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Assessment of the level of physical activity among children aged 7–15 using the short version of the IPAQ questionnaire. A pilot study

Ocena poziomu aktywności fizycznej dzieci w wieku 7–15 lat z wykorzystaniem skróconej wersji kwestionariusza IPAQ – badanie pilotażowe

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Abstract

Introduction. In February 2022, remote learning ended in Poland. This was associated with an increase in physical activity for children, including participation in physical education lessons as well as spontaneous games and play during breaks, and also the commute to and from school. The introduction of remote learning significantly limited the opportunity for children to build healthy habits in the form of leading as active a lifestyle as possible.

Aim of the study. (1) Assessing of the possibility of using the short version of the IPAQ questionnaire to assess the level of physical activity among children aged 7–15. (2) Assessing the current level of physical activity among children aged 7–15 and the degree of compliance with WHO recommendations.

Material and methods. A pilot study was conducted in the form of an anonymous online survey, based on the shortened version of the IPAQ questionnaire, on a group of 30 randomly selected children.

Results. (1) The short version of the IPAQ questionnaire allowed for an easy and precise calculation of the level of physical activity in the studied group. (2) The studied group did not achieve the minimum level of physical activity recommended by the WHO.

Conclusions. (1) The short version of the IPAQ questionnaire can be used to assess the level of physical activity among children after introducing changes to the qualification criteria with reference to WHO recommendations. (2) There is a need for education promoting health behaviors associated with engaging in physical activity.

Key words:

IPAQ, children's physical activity

Streszczenie

Wprowadzenie. W lutym 2022 roku zakończyła się w Polsce nauka zdalna. Dla dzieci wiązało się to również ze zwiększeniem aktywności fizycznej związanej zarówno z uczestnictwem w lekcjach wychowania fizycznego, jak i ze spontanicznymi grami i zabawami podczas przerw, a także pokonywaniem drogi do i ze szkoły. Wprowadzenie nauki zdalnej w sposób zdecydowany ograniczyło dzieciom możliwość budowania nawyków prozdrowotnych w postaci prowadzenia jak najbardziej aktywnego trybu życia.

Cel pracy. 1. Ocena możliwości wykorzystania krótkiej wersji kwestionariusza IPAQ do oceny poziomu aktywności fizycznej dzieci w wieku 7–15 lat. 2. Ocena aktualnego poziomu aktywności fizycznej dzieci w wieku 7–15 lat i stopnia realizacji zaleceń WHO.

Materiał i metodyka. Badanie pilotażowe zostało przeprowadzone w formie anonimowej ankiety internetowej, bazującej na skróconej wersji kwestionariusza IPAQ na grupie 30 losowo wybranych dzieci.

Wyniki. 1. Krótka wersja kwestionariusza IPAQ pozwoliła w łatwy i precyzyjny sposób obliczyć poziom aktywności fizycznej w badanej grupie. 2. Badana grupa nie osiągnęła minimalnego poziomu aktywności fizycznej rekomendowanego przez WHO.

Wnioski. 1. Krótką wersję kwestionariusza IPAQ można wykorzystać do oceny poziomu aktywności fizycznej dzieci po wprowadzeniu zmiany kryteriów kwalifikacji z odniesieniem do rekomendacji WHO. 2. Niezbędna jest edukacja promująca zachowania prozdrowotne związane z podejmowaniem aktywności fizycznej.

Słowa kluczowe:

IPAQ, aktywność fizyczna dzieci

Introduction

On February 21, 2022, by the regulation of the Ministry of National Education, remote learning officially ended in Poland [1, 2]. For children, this meant, besides returning to daily school duties, an increase in physical activity, not only from participating in physical education classes but also from spontaneous games and play during breaks, and commuting to and from school. The introduction of remote learning had significantly limited the opportunity for children to build healthy habits by leading an active lifestyle. Children naturally exhibit a need for movement [3], so it was assumed that with the lifting of restrictions, they would gradually and willingly increase the amount of physical activity in their weekly schedule.

One of the most advanced methods for assessing physical activity is the International Physical Activity Questionnaire (IPAQ). It provides precise methodological guidelines allowing for comparison of results, including at an international level. IPAQ is dedicated to respondents aged 15–69 years, mainly due to the risk associated with interpreting its content [4, 5]. To date, the original version of IPAQ has not been used to assess the level of physical activity in children. In 2018, The HELENA Study attempted to use the long version of the IPAQ in a group of children below 14 years of age, but the results were considered unsatisfactory [5, 6].

This study attempts to use the short version of the IPAQ to assess the level of physical activity in individuals under 15 years of age, hence it is of a pilot nature.

Objective of the study

The aim of the study was to verify:

1. The possibility of using the short version of the IPAQ questionnaire to assess the level of physical activity among children aged 7–15,
2. The current level of physical activity among children aged 7–15 and the degree of compliance with WHO recommendations.

Material and methodology

Characteristics of the study group

The pilot study involved 30 randomly selected children (15 girls and 15 boys) aged 7–15 years.

70% of the study group consisted of children living in large population cities, exceeding 100 thousand inhabitants. 30% were residents of medium-sized cities, estimated between 20 and 100 thousand inhabitants. The vast majority of the participants were residents of the Pomeranian Voivodeship.

One child regularly took medication for a chronic illness, and one participated in rehabilitation activities, except for the week covered by the study.

Research methodology

The study was conducted in the form of an anonymous online survey based on the short version of the IPAQ questionnaire. To exclude incorrect interpretation of some questions by the youngest participants and thus incorrect estimation of the results, parents were asked to fill out the questionnaires. The study period for each child covered the last 7 days preceding the

completion of the questionnaire. To ensure the days studied were as "typical" as possible, the study was conducted from May 24 to June 30, 2022, thereby excluding physical activity of a seasonal nature associated with longer breaks in schooling.

The questions in the questionnaire related to the children's participation in vigorous and moderate-intensity physical activities for at least 10 continuous minutes, as well as the amount of time spent in a sedentary position. Based on the collected information, the Metabolic Equivalent of Task (MET) value was calculated for each child to assess the level of physical exertion.

As the IPAQ questionnaire is intended for adults, to interpret the results for the study group, classification criteria had to be changed and adjusted to the age of the group. For this purpose, WHO recommended values contained in the Guidelines on Physical Activity and Sedentary Behavior 2020 were used and converted into MET-minutes/week, in accordance with the methodological guidelines of IPAQ.

Since to date, the IPAQ questionnaire has not been used to assess the level of physical activity in children, this study is of a pilot nature.

Research results

The possibility of using the IPAQ questionnaire to assess the level of physical activity among children aged 7–15

As the IPAQ questionnaire is intended for assessing the physical activity level of adults, it was assumed that its classification criteria also pertain to adults. Therefore, to interpret the results for the age group of 7–15 years, it was necessary to change the classification criteria. For this purpose, recommendations from the World Health Organization, which advises children aged 5–17 to undertake at least 60 minutes of moderate to vigorous physical activity daily, with vigorous activities comprising at least 3 days a week [7], were utilized.

The recommended minimum was converted into MET-minutes/week as follows:

- 3 times a week of vigorous physical activity lasting at least 60 minutes $\times$ factor of 8.0 = 1440 MET-min./week.
- 4 times a week of moderate physical activity lasting at least 60 minutes $\times$ factor of 4.0 = 960 MET-min./week.

Adding the above values gives a result of 2400 MET-min./week, which according to WHO indications should be the minimum level of physical exertion achieved by children aged 5–17. As the scope of work covered children aged 7–15, this value was adopted as the lower limit of WHO recommendations for assessing the current level of physical activity.

The analysis of the results in the above manner provides information on the current level of physical activity presented by the child and indicates whether it meets the minimum recommendations of the World Health Organization in this regard.

The results obtained for each child were calculated for physical activity level and recorded in MET-minutes/week units using the formula:

total MET-minutes/week = MET coefficient value $\times$ number of days $\times$ average time dedicated to performing a given activity

The MET coefficient value for each level of physical exertion according to IPAQ is presented in Table 1.

Table 1. MET coefficient value for different types of physical exertion [4]

Type of activity	MET Coefficient
vigorous	8.0
moderate	4.0
walking for at least 10 minutes continuously	3.3

The short version of the IPAQ questionnaire allowed an easy and precise calculation of the level of physical activity in the study group. The biggest issue proved to be determining the level of physical activity during the child's time at school. It is difficult for parents to estimate how much time various types of physical activities occupy during school hours. For the study to be reliable, it would be necessary to establish the intensity level of physical education classes and the way children spend breaks between classes for each child. A good practice might be to complete the questionnaire together with the child.

Current level of physical activity among children aged 7–15 and the fulfillment of WHO Guidelines

93% of the surveyed children actively participated in physical education classes during the study period. 80% of respondents declared participation in extracurricular activities of a recreational and sports nature, with over 76% of the respondents participating in both physical education classes and additional activities.

Activities requiring vigorous effort, according to IPAQ guidelines, are those that cause rapid and heavy breathing and a fast heartbeat. These include running or fast cycling, among others [4, 7, 8].

Among the respondents, 77% indicated performing activities of such intensity. Over half of these (52%) indicated that their vigorous effort exceeded one hour.

Moderate-effort activities are those characterized by a slight acceleration of heart rate and breathing, such as brisk walking, normal-paced cycling, etc. [4, 7, 8]. Among the respondents, 83% indicated performing activities of this intensity. Children who exceeded 60 minutes of moderate effort weekly constituted 24% of the study group, while over half of the respondents declared an intensity range of 30-60 minutes. 20% indicated between 15 and 30 minutes of moderate effort, while 4% were children who dedicate 10 to 15 minutes to such intensity effort.

The form of physical activity also inquired about was walking for more than 10 continuous minutes, pertaining to usual daily activities. 97% of the respondents confirmed this form of activity, with 45% indicating the duration of continuous walking in the range of 15-30 minutes. Most respondents (56%) prefer a longer walking duration: 30-60 minutes (28%) and over 60 minutes (28%).

In the study group, no child achieved the minimum value of 2400 MET-min./week, although nearly 17% exceeded the value of 2300 MET. 23.3% of respondents managed to exceed the level of 2000 MET-min./week, 50% of children achieved a score above 1000 MET-min./week, while as many as 26.7% obtained a score below 1000 MET-min./week.

Detailed data regarding the quantity and duration of individual efforts in the study group, along with conversion to MET units for each activity and the total sum, are presented in Table 2.

Table 2. Detailed data on the quantity and duration of individual efforts in the study group, along with the conversion into MET units for each activity and the total sum

No.	Intense activity (min.)	No. of days per week	MET Value (8.0)	Moderate Activity (min.)	Number of days in a week	MET Value (4.0)	Walking (min.)	Daily walking time	MET Value (3.3)	Total MET Value
1.	> 60	1	480	15–30	5	500	15–30	5	412.5	1392.5
2.	30–60	3	1080	30–60	5	900	15–30	5	412.5	2392.5
3.	–	–	0	15–30	5	500	15–30	5	412.5	912.5
4.	30–60	2	1080	30–60	5	900	30–60	2	297	2277
5.	> 60	1	480	> 60	1	240	> 60	1	198	918
6.	30–60	3	1080	10–15	5	300	30–60	2	297	1677
7.	30–60	3	1080	30–60	5	900	15–30	5	412.5	2392.5
8.	15–30	5	1000	15–30	5	500	30–60	2	297	1797
9.	–	–	0	> 60	3	252	> 60	1	198	450
10.	> 60	2	960	30–60	3	540	15–30	5	412.5	1912.5
11.	–	–	0	–	–	0	> 60	2	396	396
12.	–	–	0	30–60	5	900	15–30	5	412.5	1312.5
13.	> 60	2	960	30–60	3	540	15–30	5	412.5	1912.5
14.	> 60	2	960	> 60	1	240	> 60	1	198	1398
15.	> 60	2	960	> 60	1	240	> 60	1	198	1398
16.	15–30	5	1000	15–30	5	500	> 60	2	396	1896
17.	> 60	2	960	30–6	3	540	30–60	2	297	1797
18.	–	–	0	–	–	0	15–30	5	412.5	412.5
19.	15–30	5	1000	30–60	5	900	15–30	5	412.5	2312.5
20.	> 60	3	1440	–	–	0	30–60	2	297	1737
21.	> 60	2	960	> 60	1	240	15–30	5	412.5	1612.5
22.	> 60	2	960	> 60	1	240	> 60	1	198	1398
23.	–	–	0	15–30	5	500	15–30	5	412.5	912.5
24.	15–30	5	1000	30–60	5	900	30–60	2	297	2312.5
25.	–	–	0	–	–	0	> 60	2	396	396
26.	10–15	5	600	–	–	0	30–60	2	297	897
27.	30–60	3	1080	30–60	5	900	15–30	5	412.5	2392.5
28.	> 60	3	1440	30–60	1	180	15–30	5	412.5	2032.5
29.	> 60	2	960	30–60	1	180	30–60	2	297	1437
30.	30–60	3	1080	30–60	3	540	–	–	0	1620

The above results clearly indicate that the studied group did not meet the World Health Organization's recommendations for the minimum level of physical activity.

Discussion

For many years, research has been conducted worldwide and in Poland on the level of physical activity among children. According to the estimates of the World Health Organization from 2020, the European Commission, and national reports, the level of physical activity among the youngest is decreasing [8, 9, 11, 12]. A 2021 report by the Public Health Committee of the Polish Academy of Sciences showed that out of 49 countries covered by the international HBSC study (the Health Behaviour in School-aged Children), Poland ranked 31st in terms of the Vigorous Physical Activity (VPA) index [10]. The 2022 report of the Ombudsman for Children indicates that 17% of students require intervention in the area related to physical health, with 19% of this concerning second-grade primary school students [9].

The above data show that the issue of low physical activity among children should be continuously researched to systematically implement appropriate solutions for specific age groups. Is it difficult to achieve the minimum level of physical activity among children aged 7–15 years required by the World Health Organization? Theoretically, no. Considering the number of physical education classes per week, active breaks between classes, commuting to and from school as part of moderate physical effort, and at least once a week participating in additional extracurricular activities, achieving 2400 MET should not be a problem. However, proper social education on this topic is a condition. Unjustified medical exemptions from physical education classes and excuses written by parents do not help build correct health-promoting habits. Besides, it is important to remember that physical education in schools is not, and should not be, merely a break between other subjects. According to the curriculum, it plays an important educational, developmental, and health function. Its task is to support the physical, mental, intellectual, and social development of students. It is also meant to shape the customs of physical activity and care for one's health at every stage of life [13].

If we want a more active and healthier society in the future, we should start implementing health-promoting behaviors as early as possible. The best solution is to promote activity in schools during class time. However, to be successful, implementing health-promoting behaviors must always go hand in hand with properly directed education aimed at parents and children themselves.

Conclusions

The short version of the IPAQ questionnaire is a tool that can be effective in the easy and precise assessment of physical activity levels among children aged 7–15. The condition is the change in qualification criteria, which should refer to WHO recommendations. Moreover, to make the study reliable, it would be necessary to determine for each child, among others, the intensity level of physical education classes and ways of spending breaks between classes.

In the current study, none of the children met the guidelines

contained in the World Health Organization's recommendations concerning physical activity for this age group. Broadly defined education promoting health behaviors associated with engaging in physical activity is essential.

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