

Nicola Lovecchio¹

Original scientific paper

Dario Novak²

Luca Eid³

¹*Functional Anatomy Research Center (FARC), Department of Human Morphology and Biomedical Sciences – „Citta’ Studi”, University of Milan, Italy.*

²*Faculty of Kinesiology, University of Zagreb, Croatia*

³*ANSAS (Italian National School Agency), Minister of Education, University and Research, Milan, Italy*

GROWTH PATTERNS IN YOUNG ITALIAN STUDENTS: A LONGITUDINAL STUDY

INTRODUCTION

Our body is exposed to the physical growth effects during the first two decades of life. Changes in body and gender evolution are the macroscopic outcomes that affect all adolescents.

Also, the hormonal levels cause an increasing and important peak of muscular strength and power, variations in endurance and in speed performance. Even in the school environment, physical activity is modified and sometimes compromised. In particular, during school course all Physical Education (PE) teachers observe the growing path of their students.

The aim of this study is to show the growth patterns of Italian students observed during three different stages.

METHODS

Height and weight were measured (1) on three wide samples of adolescents (n=748; 14, 15 and 16-year-olds). The measurements were repeated on the same sample in the following two years. As such, a brief longitudinal study on anthropometric characteristics was assessed on 403 males (150, 114, 139 of 14, 15 and 16-year-olds respectively) and 345 females (131, 123, 91 of the three age groups).

PE teachers conducted all phases of the protocol during PE lessons. In particular, body weight was measured to the nearest 0.5 kg on a beam-balance scale, and stature was measured to the nearest 1 cm with a stadiometer (1).

RESULTS

In 2006, the 14-year-old male students were 167.5 cm in height and reached 175 cm in the following two years. In the same year, the 15-year-old males started from 171 cm (same value reached by 14-year-old group after one year) and reached 176 cm. The last group (16-year-olds) were 175 cm in height and the average 2-year increase was 1 cm.

Therefore, it was possible to define two important peaks of growth (mean=4 cm), while in the last steps (16 to 17 years) the phenomenon had a minimum variation (1 cm).

In all groups there was an increase in stature. The range was between 160 cm (14-year-old group in 2006) and 167 cm (third step for 16-year-old group in 2006). In particular, 16-year-old girls (Fig. 1) measured 165 cm while the last peak of growth is presumably between 17 and 18 years (167 cm).

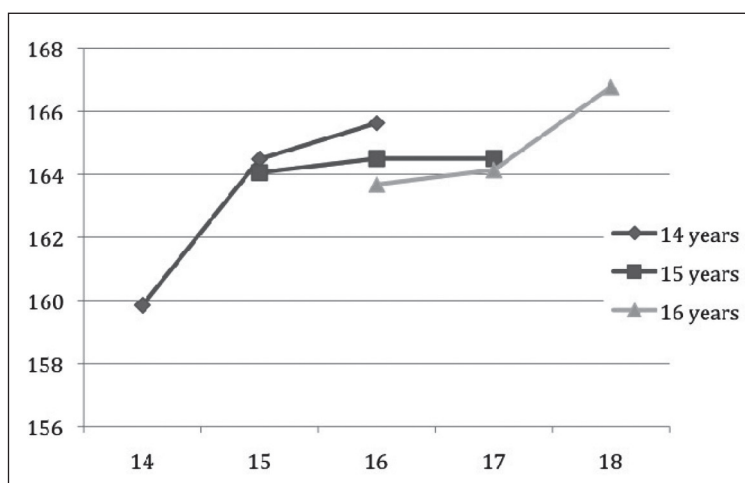


Fig.1 Height trend among young female students

Weight in males showed a non-linear trend. Indeed, in the first group (14-year-olds) there was an increase from 3 and 9 kg in 2007 and 2008, reaching 72 kg. In the second group the initial weight was 67 kg in 2006, increasing about 1 and 1.5 kg during the following two years. The last group (16-year-olds in 2006) showed an initial 3 kg decrease and a second phase of increase (3 kg).

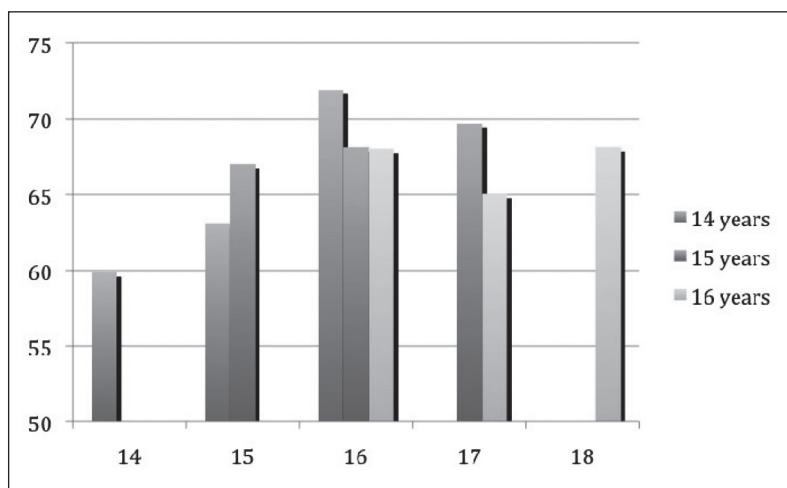


Fig. 2 Weight trend among young male student

Females also showed a non-linear trend in ponderal status. Namely, all three groups after the first measurement had obtained inferior weights compared to the second one. The greatest gap between the first and the third step was 8 kg (14-year-old group).

DISCUSSION

The real definition of growth allows an insight into critical aspects. Especially considering height, there were similar measures among different age groups (2) while according to gender, there was a weight increase among both males and females, but with a non-linear trend.

Future investigations could compare the growth trend between urban and rural populations, the effects of socioeconomic hierarchies (3) and the variability due to motor habits.

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