

# OBJECTIVELY MEASURED AND SELF-REPORTED PHYSICAL ACTIVITY AMONG FINNISH SECONDARY SCHOOL STUDENTS

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### INTRODUCTION

According to the recommendations of Finnish health experts, all secondary school-aged students should be physically active for at least 60 minutes per day [4]. The review of recent studies [1, 3, 6], shows that a large part of Finnish adolescents (16–41 %) fail to achieve the recommendation. Although there are a plethora of research showing the number of physically active children and adolescents, there is a lack of studies analyzing objectively measured PA among secondary school students [9].

The specific aim of this study was to analyze associations of self-reported and objectively measured PA among secondary school students. Secondly, differences between boys and girls and between grades in self-reported and objective measurements were analyzed. It was also examined, how large part of secondary school girls and boys do not meet the recommendation of daily PA.

### METHOD

**Participants.** The participants were recruited from a secondary school located in Northeast Finland through direct contact with the school principal. The sample comprised 137 adolescents (87 girls and 50 boys) aged between 13- to 16-years at the commencement of the study.

**Measures.** To assess students' self-reported physical activity the Health Behaviour in School-aged Children Research Protocol [HBSC; 2] was used. The introduction preceding the items was: *"In the next two questions physical activity means all activities which raises your heart rates or momentarily get you out of breath for example in doing exercise, playing with your friends, going to school, or in school physical education. Sport also includes for example jogging, intensive walking, roller skating, cycling, dancing, skating, skiing, soccer, basketball and baseball."* The items required students to summarize their time spent in physical activity each day following: 1) *"When you think about your typical week, on how many days you are physically active for a total of at least 60 minutes per day?"* and 2) *"Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?"*. The mean of the two item scores was calculated and used as the students' physical activity score.

To analyze adolescents' objectively measured PA Polar Active activity monitors [5] were used, which measured daily PA in minutes, ranging from moderate to vigorous PA. Measurements were carried out during a one-week period in April 2011.

### RESULTS

Descriptive statistics and Pearson's correlation coefficients were examined (Table 1). The correlation between self-reported (SR) and objectively measured PA (OM) was highest at Grade 9 in the data of girls. Correlation coefficients were higher at Grade 8 and Grade 9 compared to Grade 7.

Statistically significant differences between grades were revealed in self-reported PA ( $F(2, 210) = 13.625, p < .001$ ). Tukeys' post hoc test showed that statistically significant differences in self-reported PA were found between Grade 7 (Mean = 5.5) and Grade 8 (Mean = 4.0) ( $p < .05$ ), and Grade 7 (Mean = 5.5) and Grade 9 (Mean = 4.1) ( $p < .001$ ). There were no significant differences between boys and girls in self-reported or objectively measured PA nor between different grades in objectively measured PA.

Table 1. Descriptive statistics and Pearson's correlation coefficients (girls = 87; boys = 50).

Grade	Group	Min. (OM minutes/d)	Max. (OM minutes/d)	Mean (OM minutes/d)	SD (OM minutes/d)	Mean (SR d/w)	SD (SR d/w)	Correlation (OM/SR)
Grade 7	girls	34	223	111.2	43.0	5.3	1.4	.076
	boys	40	150	93.0	38.1	5.8	1.2	.150
	all	34	223	103.9	41.3	5.5***	1.3	.084
Grade 8	girls	18	169	72.7	48.2	3.8	1.8	.522
	boys	30	206	81.4	56.2	4.3	1.8	.625
	all	18	206	76.8	50.7	4.0*	1.8	.577*
Grade 9	girls	29	216	89.2	54.6	3.7	1.5	.724***
	boys	55	152	81.4	27.9	4.5	1.8	.557*
	all	29	216	85.4	43.3	4.1***	1.7	.593***

\*)  $p < .05$   
\*\*\*)  $p < .001$

About one-third of girls and boys did not achieve the 60 minutes recommendation by objective measurements and two-third failed to meet the recommendation by self-reported measurements (Figure 1).

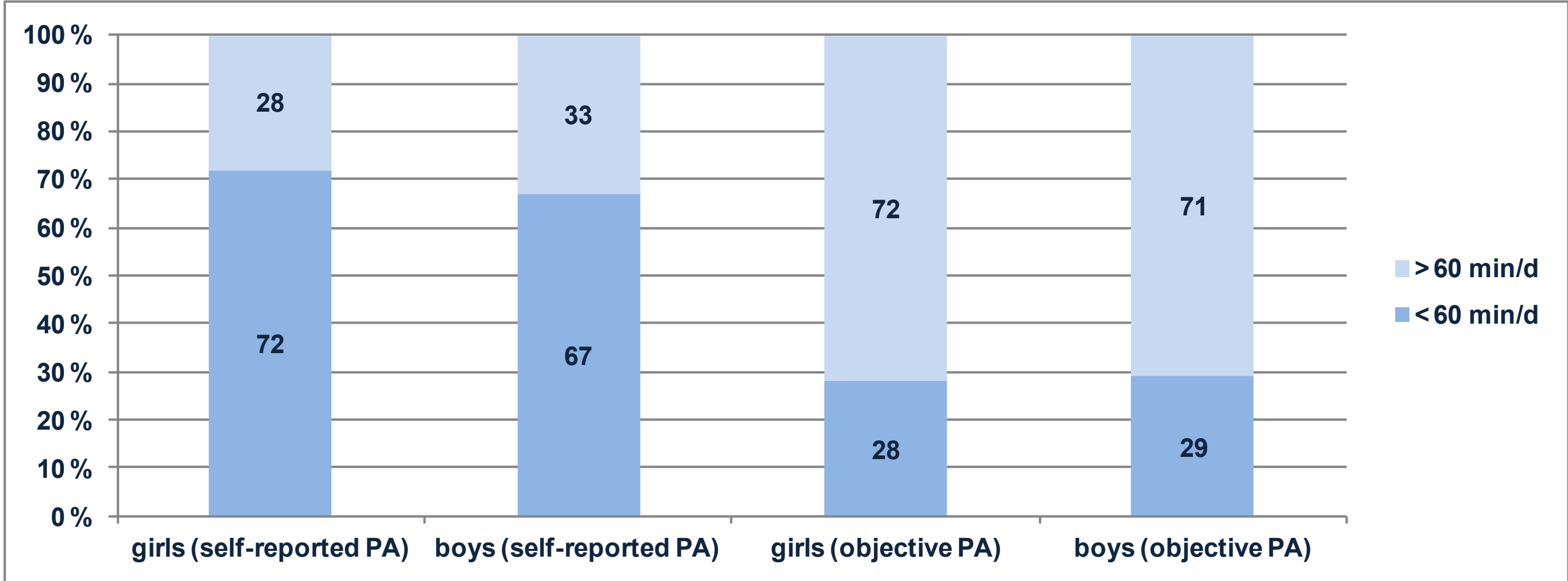


Figure 1. The percentages of adolescents, who met and failed to meet the recommendation of daily PA measured by objective and self-reported measurements.

### DISCUSSION

There are many anecdotal reports that the children and adolescents of today are less active than previous generations of young people, but reliable evidence on this issue is not available [7]. However, self-reported measures have been used widely in Finnish [1, 3, 6] and international study [10] due to economical and practical issues. Only a small number of studies have compared the self-assessed PA results with actual measures of PA. The specific aim of this study was to analyze associations of self-reported and objectively measured PA among secondary school students.

Self-reported and objectively measured PA had higher correlations at Grade 8 and Grade 9 than Grade 7. HBSC [2] is quite extensive, and it may have difficulties to describe daily PA among younger students. Results showed that adolescents were able to self-report daily PA more likely at Grade 8 and Grade 9 compared to Grade 7.

Grade 7 students were physically more active than Grade 8 and Grade 9 students in self-reported but not in objective measurements. This current finding was in line with previous findings as PA decreases across the secondary school years [10]. However, self-reported and objective measures did not have high correlation at Grade 7.

In addition, objective PA revealed a lower number of adolescents, who failed to meet the recommendation of 60 minutes PA per day compared to self-reported PA. This finding was not in line with the previous study [8], as objectively measured PA would reveal higher number of adolescents, which makes it important to get more detailed information about gauge relationships in further studies.

About 30 % of adolescents did not meet the recommendation of 60 minutes PA per day by objective measurements. The finding is similar to previous findings [1, 3, 6], as they have shown that about 16–41 % of Finnish adolescents fails to achieve the recommendation. According to the findings of this study, objective PA measurements are recommended to be used especially at the lower grades.

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