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Factors Related to Early Menarche in Adolescent Girls at Muhammadiyah 4 Junior High School East Jakarta

Nastiti Dyah Prastiwi[1*], Rr. Arum Ariasih[2], Nurfadhilah[3], Nur Romdhona[4]

[1] Public Health Study Program, Faculty of Public Health, University of Muhammadiyah Jakarta | email: nastitidyah.nd@gmail.com

[2] Public Health Study Program, Faculty of Public Health, University of Muhammadiyah Jakarta | email: arumariasih2018@gmail.com

[3] Public Health Study Program, Faculty of Public Health, University of Muhammadiyah Jakarta | email: nurfadhilah.nf@umj.ac.id

[4] Public Health Study Program, Faculty of Public Health, University of Muhammadiyah Jakarta | email: dhonasam28@gmail.com

*Corresponding Author: nastitidyah.nd@gmail.com

ABSTRACT

Introduction: The age of menarche varies from the age range of 10-16 years and is said to be normal if it occurs at the age of 12-14 years. Nationally, the average menarche aged 13-14 years occurs in 37.5% of girls in Indonesia, with the prevalence of early menarche reaching 20.9%. Statistical results in Indonesia show that the age of menarche has decreased from an average age of 14 years to 12-13 years.

Objective: This research aims to see what factors are associated with adolescent girls' early menarche.

Method: This type of research is quantitative with a cross-sectional study design. The research design in this study is analytical observational. The sample in this study was 56 respondents.

Result: There is no statistically significant relationship but there is a substantial relationship between the frequency of consumption of junk food with age of menarche (p-value=1.000 and OR=1.104), physical activity with age of menarche (p-value=0.759 and OR=1.609), sleep rest with adolescent girls' early menarche (p-value=0.958 and OR=1.224), and mothers' menarche age with adolescent girls' early menarche (p-value=0.867 and OR=1.389).

Conclusion: There is no statistically significant relationship but there is a substantial relationship between the frequency of consumption of junk food, physical activity, sleep rest, and mothers' menarche age with adolescent girls' early menarche. Adolescent girls are expected to maintain good consumption patterns and avoid excessive consumption of junk food, carry out regular and not-too-heavy physical activity, and have adequate sleep rest time at night so that they can avoid early menarche and the risk of various diseases in the future.

Keywords: Early Menarche; Junk Food; Menarche Age; Physical Activity; Sleep Rest

INTRODUCTION

Menarche is the first bleeding experienced by adolescent girls. The age of menarche varies from the age range of 10-16 years and is said to be normal if it occurs at the age of 12-14 years. Adolescent girls who experience menarche under the age of 12 are called early menarche [1,2]. The effects of early menarche include stunted growth, emotional stress, the occurrence of breast cancer and ovarian cancer, as well as the risk of pregnancy at a young age. The age of menarche also has a risk of developing Type 2 Diabetes Mellitus in adulthood [3–6].

Early menarche is influenced by several factors, including body mass index, consumption of fast food, socioeconomic status, genetics, and lifestyle. Adolescents like fast food. Fast food is a food that contains high calories and fat. Consuming fast food in adolescents will affect the increase in nutrition. This is because the fat content, animal protein, and trans-fat contained in junk food will trigger the release of hormones that affect the occurrence of menarche and the emergence of secondary signs faster than normal age. Generally, fast food contains high calories, fat, sugar, and sodium (Na), but is low in fiber, vitamin A, ascorbic acid, calcium, and folate [5,6].

Results of Riskesdas 2010, the average age of menarche in Indonesia is 13 years (20%) with an earlier occurrence at the age of less than 9 years. Nationally, the average menarche aged 13-14 years occurs in 37.5% of girls in Indonesia, with the prevalence of early menarche reaching 20.9% [1]. Statistical results in Indonesia show that the age of menarche has decreased from an average age of 14 years to 12-13 years [7]. Research in Jakarta shows that the average age of menarche for girls is 12.3 years. In the same age range, the average age at menarche decreased to 11.4 years [5].

Adolescence is a period between children and adults who are in the age range of 12-18 years. Other researchers gives the age limit for adolescents, which is between the ages of 12-21 years [8]. Adolescence is marked by many changes, both physical and psychological. According to WHO, the age of 10-19 years is the period of adolescence. Adolescence is a stage of change from childhood to adulthood. Before entering adolescence, a person will experience a period of puberty first. Puberty will be the acceleration of growth and physical development in children [9]. Characterized by the maturity of the reproductive organs, namely high-speed physical growth, psychological changes, secondary sex characteristics, and menarche. The role of parents is needed when the child is a adolescence. Adolescences often do not maintain their consumption patterns, and consider themselves to be small, and it will be fine if they consume any type of food, so fast food or junk food is often an option. Consuming junk food too frequently will greatly affect early menarche age in adolescent girls [10].

Based on the description above, paying attention to and maintaining the consumption pattern and lifestyle of adolescents is very important to prevent the body from various kinds of disorders that can be caused by a bad lifestyle, one of which is early menarche. The environment around the school is strategic so that there are several shopping centers, minimarkets, places to eat, and many street vendors which give adolescent girls a high chance to consume junk food more often. Therefore, the authors are interested in researching factors related to the adolescent girls' early menarche at Muhammadiyah 4 Junior High School, East Jakarta.

METHOD

This type of research is a quantitative study with a cross-sectional study design. The research design in this study was analytical observational. The sample in this study was 56 respondents. The research was conducted using a questionnaire in the form of a Google form link. The data was analyzed using SPSS Statistics. This research has ethical clearance with letter number No. 10.501.B/KEPK-FKMUMJ/V/2022.

RESULTS

This study was analyzed by univariate analysis and bivariate analysis using the Chi-Square test and the following results were obtained.

Table 1. Characteristics of Respondents

Variable	Frequency (n)	Percent (%)
Adolescent Girls' Early Menarche		
Early Menarche (≤12 years)	17	30.4
No Early Menarche (>12 years)	39	69.6
Junk Food Consumption Frequency		
Frequently	32	57.1
Rarely	24	42.9
Physical Activity		
Not Enough	43	55.4
Enough	13	44.6

Sleep Rest		
Not Enough	31	55.4
Enough	25	44.6
Mothers' Menarche Age		
Early Menarche (≤13 years)	14	25
No Early Menarche (>13 years)	42	75

Based on Table 1, the variable incidence of menarche in respondents showed that more respondents who did not menarche early were 39 respondents (69.6%). Then the results of the analysis of the frequency of junk food consumption variables were more respondents in the frequent category, namely 32 respondents (57.1%), while the rare category was 24 respondents (42.9%). The variable of physical activity in respondents for one week before menarche based on categorization showed that more in the less category were 43 respondents (55.4%), while the sufficient category was 13 respondents (44.6%). Sleep rest variable can be seen that respondents who lack sleep for one week before menarche as many as 31 respondents (55.4%). While the respondents who got enough sleep for one week before menarche were 25 respondents (44.6%). Furthermore, the variable of mothers' menarche age was mostly found in the category of not early menarche, namely 42 respondents (75%), while mothers who experienced early menarche were 14 respondents (25%).

Table 2. Relationships between Frequency of Junk Food Consumption, Physical Activity, Sleep Rest, and Mothers' Menarche Age with Adolescent Girls' Early Menarche

Variable	Adolescent Girls' Early Menarche						OR	*P-value*
	Early Menarche (≤12 years)		No Early Menarche (>12 years)		Total			
	n	%	n	%	n	%		
Junk Food Consumption Frequency								
Frequently	10	31.3	22	68.8	32	100	1.104	1.000
Rarely	7	29.2	17	70.8	24	100		
Physical Activity								
Not Enough	14	32.6	29	67.4	43	100	1.609	0.759
Enough	3	23.1	10	76.9	13	100		
Sleep Rest								
Not Enough	10	32.3	21	67.7	31	100	1.224	0.958
Enough	7	28	18	72	25	100		
Mothers' Menarche Age								
Early Menarche (≤13 years)	5	35.7	9	64.3	14	100	1.389	0.867
No Early Menarche (>13 years)	12	28.6	30	71.4	42	100		

Based on Table 2, the Chi-Square test between the variable frequency of consumption of junk food and adolescent girls' early menarche obtained a p-value = 1,000 (p > 0.05). It can be concluded that there is no statistically significant relationship between the frequency of consumption of junk food and adolescent girls' early menarche. However, there is a substantially significant relationship because the OR = 1.104 (OR > 1).

The results of the Chi-Square statistical test between physical activity and adolescent girls' early menarche obtained p-value = 0.759 (p > 0.05). It can be concluded that there is no statistically significant relationship between physical activity and adolescent girls' early menarche. The results of the analysis also obtained an OR = 1.609, which can be concluded that there is a substantially significant relationship because the OR > 1.

The results of the Chi-Square test between sleep rest and adolescent girls' early menarche obtained a value of p-value = 0.958 (p > 0.05), it can be concluded that there is no statistically significant relationship between sleep rest and adolescent girls' early menarche. Meanwhile, in substance, the results are related to the value of OR = 1.224 (OR > 1).

The results of statistical tests between the mothers' menarche age and adolescent girls' early menarche age using Chi-Square obtained p-value = 0.867 (p > 0.05) which means that there is no statistically significant relationship between the mothers' menarche age and adolescent girls' early menarche. However, there is a substantially significant relationship with the value of OR = 1.389 (OR > 1).

DISCUSSION

The Relationship between Junk Food Consumption Frequency and Adolescent Girls' Early Menarche

The results of this study obtained a p-value = 1,000 using the Chi-Square statistical test. It can be concluded that there is no statistical relationship between the frequency of junk food consumption and adolescent girls' early menarche, with OR = 1.104 (95% CI = 0.348 – 3.503), meaning that respondents who frequently consume junk food have a 1.1 times greater chance higher to experience early menarche compared to respondents who rarely consume junk food.

This research is supported by previous research, the results obtained p-value = 0.416, it can be concluded that the consumption of fast food does not have a direct impact on early menarche [11]. It is stated that there are many factors behind the acceleration of the age of menarche being faster than before. Then, statistical results obtained a p-value = 0.210, meaning that there is no significant relationship between fast food consumption and early menarche age [12].

Although adolescent girls often consume junk food, they do not experience early menarche. This is due to the small number of samples so the results of this study are not statistically significant, but are significant in substance and have a risk factor because the OR > 1. Thus, the frequency of consumption of junk food is one of the risk factors for early menarche. However, rarely consuming junk food does not necessarily prevent a young woman from experiencing early menarche. This is following what was explained by previous researchers. The low consumption of junk food has not made a pathophysiological change and has not had an impact on the age of menarche. Increased nutritional factors and excessive consumption of junk food were not found in the study, so they did not affect sexual maturation and adolescent growth [11].

According to the Ministry of Health 2012, menarche is influenced by many things. One of them is the hormonal changes that affect the maturation of cells [13]. Consumption of good food and even excess can accelerate the formation of hormones that can initiate the arrival of menarche. Likewise, fast food contains high saturated fat and high sugar content so it has a negative effect if consumed by the body [11].

The Relationship between Physical Activity and Adolescent Girls' Early Menarche

Based on the Chi-Square statistical test in this study, the p-value = 0.759. It can be concluded that there is no significant relationship between physical activity and adolescent girls' early menarche. However, the OR = 1.609 (95% CI = 0.382 – 6.787), means that respondents who lack physical activity have a 1.6 times greater chance of experiencing early menarche. The results of this study were not statistically significant, but substantially significant and had risk factors because the OR > 1. This was due to the small number of research respondents.

The results of this study are in line with previous studies which had a p-value = 0.091 with 95% CI = 0.880 – 2.620 [14]. This research is supported by other studies with the same results, namely there is no relationship between physical activity and early menarche age, with a p-value = 0.563 [15]. In addition, there was no relationship between physical activity and early menarche age [16].

Based on the research that has been done, most of the adolescent girls do not do physical activity. This is because of the COVID-19 pandemic that occurred in Indonesia, thus making some adolescent girls limit themselves in carrying out daily physical activities. They tend to stay at home to play with handphones, watch television, do chores, sleep, and do other activities. However, this doesn't make adolescent girls experience early or late menarche. Heavy, intense, and mentally stressful physical activity can slow down the age of menarche. While daily physical activity does not affect the age of menarche [17]. Physical activity may not directly affect the age of menarche but has a secondary effect on the hypothalamic-pituitary hormones through their effect on changes in body mass index [18].

The Relationship between Sleep Rest and Adolescent Girls' Early Menarche

In this study, the results of the Chi-Square statistical test with p-value = 0.958, that there was no significant relationship between sleep rest and adolescent girls' early menarche. From the results of the analysis, the OR = 1.224 (95% CI = 0.387 - 3.879), meaning that respondents who lack sleep have a 1.22 times greater chance of experiencing early menarche. So, sleep rest is one of the factors that can affect the age of early menarche. Although the results of this study were not statistically significant (p-value > 0.05), the results of this study were substantially significant. Besides that, they also had risks because the OR was > 1.

Per previous research with a p-value = 0.162, there is no relationship between sleep rest and the age of menarche [19]. Another study has a p-value = 0.942 which can be interpreted that there is no relationship between sleep rest and early menarche age. Adolescent girls are more likely to experience sleep disorders than adolescent boys. This is thought to be because girls have a higher risk of experiencing puberty-related fatigue [20].

Based on research that has been conducted on adolescent girls at Muhammadiyah 4 Junior High School, East Jakarta, not a few who sleep late at night because playing handphones, watching Korean dramas or movies.

Adolescences need time to rest at night which is quite appropriate for their age. As a result, their sleeping hours become messy, sleeping late and waking up during the day, which causes the body to feel tired from lack of sleep at night. Adolescents often stay up late at night and sleep until noon, even though the need for night sleep is important [19]. Stress, fatigue, and illness are factors for adolescent sleep rest. Fatigue is one of the most influential factors [21]. According to the Ministry of Health, the need for sleep rest is appropriate for adolescents aged 6-12 years, which is 10 hours/day, while those aged 12-18 years need 8-9 hours of sleep/day [22].

The Relationship between Mothers' Menarche Age and Adolescent Girls' Early Menarche

The results of statistical tests using Chi-Square obtained a p-value = 0.867, which means that there is no significant relationship between the mothers' menarche age and adolescent girls' early menarche. The OR = 1.389 (95% CI = 0.385 – 5.005), meaning that adolescent girls who have mothers with early menarche have a 1.389 times higher chance of experiencing early menarche as well.

This study is in line with previous research, with a p-value = 0.691 so there is no significant relationship between the mothers' menarche age and adolescent girls' early menarche [23]. Then, further research showed a p-value = 0.134, which means that there is no relationship between the mothers' menarche age and adolescent girls' early menarche [24]. Other research also got the same results. The proportion of early menarche age (≤12 years), was more found in mothers who experienced menarche 12 years (44.4%) than mothers who experienced menarche >12 years (32.9%) [25].

In the research that has been done, most of the adolescent girls who did not experience early menarche turned out to have mothers who did not experience early menarche either. This can mean that the age of menarche between adolescent girls and their mothers is the same or not much different. The small sample makes the results of this study not statistically significant. But in substance, the results of this study can be said to be significant because the OR is > 1, which means there is a risk factor between the mothers' menarche age and adolescent girls' early menarche. According to previous research, when sexual maturity occurs, a child will follow the time of his mother's menarche. The mother's menarche age can affect the acceleration of growth in children which can affect the age of her child's menarche too. The mother's menarche age is related to her daughter's menarche age, but this is not solely due to the influence of genetics but from other factors such as the family environment [23].

CONCLUSION

All the respondents (56 respondents) have experienced their first menstruation or menarche. It was found that there was no statistically significant relationship between the frequency of consumption of junk food, physical activity, sleep rest, and mothers' menarche age with adolescent girls' early menarche at Muhammadiyah 4 Junior High School, East Jakarta with p-value > 0.05. However, there was a substantially significant relationship between the frequency of consumption of junk food, physical activity, sleep rest, and mothers' menarche age with adolescent girls' early menarche with OR > 1.

SUGGESTION

Adolescent girls are expected to maintain good consumption patterns and avoid consuming junk food. Excessively, perform regular physical activity and not too heavy, and have adequate sleep rest time at night to avoid early menarche and the risk of various diseases in the future.

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