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**Assessment of Certain factors that influencing the  
Age At Menarche among Iraqi girls**

**ABSTRACT**

**Background:** Menarche is the 1st menstrual cycle experienced by the females. Several factors have been shown to significantly influence age at menarche, such as genetic parameters, socioeconomic conditions, general health and life style, nutritional status, physical activity. The mean of menarche age was from 12-13 years in Europe.

**Subject and methods:** cross-section study which was conducted in different regions of Iraq from the north to the south. With selecting the women ages from 17 to 25 years. The sample size was 646 girls. All data was collected through online google forms questionnaire. Data analysis was done by manual statistical method. The study was conducted during the period from 1<sup>st</sup> November 2020- 30<sup>th</sup> March 2021. The questionnaire was well structured and including information regarding certain factors associated with menarche age.

**Results:** The current study was about assessment of certain factors that influence the age at menarche among Iraqi girls. The most frequent age of menarche was among those with age group 12-14 years (72.2%) followed by the age group less than 12 years (16.7%) and the lowest frequency was among those with age group more than 14 years (11.1%). Most of the girls with age at menarche was with same of their mother age at menarche (78.5%).

**Conclusion:** The most frequent age of menarche among Iraqi female was 13 years and most of girls age at menarche was similar of their mothers. It was documented that there was an effects of genetic factors in addition to body weight on occurrence of menarche.

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## **Introduction:**

Menarche is the 1st menstrual cycle experienced by the females and it is an important event in the female life. Menarche is the first step of transformation of girls to women and an important event for each female as it marks the beginning of her adulthood with all its known biological and psychological consequences<sup>(1-3)</sup>.

Menarche is affected by genetic factors<sup>(4,5)</sup>, race, environmental conditions, nutrition<sup>(6)</sup>, physical activity<sup>(7)</sup>, geographic location, urban or rural residence, health status<sup>(8)</sup>, psychological factors, blindness, body mass index (BMI), family size, socioeconomic status<sup>(9)</sup>, parental educational level, occupation of parents, loss of parents, child sexual abuse, physical stress, tea consumption, and passive smoking<sup>(10-19)</sup>. Genetic factors to AAM is estimated to be about 57–82%<sup>(20-22)</sup>. It has been documented that the AAM of Asian females was 11.67-13 years<sup>(23,24)</sup> while AAM of Caucasian females was 11.96-12.93

years<sup>(25,26)</sup>.

Aim of the study : To determine certain demographic factors associated age at menarche among Iraqi girls.

Objectives :

- 1- To determine distribution of AAM occurrence according to female age
- 2- To determine distribution of menarche occurrence according to female residence
- 3- To determine distribution of menarche occurrence according to female family history
- 4- To determine distribution of menarche occurrence according to female BMI
- 5- To determine distribution of menarche occurrence according to female physical activity
- 6- To determine distribution of menarche occurrence according to female diet habit

## **Subjects and methods :**

A cross- section study which was conducted in different regions of Iraq from the north to the south . A

convenient sample with selecting the women ages from 17 to 25years. The sampling process was done by sending a questionnaire which included information regarding date of menarche age in addition to information which can affect this process, through online net to different females groups and they answered the questions. Part of sample was collected by direct interview with

girls in Tikrit province. Data analysis was doing by manual statistical method ,frequency and Chi square test . The study was conducted during the period from 1<sup>st</sup> November 2020- 30<sup>th</sup> march 2021. The questionnaire was well structured and including information regarding certain factors associated with menarche age.

### Results :

**Fig. 1)Distribution of study sample according to Age At Menarche**

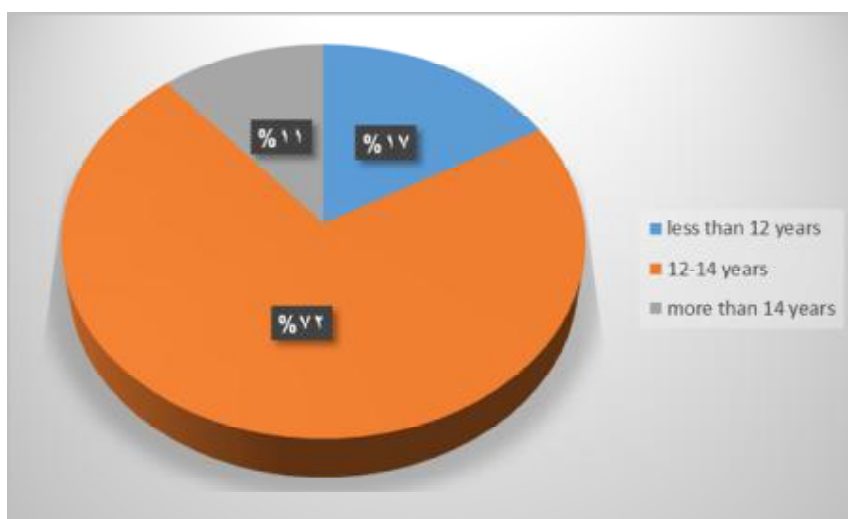


Fig.1) shows that the most frequent female of menarche age between 12-14 years (72%) . The female with age at menarche less than 12 was years(17%). And the last those with menarche at age 14 years and more(11%).

**Table 1) Distribution of study sample according to certain factors affecting Age At Menarche**

Girls AAM \ Mother AAM	< 12 years	12-14 years	14 years and more	Total	Chi test at p value< 05
Same age	34 9.9%	270 78.5%	40 11.6%	344 100%	The chi-square =109.7244. <i>p</i> -value is < 0.00001. The result is significant
< age	4 3.2%	95 75.4%	27 21.4%	126 100%	
>age	70 39.8%	101 57.4%	5 2.8%	176 100%	
<b>BMI</b>					
Underweight	23 23%	59 59%	18 18%	100 100%	The chi-square is 13.8314. <i>p</i> -value is .007853. the result is significant
Normal	42 13.5%	241 77.5%	28 9%	311 100%	
Overweight	43 18.3%	166 70.6%	26 11.1%	235 100%	
<b>Physical activity</b>					
Highly active	58 17.6%	228 69.1%	44 13.3	330 100%	The chi-square = 4.0612. <i>p</i> -value is =0.131254. The result is not significant
Normal	50 15.8%	238 75.3%	28 8.9%	316 100%	
Food habit					
Vegetarian	7 15.2%	30 65.2%	9 19.6	46 100%	The chi-square = 3.5456. <i>p</i> -value is 0.16986. The result is not significant
Non vegetarian	101 16.8%	436 72.7%	63 10.5%	600 100%	
<b>Regions</b>					
North	15	105	18	138	The chi-square

	10.9%	76.1%	13%	100%	= 4.9061. <i>p</i> -value is 0.29065. The result is not significant
Middle	75 18.4%	288 70.6%	45 11%	408	
South	18 18%	73 73%	9 9%	100 100%	
Total	108 16.7%	466 72.1%	72 11.2%	646 100%	

Table 1) shows that the frequency of female with age at menarche age with same age of their mothers as follow ( females with age at menarche 12-14 (78.5%), females with age at menarche with age 14 years and more was (11.6% ) and females with age at menarche less than 12 years was (9.9%). There was with a significant difference.

Table 1) reveals that the most frequent female with age at menarche 12- 14 years was among girls with normal weight (77.5%). The most frequent female with age at menarche less than 12 years and those group with 14 years more was among under weight females (23%, 18% respectively with a significant difference.

Table 1) shows that the higher frequency of girls with age at menarche less than12 years and those

with age at menarche 14 years and more were among females with high physical activity (17.6%, 13.3% respectively) while those with menarche age 12-14 years was with normal physical activity (75.3%) with no significant difference

Table 1) shows that the most frequent female with age at menarche less than 12 years and group of 12- 14 years was among those with non vegetarian food habit (16.8%,72.7% respectively) and those female with age at menarche age 14 years and more was among female with vegetarian food habit (19.6%) with no significant difference.

Table 1) shows that the most frequent female with age at menarche less than 12 years was among female from middle and south region of Iraq (18.4%, 18% respectively )and. The

female with age at menarche 12-14 years and with 14 years and more was among those from north region (76.1%,13% respectively) with no significant difference.

### **Discussion :**

This study determined certain factors affecting age at menarche among Iraqi girls. It has been documented that the most common girls with age at menarche about 13.5 years (72%), this result was lower than that reported in Iran (78.4%)<sup>(27)</sup>, and higher than that found in India (42.3%)<sup>(28)</sup>. The frequency of females with age of menarche less than 12 years and after 14 years was 17% and 11% respectively. This result was higher than that found by Alibereisen (5%)<sup>(29)</sup>. A study done in India found that mean age at menarche was 11 years<sup>(30)</sup>. In Caucasian female the most frequent of age at menarche was about 12.5years<sup>(2,26)</sup>. This differences in results may be due to social and environmental factors<sup>(31,32)</sup>. It has been documented that genetic factors had been effect on (50-80 %) of occurrence age menarche<sup>(33,34)</sup>.

It has been documented by Ailbereisen RK that about 5% of the females with menarche at age before 10 years and after 15 years<sup>(29)</sup>. This result was more than that found in India (7.4%)<sup>(28)</sup>. The female with age at menarche 14 years and more (11%). This result was lower than that found in India (25%)<sup>(28)</sup>. This may be as a result of genetic and environmental factors<sup>(35)</sup>. In another study in India it has been found that the mean of age at menarche with same of their daughters was 11 years<sup>(30)</sup>.

It has been documented that high frequency of females with age of menarche 12.5 years (78%) was among those their maternal age at menarche was the same of their daughters which indicate effects of genetic and environmental factors on this aspects<sup>(31,32,34)</sup>. The genetic factors affect 50-80% of age at menarche<sup>(33)</sup>. The females with age at menarche less than 12 years and those with age at menarche more than 14 years differ from their mothers age at menarche because of life style ,environmental and nutritional factors<sup>(31,32,35)</sup>.

Regarding body mass index of study sample females ,it has been shown that the female with age at menarche less than 12 years and among those with age at menarche 14 years were more prevalent among those with underweight (23%,18% respectively).while those with age at menarche 12-14 years were more prevalent among those with normal weight(77%). Obesity had been a rule in early age at menarche <sup>(36,37)</sup> while in another studies was done by Demerath EW etal , they found that there was no relation between body mass index and age at menarche <sup>(38)</sup>.

Regarding physical activity of study sample females ,it has been shown that the female with age at menarche less than 12 years and those with age at menarche 14 years and more were more prevalent among those with high physical activity(17.6%,13.3% respectively).while those with age at menarche 12-14 years were more prevalent among those with normal physical activity(75.3%). It has been

reported that high physical activity delay age at menarche <sup>(39)</sup> while other study reported that there was no effects of physical activity on age at menarche <sup>(27,40)</sup>. Other studies has been documented that there was an association between physical activity and age at menarche <sup>(30,41-44)</sup>.

Regarding food habits of study sample females ,it has been shown that the female with age at menarche less than 12 years and those with age at menarche 12- 14 years were more prevalent among those who was nonvegetarian (16.8%,72.7% respectively).while those with age at menarche 14 years and more were more prevalent among those who were vegetarian(19.6%%). This differences may be due to effects of life style and nutritional status <sup>(6)</sup>, general health and life style<sup>(8)</sup>.

Regarding residence of study sample females ,it has been shown that the female with age at menarche less than 12 years were more prevalent among those with middle area of Iraq (18.3% )while those with age at

menarche 12-14 years and those with age at menarche 14 years and more were more prevalent among those from north (76.1%, 13% respectively). These differences may be due to differences of environmental, geographical factors of location<sup>(10,11)</sup>.

**Conclusions :** The most frequent age of menarche among Iraqi female was 13 years and most of girls age at menarche was similar of their mothers. It was documented that there was an effects of genetic factors in addition to body weight on occurrence of menarche.

**Recommendations :** We can recommend for more details study regarding other factors which need more investigation with large sample size.

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