

Early Puberty of Schoolgirls and its Impact on Academic Standing and Attitude towards School and Teachers, in the City of Jeddah, Saudi Arabia

Amani Ahmad Rifai Filimban¹ and Tahia Abdullah Maimanee²

¹. Department of Biology, Collage of Science, King Abdulaziz University, Jeddah, Saudi Arabia. P.O. Box: 42845 Jeddah 21551, Saudi Arabia

². Department of Biology, Collage of Science, King Abdulaziz University
afilimban@kau.edu.sa

Abstract: Although facts have showed that the age of puberty among girls seems to have been decreasing in recent decades in different countries around the world including the Gulf region, unfortunately the data regarding puberty of elementary school female students is still scarce in the Gulf region. The main goal of this study is to investigate early puberty among a sample of Saudi schoolgirls through Ages (8- 11) Years. Thus, while also examining the impact of early puberty on their behavior and grades in Jeddah, Saudi Arabia. The study was done on 508 randomly selected female students from ages 8-11 years in the city of Jeddah. Data was collected by conducting interviews with these students on a school day, conducted in their schools. The interview questions included: demographic information, the scale of grades, as well as the questionnaire of the Behavior Assessment System for Children (the second edition) (BASC 2), to evaluate the personality and self-comprehension of girls going through puberty. The results of the study illustrated that the mean age of puberty among Saudi girls is presently 10.11 years old. Likewise the study showed that pubertal girls suffer from negative behavior; such as school problems composite that includes a change in attitude towards the school and its teachers with a significant relationship estimated by ($P=0.00$) ($R=0.29$). Also, early puberty affects the academic grades of pubertal girls. The age of puberty among Saudi girls follows the secular trend in decreasing. Moreover, significant links have been found between early puberty, and decreased academic standing, as well as a negative behavior towards school and teachers among pubertal girls.

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1. Introduction

Puberty is a main process in human development includes physical changes which take place during childhood when the child body turns to an adult body (El-Sayed Amr, 2012). The onset of menstruation is a marker of puberty which is an indicator in the process of female sexual maturity, physiological development, health and nutritional status (Wang, 2002). This includes the most rapid physical growth and hormonal changes, which involves the appearance of complex behavior and the stirring of new emotions (Brooks-Gunn, 1988).

Early puberty is defined as the onset of development of breasts, menstrual cycle and other secondary sex characteristics earlier than usual (Steinberg, 2008). Early puberty is influenced by many factors, such as biological and environment factors (Harden and Mendle, 2011). Singh et al (2006) stated that the age of puberty can range from 12 to 15 years old, while Jannelli (2005) mentioned that puberty occurs at an average age of 12.5 to 13 years old. However, the age at menarche appears to have been declining in recent decades in different countries (Lehmann et al, 2010). For example, in Ireland it was

from 13.52 years old in 1986 to 12.53 years old in 2006 (O'Connell et al, 2009), in Croatia it was from 12.92 years old in 1997 to 12.31 years old in 2010 (Vecek et al, 2012), in the United States of America it was 12.43 years old (Chumlea et al, 2005), in Britain it was around 13 years old (Whincup et al, 2005), in Japan it was 12.3 years old (Hosokawa et al, 2012), in India it was 13.22 years old (Deb, 2011), in Bangladesh it was 13.12 years old (Hossain et al, 2010), in Ghana it was 12.74 years old (Aryeety et al, 2011), in Ethiopia it was 16.9 years old (Zegeye et al, 2009), and in Egypt it was 12.44 years old (Ghaly et al, 2008). There were very few studies done concerning pubertal age in the Arabian Gulf countries. In fact, only three countries have done studies regarding the matter. In Saudi Arabia it was 13.05 years old (Babayet al, 2004), in the United Arab Emirate it was 12.68 years old (Badrinath et al, 2004), and in Kuwait it was 12.41 years old (Al-Awadhi et al, 2013).

Derbyshire, 2010 has demonstrated that early puberty in girls can have adverse behavioral effects in their life that lead to behavioral changes and problems. The physical, mental, and emotional changes which occur during puberty can produce

stress and result in making life difficult for girls (Kaltiala et al, 2003). Besides clearly visible physical changes, puberty also reflects on some temperamental and behavioral changes (Koolschijn et al, 2014). Mensah et al, (2013) recorded that early puberty of Australian girls, has been linked to higher rates of mental health problems and different behavioral patterns in girls.

2. Material and Methods

In order to conduct a school-based questionnaire in Jeddah, this project acquired the support of the Ministry of Higher Education in Saudi Arabia. We conducted a cross-sectional study among 508 schoolgirls. These girls were selected randomly to estimate the age of puberty of females in the city of Jeddah city and to examine their behavior. Data was gathered for the study by using the Behavior Assessment System for Children the Second Edition (BASC2) questionnaire. Approximately 20 to 30 minutes were spent with each student at a private quiet room at their school to complete the interviews. We gave each student a general overview of the study and explained the procedures. In addition, we reassured the students that their information would be protected and be strictly confidential.

The questionnaire included demographic information; the girl's name, age, date of puberty, and academic standing. In addition, 139 statements were applied on the participants to evaluate the behavior and personality of girls through ages 8-11. This questionnaire measures many variables. One of which is the negative behavior towards teachers and school which evaluates the school problem composite. This is defined by the feeling of alienation, hostility and dissatisfaction regarding school, accompanied with resentment and dislike of teachers, and beliefs that they are unfair and uncaring. The school problems composite that includes the negative attitude towards school and teachers provides a good indication of problems in behavior and summarizes the responses of girls. The risk situation in regards to negative behavior is distinguished when the student's evaluation marked as higher than or equal to the 70th percentage from the scale of BASC 2. The scores were computed depending on the scale, and the percentage is calculated accordingly.

Once all the data was collected, we entered the data into an Excel database for analysis. Data was analyzed using the Statistical Package for the Social Sciences computer software (SPSS for Windows, Version 20.0, SPSS, Inc., 2011). Additionally, we applied the Chi Square in order to estimate the relationship between all variables. Based on the Chi Square analysis, the P-value that is less than or equal to 0.05 is considered significant.

3. Results

The results in the sample of 508 girls show that the percentage of girls who had attained puberty was 16% (Table1) and the mean age of pubertal Saudi girls was 10.11 ± 0.81 years (Table 2).

In regards to the attitude to school, it assesses the general opinion about school. 54.3% of pubertal girls are in risk and had a negative attitude and discomfort towards school. This means they are feeling alienated, hostile and dissatisfied concerning school, more than non -pubertal girls, which was represented at 28.1% (Table 3).According to the Chi Square Analysis, there was a significant relationship between puberty and the attitude towards school estimated by ($P=0.00$), ($df=2$) and a weak positive correlation at ($R=0.22$) (Table 4).

Regarding the attitude towards teachers, it assesses the individual's perception of teachers as being unfair or unmotivated to help their student. 91.4% of pubertal girls are in risk and had a negative attitude towards teachers, dissatisfaction, resentment and dislike of teachers. That means they believe that teachers are unfair and uncaring about students, more than the percentage of non pubertal girls which showed 63.5% (Table 3). In addition, there was a significant relationship between puberty and the attitude towards teachers with ($P=0.00$), ($df=2$) and a weak positive correlation at ($R=0.24$) (Table 5).When exploring the school problem composite, more than half of the sample (55.6 %) of pubertal girls in the sample are at a risk status that demonstrated dissatisfaction with school. The dissatisfaction was displayed by having severe problems within the school environment, with the school personnel which may be affecting academic standing. This percentage was greater than non-pubertal girls at 20.4 % (Table 6). There was a significant relationship between puberty and the school problems composite with ($P=0.00$), ($df=2$) and a weak positive correlation of ($R=0.29$) (Table 7).

On the other hand,53% of the pubertal girls got less than excellent grades, whereas 47% got excellent grades (Table8).There was a significant relationship in table 9 between puberty and the grades of girls including excellent or less than excellent grade ($P=0.00$), with ($df= 1$) and a weak positive correlation at ($R=0.16$).

Table 1: The Percentage of Pubertal and Non-Pubertal Girls

Variables Description	*N	*%
Non pubertal girls	427	84
pubertal girls	81	16
Total	508	100

*(N=number of sample, % = percent).

Table 1: The Mean Age of the Puberty of Saudi Girls

Statistics		
Age of puberty		
N	Valid	81
	Missing	0
Mean		10.1111
Median		10.0000
Mode		10.00
Std. Deviation		.80623

Table 3: The Percentage of Negative Attitude to School and Teacher

Variables	Description	% of Puberty	% of Non Puberty
Attitude to school	High and risk status	54.3	28.1
Attitude to teacher	High and risk status	91.4	63.5

Table 4: The Puberty and The Attitude to School

Crosstab					
Count					
		School attitude			Total
		Low	average	high sig	
Puberty	no	307	76	44	427
	yes	37	22	22	81
Total		344	98	66	508

Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	24.894 ^a	2	.000	
Likelihood Ratio	22.510	2	.000	
Linear-by-Linear Association	24.837	1	.000	
N of Valid Cases	508			

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.52.

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.216	.000
N of Valid Cases		508	

Table 5: The Puberty and the Attitude to Teacher

Crosstab					
Count					
		Teacher attitude			Total
		low	average	high sig	
Puberty	no	156	104	167	427
	yes	7	17	57	81
Total		163	121	224	508

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.921 ^a	2	.000
Likelihood Ratio	35.692	2	.000
Linear-by-Linear Association	31.812	1	.000
N of Valid Cases	508		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.29.

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.243	.000
N of Valid Cases		508	

Table 6: The Percentage of School Problems Composite

Composites	Puberty	Low (Normal attitude)		At Risk High Sig.	
		N	%	N	%
School Problems	Yes	36	44.4	45	55.6
	No	340	79.6	87	20.4

Table 7: The Puberty and the School Problems Composite

Crosstab					
Count					
		School Problems			Total
		low	risk	high sig	
Puberty	no	340	25	62	427
	yes	36	9	36	81
Total		376	34	98	508

Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	45.800 ^a	2	.000	
Likelihood Ratio	40.246	2	.000	
Linear-by-Linear Association	45.459	1	.000	
N of Valid Cases	508			

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.42.

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.288	.000
N of Valid Cases		508	

Table 8: The Percentage of School Problems Composite

Variables	Description	Puberty *N	%
Grade	< Excellent	43	53
	Excellent	38	47

(*N=Number, %= Percent)

Table 9: The Puberty and the Grade

Crosstab				
Count		Grade		Total
		<Excellent	Excellent	
Puberty	no	135	292	427
	yes	43	38	81
Total		178	330	508

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.789 ^a	1	.000		
Continuity Correction ^b	12.862	1	.000		
Likelihood Ratio	13.227	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	13.762	1	.000		
N of Valid Cases	508				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 28.38.
b. Computed only for a 2x2 table.

Symmetric Measures			
		Value	Approx. Sig.
Nominal	by Contingency	.163	.000
Nominal	Coefficient		
N of Valid Cases		508	

4. Discussions

Puberty has various definitions: generally, it is the signal of the onset of the female reproductive cycle that means the onset of puberty (Forman et al, 2013). It is also known as a period of increased secretion of gonadal steroid hormones, therefore it is a sensitive period during the development of girl's life (Sisk and Zehr, 2005; Zehr et al, 2007). Another definition of puberty is the time in which a child's sexual and physical characteristics mature (Ostojic, 2013).

The aim of this study is to discover the current pubertal age among Saudi girls in the city of Jeddah

and to study the influence of early puberty on their behavior and their academic standing.

Also, the comparison with other countries mentioned that the age of puberty in Saudi girls 10.11 years was close to that in Turkey which was 10.16 years (Semiz et al, 2008), and less than the age of puberty in other oil-rich countries in the Arabian Gulf region. In Kuwait and the United Arab Emirate the age of puberty is 12.41, 12.68 years respectively (Al-Awadhi et al, 2013; Badrinath et al, 2004).

The second major goal of this current study is to assess the behavior of pubertal girls and the impact of early puberty on their grades at school in the city of Jeddah, thus, by using the questionnaire (BASC-2) (Reynolds and Campus, 2004). The current study is the premier study in the Gulf region to investigate the relationship between early puberty in girls and its effect on both the grades and the behavior by using the (BASC-2) questionnaire.

Moreover, the current study examined the self-assessed personality of pubertal girls. The results reported that pubertal girls from ages 8 to 11 suffered from behavioral school problems. This includes the negative attitude towards the school and its teachers. These findings are in an agreement with De-Rose et al (2011) who indicated the association between early pubertal timing and problems of behavior for groups of Caucasian and African American girls. In addition, this was consistent with (Ge et al., 1996) which mentioned that girls who had attained puberty earlier than their peers may be forced to confront different challenges before they are emotionally or cognitively prepared to do. As a result, this might trigger a negative effect such as negative emotions, fear, and confusion in the behavior of girls. On the other hand, (Mendle et al, 2010) mentioned that early puberty may amplify feelings of being isolated or misunderstood by others and odd behavior may be perceived by others in such a way and result in conflict, social problems and cessation of relationships. Also, De-Rose et al (2011) demonstrated that the early maturing of Caucasian girls had increased in internalizing social problems from the 1st to the 6th grade and Reardon et al (2009) are in agreement with the current study where they found significant associations between early pubertal timing and behavioral problems.

Concerning the academic grade of girls at schools, this study intimated a significant relationship between puberty and the grades of girls at school. The percentage of pubertal girls who got grades which were less than excellent was slightly higher than the percentage of those who got an excellent grade in the same group. This group is where the biggest percentage of pubertal girls who got less than excellent were at age 11 and 10 years, followed by the highest percentage at age 8 and 9 years.

In addition, the percentage of pubertal girls who got an excellent grade is still much less than other girls in the non-pubertal group. This might be due to the effect of early puberty on the mental capabilities.

These findings are consistent with Mensah et al (2013) who reported the association between early puberty and poor mental health among Australian girls. On the other hand, Patton et al (2008) agreed with this result and mentioned that early puberty causes some mental behavioral problems and presents symptoms of depression and anxiety. This was confirmed with Mendle et al (2010) who demonstrated that early pubertal girls are more likely to have a poor academic performance in school and less interest in academic subjects than peers with a later pubertal age. Also, Simmons & Blyth (1987) found that early pubertal girls are more likely to engage in relationships, which may distract them from academic work. This shows a correlation between early puberty in girls and lower academic grades at school.

The explanation may be due to the emotional immaturity and mismatch between the feelings of girls and their attitudes (Westling et al, 2012).

In conclusion, the mean age at puberty among Saudi girls in the city of Jeddah is 10.11 years and the pubertal age is still dropping taking the secular trend. In addition, the present results indicated how early puberty would affect the behavior of these girls and would impact on the society as a whole.

The current study is the first study in the Arabian Gulf region that studied the behavior of pubertal girls from ages 8-11 years old by using BASC 2 personality questionnaire, which indicated that puberty affects the behavior of girls. The new findings in this current study demonstrated that pubertal girls suffer from negative attitudes towards school and teachers throughout this period of change. Likewise, early puberty negatively influence grades hence, the pubertal girls tend to have less interest in school and decreased academic performance and standing at school.

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Corresponding Author:

Amani Ahmad Rifai Filimban
Department of Biology
Collage of Science, King Abdulaziz University
Jeddah, Saudi Arabia

P.O. Box: 42845 Jeddah 21551, Saudi Arabia.

E-mail: afilimban@kau.edu.sa

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