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Lifestyle in children with and without developmental coordination disorder

Estilo de vida de escolares com e sem transtorno do desenvolvimento da coordenação

Estilo de vida de estudantes com y sin trastornos del desarrollo de la coordinación

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ABSTRACT | This study aimed to characterize the lifestyle of schoolchildren aged 11 to 13 years with and without developmental coordination disorder (DCD). The study included 108 schoolchildren enrolled in a public school in Florianópolis (SC). For motor evaluation was used the Movement Assessment for Children 2; and lifestyle was assessed using the Inventory of Lifestyles in Childhood and Adolescents. The used Statistical tests were chi-square and Fisher exact test, with significance level of $p < 0.05$. We found similar habits in most activities inside and outside home, as well as a significant association between probable DCD and the activity play video game. For sociocultural and sports, participation habits were similar, observing a lower participation of parents of children and adolescents with DCD in these activities.

Keywords | Life Style; Motor Skills Disorders; Child.

RESUMO | Objetivou-se caracterizar o estilo de vida de escolares de 11 a 13 anos com e sem transtorno do desenvolvimento da coordenação (TDC). Participaram 108 escolares de uma escola pública de Florianópolis (SC). Para a avaliação motora, utilizou-se a *Movement Assessment for Children 2* e o estilo de vida foi avaliado pelo Inventário de Estilo de Vida na Infância e Adolescência (EVIA). Os testes estatísticos utilizados foram o do χ^2 e o exato de Fisher, com nível de significância de $p < 0,05$. Foram verificados hábitos semelhantes na

maioria das atividades dentro e fora de casa, e associação estatisticamente significativa entre provável TDC e a atividade jogar videogame. Para a participação sociocultural e esportiva, os hábitos mostraram-se similares, observando-se uma menor participação dos pais das crianças e adolescentes com TDC nessas atividades.

Descritores | Estilo de Vida; Transtornos das Habilidades Motoras; Crianças.

RESUMEN | Este estudio tuvo como objetivo caracterizar el estilo de vida de estudiantes de 11 a 13 años con o sin trastorno de desarrollo de la coordinación (TDC). Participaron 108 estudiantes de una escuela pública de Florianópolis (SC). Para la evaluación motora, se utilizó la *Movement Assessment for Children 2* y el estilo de vida se evaluó por el Inventario de Estilo de Vida en la Infancia y Adolescencia (EVIA). Las pruebas estadísticas utilizadas fueron la del χ^2 y la exacta de Fisher, con nivel de significación de $p < 0,05$. Se observaron hábitos similares en la mayoría de las actividades dentro y fuera del hogar, y la asociación estadísticamente significativa entre probable TDC y la actividad de jugar el videojuego. Para la participación sociocultural y deportiva, los hábitos fueron similares, observándose una menor participación de los padres de los niños y adolescentes con TDC en esas actividades.

Palabras clave | Estilo de Vida; Destreza Motora; Niño.

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INTRODUCTION

Living habits and lifestyle are individual behaviors which comprise everyday aspects, care with feeding, hygiene and sleep, chores and tasks, leisure and physical activity^{1,2}.

Due to economical and social changes, people's habits have been going through changes which reflect in their quality of life, such as an increase in professional obligations, technological availability, increase of insecurity and decrease of public spaces due to urbanization^{3,4}. These changes limit the practice of physical activities and make living habits rather sedentary.

The transformations also reflect in children and adolescents' lifestyle, since they end up choosing more static activities such as the use of computer, electronic games and television⁵⁻⁸. These behaviors impair obtaining the necessary motor basis for the acquisition of more complex abilities, which may push them away from motor practices, increasing the risk of overweight/obesity⁹. Regarding children with motor deficit or developmental coordination disorders (DCD), the barrier to be transposed for the practice of physical activities is the poor motor coordination itself¹⁰.

Investigations have been developed in many countries in the attempt of getting to know the characteristics of children and adolescents as for their lifestyle, focusing on motor activities, evidencing the different preferences of activities, higher participation of males in physical activities and also negative aspects of sedentary habits in relation to motor performance and health^{5,11-19}.

As evidenced by Poletto²⁰, researches focused on phenomena related to the routine of children and adolescents, rather than only on biological aspects, are necessary, considering that in this stage of their lives, they are very sensitive to environmental conditions which may alter their behavior. Due to the shortage of researches verifying the lifestyle of children with motor deficit¹⁸ and considering the reflex of the environment on motor development, we tried to investigate the lifestyle of school children between 11 and 13 years of age with and without DCD in Florianópolis (SC).

METHODOLOGY

Location of the study

The study was carried out in a school of the state public network, in the central region of Florianópolis (SC), being considered one of the largest schools in Latin America.

The research was approved as for its ethics by the Research and Ethics Committee, No. 224/2010, and the data collection happened within the months of February and May, 2011.

Participants

The school children were part of a group of 590 students, of both gender, aged between 11 and 13 years old, and were selected in a non-probabilistic way. The pedagogical team authorized the invitation of 400 students, thus, 400 Informed Consent Forms, from which there was a response of 130 terms signed up by parents and legal guardians, allowing the participation of the students in the research.

The inclusion criteria were: voluntary participation by students; established age range; authorization by parents or legal guardians; absence of physical problems of lower and upper limbs which would impair the conducting of the assessments (indicated by teachers).

Given these criteria, from the 130 terms handed in, it was possible to assess the lifestyle and motor performance of 108 students (72 girls and 36 boys), average age 11.31 years old (± 0.54 years old). The sample loss occurred due to school strikes, absence of the student in school on data collection days and some stakeholder, among them the participants' health status and weather conditions.

Instruments

For the motor evaluation, we used the Movement Assessment Battery for Children 2²¹, whose tasks are appropriate for the following age ranges: age range 1 (3 to 6 years of age); age range 2 (7 to 10 years of age); age range 3 (11 to 16 years).

The skills assessed are manual dexterity (time in seconds), launching/receiving (number of correct takes) and static and dynamic balance (time in seconds and number of steps). According to the score obtained, the children and adolescents may be classified into 3 categories: indication of motor impairment ($\leq 5^{\text{th}}$ score), borderline motor impairment (scores between the 5th and the 16th) and normal/typical motor development ($\geq 16^{\text{th}}$ score). In this study, the term used in order to indicate motor problems was "probable DCD", which is indicated by the fact that a formal diagnosis by a pediatrician or occupational therapist was not established¹².

In order to identify the lifestyle, we used the Inventory of Lifestyle in Childhood and Adolescence (EVIA), adapted into Brazilian reality²². The inventory is destined to children

and adolescents aged between 7 and 14 years old, consisting of question regarding living habits in the following aspects: daily life organization; sociocultural participation; participation in sports activities. Two more questions regarding the participation of parents in physical or sports activities (yes/no alternatives) and in physical education classes (yes/no alternatives) were included.

Data collection procedure

Meeting with the pedagogical staff were conducted in order to explain the objectives of the research, as well as information on shifts provided by the school for data collection. The assessments were performed in a proper and well lit school environment, since the school made available a wide room to be used during the study.

The motor assessment (MABC-2) lasted from 40 to 45 minutes, varying according to the ability of students in the performance of the tasks. The motor tests were performed individually by previously trained evaluators, following the protocol order, first performing the manual dexterity tasks (inverting pins, forming triangles and tracing trails), then ability with a Ball (receiving the Ball with one hand, throwing the Ball at the target) and ending with balance tasks (balancing on a plaque, walking on a line, hopping on carpets).

At the end of the motor assessments, the EVIA was applied. The use of the survey lasted, approximately, 15 minutes and it was conducted as an interview by the assessers, in an attempt to make data collection more dynamic and also to clarify students' doubts as for the questions.

Data analysis

The data were analyzed in the statistics software SPSS, version 17.0, using a descriptive (mean, standard-deviation, simple frequency and percentage) and inferential statistic. In order to verify the association between the variables (motor classification and lifestyle), we used the nonparametric χ^2 and exacts Fisher tests with residual adjustment, adopting a significance level of $p < 0.05$.

RESULTS

It was verified that 73 (67.6%) students presented typical motor development (TMD), 24 (22.2%), risk of developmental coordinator disorder (risk of DCD), and 11 (10.2%), probable developmental coordinator disorder

(PDCD). Given the objectives of the study in comparing the living habits of students with and without DCD, the students presenting risk of DCD were not included in the analysis.

It is noteworthy that the variation of n in the distribution of frequencies in the answers in the EVIA questionnaire was due to the students having chosen more than one alternative for some questions, which ended up invalidating their answers.

For the activities carried out inside their homes, it was found a statistically significant association between the PDCD motor classification and the activity of playing videogame (Table 1). For the remaining activities, the characteristics were similar, according to the motor classification.

Regarding the activities performed outside home, the living habits of students with and without DCD proved to be similar, as presented in Table 2.

As for sociocultural participation, there was no association between taking part in group activities ($p=0.651$), materials ($p=0.993$) and places for leisure ($p=0.653$) and the motor classification of students. It was observed that 63.6% of students with PDCD and 56.3% of students with TMD declared participating in group activities, especially religious/dancing activities and workshops at school.

No associations between motor classification and the practice of sports with guidance ($p=0.349$), participation of parents in physical activities ($p=0.173$) and

Table 1. Association between indoor activities and the students' motor classification

Indoor activities	TMD (n=73)	PDCD (n=11)	p-value
	f (%)	f (%)	
Watching TV			
Many times	41 (57.7)	7 (63.3)	1.000
A little/never	30 (42.3)	4 (36.4)	
Playing videogame			
Many times	11 (15.5)	7 (63.3)*	0.002*
A little/never	60 (84.5)	4 (36.4)	
Leisure reading			
Many times	21 (29.6)	4 (40.0)	0.489
A little/never	50 (70.4)	6 (60.0)	
Listening to music			
Many times	50 (70.4)	8 (80.0)	0.717
A little/never	21 (29.6)	2 (20.0)	
Talking/playing with friends			
Many times	44 (62.0)	7 (63.6)	1.000
A little/never	27 (38.0)	4 (36.4)	
Studying			
Many times	32 (45.1)	6 (54.5)	0.558
A little/never	39 (59.4)	5 (45.5)	
House chores			
Many times	39 (54.9)	8 (72.7)	0.338
A little/never	32 (45.1)	3 (27.3)	

TMD: typical motor development; PDCD: probable developmental coordination disorder; f: frequency; χ^2 test; p: significance index; *significance level $p < 0.05$; ¥: residual adjustment (> -2.5 ; $< +2.5$)

Table 2. Association between outdoor activities and the students' motor classification

Outdoor activities	TMD (n=73)	PDCD (n=11)	p-value
	f (%)	f (%)	
Talking or playing with friends			
Many times	36 (51.4)	7 (70.0)	0.326
A little/never	34 (48.6)	3 (30.0)	
Strolling			
Many times	31 (44.3)	4 (40.0)	1.000
A little/never	39 (55.7)	6 (60.0)	
Riding in a car			
Many times	35 (49.3)	5 (50.0)	1.000
A little/never	36 (50.7)	5 (50.0)	
Riding a bicycle			
Many times	20 (28.6)	3 (30.0)	1.000
A little/never	50 (70.4)	7 (70.0)	
Roller-skating			
Many times	5 (7.2)	1 (10.0)	0.569
A little/never	64 (92.8)	9 (91.3)	
Skating			
Many times	10 (14.1)	1 (10.0)	1.000
A little/never	61 (85.9)	9 (90.0)	
Playing with a ball			
Many times	28 (39.4)	5 (50.0)	0.233
A little/never	43 (60.6)	5 (50.0)	
Going to the movies/to the shopping mall			
Many times	23 (32.4)	4 (40.0)	0.724
A little/never	48 (67.6)	6 (60.0)	

TMD: typical motor development; PDCD: probable developmental coordination disorder; f: frequency; χ^2 test; p: significance index; *significance level $p < 0.05$

participation in physical education classes ($p=0.575$) were found. However, it was observed that most students in both groups do not have the habit of practicing sports. It was observed higher participation in physical activities by parents of students with TMD; on the other hand, when observing the participation of students in physical education classes, it was observed that, in both groups, most of them have this habit.

DISCUSSION

There was no association between activities performed inside the house and the motor classification; the most frequent activities were listening to music, talking/playing with friends and watching TV. Koerich *et al.*²³ found similar results for students with and without motor difficulties, which allows inferring that the habit of having indoor activities is common at this age range, regardless motor classification.

For the activity of playing videogame, it was found a significant association with the PDCD classification. These data are similar to those of studies¹⁸ in which the relations between the psychomotor profile and the lifestyle of students in João Pessoa (PB), were evaluated, verifying

that 44.3% of children with motor disorders would rather have activities such as watching TV, surfing the net and playing electronic games, while students without motor disorders would rather have dynamic activities (riding a bicycle/practicing sports).

The permanence before TV or other audiovisual media during childhood and adolescence contributed to sedentary behavior of other daily activities and to the increase of body weight, reflecting low performance in motor tasks^{11,24}. Such aspects were observed in investigations^{5,11,16} conducted with Portuguese, Brazilian and German children, observing the association of motor skills to watching TV, indicating that children with less time devoted to these activities presented superior motor performance than the ones who dedicated more time to it.

From these considerations, it is important to highlight current researches which have been pointing to evidences contrary to the present study, verifying that the Exergames (exercises and game) or Nintendo Wii had positive impact in the increase of physical activity practice among children and adolescents, when compared to traditional games, considered to be sedentary^{25,26}. These review researches verify that these games contribute to the increase of caloric burn, improvement of psychological and motivational aspects and are also used by doctors and physical therapists in programs of motor rehabilitation, contributing to the improvement of motivation and adherence to the programs^{25,26}.

The study carried out by Finco and Fraga²⁷ meets these information when recognizing the contribution of the Wii Fit game to higher bodily interaction. The authors verified the perceptions in three virtual communities as for the influence of the game in their feeding and physical activities practices. The results revealed by the participants indicated positive points of view on the game, which increased their interest on physical activities practice, better care as for body weight and health aspects, as well as the importance of having healthy eating habits. Backing up these findings, an international research investigated the associations between the electronic media (television and games) and the welfare (eating habits and lifestyle) of young children, observing worse results for watching TV, when compared to the use of electronic games²⁸.

The information in previously presented researches evidence the importance of knowing the kind of electronic game used in the living habits of children and adolescents, for there is a difference between the benefits from Exergames and traditional games pointed as stimulators of the sedentary life. In this study, the kind

of games used were not identified, which may be considered as a limitation.

However, adolescents with PDCD presented higher frequencies of these practices, which may indicate that those were traditional games.

For the outdoor activities, in both groups we verified activities such as talking/playing with friends, walking the dog, strolling, playing with a Ball and going to the movies, without association to motor classification. Similar habits among students with and without motor difficulties were found in a research²³, given that the most common activities were playing with a ball, riding in the car and talking/playing with friends. In another instigation, however¹⁸, it was verified that — most — students with motor coordinator disorders reported not practicing any activities, while a great number of children with typical development reported participating in sports, which evidences their being more active than children with motor disorders.

As for the verification of the participation by students with PDCD and TMD in group activities, it was found that most of them have such habit without significant association. The most frequent activities were the religious ones, dancing, theater, and workshops in school. In the study by Silva²⁹ assessing the living habits of students with DCD from 10 to 11 years of age, it was observed that the most common activities were performed in their parish centers, dancing, and activities in sports clubs. A positive aspect observed in this study is the great participation of students with probable DCD in these activities, since, as pointed out by the literature, they prefer individual and lonely activities. Poulsen³⁰ confirms this when evaluating leisure physical activities of boys with DCD from 10 to 13 years of age, evidencing that those reported low participation in team-up activities and high participation in structured activities which demand low levels of physical aptitude and lower energy expenditure, such as singing groups in church.

As for the participation in sports with guidance, it was observed that, even with no significant association between sports participation and motor classification, students with probable DCD had lower frequency of participation in these activities, which may be a result of the limited motor coordination itself. Children with difficulties in motor coordination avoid places where physical activities are promoted, by the fact of their being unsuccessful in them, since the poor motor coordination limits the performance of complex movements required in sports and games¹⁹.

About the participation of parents in physical activities and sports, there was a minority of parents of students

with TDCD practicing physical activities (27.3%), without significant association. When parents are physically active the children present higher probability of taking up physical activities or sports, and this participation depends on parental availability and encouragement, stimuli for going to places of leisure activities and equipment for the practices³¹. Seabra *et al.*¹⁴ corroborate this idea when observing that 70% of students revealed taking part in physical activities or sports because their parents, sibling and partners also did so. According to the authors, the family practicing sports has a great influence in the sports practice of children and adolescents.

It was observed that, in both groups, most students took part in physical education classes, which is positive and contrasts with the literature, since it evidences lower participation of children with motor difficulties, lower self-confidence, as well as lack of interest for physical education classes¹².

The limitations found in this study are related to the lack of identification of the kind of electronic games played by the students, which could have indicated if the use of games really does characterize a sedentary practice.

CONCLUSION

Based on the results in this study, it is possible to conclude that students with TMD and PDCD have similar lifestyles and with sedentary characteristics in most activities both in and outdoors, and the activity of playing videogames was associated to PDCD.

It is highlighted the relevance of lifestyle of students, that along with motor and health assessments serve as subsidies for the preparation of physical education classes in school, given the importance of these aspects in motor development.

It is suggested, for future studies the investigation of the kinds of electronic games are used, and the relation of these games to the motor characteristics of the students, as well as verifying the psychosocial factors which best explain the behavior of children and adolescents in the practice of physical activities.

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