolescents were recorded in Pematang Kabau Health Center. The sample in this study was 30 adolescents with a purposive sampling. Measuring instruments used include microtome, scales, and 2 times 24-h food recall questionnaire on working days and weekend.

In this study, the adequacy of the nutrients analyzed were macronutrients (energy, protein, fat, and carbohydrates). The level of nutrient adequacy is classified into 5 categories, namely: 1) severe deficit if the level of nutrient adequacy is less than 70 percent of the RDA, 2) moderate deficit if the level of nutrient adequacy is in the range of 70 to 79 percent of the RDA), 3) mild deficit if the level of nutrient adequacy in the range of 80 to 89 percent of the RDA), 4) normal if the level of nutrient adequacy is in the range of 90 to 119 percent of the RDA, and 5) excess if the level of nutrient adequacy is more than or equal to 120 percent of the RDA [7].

Nutritional status data in adolescents are categorized based on body mass index by age. The nutritional status categories consist of underweight (−3 SD < −2 SD z-score), normal (−2 SD <1 SD z-score), overweight (1–2 SD z-score), and obesity (>2 SD z-score) [8]. Data on eating habits were categorized as poor if the answer score was <21 times/week, and good if the answer score ≥21 times/week. The food taboo variables were categorized into taboos and no taboos. Adolescent education consists of low education if not attending school, graduating from elementary school, and graduating from junior high school and higher education if it passed the high school and university.

Data were collected by conducting guided interviews using a questionnaire and direct measurement of nutritional status. The data analysis used univariate analysis.

Results

Characteristics of SAD adolescents

The characteristics of SAD adolescents in this study included age, gender, religion, and adolescent education.

Based on Table 1, it is known that most of the adolescents are in the age range of 10–15 years (early teens) as many as 18 respondents (60%) with an average age of 15 years, female (63.3%), and embracing Islam (76.6%), and all of the SAD adolescents have low education (100%).

Table 1: The distribution of SAD adolescent characteristics

Characteristics	Total (n)	Percentage
Age		
10–15 years	18	60
16–17 years	4	13.3
18–19 years	8	26.7
Gender		
Male	11	36.7
Female	19	63.3
Religion		
Islam	23	76.6
Ancestral Faith	5	16.7
Christian	2	6.7
Adolescent education		
Low	30	100
High	0	0

Overview of the nutritional status of SAD adolescents

The distribution of the nutritional status among SAD adolescents in the working area of the Pematang Kabau Health Center is shown in Table 2.

Table 2: The distribution of nutritional status among SAD adolescents in the working area of Pematang Kabau Health Center

Category nutritional status	Total (n)	Percentage
Underweight	4	13.3
Normal	25	83.4
Overweight	1	3.3
Obesity	0	0
Total	30	100.0

In Table 2, it is known that most of the adolescents have normal nutritional status, as many as 25 respondents (83.3%).

Table 3: The distribution of eating habits among SAD adolescents in the working area of Pematang Kabau Health Center

Eating habit	Total (n)	Percentage
Poor eating habits	17	56.7
Good eating habits	13	43.3
Total	30	100

Overview of eating habits

The distribution of eating habits among SAD adolescents in the working area of the Pematang Kabau Health Center is shown in Table 3.

It is shown in Table 3 that most of the SAD adolescents have poor eating habits (56.7%). Poor eating habits marked by low eating frequency are shown in Table 4.

Table 4: The description of eating habits by food group among SAD adolescents in the working area of Pematang Kabau Health Center

Type of food group	Minimum (x/week)	Maximum (x/week)	Mean ± SD
Food sources of carbohydrates	14	35	27.5 ± 5
Vegetable	1	3	1.70 ± 0.65
Animal side dishes	1	2	1.27 ± 0.45
Vegetable side dishes	1	10	3.20 ± 2.21
Fruit	0	2	0.93 ± 0.365
Drink	4	15	9.43 ± 2.96
Milk	0	1	0.27 ± 0.45

Based on Table 4, it is known that most of the SAD adolescents are classified as lacking in consuming milk, which is <1 time/week. Furthermore, the food groups that are rarely consumed are fruit (1 time/week) and vegetables (1–2 times/week).

Overview of macronutrient adequacy levels

The adequacy level overview of macronutrients in adolescents SAD in Pematang Kabau Health Center is shown in Table 5.

Table 5: The distribution of macronutrient adequacy levels among SAD adolescents in the working area of Pematang Kabau Health Center

Macronutrient adequacy level	Amount (n)	Percentage
Energy adequacy level		
Severe deficit	30	100
Moderate deficit	0	0
Mild deficit	0	0
Normal	0	0
Protein adequacy level		
Severe deficit	27	90.0
Moderate deficit	1	3.3
Mild deficit	0	0
Normal	2	6.7
Fat adequacy level		
Severe deficit	30	100
Moderate deficit	0	0
Mild deficit	0	0
Normal	0	0
Carbohydrate adequacy level		
Severe deficit	24	80
Moderate deficit	5	16.7
Mild deficit	0	0
Normal	1	3.3

Based on Table 5, it is known that all respondents (100%) have sufficient levels of energy and fat which are classified as severe deficits. Meanwhile, the level of protein and carbohydrate adequacy is classified as a severe deficit with 90.0% and 80.0%, respectively.

Table 6: The distribution of food taboos among SAD adolescents in the working area of Pematang Kabau Health Center

Food taboos	Total (n)	Percentage
There are taboos	7	23.3
There are no taboos	23	76.7
Amount	30	100

Overview of food taboos

The distribution of food taboo among SAD adolescents in the Pematang Kabau Health Center Work Area is shown in Table 6.

Table 6 shows that most of the respondents do not have food taboos as many as 23 respondents (76.7%). However, it was still found as many as 7 SAD adolescents who had food taboos such as not consuming free-range chicken and not consuming lemons.

Discussion

Characteristics of SAD adolescents

This study showed that the majority of SAD adolescents in this study are classified as early adolescents. According to Norris *et al.* (2021), early adolescence at the age of 10–15 years is characterized by the incidence of puberty and an increase in cognitive development, a rapid increase in growth and physical maturity [9].

The nutritional problems in early adolescence arise due to incorrect nutritional behavior, namely an imbalance between nutritional consumption and recommended nutritional adequacy. Adolescents need a balanced nutritional element to achieve achievement and quality human resources [10]. According to Ariestya *et al.* (2015), still 80% of adolescents have the habit of skipping meals, 20% consume food 3 times a day, and 60% of adolescents replace food with snacks [11].

By level of education, it is known that all of adolescent SAD has a low education (100%) (Table 1), where they are not in school, and there is a school but did not graduate. Formal education is a relatively new phenomenon for SAD individuals. This study also showed that most of the youth of SAD Pematang Kabau are female (63.3%). Adolescent girls experience a faster growth rate than boys because their bodies need preparation before reproductive age, while boys experience growth spurts 2 years later [12]. On the other hand, the characteristics of the respondents based on religion are that most of the respondents are Muslim (76.7%). However, there are still ancestral beliefs that are embraced by a small number of respondents, namely animism. SAD believes that in order to survive, every activity must perform worship of ancestral spirits..

Nutritional status of SAD adolescents

The results showed that most of the adolescents had normal nutritional status. The results of this study are in line with Lasandang *et al.* (2016), which showed that the majority of adolescents at 6 junior high schools of Tidore Island had normal nutritional status [13]. However, this study still found SAD adolescents with poor nutritional status, namely 13.3% with an average z-score of −2.75 SD. Based on data from the Indonesian Basic Health Research Report (Riskesdas) of Jambi Province in 2018, the prevalence of undernutrition status in adolescents is below 10%, so it can be said that the prevalence of undernutrition status in SAD adolescents in Pematang Kabau Village is higher than the prevalence of malnutrition in Jambi Province. The prevalence of undernutrition is also higher than the national data from Riskesdas in 2018 where the prevalence of underweight in adolescents aged 13–15 years is 11.1% consisting of 3.3% very thin and 7.8% thin [1].

The results of nutritional status which tend to be normal in SAD adolescents are good things. The normal nutritional status plays a role in achieving reproductive health, as well as optimal growth and development in adolescents [12]. Meanwhile, good nutritional status in adolescence is also very important so that the pregnancy period is not at risk. Prospective mothers whose height is less than 145 cm are at high risk of experiencing difficulties during childbirth, while mothers who have a history of underweight (<45 kg) tend to give birth early (prematurely) with a risk of low birth weight and impaired child development [10].

Therefore, it is expected that nutrition workers and other health workers in the Pematang Kabau Health Center Work Area to be active in providing regular education to SAD adolescents and SAD family members about the importance of nutrition in adolescence. For adolescents who have overweight and underweight nutritional status, assistance efforts are needed to regulate eating habits and good physical activity in order to achieve normal nutritional status.

Eating habits of SAD adolescents

The results of the study on SAD adolescents showed that most of them had poor eating habits (56.7%). Most SAD adolescents are known to be less in consuming milk. The low consumption of milk causes adolescents to experience nutritional deficiencies such as calcium, potassium, protein, and vitamin D which play a role in bone health, so that if this continues to occur, it will interfere with the growth process of adolescents.

A healthy-based food pattern, positively associated with higher physical activity levels, and some dietary behaviors such as less frequent out-of-home eating and fast food intake, shows that both healthy eating and active lifestyle habits are important determinant factors of healthy-based food patterns in these adolescents. On the contrary, unhealthy dietary behavioral practices such as a high frequency of breakfast skipping, and high frequency of eating out from home in a week, and intakes of fast foods, carbonated sweetened beverages, and snacking in a day were significantly and positively associated with greater adherence to the "Western-based" food pattern among these adolescents [14].

In general, almost all types of food consumed by adolescents with SAD, only the frequency is classified as lacking. In the habit of eating vegetable side dishes, vegetables and fruit are still very lacking because SAD adolescents can get food, namely when there is a market, which is once a week. The more complete the food consumed, the more complete the composition of nutrients. On the other hand, if the daily consumption of food is not complete, it will cause an imbalance of nutrients, where nutrients are needed for a healthy and productive life.

Eating habits can be an estimate of the level of adequacy of nutritional consumption. That is, the higher the frequency of eating a person, the greater the chance of fulfilling nutritional adequacy [15]. One of the causes of malnutrition related to eating habits is because the food is not sufficient in quantity and too low in nutritional quality, and if it lasts a long time, it causes changes in metabolism in the brain, resulting in a decrease in adolescent intelligence [16].

Based on the results of interviews and in-depth approaches carried out by researchers, it was found that most SAD adolescents (50%) did not eat breakfast because they were not used to it and there was no food to eat in the morning. This is in line with a study among the Iranian students, which showed that the total pooled prevalence of skipping the breakfast was 0.216 (95% CI: 0.213–0.22); the girls had a higher percentage for skipping breakfast compared with boys (26% vs. 18%). Skipping breakfast has been reported in several countries, and skipping the breakfast meal was more common in children and adolescents [17]. Poor socioeconomic status was strongly associated with skipping breakfast in the Iranian population. However, eating breakfast is often done by children whose parents have good education and economic status [18].

Therefore, it is expected that nutrition workers and other health workers in the Pematang Kabau Public Health Center will actively provide education related to balanced nutrition cones for adolescents and provide nutritional assistance to SAD adolescents who have poor eating habits and it is hoped that cross-sectors such as the agriculture office, the food security office can conduct local food campaigns so that the food consumed by SAD youth is more varied and sufficient.

Macronutrient adequacy levels of SAD adolescents

The results showed that all respondents (100%) had a level of energy sufficiency which was classified as a severe level of deficit. The results of this study are

in line with research in Nigeria which showed more macronutrient inadequacies in the older children [19].

This study found that the average energy intake of SAD adolescents was 916 kcal/day with an average energy adequacy level of 41.3%. Meanwhile, the recommended energy adequacy requirement for adolescents is 2200 kcal. Ideally, adolescents should consume 3–8 servings of staple foods every day (2100–2500 kcal) [20]. This portion is adjusted to the calorie needs, age, and activity of adolescents. Staple food is given in greater quantities than other sources because of its function as the main source of energy. While the basic eating habits of SAD adolescents have the habit of eating staples or lacking carbohydrates. This is because SAD adolescents consume carbohydrates that do not vary and in small amounts. Meanwhile, in the teenage period, adequate energy intake is needed to balance the growth and development of adolescents. So if the level of carbohydrate adequacy is less then the source of energy is also lacking and can interfere with the process of adolescent growth and development.

Energy intake that is less than needs causes energy reserves contained in the body and stored in muscles to be used up. If it lasts for a long time, it can result in decreased learning achievement, work productivity, weight loss, and a state of malnutrition. Continued weight loss will lead to malnutrition which will result in stunted growth and development. Another impact that can arise is height that does not reach the normal size and is susceptible to infectious diseases. Meanwhile, excessive energy consumption will result in weight gain, and if it continues, it will cause obesity and the risk of degenerative diseases [21].

Energy and carbohydrate intakes are interrelated because carbohydrates are the largest main source of energy, where 75% of the total energy is obtained from carbohydrate sources. In order to meet the energy needs in a day, it is recommended to eat regularly 3 times a day starting with breakfast, lunch, and dinner and not skipping the consumption of distractions [22].

This study found that the average protein intake in SAD adolescents was 30.2 g/day with an average protein adequacy level of 30.2%. Meanwhile, the recommended protein adequacy requirement for adolescents is 80 g/day. Ideally, adolescents should consume 2–4 servings of side dishes per day (80–160 g/day). This portion is adjusted to the protein needs, age, and activity of adolescents [20]. While the eating habit of animal and vegetable protein sourced from side dishes in SAD adolescents is less, namely 1 until 3 servings/week (40 until 120 g/week). This is because SAD adolescents consume sources of vegetable and animal protein that do not vary and in small amounts.

The lack of protein adequacy in SAD adolescents is caused by the lack of consumption of side dishes. Most of the respondents only consumed side dishes or protein sources such as tempeh, tofu, eggs, chicken, and fish as much as 1 until 3 times/week. In addition, economic factors and barriers to food access are also one of the factors causing low protein intake. Access to SAD food is available when there is a community market in Pematang Kabau Village, which is once a week.

Consumption of animal and vegetable side dishes should be varied because they have different essential amino acid advantages between animal and vegetable [23]. Therefore, SAD adolescents are recommended to consume various side dishes every day. To meet the needs of animal and vegetable protein in a day it is recommended to eat regularly 3 times a day, namely breakfast, lunch and dinner.

The impact of insufficient protein intake in SAD adolescents has an impact on poor growth, decreased body resistance, more vulnerability to disease, and decreased creativity and memory; on the other hand, excess can cause health problems, especially in the kidneys and liver because they have to work more hard. In general, protein is needed by our body to build muscle or grow our body. Muscles, nails, and hair are also made of protein. Protein is needed for growth, development of the body, the formation of new tissues, and maintenance of the body. Protein is also useful for clearing the mind and increasing the concentration of adolescent intelligence [24].

This study found that the average fat intake in SAD adolescents was 20 g/day with an average fat adequacy level of 27%. Meanwhile, the recommended fat adequacy requirement for adolescents is 70 g/day. According to Regulation of the Minister of Health, ideally the consumption of food sources of fat (animal protein) in adolescents every day is 20–25% of the total energy or equivalent to 67–70 g/day while the frequency of eating habits of fat sources is in the animal protein of SAD adolescents, namely an average of 1 per week (20 g/day). This portion is adjusted to the calorie needs, age, and activity of adolescents [20].

The impact of insufficient fat intake on adolescents is that the skin will appear itchy and scales, it is difficult to focus on decreasing concentration, the body will be weak, and when the temperature is cold, it is easy to feel cold. Conversely, excess fat intake is at risk of being overweight, obese, and increasing the risk of cardiovascular disease in future. Many people associate fat with a negative side, but fat has very vital benefits for the body [9]. Fat has benefits for the body in helping cell growth, providing energy, producing hormones, helping improve brain performance, supporting skin health, and helping the process of vitamin absorption so that it can work optimally fat soluble, such as vitamins A, D, E, and K [21].

Based on the recall data obtained at the time of the study, it was shown that the tribal youths still did not consume fat sources of food such as animal side dishes, snacks, or foods containing oil. Therefore, it is expected that nutrition and health officers at Pematang Kabau Health Center can provide education about the role of

nutrition in life to adolescents and SAD family members. For adolescents who have a fat adequacy level, they need nutritional assistance efforts to regulate good eating habits and activities so that the level of fat adequacy is fulfilled.

This study found that the average carbohydrate intake in SAD adolescents was 161.2 g/day with an average protein adequacy level of 49%. While the recommendation for carbohydrate adequacy in adolescents is 350 g/day. Ideally, adolescents should consume 3–8 servings of staple food (300–400 g/day). While the frequency of basic eating habits of SAD adolescents has the habit of eating staples or carbohydrates, which is an average of 1–3 times/day (100–200 g/day) [20].

The lack of adequate levels of carbohydrates is a factor in the lack of basic food intake consumed by respondents. Most of the respondents only consumed staple foods such as rice, instant noodles, and potatoes. Based on the results of the study, it was found that there were still many adolescents who did not get enough carbohydrate nutrients; this was a phenomenon found in the field at the time of recall. According to Ambarwati (2012), the need for carbohydrates as the main energy source in adolescence is approximately 45% of total energy [25]. Food sources of carbohydrates can be rice, potatoes, corn, wheat, fruits and sweet potatoes. Therefore, SAD adolescents are recommended to consume varied staple foods with a frequency of 3–8 servings per day so that the level of carbohydrate adequacy can be fulfilled.

Impact of insufficient carbohydrate intake in SAD adolescents causes various side effects such as extreme fatigue, headache, stomach pain, slow menstruation, and diarrhea. Carbohydrates must be available in sufficient quantities because a lack of carbohydrates about 15% of the available calories can cause hunger and weight loss; on the other hand, if the amount of carbohydrates available in high amounts can cause weight gain, and if it continues, it will cause obesity and the risk of degenerative diseases [21].

Food taboos

The study found that most SAD adolescents did not have any dietary restrictions (76.7%). However, it was still found as many as 23.3% adolescents who had dietary restrictions such as not consuming free-range chicken and not consuming lemons. According to in-depth interviews, native chickens are believed to be sacred animals for traditional ceremonies, while lemons are believed to cause stomach pain.

This study found that in addition to taboo foods, the indigenous tribal community also provided foods that were recommended and considered healthy foods. Based on the results of interviews and an in-depth approach with the *Tumenggung* (tribal leader), it was found that the indigenous tribal community of the SAD often consumes spices to improve health such as kencur rice, sembukan leaves, and sambiloto and recommends drinking water from a wooden stump if a family member is sick.

The impact of the prohibition on eating free-range chicken resulted in the respondent lacking one type of food, namely chicken meat which is a source of protein and lemon which resulted in the respondent lacking one type of vitamin C source needed by the body. SAD teenagers who have dietary restrictions are those who have faith in their ancestors. Based on the Girl Effect and Nutrition International study in 2018, belief in certain food taboos has an impact on poor nutritional status and stunted growth in adolescents. Adolescents surveyed said they avoided cucumbers because they were thought to cause vaginal discharge, and pineapples, which could make it difficult for them to have children in future [26]. According to a study of Massie in 2013, the phenomenon of food taboo among women in Indonesia is still a problem because there are many types of food that should be consumed but are actually avoided. As a result, women, especially those who are pregnant or breastfeeding, do not dare to eat certain foods that affect their nutritional status [27].

The SAD is one of the indigenous peoples who still uphold ancestral customs and culture. Even though these people are now exposed to the modernization period, until now in terms of treatment and dietary restrictions, they still believe in past culture. People who adhere to a taboo usually believe that if the taboo is violated, it will result in losses that are considered a punishment. In reality, this punishment does not always occur and often does not occur at all. It seems that various taboos or taboos were originally intended to protect health, but this goal even has the opposite effect, namely harming nutritional and health conditions.

Therefore, it is hoped that the Village Head and *Tumenggung* in the working area of Pematang Kabau Health Center will provide an understanding regarding taboo foods that should be consumed but are taboo for SAD adolescents. Meanwhile, nutritionists are expected to be able to provide education and nutritional assistance for SAD adolescents who have dietary restrictions to achieve normal nutritional status.

The limitations of this study are SAD's communication and language skills, so it takes a long time to recall food consumption. However, in this study, *Tumenggung* was accompanied by *Tumenggung* to assist in translating the language during the research process.

Conclusions

Based on the results of the study, it can be concluded that there are still nutritional problems in adolescents with SAD, especially in the aspects of

consumption and eating habits. Therefore, it is hoped that nutrition and health workers will be active in providing regular education to SAD adolescents so as not to cause nutritional problems.

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