

RELATIONS BETWEEN PHYSICAL FITNESS AND HABITUAL PHYSICAL ACTIVITY LEVELS IN BOYS AND GIRLS AGED 8 TO 12 YEARS OLD

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Abstract: The aim of this study was to quantify the habitual physical activity level (HPA) following school and free days, and to analyze the relations with the physical fitness level (PF) in French prepubertal children. Thirty-nine children (15 boys and 24 girls), aged 8 to 12 years old, were involved in the study. They performed six field tests, some of which comprised to the European physical fitness test battery (EUROFIT). Children HPA was recorded during a 7-day period, between 7 am and 9 pm, and the time spent above a HPA threshold corresponding to moderate to vigorous intensity (> 3 Mets) was calculated. In prepubertal children, HPA was significantly higher during school days, but not related to the different components of PF

Key words: Physical activity, Physical fitness, Children, Adolescent

Technical support: Microsoft Powerpoint with Macintosh OS

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Introduction - The aim of this study was to quantify the habitual physical activity level (HPA) following school and free days, and to analyze the relations with the physical fitness level (PF) in French prepubertal children.

Methods - Thirty-nine children (15 boys et 24 girls), aged 8 to 12 years old were involved in this study. They performed anthropometric measurements and six field tests, some of which comprised to the European physical fitness test battery (EUROFIT). The selected tests were standing broad jump (SBJ in cm), 10*5 meter shuttle run (SHR in s), sit-and-reach (SAR in cm), number of sit-ups in 30 seconds (SUP), hand grip (HG in kgf) and 20 meter shuttle run (20MST in km.h⁻¹). Children HPA was recorded during a 7-day period (monday till monday), with an uniaxial accelerometer (Computer Science Applications Inc (CSA), model 7164, Shalimar, FL). The epoch duration or sampling period was set to 10s. The HPA was reintegrated following a 1 min period between 7 am and 9 pm. The time spent above a HPA threshold corresponding to moderate to vigorous intensity (> 3 Mets) (MVPA time) was calculated (Freedson et al., 1998).

Results - There was no significant difference between boys and girls for the whole anthropometric measurements and for SBJ, SHR, SUP and HG. EUROFIT test performances are presented in table 1.

Table 1: Anthropometric measurements and EUROFIT results in boys and in girls

Boys and Girls (n=39)	Mean ± standard deviation
Age (years)	10.3±0.7
Body mass (kg)	38.4±10.1
Height (cm)	141.7±7.7
Body Mass Index (kg.m ⁻²)	25.7±9
Percentage of Fat Mass	18.9±4
SBJ (cm)	137.3±22.3
SHR (s)	21.6±1.7
SUP (n)	14.7±4.6
HG (kg)	15.7±3.8
Boys (n=14)	
SAR (cm)	12.5±4.9
20-MST (km.h ⁻¹)	10.5±0.9*
Girls (n=25)	
SAR (cm)	20.3±7.3***
20-MST (km.h ⁻¹)	9.9±0.6

***: significantly different at p<0.001 ; *: significantly different at p<0.05

There was no significant difference between HPA and MVPA time boys and girls, for school days (monday to friday), as for free days (wednesday and sunday). Results for HPA and MVPA time were consequently presented for the whole population in table 2. Nevertheless, HPA (counts.min⁻¹) and MVPA time (min.day⁻¹) were significantly higher (respectively, p<0.001 et p<0.01) during school days than free days. Significant relationships (p<0.001) between HPA and MVPA time were observed, for school days (r=0.82) and free days (r=0,89).

Table 2: HPA and MVPA time for the whole population

Mean ± standard deviation		
	School days	Free days
HPA (counts.min ⁻¹)	389.3±204.1***	318.7±193.3
MVPA time (min.day ⁻¹)	44.6±34.5**	32.9±28.8

***: significantly different at p<0.001 ; **: significantly different at p<0.01

In the majority of cases, there was no significant relationship between PF components and HPA. Only relationships between SBJ and MVPA time (r=0.36, p<0.05) during school days, and between HG and MVPA time (r=0.38, p<0.05) and between body mass index and MVPA time (r=0.34, p<0.05), during free days, were found.

Conclusion - In children, the habitual physical activity level is significantly higher during school days, but was not related to the different components of physical fitness. Moreover, 56% of the children participated in MVPA activities for at least half an hour per day. le niveau d'activité physique habituelle est significativement supérieur pendant le temps scolaire, mais ne semble pas lié aux différentes dimensions de la condition physique. Il serait intéressant d'observer l'influence d'une augmentation du niveau d'activité physique, et de son intensité, pendant le temps scolaire sur l'APH moyen de la semaine.

References - ¹Committee of Experts on Sports Research. Handbook for the Eurofit tests of physical fitness. Rome : Edigraf Editoriale Grafica ; 1988, 30 : 58.

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