

SEXUAL MATURATION IN GIRLS: ASSOCIATION WITH PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR AMONG ADOLESCENTS AGED 10-15 (HBSC 2018 - FRENCH-SPEAKING BELGIUM)

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INTRODUCTION

- During adolescence, physical activity tends to decline, especially among girls [1].
- Adolescent inactivity can be due in part to biological factors, among which pubertal development may play a role [2,3].

OBJECTIVE

- The aim of this study was to study the relationship of sexual maturation (based on menarche) with physical activity and sedentary behaviour in girls.

METHODS

Survey and sample

- "Health Behaviour in School-aged Children" (HBSC) cross-sectional survey in French-speaking schools in 2018.
- Two-stage random sample of 3,911 10-15-year-old girls who self-completed a questionnaire anonymously.

Main outcome variables

- Recommended levels of physical activity (PA) [4]: global PA: at least 60 min. of moderate- to vigorous-intensity PA daily and vigorous PA: at least 3 times/week.
- Sedentary week time (SWT): all-screen use duration, categorized in tertiles.

Co-variables

- Sociodemographic characteristics: age, family structure, Family Affluence Scale (FAS) [5], migration status.
- Body perception.
- Proportions of pubescent girls in the class (< 50 % vs. ≥ 50 %).

Statistics

- Multilevel multiple binary (for PA) and multinomial (for SWT) logistic regressions, stratified by age group (≤ 12.5 years vs. > 12.5 years).

RESULTS

Sample characteristics

Almost one in two girls had already had their first period (55.3 %). This proportion was 20 % for those under 12.5 years old, and 85.4 % for those over 12.5 – Table 1. Moreover, girls aged > 12.5 years were less likely to engage in sufficient PA and reported higher levels of SWT – Table 2.

Physical activity

Within the group aged >12.5 years, post-menarcheal girls were less likely to engage in sufficient vigorous PA than pre-menarcheal girls regardless of the other covariates introduced into the model – Table 2. Among covariates, only Family Affluence Scale in both age groups and body perception in ≤12.5 years were associated with vigorous PA – Table 2. In both age groups, sexual maturation was not associated with reaching the WHO recommendations for global PA or daily moderate-to-vigorous physical activity (data not shown).

Sedentary week-time

Within the group aged ≤ 12.5 years, post-menarcheal girls were more likely to spend long SWT than pre-menarcheal girls. Sexual maturation was not associated with moderate SWT – Fig. 1. Blended family structure, perceiving one's body as too fat, and the proportion of pubescent girls in the class were associated with moderate and long screen time. Post-menarcheal girls were less likely to spend moderate or long screen time when there were less than 50 % pubescent girls in the class.

Among girls aged > 12.5 years, post-menarcheal girls were more likely to spend moderate and long SWT than pre-menarcheal girls – Fig. 2.

Among covariates, living in a single-parent family household and the FAS were associated with long screen time.

The percentage of pubescent girls in the class was not associated with screen time in this age group.

Adjustment for age

The analyses presented here were stratified by age group. Additional adjustments to age as a continuous variable resulted in vigorous PA being no longer associated with menarches in girls aged > 12.5 years. Moreover, among girls aged ≤ 12.5 years, moderate screen time was no longer associated with menarches. However, these results are not explained by a confounding age effect: continuous age was not associated with the outcome in both models.

CONCLUSION

- Understanding factors involved in the decline of PA during adolescence is crucial for the promotion of PA and reduction of sedentary behaviours. Our results suggest that during adolescence, the physiological changes induced by sexual maturation may contribute to the decline of vigorous physical activity and the increase in sedentary behaviour in girls.
- The cross-sectional design of this study limits the interpretation of the results, as it does not identify causal relationships like with longitudinal data.
- To our knowledge, only a few studies have examined the relationship between sexual maturation in girls and sedentary behaviours [3,6]. Our study fills a gap in the literature by focusing on screen time, a very relevant health behaviour in adolescent girls.

KEY MESSAGES

- Development of strategies aimed at improving physical activity among adolescent girls should take into account, among other aspects, pubertal development.
- Specific interventions, targeting pubescent girls, should also be developed to reduce screen time in order to prevent its potential negative consequences.

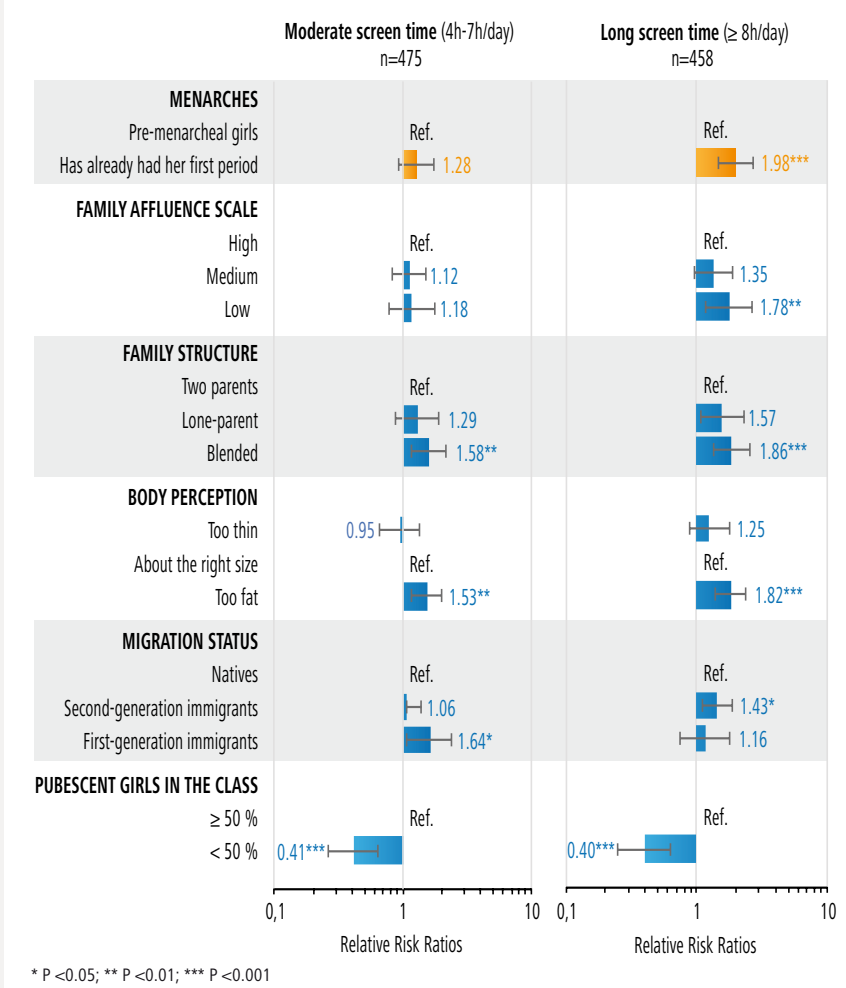


T1 Characteristics of the 10-15-year-old girls (%) by age category, 2018 HBSC survey (n=3,911)

Sample	≤ 12.5 years (n=1,802)	> 12.5 years (n=2,109)
Post-menarcheal girls	20.0	85.4
Vigorous physical activity ≥ 3 times a week	47.6	40.1
Daily moderate-to-vigorous physical activity ≥ 60 minutes	15.5	11.9
Recommended global physical activity *	10.4	7.6
Sedentary week time (all-screen use duration)	Low (0-4h/day)	48.2
	Moderate (4h/day-7h/day)	26.4
	High (≥ 8h/day)	25.4
Family Affluence Scale	High	20.6
	Medium	60.8
	Low	18.5
	Low	20.8
Family structure	Two parents	69.0
	Lone-parent	11.6
	Blended	19.4
Body perception	Too thin	14.4
	About the right size	53.3
	Too fat	32.4
Migration status	Natives	54.2
	Second-generation immigrants	34.8
	First-generation immigrants	11.0
≥ 50 % pubescent girls in the class **	10.8	90.8

* Daily moderate-to-vigorous physical activity ≥60 minutes combined with vigorous physical activity ≥3 times a week.
** In order to consider a possible class effect in multilevel models.

F1 Relative Risk Ratio of the multiple multilevel multinomial regressions analysing the relationship between sexual maturation (menarche) and sedentary week time (Ref. <4h/day) in girls aged ≤12.5 years



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T2 Adjusted odd ratios of the multiple multilevel logistic regressions analysing the relationship between sexual maturation (menarche), sociodemographic and environmental characteristics, and vigorous physical activity ≥ 3 times a week (n=3,911)

		girls aged ≤12,5 years (n=1,802)		girls aged >12,5 years (n=2,109)	
		OR [IC 95 %]	P	OR [IC 95 %]	P
Menarche	Pre-menarcheal girls	1	0.09	1	0.04
	Post-menarcheal girls	1.24 [0.96-1.60]		0.76 [0.58-1.00]	
Family Affluence Scale	High	1	<0.001	1	<0.001
	Medium	0.57 [0.44-0.73]		0.67 [0.53-0.83]	
	Low	0.35 [0.25-0.49]		0.37 [0.27-0.49]	
Family structure	Two parents	1	0.48	1	0.34
	Lone-parent	1.16 [0.85-1.58]		0.82 [0.63-1.07]	
	Blended	1.13 [0.88-1.46]		0.96 [0.77-1.20]	
Body perception	Too thin	1.09 [0.82-1.45]	0.02	0.90 [0.67-1.19]	0.64
	About the right size	1		1	
	Too fat	0.75 [0.60-0.94]		0.93 [0.76-1.13]	
Migration status	Natives	1	0.36	1	0.09
	Second-gen. immigrants	0.87 [0.70-1.08]		0.85 [0.70-1.04]	
	First-gen. immigrants	0.85 [0.61-1.18]		0.76 [0.57-1.01]	
Pubescent girls in the class	≥ 50 %	1	0.22	1	0.83
	< 50 %	1.24 [0.88-1.75]		0.96 [0.68-1.36]	

F2 Relative Risk Ratio of the multiple multilevel multinomial regressions analysing the relationship between sexual maturation (menarche) and sedentary week time (Ref. <4h/day) in girls aged >12.5 years

