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Analysis of Knowledge Factors and Activity Patterns on Stunting in Adolescents (Junior High School) through Nutritional Patterns in Bojonegoro Regency

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Abstract

The problem of stunting is what illustrates the existence of chronic nutritional problems directly affecting health. Stunting in adolescents leads to decreased reproduction, increased risk of obesity, reduced concentration of learning, and degenerative diseases in the future. Adolescents need to obtain access to information and education about stunting. The purpose of this study analyzed the direct and indirect effect of knowledge factors and activity patterns of stunting in adolescents through nutritional patterns. This study was an observational analytic study with a cross-sectional design. The number of samples were 380 adolescents aged 10-15 years. The analysis of this study used path analysis. The results of this study showed that the activity pattern had a positive and significant effect directly on the incidence of stunting with a value of p = 0.048 and knowledge had a negative and significant effect directly on the incidence of stunting with a value of p=0.000. Furthermore, the activity patterns also have an indirect positive effect on the incidence of stunting through nutritional patterns, while knowledge has an indirect negative effect on the incidence of stunting through nutritional patterns. This showed that knowledge is the most influencing factor on the incidence of stunting in adolescents through nutritional patterns with a total value of the indirect effect of 1.27.

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INTRODUCTION

Stunting is an increasingly nutritional problem in developing countries such as Indonesia, both affected by mothers, future mothers, fetal period, infancy, toddlers, and adolescents also other problems that indirectly affect health Rahmawati et al. (2015). The incidence of stunting which occurs since childhood and is associated with slow motor rate development and low levels of intelligence (Martorell & Young, 2012).

Adolescence is a period associated with very low disease morbidity and mortality rates, but adolescents tend to have a higher prevalence of risk-taking behaviors, including unhealthy eating patterns that lead to nutritional problems such as being overweight, short stature, obesity, and anorexia (Ministry of Health, 2015). In this era, pathological changes in the occurrence of linear growth retarderings corelate to both morbidity and mortality rates, decreased physical capacity, developmental nervous system and economic conditions and increased risks of metabolic disease as adults (Prendergast et al., 2014)

Indonesia is one of the developing countries experiencing the fourth-highest stunting in the world wherein in 2018 the stunting rate has been 30.8% (Riskesdas, 2018). Based on the results of the Study on the Nutritional Status of Indonesian Toddlers (2019), the stunting rate was 27.6%, which has decreased by 1.5% from last year (Izwardy, 2020)

There was 26.2% stunting prevalence in East Java in 2018, However, in 2019 the prevalence of stunting in East Java was 36.8%, a drastic increase from the previous year, which was 10.6% and this figure is still far from the prevalence of international stunting standards, which is 20%.

Bojonegoro Regency is one of the areas in East Java with a high incidence of stunting. The incidence of stunting each year has increased. Based on the results of study, the incidence of stunting rate increased from 2016 prevalence of 7.1% in 2017, an increase in the prevalence of stunting, which was 7.6%, even in 2018 it has increased to 8.4%.Even though it was said to be safe in East Java compared to the stunting rate in other areas, every year this stunting rate continues to increase and continues to spread evenly throughout the region (Bojonegoro Health Office, 2018).

According on the results of a preliminary analysis conducted by researchers from anthropometric data obtained from three health centers in the Bojonegoro Regency, there were about 32 cases of adolescent stunting which was seen from the stage of each adolescent and there were 3 health centers with the highest number of stunting cases in adolescents, namely the Kanor Public Health Center area 12 cases of adolescent stunting, in the area of Public Health Center Sukosewu with a total of 9 cases of adolescent stunting and in the area of Public Health Center Balen with a total of 12 cases of adolescent stunting. This is in line with cases in the three sub districts of children under five who are most stunted. Interviews from the nutrition program holders of all three centers were obtained that the teen stunting case still has no records, usually in school prisons and only physical, sense, height, and weight inspection.

Stunted is the lowest group compared with others, possibly because of increased inflammation as well as decreased antioxidal capacity caused by lower nutritional intake (Beal et al., 2018). The state of the individual this stunting also triggers the process of producing adipose cells that can increase continuously as foreign stimulus by the immune mechanism and detected as free radias that can threaten the body (Hidayat et al., 2018)

Adolescents tend to spend time doing physical activities that release low energy (Suryani et al., 2015). Low energy costs are caused by a low body energy consumption reward, which appears to reduce physical activity in disrupted children. Sedentary habits and advancement in technology also affect low physical activity (Bonita & Fitranti, 2017).

A person's understanding of all those health will also identify multiple forms of issues in health and find solutions (Arnelia et al., 2010). The nutrition disorders occur due to poor awareness of needs, supplemental nutrition, and poverty, so healthy foods are not accessible (Septamarini et al., 2019)

The problem of stunting in adolescents needs to be handled seriously, because it can affect the growth and development of adolescents both in achievement and in preparing for the next generation (Aryastami & Taringan, 2017). The stunting itself will cause a decrease in reproduction and an increased risk of obesity and degenerative diseases in the future (Aramico, 2013). Moreover, stunting also causes an increase in mortality, morbidity in the development of both children and adolescents that will result in decreased cognitive, motor and language development (Sari et al., 2017).

Therefore, there is a need for socialization for adolescents to get access to information and education about stunting and its prevention (Aryastami & Taringan, 2017).

This study aims to analyze the factors of activity patterns and knowledge of the incidence of stunting in adolescents through nutritional patterns in the Bojonegoro Regency, East Java.

METHODS

This study was an observational analytic study using a cross-sectional design. The population of this study were adolescents in junior high school students (aged 10-15 years) in the Bojonegoro Regency, East Java, with a total population of 7,462 students. The sampling technique used cluster sampling to determine the case study. Meanwhile, the sampling technique used was random sampling of the population. The types of data used in this study were primary data and secondary data. The primary data was collected by researchers through a questionnaire to answer study questions. The secondary data collected in this study were obtained from reports on the general number of stunting at the Bojonegoro District Health Office and data on the total number of junior high school students from the Bojonegoro Regency Education Office.

The data collecting procedure of this study were questionnaires and observation sheets. This study used path analysis techniques (Path Analysis), namely the analysis technique which was the development of regression analysis techniques.

The path analysis scheme can be described as follows:

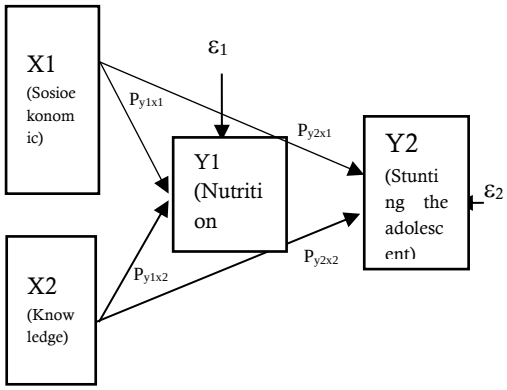

Figure 1. Path analysis scheme

RESULTS AND DISCUSSION

This study was conducted at Junior High School/State Madrasah Tsanawiyah, Bojonegoro Regency, East Java. The results of this study and discussion are the analysis of

activity patterns and knowledge of the incidence of stunting in adolescents through nutritional patterns.

The results of study on activity patterns and knowledge can be seen in Table 1.

Table 1 Results of activity patterns and knowledge of the intervening variables of nutritional patterns.

Variable	Nutrition Pattern				B	CI 95%		p
	Good		Less			Lower limit	Upper limit	
	∑	%	∑	%				
Activity pattern					1.92	1.00	3.67	0.048
Light	111	41.2	159	58.8				
Medium	40	37.1	68	62.9				
Heavy	1	50	1	50				
Knowledge						-	1.57	0.002
					1.09	0.64		
Good	60	40.5	88	59.5				
Moderate	0	0	0	0				
Less	92	39.7	140	60.3				

Based on table 1, the results of path analysis show the statistical value for the effect of nutritional patterns as an intervening variable belong activity pattern variables on the incidence of stunting in adolescents by showing that the value of b = 1.92 with a value of p = 0.048 <0.05; CI (95%) = 1.00 to 3.67. So it can be concluded that there is a significant indirect effect with a positive relationship, meaning that if the heavier the activities carried out by adolescents, the less the nutritional pattern will be so that it can increase the incidence of stunting. This is caused adolescents with sufficient activity patterns will be able to adjust the nutritional pattern as well. In this study, the variable nutritional patterns have a higher probability than activity patterns.

This study is in line with the study of Candra et al. (2016) which explains the results of their research that physical activity in adolescents affects the nutrition patterns of adolescents themselves, causing health problems because physical activity causes the process of burning energy so that the more youth are active, the more energy they have used. The same thing happened in the research of Baja & Rismayanthi (2019), if the physical activity carried out is higher, the nutritional pattern will be good, thereby reducing the risk of stunting and obesity.

In contrast to research by Zuhdy et al. (2015) which explains that the physical activity patterns of adolescents have no significant relationship with nutritional patterns because at this age the physical activity of adolescents is a very diverse and physical activity that is carried out routinely can burn fat that has accumulated in the body. Research by Sabbah et al. (2007) explains that adolescents are getting older, will be reduced the pattern of their activity, this can be related to the geographical location in Gaza which is an area with a dense population, poverty, lack of accessibility and availability of good foodstuffs local and factory-produced food.

The results of the path analysis showed the statistical value for the effect of nutritional patterns as an intervening variable between knowledge on the incidence of stunting in adolescents by showing that the value of b = 1.09; p = 0.002; CI (95%) = - 0.64 to 1.57. So it can be concluded that there is a significant indirect effect with a negative relationship, meaning that if adolescent knowledge is better, it can improve nutritional patterns so that it can reduce the incidence of stunting in adolescents. This is because if respondents who have good knowledge will be able to distinguish between adequate and insufficient nutrition patterns, in this study the nutritional pattern variable has a higher probability than knowledge.

This research is in line with the research of Sekti et al. (2019) which explains that there is a relationship between knowledge and consumption patterns of adolescents, by providing education to one group with the

hope that good knowledge can improve nutritional patterns in adolescents. This is in accordance with Alam et al. (2010) in the study of their research which explains that there is an influence belong adolescent knowledge about nutritional patterns which can lead to anemia in adolescent girls, even more than half of the adolescents cannot mention the main source of energy and protein food and the importance of supplemental nutrition during adolescence.

In contrast to the results of a study by Musyayyib et al. (2017) which explains that there is no relationship between knowledge and nutritional patterns of adolescents, this can be due to the nutritional knowledge possessed by adolescents which perhaps not necessarily change their eating habits. Active parental involvement can also affect the success of the intervention given if a child's desire to apply a good nutritional pattern is not in line with the role of parents in providing food at home, the results of the intervention obtained cannot be maximized (Kobel et al., 2014)

Table 2 The results of the analysis of the effect of activity patterns, knowledge, and nutrition patterns on the incidence of stunting in adolescents.

Variable	Stunting						B	CI 95%		p
	Normal		Short		Very short			Lower limit	Upper limit	
	∑	%	∑	%	∑	%				
Activity pattern							0.07	-0.02	0.18	0.04
Light	88	23.1	34	8.9	9	2.5				
Moderate	227	59.8	17	4.5	3	0.8				
Heavy	0	0	1	0.2	1	0.2				
Knowledge							1.09	0.78	1.73	0.00
Good	123	32.3	19	5	6	1.6				
Moderate	0	0	0	0	0	0				
Less	192	50.6	33	8.6	7	1.9				
Nutrition Pattern							-0.92	-0.18	-0.21	0.01
Good	128	33.6	18	4.7	6	1.7				
Less	187	49.3	34	8.9	7	1.9				

Based on table 2 with path analysis about the effect of activity patterns of stunting in adolescents, it shows that the value of b = 0.07; p 0.048; CI (95%) = -0.02 to 0.18. So, it can be concluded that more and more adolescents with light activity patterns are stunted. The stunting adolescents spend more time doing activities that release low energy, wherewith low energy expenditure is a form of body adaptation to carry out light activity patterns.

In line with research Candra et al. (2016) explained that the activity patterns of adolescents in Malang are still less active, causing obesity which leads to the incidence of stunting in adolescents, which is because the intake of incoming nutrition patterns is not balanced with daily activities.

It is different from other studies which explain that children who are in areas with limited food supplies cause some children to do heavier activities, namely by working so that they are at risk of stunting in children (Bernal et al., 2014)

Based on table 2 with path analysis about the effect of knowledge on the incidence of stunting in adolescents, it shows that the value of b = 1.09; p 0.000; CI (95%) = 0.78 to 1.73. Thus, the more respondents with good knowledge will reduce the risk of stunting in adolescents. This is due to the lack of knowledge that dominates the results of the study obtained so that knowledge becomes one of the factors that influence the occurrence of stunting in adolescents. The lack of knowledge of

adolescents about stunting will result in a person not being able to fulfill their nutritional needs properly, thus causing them to be prone to experiencing nutritional problems, namely stunting.

The results of this study are the same as research by Bantie et al. (2019) which explains that in several regions of China, Nigeria, Tehran, Iran, Colombia, Sudan, and Pakistan there are still stunted adolescents with insufficient knowledge. In several countries, the problem is different, which perhaps is due to differences in socio-demographic characteristics such as education systems, lifestyle patterns and access to information about health. This is the same as research by Rengma et al. (2016) which shows that there is a lack of knowledge and direction from nutrition organizations for underprivileged people, so that many in these areas experience stunting among adolescents. Another study also noted that low knowledge groups can cause stunting (Septamarini et al., 2019).

Knowledge is a good factor directly affecting a person's nutritional status and has an important role. A person's knowledge of sufficient health will be able to find out various kinds of health problems that may arise so that solutions can be sought for solutions (Notoatmodjo, 2014).

Based on table 2 with path analysis on the effect of nutritional patterns on the incidence of stunting in adolescents, it shows that the value of b = -0.92; p = 0.01; CI (95%) = - 0.18 to -0.21. Thus, the more respondents with sufficient nutritional patterns, the lower the risk of stunting in adolescents. This is because nutritional patterns are a basic part of adolescent nutritional needs because at this age adolescents are more likely to eat unhealthy foods.

In line with the results of research by Yansih & Dewina (2020), the results show that nutritional patterns have an effect on the incidence of stunting in children with a p value = 0.024. Similar results are found in the research of Roba et al. (2016) which explains that stunting cases in adolescents can be caused by one of the causes of nutritional patterns that are too monotonous to make teenagers lazy to eat.

Different from the study of Melaku et al. (2018) which explains the results that statistically there is no significant basis between household nutrition patterns and the incidence of stunting in adolescents. Meanwhile, children also need adequate nutrition from the food they eat to support their growth and development. According to Purwani in Yansih & Dewina, (2020) explains that lack of nutritional intake both in quality and quantity is lacking, decreased health, too heavy physical activity, and emotional disturbances can cause a decrease in appetite. Providing a good diet can also improve nutritional status in children. A good nutritional status can help children get optimal growth and development.

CONCLUSION

Based on the results of study and discussion of the incidence of stunting in adolescents, we can conclude that there is a significant positive effect between activity patterns on the incidence of stunting in adolescents, and there is a significant negative effect belong knowledge on the incidence of stunting in adolescents.

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