

THE CORRELATION BETWEEN HEREDITY AND MASS MEDIA EXPOSURE FACTORS ON THE EARLY MENARCHE INCIDENT ON ADOLESCENT GIRLS

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ABSTRACT

Keywords:

early menarche,
young women,
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mass media exposure

Menarche is the first menstruation that occurs in young women. The normal age is 12-14 years, but now there's a tendency to decrease to younger age. The purpose of this study was to analyze the correlation of heredity and mass media exposure factors with the incidence of early menarche in adolescent girls at SMPN 56 Surabaya. The study used an observational analytic design with a cross-sectional approach. The sample of this research was adolescent girls of 7th-8th grade of SMPN 56 Surabaya and mothers, taken using simple random sampling method. The instrument was a questionnaire distributed online. The research data analyzed using the *Chi-square* test. The results showed that 39.13% adolescent girls who experienced early menarche had mothers who had a history of early menarche. The mass media exposure with a light level was 15.21% experienced premature menarche, while 84.78% experienced early menarche. The results of the *Chi-square* correlation test analysis between heredity and the incidence of early menarche in young girls stated that there was no relationship between the two variables with $p = 0.068$. The results of *Chi-square* analysis between the mass media exposure factors and the incidence of early menarche in young women obtained p value = 0.030, which can be concluded that there is a relationship between the two variables. The study concluded that there is a relationship between exposure to mass media and the incidence of menarche in young women so that supervision of adolescent girls is needed in accessing information in the mass media.

ABSTRAK

Kata kunci:

menarche dini,
remaja putri,
keturunan,
paparan media massa

Menarche adalah menstruasi yang pertama kali terjadi pada remaja putri. Usia menarche normal adalah 12-14 tahun, namun sekarang terdapat kecenderungan penurunan usia menarche di usia termuda. Tujuan penelitian adalah menganalisis hubungan faktor keturunan dan paparan media massa terhadap kejadian menarche dini pada remaja putri di SMPN 56 Surabaya. Penelitian menggunakan desain studi analitik observasional dengan pendekatan cross-sectional. Sampel penelitian adalah remaja putri siswi kelas VII dan VIII SMPN 56 Surabaya dan ibu kandung yang diambil dengan menggunakan metode simple random sampling. Instrumen penelitian adalah kuesioner yang disebarakan secara online. Data penelitian dianalisis menggunakan uji *Chi-square*. Hasil penelitian didapatkan bahwa 39.13% remaja putri yang mengalami menarche dini memiliki ibu yang mempunyai riwayat menarche dini. Paparan media massa dengan tingkat terpapar ringan sebanyak 15.21% remaja putri mengalami menarche dini sedangkan pada tingkat keterpaparan berat sebanyak 84.78% remaja putri mengalami menarche dini. Hasil analisis uji korelasi *Chi-square* antara faktor keturunan terhadap kejadian menarche dini pada remaja putri menyatakan bahwa tidak ada hubungan antara kedua variabel tersebut dengan nilai $p = 0.068$ sedangkan hasil uji analisis *Chi-square* antara faktor paparan media massa dan kejadian menarche dini remaja putri sehingga memperoleh nilai p value = 0.030 sehingga dapat disimpulkan terdapat hubungan antara kedua variabel tersebut. Penelitian disimpulkan menjadi terdapat hubungan antara paparan media massa dan kejadian menarche pada remaja putri sehingga diperlukan pengawasan terhadap remaja putri dalam mengakses informasi di media massa.

INTRODUCTION

The first menstruation in adolescent girls, or often referred to as menarche, experiences signs such as bleeding from a woman's genitals due to the shedding of the endometrial lining (1). Menarche that occurs in adolescent girls is generally aged 12-14 years but there is often a decline in age at menarche to a younger age so that elementary school students experience menarche first or it can be called early menarche (2). Conditions that occur in a person who experiences early menarche can be associated with precocious puberty, occurring in children younger than 12 years of age (1).

The results of previous studies showed that the age of menarche in adolescent girls began to change in 2013 when compared to the previous year (1). Indonesia has experienced a decline in the age of menarche and, according to the results of the Basic Health Research, there are 5.2% of Indonesian female adolescents experiencing menarche aged <12 years. In Surabaya, 0.1% of adolescent girls had early menarche which occurred at the age of 6-8 years, another 26.3% experienced menarche at the age of >14 years (3). Research conducted in Surabaya stated that as many as 29.6% of adolescents experienced early menarche with ages between 9 to 11 years (4). Early menarche can be influenced by several factors, namely geographical factors, race/culture, nutritional status, heredity, socioeconomic factors, exposure to mass media and the environment (1).

Current technological advances make teenagers often use audio and print media for negative things such as viewing videos and pictures that are not appropriate for their age (1). Exposure to mass media can be a bad impact on teenagers which will result in free sex behavior. One of the other factors of early menarche is heredity because it can affect the age of menarche sooner or later. The age of the mother's menarche can affect the age of menarche that will occur in her daughter, while heredity cannot be modified (5).

Acceleration at the age of menarche will put adolescent girls at risk for breast cancer, late menopause, emotional stress, heart disease, and gestational diabetes. Adolescent girls who are curious about their sexual life can have an impact on the occurrence of unwanted pregnancies (6).

The results of the study based on the area of residence obtained that in urban areas as many as 5,890-9,971 adolescents and in rural areas as many as 4,081-9,971 unmarried girls have had sex with the opposite sex (7). Other studies conclude that there are several significant relationships of mass media exposure to the incidence of early menarche in SMP Muhammadiyah 4 Yogyakarta (1).

The results of a preliminary study at SMPN 56 Surabaya conducted online by researchers to 10 female students found that five students experienced early menarche at the age of 9-11 years. The purpose of this study was to analyze the relationship between heredity and mass media exposure to the incidence of early menarche in adolescent girls at SMPN 56 Surabaya.

METHODS

The study used an observational analytic study method with a cross-sectional design because the researcher wanted to analyze the relationship between heredity and mass media exposure to the incidence of early menarche at one time. The subjects in the study were teenage girls in grades VII and VIII of SMPN 56 Surabaya. The sample size of this study was calculated using the Slovin formula and obtained a sample size of 76 students. The research sample was taken using simple random sampling method, that is, all the population of 301 students had the same opportunity to be included in the 76 sample units. Respondents in this study amounted to 76 female students and mothers who entered the sample unit and met the inclusion criteria, which were teenage girls in grades VII and VIII of SMPN 56 Surabaya, had experienced menarche, domiciled in the sub-district of Dukuh Pakis and of Javanese ethnicity. The location of this research is SMPN 56 Surabaya, carried out in January-March 2021.

The instrument used in collecting research data is a questionnaire that will be distributed online. Data processing techniques include editing, coding, data entry, cleaning and tabulating techniques. The research data analysis method used bivariate analysis with *Chi-square* test to determine the relationship between the two dependent and independent variables.

RESULT

The following are the results of the research that have been presented in the frequency distribution and the results of the *Chi-square* statistical test analysis are contained in Tables 1, 2, 3, and 4. The results of the study are presented in descriptive data through Tables 1 and 2. Table 1 describes the characteristics of the female adolescent respondents, while Table 2 describes the characteristics of the respondents' biological mothers.

Table 1 shows that the average age of young women in junior high school is 12-14 years, which is classified as early adolescence. The characteristics of early adolescence are

unstable, emotional, unrealistic and a critical period.

The age distribution of female adolescent respondents shows that half of them, namely 50.0%, are 13 years old. Most of the female adolescent respondents were in grade 7 as many as 57.9%. More than half of young women experience early menarche, which is 60.5%. Most young women are heavily exposed to mass media as much as 75.0%. This percentage dominates so that it can also be explained that most teenagers access mass media a lot in their daily lives. The mass media exposure will then be examined for its relationship to the incidence of menarche in adolescent girls.

Table 1. Distribution of Young Women Respondents Based on Characteristics

Variable	f	%
Young Women Age		
12 years old	14	18.4
13 years old	38	50.0
14 years	20	26.3
15 years	4	5.3
Total	76	100.0
Young Women Class		
Grade VII	44	57.9
Grade VIII	32	42.1
Total	76	100.0
The Incident of Early Menarche in Young Women		
Yes	46	60.5
Not	30	39.5
Total	76	100.0
Mass Media Exposure		
Light	19	25.0
Heavy	57	75.0
Total	76	100.0

Table 2 shows that more than half of the respondents, namely 52.6% of female adolescent mothers are less than 30 years old and most of the female adolescent mothers are working, as many as 73.7%. Most of the teenage girls, 69.7%, did not have a history of early menarche. From descriptive results on the data of mothers of adolescent girls, it can be concluded that mothers who have a history of early menarche are few. The history of early menarche that has occurred in the mother is a hereditary factor which will then be searched for its relationship

to the incidence of early menarche that occurs in adolescent girls.

Table 3 has shows that mothers with a history of early menarche and children with early menarche is as much as 78.3% while in mothers who do not have early menarche and children there is an incidence of early menarche as much as 52.8%. The table also explains the *Chi-square* test, p value = 0.068 so that the conclusion is that there is no relationship between heredity and the incidence of early menarche in adolescent girls.

Table 2. Distribution of Respondents of Young Women Mothers Based on Characteristics

Characteristics	f	%
Mother's Age		
20-35 Years	23	30.3
36-50 Years	30	39.5
< 50 Years	23	30.3
Total	76	100.0
Mother's Job		
Working	56	73.7
Doesn't work	20	26.3
Total	76	100.0
Maternal Early Menarche		
Yes	23	30.0
Not	53	69.7
Total	76	100.0

Table 3. Analysis of the Relationship between Hereditary Factors and the Incidence of Early Menarche in Young Women

History of Early Menarche in Mother	Early Menarche Incidence in Children						p value
	Yes		Not		Total	%	
	f	%	f	%			
Yes	18	78.3	5	21.7	23	100.0	0.068
Not	28	52.8	25	47.2	53	100.0	
Total	46	60.5	30	39.5	76	100.0	

Table 4. Analysis of the Relationship of Mass Media Exposure to Early Menarche Incidence in Young Women

Mass Media Exposure	Early Menarche Incidence in Children						p value
	Yes		Not		Total	%	
	F	%	F	%			
Light	7	36.8	12	63.2	19	100.0	0.030
Heavy	39	68.4	18	31.6	57	100.0	
Total	46	60.5	30	39.5	76	100.0	

Table 4 shows that young women who experienced light mass media exposure had 36.8% early menarche, while young women who experienced heavy media exposure and 68.4% had early menarche. From the *Chi-square* test, p value = 0.030, it can be concluded that there is a relationship between exposure to mass media and the incidence of early menarche in adolescent girls.

DISCUSSION

Adolescence is a time to attract attention because it has its own characteristics and a role as a determinant of individual life in society. Regulation of the Minister of Health of the Republic of Indonesia in 2017 states adolescents are residents aged 10-18 years who

are not married. Indonesia, with the age group of 10-19 years, as seen in the 2010 Population Census, has reached 43.5 million or about 18% of the total population.

Adolescence is the most vulnerable period in development, where adolescents experience physical changes. Specific and psychological changes occur in adolescents who begin to search for self-identity. In the search for self-identity, adolescents still have to face environmental conditions that also require adjustment to themselves (8).

Adolescents have characteristics such as experiencing a very rapid physical transformation (development), compared to the period of growth before or after; the physical development of young people is very rapid. The bones of the body develop rapidly so that

the bodies of young girls look bigger and stronger. Kidneys, heart along with digestion and various internal body organs grow stronger and can function perfectly (9).

The period during adolescence is a period that is very strong both physically and very creatively mentally and also has a more planned focus of concern for peers and in which one gradually frees oneself from attachment to family, especially to parents, but in the aspect of a strong will, being strong to free oneself from parents is not accompanied by the ability to live independently in the economic field (9). Young people have understood the bond to the opposite sex not only as a friend but the bond has begun to tend toward mutual liking to have true beliefs about religion during this period..

Adolescents have an effort to create a truth; teenagers can make it a good and correct method, so that they will get peace and vice versa if they feel that they do not find the truth, their beliefs about religion will waver.(9), and have the expertise to display independence. Adolescent independence is generally shown in their expertise in making decisions regarding their activities in the transition period of childhood and adult life. Adolescents have difficulty adjusting to life as adults and the search for self-evidence is a peculiarity of adolescent growth through the transition period, as stated earlier.

Teenagers need a sense of confidence to live the right way so that they can focus on how to behave in everyday life; the belief in life or so-called philosophy of life. Adolescents need a philosophy of life in order to establish themselves both socially, emotionally, morally and intellectually so that it can bring out their happiness. Adolescents need something to trust, to behave like members of the family (such as children, brothers, sisters). All of that can be owned by teenagers, if introduced to philosophical values, given from adults who have those philosophical values (parents and teachers) and are recognized for associated behavior and will be rewarded if their behavior is positive. in accordance with the value of the philosophy of life (9).

The first menstrual bleeding is referred to as menarche, and the age at menarche is the most important period in a teenager's life and is part of a complex process of physical and emotional development. Menarche is the most

frequently remembered milestone of puberty for most women, and is often considered a fertility signal from both a social and medical perspective (10). A young woman's menarche can have both positive and negative reactions; if a young woman has been prepared and received information about menstruation, she will not be anxious. Negative reactions that will occur are such as psychological and physical disorders (11).

Menstruation that occurs in every woman has a different time, depending on factors such as the woman's health, nutrition and weight. Menstruation occurs when the lining of the uterus sheds and blood comes out, known as menstrual blood. When experiencing menarche, young women are psychologically attracted to the opposite sex.

Discomfort is a symptom that occurs when experiencing menarche, namely headaches, and pains in the stomach, legs and waist. Emotional changes also often occur during menstruation, such as feeling lonely, sad and angry. The cause of this occurrence is due to the release of hormones. Symptoms before menstruation occur in various body systems, including breast pain, aches and pains, low back pain, bloating, acne, being more sensitive, and sometimes feeling lazy (12).

The age of early menarche is <12 years, whereas normal menarche is between the ages of 12-14 years and late is more than 14 years. The age of menarche greatly affects health. Slow menarche results in the slow maturity of the body, both hormones and organs. Not only that, slow menarche in the long term can increase a woman's risk of developing osteoporosis because of the slow production of estrogen, which can affect the determination of bone mass. On the other hand, early menarche is usually associated with an increased risk of breast cancer due to the rapid increase in the hormone estrogen, obesity and miscarriage.

The psychosocial consequences of early menarche can be in the form of unbalanced emotions where during menstruation the hypothalamus produces more estrogen hormones. The increase in the hormone estrogen causes the secondary sex of adolescents to experience menstruation, and the formation of breast enlargement can confuse young women when they are under 12 years old (13). Early menarche also results in

the intimate attitude of young people where the reproductive system matures more quickly, giving rise to unhealthy intimate urges, giving rise to abnormal and irresponsible intimate activities (14).

The shrinkage of the age of menarche causes reproductive health problems. Teenagers who experience early menarche will understand active intimate life begins with the emergence of interest and desire for intimate activities. This can increase unwanted pregnancies; childbirth can increase the action of abortion, and increase mortality. Early menarche is at risk of pregnancy at a young age (1).

The age of menarche in the mother is a predictor of the age of menarche in her child. A study states that the estrogen receptor is a special gene that determines the age of menarche in adolescent girls that changes the biological activity of estrogen (15). Maternal age at menarche affects the formation of early menarche because of the presence of an estrogen receptor gene (Gene Period), which is a gene that determines the age of menarche. Where Gene Polymorphism can alter biological activity, cellular levels influence the maturation of the hypothalamic-pituitary-gonadal center (HPG axis) which stimulates the formation of early puberty (1).

Types of mass media include print media which is a very easy source of information to obtain. Currently print media often displays crime news as well as pictures of adults who are exposed. Indirectly, teenagers adopt information that generates ideas and curiosity beyond the print media. Electronic media requires users to use electricity when accessing; online media include internet websites, Facebook, Instagram, Twitter, and YouTube which are the media most used by teenagers to obtain information (1).

Advances in data systems today make it very easy for young people to obtain data quickly by sharing a lot of data and influences young people through informed messages such as magazines with sex pictures, pornographic films and the ease of accessing the internet will accelerate the maturation of intimate hormones, causing early menarche (5).

There are levels of mass media exposure; light exposure is such as negative content from mass media that displays implicit sex material such as holding hands, and

hugging while heavy exposure is such as negative content from mass media that displays explicit sex material such as direct adult sexual activity. The role of parents is needed in terms of supervising children in using the types of mass media so that children do not easily access information that is not appropriate for them to see.

Research respondents are young women who live in urban areas, namely the city of Surabaya, where early menarche is mostly experienced by young women in urban areas more than young women in rural areas. The age of menarche is often related to several factors such as internal factors, namely genetic factors that cannot be modified and external factors such as environment, such as residence in rural and urban areas, and nutritional status where a student who has good nutrition will accelerate the age of menarche. Protein can stimulate the increase in the luteal phase, affecting the increase in Luteinizing Hormone (LH) and can prolong the follicular phase which can accelerate puberty (1). Unhealthy lifestyles such as consuming junk food will accelerate the age of menarche in adolescent girls because they have a high fat content, causing fat deposits in adipose tissue, positively correlated with an increase in leptin content. Leptin stimulates the release of Gonadotropin-releasing hormone (GnRH) affecting follicle-stimulating hormone (FSH) and LH in triggering follicle maturation and the production of estrogen which causes early menarche in adolescent girls (1).

Economic status in the family has a fairly high role in the rapid age of menarche, socioeconomics affect the ability to complete the availability of household needs; a high level of family income is related to fulfilling nutritional needs, especially nutrition for girls because the family has access to information that can affect the age of menarche (1).

Regular and long-lasting physical activity will affect the age of menarche and exposure to mass media, such as stimulation through films, books, magazines, online sites specifically for adults and stimulation of the opposite sex, increasing sexual activity resulting in sexual maturity affecting the age of menarche for young women.

The results of the *Chi-square* test of heredity with the incidence of early menarche in adolescent girls, there is no relationship between the two variables, $p = 0.068$, in line

with research in 2013 which found no significant relationship between heredity and early menarche. However, other studies have found a relationship, meaning that heredity factors and the incidence of early menarche where girls with mothers with a history of early menarche are more at risk of experiencing abnormal menarche than mothers with a history of normal menarche (16,17).

The difference in research causes the characteristics of individuals and regions to differ. In addition, the age of menarche can vary, which is influenced by various internal and external factors. The discrepancy of this study can be influenced by socioeconomic factors where young women with parents who have jobs experience more early menarche than parents who do not work; this is also evidenced in a study which states that socioeconomic status is very influential in the incidence of early menarche where are among parents with high socioeconomic status, there are as many as 85.3% of girls experiencing early menarche (5).

Socioeconomic aspects affect the income of parents in meeting their daily needs and can significantly affect the acceleration of the age of menarche. Adolescent girls who have high socioeconomic status and who are self-sufficient can complete nutrition and good health, so that young women experience menarche more quickly (18).

Socioeconomic conditions are very influential in children's development and fulfillment of needs; children with families who have sufficient economic conditions can meet all needs and will always have the opportunity to develop all kinds of skills, while children with low economic conditions will have less opportunity to develop various skills. Another situation is that parents who are busy working will be less able to see the development of their children and their attention to their children is reduced, many of whom end up paying less attention to the condition of their children; this will affect the growth and development of children. Parental income greatly affects menarche. Families with higher socioeconomic status can get adequate nutrition and good health, so they experience menarche more quickly (5).

Based on the bivariate test with *Chi-square* obtained $p = 0.030$, it is concluded that there is a relationship between exposure to mass media and early menarche, in line with

an earlier study that showed there was a relationship between early menarche and exposure to mass media (1).

The progress of the current information system makes it easier for teenagers to get information quickly, and a lot of information is shared, such as magazines with sex pictures and pornographic films that can cause intimate hormone maturation quickly, causing early menarche (5).

The level of mass media exposure is divided into two, namely exposure to mild negative content in the form of holding hands and hugging scenes and heavy negative content in the form of explicit sex modules such as showing genital images, oral sex, and engaging in sexual activities (1).

Exposure to mass media results in strong external stimuli, namely through audio, visual and audiovisual exposure. Exposure to mass media accelerates the age of menarche for adolescent girls. Mass media has an influence on the incidence of early menarche where the hormone melatonin produced at night at rest will decrease in children who are often exposed to TV and computer light for a long time.

The hormone melatonin has a function as a stabilizer of the body's circadian cycle; if the hormone melatonin decreases, it has the potential to cause psychological disorders, so that media, including TV, change thoughts and feelings not only through audio and visual but also have some impact on changing behavior patterns. The mechanism of psychological disorders is by sending neurotransmitter and neuropeptide signals to the hypothalamus producing Gonadotropin-releasing hormone (GnRH) as a stimulant for the anterior pituitary to produce FSH and LH hormones; then the ovaries produce estrogen which will affect the maturation of reproductive organ cells so that early menarche occurs (1).

The more mass media exposure becomes freer to access and the higher the young women are exposed to the media, the faster they will get an earlier menarche. Given the impact caused by early menarche is not light, researchers feel the need for strict supervision from both parents and teachers in limiting reading, viewing, and seeking information in the mass media so that adolescents can be prevented from negative media exposure.

CONCLUSIONS AND SUGGESTIONS

Conclusion

This study concludes that there is a relationship between exposure to mass media and menarche in adolescent girls, but there is no relationship between heredity and early menarche in adolescent girls.

Suggestion

Parents need to supervise young women when accessing mass media information and it is important to increase adolescent knowledge about sexuality so that there are no reproductive health problems in adolescents, especially young women who have menarche.

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