Prevalence of Nutritional Status and Dietary Habits among Adolescent in Urban Area in Medan, North Sumatera, Indonesia

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Abstract: Adolescence is an important time in life because it is a transition from childhood to adulthood. This research aimed to determine the prevalence of nutritional status and the association with dietary habits among adolescent in urban area in Medan, North Sumatera Utara. This research is an analytic study with cross sectional approach. Total sample is 400 adolescents aged 12-19 years old from 4 schools (SMP Al Wasliyah Medan, SMA Al Wasliyah Medan, SMPN 41 Medan, SMP Santo Yosep Medan). Study period was from February to July 2018. Variables included were age, Socio-economic characteristics of the parents, weight, height and dietary intake pattern. Nutritional status was evaluated according to the anthropometric indicators, which were based on the WHO criteria. Dietary intake data were gathered by using two 24hr recall questionnaires and a QFFQ. Chi-square analysis was used in order to find the association between dietary habits and nutritional status. Prevalence of underweight, overweight and obesity (WHO/National Center for Health Statistics reference) were respectively, 23.3%, 13.0% and 6.5%. Underweight (32.0%) was found to be more prevalent among adolescent with aged 10-12 years (early adolescent). Adolescent boys suffered more underweight (37.8%) than adolescent girls (18.6%).The dietary habits associated with the nutritional status were having breakfast, consuming meat/fish and vegetables(P <0.05). Underweight in adolescence has become a true public health problem in North Sumatera province.

1 INTRODUCTION

One of the characteristics of advanced nations is that has high levels of health, intelligence, and work productivity. These three things are influenced by the state of nutrition. Optimal nutrition is essential for normal growth as well as physical and intelligence development of infants, children, and adolescents (Irwandy et al., 2014). Adolescents are among the most vulnerable groups experiencing nutritional problems. Adolescence is an important period in which nutritional needs increase for growth of bone, muscle and development during this phase (Tesfaye et al., 2015). Teenagers are children aged 10-19 years. WHO defines adolescence as a time when the individual develops from the first time he shows his secondary sexual signs (puberty) until reaches sexual maturity.

Adolescent nutritional problems need a special attention for affecting the growth and development of body and its impact on adult nutritional problems in the future. Physical growth causes adolescents to require a greater intake of nutrients than children do. In this phase, adolescents are intensely active with various activities, both school and sports activities (3 (Proverawati, 2010). Especially in young women, nutritional intake is also required for the preparation of reproduction (Arisman, 2002).

Energy intake influence the incidence of stunting in school children (Lestari et al., 2018a), anemia in

pregnant women (Lestari et al., 2018b), and obesity in adult female (Lestari et al., 2017). Nutrition problems that often occur in adolescence is the lack of nutrient intake resulting in malnutrition that is too thin that can trigger chronic energy deficiency (CED) and can be affected by anemia due to iron deficiency.

Adolescent nutritional problems occur as a result of changes in eating habits caused by peers, media advertising and the need to be respected in the family (Mase et al., 2015). The development of adolescent psychology also influences eating habits, such as leaving time to eat, overeating, taking supplements, and having favorite foods (Stang and Marry, 2005). Changes in eating habits in adolescents are caused by low nutritional knowledge and inappropriate dieting behavior. The level of knowledge of one's nutritional affects the attitude and behavior of a person in choosing foods that will affect nutritional status. The higher the level of one's nutritional knowledge, the better the nutritional status (Khomsan., 2007). The imbalance between food consumed with the needs in adolescents will lead to multiple nutritional problems of less nutrition and more nutrition.

WHO reported in (2009), 1 out of 10 school children were overweight. About 30 million to 45 million children suffered from obesity. It was estimated that 2-3 percent were aged 5-17 years (Delisle and WHO, 2005). While in Indonesia, based on Riskesdas data in 2010 and 2013 showed an increased prevalence of obesity (BMI> 25), where the prevalence of adolescents aged 13-15 years who had weight obese increased from 5.2% to 5.9% (MOH, 2013). Another problem faced by teenagers was malnutrition.

The 2012 Unicef report showed that in 11 of 64 countries, more than a quarter of teenagers had status lean, were found in 21 countries from 41 countries, and more than one third of adolescent girls are anemic. Evidence suggests that malnutrition in young women continues between generations of mothers to children. Another study by Aguayo V & Paintal K in South Asia showed that malnutrition and anemia suffered by 50% of girls in South Asia (Aguayo and Kajali, 2017). Meanwhile, according to data MOH (2013), it was known that the national prevalence of lean in adolescents aged 13-15 years is 11.1%. This study aimed to determine the prevalence of nutritional status in relation to the eating habits of adolescents in urban poor areas in North Sumatra.

2 MATERIAL AND METHOD

This research is an analytic survey with cross sectional study design. Total samples of 400 adolescent aged 12-19 years coming from 4 schools: SMP Al WASLIYAH, SMA AL WASLIYAH, SMPN 41 and SMP Santo Yosep from Medan City, North Sumatra Province. Data was taken in February to July 2018.

Type of data collected in this study was primary data using questionnaires and anthropometry measurements. Socio-demographic data and dietary habits were taken by structured interview questionnaires while anthropometric measurements included height, weight and Body Mass Index (BMI). Measurements of height and weight were taken according to the WHO's guideline. Weights of the school adolescents were measured to the nearest 0.1 kg on a battery powered digital scale (SECA, UNICEF, Copenhagen) and height was measured to the nearest 0.1 cm using a wooden height-measuring board with a sliding head bar following standard anthropometric techniques (WHO, 2009). Anthropometric indicators used in this study were BMI for age z-score (BAZ) and height for age z-score (HAZ). School adolescents below -2 HAZ score were classified to be stunted and those with BAZ score less than -2 were classified to be thin. Food Frequency Questionnaire (FFQ) was used in order to obtain the dietary habits and food intake data.

SPSS statistical software was used in order to analyze the data. Chi square test was applied to calculate P-value and statistical significance.

3 RESULT

The most father's education of respondent was High School (58.3%) then followed by University (14.4%). While most respondents education was also High school (44.3%), Junior School (33.3%) and there were 13.0% graduated University. Viewed from the economic aspects, the results showed that most of respondent were in low social economy that was equal to 86.8%. This data was reinforced by findings that most respondents (57.0%) received pocket money less than IDR 7000. Respondents in this study lived in crowded populated urban areas where there were 63.3% family's members of more than four people in one house (Table 1).

Table 2 shows the total number of 400 adolescents participated in this study. It was found as many as 23.3% of adolescent suffered from

underweight. About 13.0% of them had overweight, and 6.5% had obesity (Table 2).

Table 3 shows the age group of 10-12 years (early) adolescent girls suffered more underweight (32.0%) and overweight (12.2%). While in the age group 13-15 years (mid) suffered underweight (24.0%). Obesity was more suffered by the age 6-19 years (late). This study showed adolescent boys suffered more underweight (37.8%) than adolescent girls (18.6%). However, adolescent girls were more overweight and obese (13.8% and 7.5%) than boys (Table 4).

The association between dietary habits and nutritional status is shown in Table 5. This study found that breakfast habits were significantly correlated with adolescent nutritional status (p = 0.008). In addition, it was found that most of the respondents rarely consumed side dishes made from meat / fish because of social economy conditions of parents were in the low group. There was a significant relationship between the consumption of meat with nutritional status of adolescents. It was 95.0% of that most respondents rarely consumed vegetables. There was a clear association between vegetable consumption and adolescent nutritional status. Not only rare to consumed vegetables, it was also found that 95.7% of urban youth rarely consumed vegetables.

Table 1: Distribution of adolescent according to socio-demographic features.

Variable	Category	n	%
Father's educations	No Schooling	3	0.7
	Primary School	19	4.7
	Junior School	53	13.2
	High School	235	58.3
	Diploma	32	7.9
	Bachelor Degree	58	14.4
Mother's educations	No Schooling	6	1.5
	Primary School	21	5.3
	Junior School	133	33.3
	High School	177	44.3
	Diploma	11	2.8
	Bachelor Degree	52	13.0
Social Economy	Low	347	86.8
	Middle	52	13.0
	High	1	0.3
Family's member	1-4 person	147	36.8
	> 4 person	253	63.3
Daily Pocket Money	< Rp 7,000	228	57.0
	>= Rp 7,000	172	43.0

Table 2: Prevalence of nutritional status in adolescent in urban area (n = 400).

Nutritional status	Frequency	%
Under weight	93	23.3
Normal	229	57.3
Overweight	52	13.0
Obesity	26	6.5
Total	400	100.0

Table 3: Cross distribution between age and nutritional status.

Age	Under weight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)
Early	32.0	53.7	12.2	2.4	100.0
Mid	24.0	56.1	13.7	6.3	100.0
Late	17.0	62.5	11.4	9.1	100.0

Table 4: Cross distribution between gender and nutritional status.

Gender	Under weight (%)	Normal (%)	Over weight (%)	Obese (%)	Total (%)
Boys	37.8%	48.4%	10.5%	3.2%	100.0%
Girls	18.6%	60.0%	13.8%	7.5%	100.0%

Table 5: Association between dietary habits and nutritional status.

Dietary habits	Category	Nutritional status		P
		Underweight (%)	Normal (%)	
Break fast	No	13.0	24.8	0.008
	Yes	29.8	32.3	
Meat/ fish	Never, sometimes	36.6	17.5	0.001
	Daily-weekly	32.6	17.5	
Tofu/ tempeh	Never, sometimes	26.3	34.8	0.929
	Daily-weekly	16.5	22.3	
Vegetable	Never, sometimes	39.6	55.4	0.040
	Daily-weekly	3.3	1.8	
Fruit	Never, sometimes	41.1	54.6	0.808
	Daily-weekly	1.8	2.5	
Tea	Never, sometimes	42.1	55.4	0.405
	Daily-weekly	.8.0	1.8	

4 DISCUSSION

This study found 23.3% of adolescents suffered from malnutrition. The prevalence of underweight in urban slums was higher than the national underweight (MOH, 2013) of 11.1%. This indicates that malnutrition in adolescents is a serious public health problem.

Adolescence, a period of transition between childhood and adulthood, occupies a critical position

in the life of human beings. This period is characterized by an exceptional rapid rate of growth. The peak rates of growth are exceeded only during the fetal life and early infancy (Sengar and Sharma, 2012). In this phase, adolescents are very active with various activities, both school and sports activities. Especially in young women, nutritional intake is also required for the preparation of reproductive reproduction.

The results of this study were in line with Kurniawan's research in Tangerang District, Banten Province involving 1060 children aged 10-12 years and found underweight, stunting and wasting were around 49.5%, 38.4% and 26.7% (Kurniawan et al, 2006). Another study was conducted by Hossen in Bangladesh with respondents 434 adolescent girls and found 65.9% of respondents had underweight (Hossen et al, 2016). Subsequently, a study by Vashist in India with 2000 adolescent participants found as many as 42.5% suffered from underweight (Vashist and Goel, 2009). The small underweight prevalence found by Skhiri in Tunisia (Aounallah-Skhiri, H., 2017) involving 1295 boys and 1577 girls aged 15-19 years, prevalence of underweight, overweight and obesity were, respectively, 8.1%, 17.4% and 4.1% among boys and 1.3%, 20.7% and 4.4% among girls. Similarly, a study conducted by Özgüven in Turkey involving adolescent students (284 males and 396 females) aged 14-18 years, found underweight, and overweight/obesity were 5.0% and 16.8% (Özgüven et al, 2010). This study showed that the prevalence of anemia in this population was above 15% indicating a public health problem.

This study found that the prevalence of underweight were more common in adolescents aged 10-12 years (early). Similar results were found by Joshi in Bhopal India involving 200 teenage girls found as many as 82.5% of adolescent girls suffering under weight (Joshi et al, 2014). Similar findings were reported in Neyamul Akhter study (Akhter, N. and Sondhya, 2013). This could be because of the early growth spurt in the girls with a sudden increase in height in early age group. The results of this study also indicate that malnutrition is more commonly experienced by male adolescents. This is related to the higher males' malnutrition needs than adolescent girls (Barker and Helen, 2002) and more teenage males, while nutritional intake is inadequate because the economic level of parents is mostly low. Economic limitation affects the selection of the type and amount of food consumed by family members.

As we can see in this study found that breakfast habits associated with adolescent nutrition status.

The results of a similar study conducted by Bartholomew BM (Bartholomew, 2018) concluded that there was influence breakfast on nutritional status, especially obesity. Different results conducted by Mariza in Semarang (Mariza and Kusumastuti, 2013] concluded there was no relationship between breakfasts with nutritional status. Breakfast frequency has been related to several health and lifestyle factors. Observational studies suggest frequent breakfast in adolescence to be associated with better academic and cognitive performance.

The consumption of dietary sources of animal protein such as meat and fish in this study was also related to the nutritional status of adolescents. It is known that meat and fish are a source of energy and protein for adolescent growth. Lack of this type of food causes adolescents suffer from malnutrition. Similarly, a study conducted by Samuelson in Europe involving adolescents aged 13-18 years concluded that the habit of skipping breakfast and vegetable consumption was at risk to increase the incidence of obesity in adolescents (Samuelson, 2000).

5 CONCLUSIONS

Malnutrition in adolescence has become a serious public health problem in North Sumatera Province especially in Medan City because of its high prevalence (23.3%) that it was above the National Prevalence (11.1%). Dietary habits associated with nutritional status in adolescent primarily breakfast, consumption of meat foods and vegetable (p <0.05). It is necessary to immediately do a nutritional intervention to reduce the incidence of underweight and improve the quality of life of adolescents in the future.

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