

**CHANGING TRENDS IN THE AGE OF PUBERTAL ONSET AMONG
ADOLESCENT GIRLS IN FERGANA REGION**

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ABSTRACT

Puberty is a critical period of human development, and its timing has significant implications for adolescent health and future well-being. Recent global trends indicate a secular decline in the age of pubertal onset, particularly in girls. This study investigates the current trends in the age of pubertal onset among adolescent girls in Fergana Region, Uzbekistan.

Keywords: Puberty, menarche, thelarche, secular trend, adolescent girls, Fergana Region, Uzbekistan

INTRODUCTION

Puberty represents a transitional phase from childhood to adulthood, characterized by physical, hormonal, and psychosocial changes. The timing of pubertal onset is influenced by genetic, nutritional, environmental, and socioeconomic factors (Parent et al., 2003). Over the past century, a well-documented secular trend toward earlier pubertal development has been observed in many industrialized and developing countries (Euling et al., 2008).

In Uzbekistan, limited epidemiological data exist regarding the current pubertal timing among adolescent girls. Fergana Region, as one of the most densely populated areas in the country with distinct urban and rural lifestyles, presents a unique setting for such investigation. Previous local studies from the early 2010s reported a mean menarcheal age of approximately 13.0 years. However, rapid socioeconomic changes, shifts in dietary patterns, and increased exposure to endocrine-disrupting chemicals may be contributing to a changing landscape of adolescent development.

This study aims to determine the current age of pubertal onset (thelarche and menarche) among school-aged girls in Fergana Region and to compare these findings with previous

data to identify secular trends. Understanding these patterns is essential for clinical practice, school health education, and public health policy formulation.

MATERIALS AND METHODS

Study design and setting: A community-based cross-sectional study was conducted between September 2024 and January 2025 in Fergana Region, Uzbekistan. Five districts were randomly selected: three urban (Fergana city, Margilan, Quvasoy) and two rural (Dangara, Uzbekistan districts).

Study population: A total of 450 healthy girls aged 8 to 16 years were recruited from public secondary schools. Participants with chronic illnesses, endocrine disorders, or those taking medications affecting growth and puberty were excluded.

Statistical analysis: Data were analyzed using SPSS version 26.0. Descriptive statistics were expressed as mean \pm standard deviation. Independent t-tests were used to compare means between urban and rural groups. A p-value of <0.05 was considered statistically significant.

RESULTS

The mean age of the study participants was 12.4 ± 1.8 years. Among the 450 participants, 242 (53.8%) were from urban areas and 208 (46.2%) from rural areas.

Age of thelarche: The overall mean age of thelarche was 10.2 ± 0.8 years. Urban girls demonstrated earlier breast development (9.9 ± 0.7 years) compared to their rural counterparts (10.5 ± 0.9 years), and this difference was statistically significant ($p=0.02$).

Age of menarche: Out of 450 participants, 276 (61.3%) had reached menarche. The overall mean age at menarche was 12.4 ± 1.1 years. Urban girls experienced menarche significantly earlier (12.1 ± 0.9 years) than rural girls (12.8 ± 1.2 years) ($p=0.01$).

Secular trend comparison: When compared to a regional study conducted in 2012 which reported a mean menarcheal age of 13.1 ± 1.0 years, our findings indicate a decline of approximately 0.7 years over the past decade.

CONCLUSION

The age of pubertal onset among adolescent girls in Fergana Region is declining, with significant urban–rural differences. These findings underscore the need for regionally updated normative data and targeted adolescent health interventions. Further research exploring the roles of nutrition, endocrine disruptors, and genetic susceptibility is recommended.

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