

## Early Puberty is associated with Psychological Health Problems in Korean Adolescents

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**Abstract.** This study was performed to assess the relationship between puberty timing and psychological health in adolescence. This study was conducted by using the raw data from the 9<sup>th</sup> Korea Risk Behavior Web-based Survey 2013 (KYRBS). Participants were 35,739 adolescent girls from middle and high school. There were statistically significant differences among three groups in perceived health, perceived body image and perceived happiness. It is concluded that puberty timing is associated with psychological health problems. Professionals working with adolescents should consider the psychological health needs of early maturing adolescent girls.

**Keywords:** Puberty, Health, Body Image, Suicide, Adolescent

### 1 Introduction

During puberty, hormonal, psychological, cognitive and physical changes occur simultaneously [1]. Early puberty in girls has been identified as an important risk factor for various mental health problems, such as depression, anxiety, and suicide attempts [2-3]. The general pattern is that being early has the most negative impact on girls whereas being late is most distressing for boys [4].

Previous research has described that girls feeling “on-time” regarding their puberty had the most positive feelings in terms of pubertal development [5]. Therefore, anomalies in pubertal timing (early or delayed pubertal development) could be associated with higher risks of poor health [6]. From psychological perspective, maturing off

time, either earlier or later than peers, may cause excessive stress and be a risk factor for symptoms [2]. Whether or not early menarche has a great influence than on-time or late menarche on psychological symptoms is unknown, and there are no reports based on large sample size and across districts [3].

The objective of this research is to examine the links pubertal timing and psychological health in adolescent girls.

## **2 Method**

### **2.1 Samples**

This study was conducted by using the raw data from 2013 9<sup>th</sup> Korea Youth Risk Behavior Web-based Survey (KYRBS). The data were collected with an ongoing, web-based survey conducted on a nationally representative sample of middle and high school students with a stratified, clustered, multistage probability sampling design. After the survey was fully explained, only participants who provided informed consent completed the online anonymous self-report questionnaires in a school computer room.

The number of study subjects was 35,739 girls from 1<sup>st</sup> grade of middle school to 3<sup>rd</sup> grade of high school. All ethical approval about using secondary data was acquired by the university Institutional Review Board.

### **2.2 Measures**

Pubertal timing was assessed by the age at onset of menstruation by asking “When did you have your first menstruation?”. In this study, early onset menarche refers to menarche before 10 years, and late onset refers to menarche after 13 years, including those who had not experienced menstruation after 13 years old. Psychological health-related factors included perceived health, perceived body image, and subjective feeling of happiness.

### **2.3 Data analysis**

The collected data was analyzed with descriptive statistics and chi-square tests using IBM SPSS Statistics 20.0 and  $p < 0.5$  was considered statistically significant.

### 3 Results

#### 3.1 Characteristics of the Participants

Participants were 35,739 girls aged from 12 to 18 (M=14.93, SD=1.75). Among 35,739 participants, 1,816 (5.1%) had early menarche, 30,727 (86.0%) had on-time menarche, and 3,196 (8.9%) had late menarche.

#### 3.2 Psychological Health of the Participants

Table 1 shows the status of psychological health of study participants.

**Table 1.** Psychological Health of the Participants (N=35,739)

Variable		n	%
Perceived Health	Very unhealthy	134	0.4
	Unhealthy	2,664	7.5
	Moderate	10,104	28.3
	Healthy	17,212	48.2
	Very healthy	5,625	15.7
Perceived Body image	Obesity	2,490	7.0
	Over-weight	13,514	37.8
	Normal	12,781	35.8
	Low-weight	6,059	17.0
	Very thin	895	2.5
Perceived Happiness	Very unhappy	619	1.7
	Unhappy	4,062	11.4
	Moderate	11,840	33.1
	Happy	13,144	36.8
	Very happy	6,074	17.0

#### 3.3 Puberty timing and Psychological Health

Table 2 shows the association between psychological health and puberty timing. Almost all psychological health problems occurred at a higher frequency in the early menarche group than in the other two groups.

**Table 2.** Association between Pubertal timing and Psychological Health (N=35,739)

Variables	Categories	Early menarche	On-time menarche	Late menarche
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		n(%)	n(%)	n(%)	$\chi^2(p)$
Perceived Health	Very unhealthy	24(0.1)	99(0.3)	11(0.1)	198.98 ( $<.001$ )
	Unhealthy	213(0.6)	2,260(6.3)	191(0.5)	
	Moderate	577(1.6)	8,743(24.5)	784(2.2)	
	Healthy	759(2.1)	14,904(41.7)	1,549(4.3)	
	Very healthy	243(0.7)	4,721(13.2)	661(1.8)	
Perceived Body image	Obesity	248(0.7)	2,112(5.9)	130(0.4)	1210.21 ( $<.001$ )
	Over-weight	876(2.5)	11,861(33.2)	777(2.2)	
	Normal	515(1.4)	11,186(31.3)	1,080(3.0)	
	Low-weight	155(0.4)	4,944(13.8)	960(2.7)	
	Very thin	22(0.1)	624(1.7)	249(0.7)	
Perceived Happiness	Very unhappy	62(0.2)	498(1.4)	59(0.2)	140.86 ( $<.001$ )
	Unhappy	245(0.7)	3,507(9.8)	310(0.9)	
	Moderate	624(1.7)	10,304(28.8)	912(2.6)	
	Happy	620(1.7)	11,329(31.7)	1,195(3.3)	
	Very happy	265(0.7)	5,089(14.2)	720(2.0)	

#### 4 Conclusions

Early pubertal timing associates with psychological health problems in adolescent girls. Early matured girls felt significant more negative about their health, bodies, and subjective happiness than other girls with on-time or late menarche. Teachers and school nurses should pay attention to psychological health needs of adolescents who mature earlier than the majority of their peers.

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