



EDITORIAL

A moment of truth

Puberty is a complex transition that involves dramatic changes in several domains of human development including biological, physical, psychological, and social [1]. Individual variations in the timing of puberty may influence the adoption of unhealthy behaviors. Specifically, compare to those who mature on-time or late, adolescents who mature early are at a higher risk of exposure to several psychological, social, and health disadvantages [2]. For instance, girls who experience puberty earlier than their counterparts are more susceptible to adverse health behavior such as earlier alcohol use [3], cigarette smoking [4], and eating disorder [5]. Furthermore, evidence suggests that early timing of puberty among girls is also associated with decline in physical activity (PA) [6], and an increased time spent in sedentary behavior (SB) [7]. Only a few studies have examined the relationship between puberty and body mass index (BMI) among boys by using different measures (e.g., voice break, age at onset of pubertal growth spurt, peak height velocity (PHV), pubic hair growth, testicular volume, and/or penis length), the results have been inconsistent [8]. However, a recent study examining the trend of age at spermathe and its association with BMI among Chinese school boys found that a higher BMI or BMI-for-age z-score was associated with an increased likelihood of having reached spermathe, indicating the overlapping trend of earlier age at spermathe and increase in BMI over the past 15 years among Chinese boys [9].

While much of the research is conducted in the European and North American contexts, studies among Korean adolescents are limited. In Korea, health care costs associated with precocious puberty (i.e., the onset of signs of puberty before age 7–8 in girls and age 9 for boys) have increased remarkably for the past decade. A total cost of health care for precocious puberty was approximately 2.3 million US dollars in 2006 and 17.9 million US dollars in 2010 [10]. This trend overlaps with the increasing trend of childhood obesity in Korea, which the prevalence doubled from 5.4% in 1998 to 10.8% 2008 [11]. Greater understanding of the associations between pubertal timing, PA, and SB, independent of weight status among Korean adolescents may

help researchers and policy makers to develop health promotion strategies for adolescents during this formative years (i.e., adolescence). Therefore, the purpose of this study was to examine the associations between pubertal timing, PA, and SB after controlling for BMI. It is hypothesized that adolescents who experience menarche and spermathe earlier or later than their peers will show negative outcomes.

In the current issue of *Osong Public Health and Research Perspectives*, a study examined the timing of menarche and spermathe and their associations with PA and SB after controlling for BMI [12]. Multiple logistic regression analyses was conducted to determine whether the timing of menarche in girls and spermathe in boys are associated with PA and SB independent of BMI in a nationally representative sample of Korean adolescents (13–18 years) (N = 74,186). After controlling for age, family economic status, and BMI, early timing of spermathe among boys was associated with a higher likelihood of engaging in PA and a lower likelihood of engaging in SB for less than 2 hours during weekdays. In contrast, boys with late timing of spermathe were less likely to engage in PA and more likely to engage in SB for less than 2 hours. Among girls, early or late timing of menarche was associated with a higher likelihood of engaging in PA and a lower likelihood of engaging in SB. Conclusions. Timing of menarche in girls and spermathe in boys could be a marker for PA and SB among Korean adolescents. To promote PA and discourage SB among Korean adolescents, school-based, grade-specific interventions can be tailored by the absence or presence of menarche/spermathe.

The authors argued that pubertal timing was a potential relevant marker associated with PA and SB, independent of BMI among Korean adolescents. The results have implications for public health policy. Interventions promoting active living among adolescents should be tailored based on different maturational timing with other sociodemographic characteristics; premenarcheal/spermatheal stage may be a critical period for health behavior formation. Furthermore, physicians and health professionals are suggested to use pubertal timing and health behavior early or late timing of

puberty as a marker for overweight and physically inactive lifestyle among Korean adolescent boys. It is recommended to promote adopting physically active lifestyle among boys with early or late timing of puberty. Specifically, discouraging overall SB should be focused on boys with early pubertal timing and promoting PA should target boys with late pubertal timing. In addition, it may help researchers to better understand on how relative pubertal timing influence health behavior by incorporating mediating or moderating variables (i.e., psychosocial factors associated with puberty) in future studies. Longitudinal tracking is also required for future studies. It is still unclear that pubertal timing influence the decline in PA and increase in SB.

Early or late timing of puberty could be a relevant marker for physically inactive lifestyle among Korean adolescent boys. The results of this study has some consistent and inconsistent findings compared to existing literature mostly from Western countries; nonetheless, the present study makes a unique contribution to the limited existing research examining pubertal timing and health behavior, particularly among adolescent boys. School-based interventions to promote PA and discourage SB among Korean adolescents should take individual differences in pubertal timing into consideration.

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Hae-Wol Cho*

Editor-in-Chief

*Osong Public Health and Research Perspectives,
Korea Centers for Disease Control and Prevention,
Cheongju, Korea*

Professor Emeritus

*College of Medicine, Eulji University, Daejeon,
Korea*

*Corresponding author.

E-mail: hwcho@eulji.ac.kr

Chaeshin Chu**

Managing Editor

*Osong Public Health and Research Perspectives,
Korea Centers for Disease Control and Prevention,
Cheongju, Korea*

**Corresponding author.

E-mail: cchu@cdc.go.kr