NUTRITION HABITS AND PHYSICAL ACTIVITY OF DISABLED ADOLESCENTS IN HUNGARY

Ágota Barabás[1], Melinda Nagy[2], Anita Katalin Grestyák Molnárné[3], Attila Csaba Nagy[4], Viktoria Pazmany[1], Mária Zahatňanská[5], Mária Konečná[6], Vincent Sedlák[6], Marta Mydlárová Blaščáková[6], Janka Poráčová[6], Renáta Erdei Jávorné[1]

[1]Department of Health Methodology and Prevention, Faculty of Health Sciences, University of Debrecen, Nyíregyháza, Hungary
[2]Department of Biology, Faculty of Education, J. Selye University, Komárno, Slovak Republic
[3]Department of Nursing and Midwifery, Faculty of Health Sciences, University of Debrecen, Nyíregyháza, Hungary
[4]Department of Health Informatics, Faculty of Health Sciences, University of Debrecen, Debrecen, Hungary
[5]Institute of Pedagogy, Andragogy and Psychology, Faculty of Humanities and Natural Sciences, University of Prešov, Prešov, Slovak Republic
[6]Department of Biology, Faculty of Humanities and Natural Sciences, University of Prešov, Prešov, Slovak Republic

SUMMARY

Objectives: The overall aim of the research is to gain insight into the lifestyle and health behaviour of young people with disabilities aged 12–18 years, and to learn about the factors shaping their health. In this study, our aim was to investigate the eating habits and physical activity of adolescents with disabilities and the influencing factors.

Methods: The study's source population was young people aged 12–18 with disabilities in the Szabolcs-Szatmár-Bereg County. A total of 239 completed questionnaires were processed and analysed. Boys were overrepresented in the study.

Results: The results show that inadequate eating habits also exist in the population we studied, the consumption of certain foods correlates with the education level of parents. A more secure social background is a protective factor in terms of physical activity. The survey was made with the aim of intervention much needed. With precise knowledge of the health behaviour of the target group, our goal is to develop a complex intervention programme adapted to the needs of children with disabilities.

Conclusion: The eating habits of adolescents with disabilities in the Szabolcs-Szatmár-Bereg County are unsatisfactory. Experience and results show that differentiated health promotion of young people with disabilities is necessary.

Key words: disability, adolescents, physical activity, nutrition, health behaviour

Address for correspondence: Á. Barabás, Department of Health Methodology and Prevention Faculty of Health, University of Debrecen, Sóstói u. 2–4, 4400 Nyíregyháza, Hungary. E-mail: barabas.agota@etk.unideb.hu

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INTRODUCTION

Hungary's health status can be classified as one of the most unfavourable among the European Union (EU) member states, this especially applies for vulnerable groups. In Hungary, the proportion of deaths occurring at an early age is very high (death at age under 65), and it can be identified as the main cause of shorter life expectancy. In the country, there are significant differences between the western and eastern counties (1). The employment rate is lower in the Szabolcs-Szatmár-Bereg County than in the western counties. In Hungary, the per capita gross domestic product (GDP) is not evenly distributed. In 2021, GDP per capita was 57.3% of the national average, while in Hungary's capital city, it was 208.1% (2, 3). The basic indicator of the health status of the adult population is life expectancy at birth, early death, and the quality of life achieved during their lives (4). In Hungary in 2021, life expectancy at birth was 78.0 years for women and 71.1 years for men, an average of 74.5 years, while in the 27 EU member states it was 82.8 years for women, and 77.2 years for men, which is an average of 80.1 life expectancy in 2021 (5, 6).

Childhood disability reduces the individual's life chances, and children with disabilities have less access to healthcare services and education (7). Childhood health status is a predictor of adult health status, because those who live with illness in childhood are more likely to become sick adults. Childhood health affects adult life, behaviour, participation in society, and in the labour market. The connection between income status and health care is known, the lower the socioeconomic status of the parents, the less they can get high-quality child health care (8).

In countries where people's financial situation is more independent of the social parents' situation, i.e., there is greater social mobility, the health status is influenced by the social situation of the parents to a lesser extent. In Hungary, the data of the 2016–2018 European Social Survey shows that social mobility was lower compared to EU member states, so in Hungary, children mostly inherited the social status of their parents, and the health status depended mostly on the parents' education. Parents' education is significantly related to their children's social status, which indirectly influences the adult health status (9).

The Health Behaviour in School-aged Children (HBSC) survey provides a broad insight into the lifestyle, well-being and social environment of adolescents. The international results of 2018 show that the level of physical activity in most countries/regions is unfavourable, less than every fifth adolescent achieves global physical activity, which means at least 60 minutes per day (8, 10). For children and adolescents, an average of at least 60 minutes of moderate to vigorous intensity and mostly aerobic physical activity per day is recommended (11).

Every fifth adolescent is overweight or obese. Obesity and overweight are higher in the younger age group and among boys. Children from families with a better socioeconomic background have a higher proportion of supportive relationships, the frequency of their physical activity is higher, their eating habits are better, they are better nourished, their health and overall well-being also improved. Boys' satisfaction with life is more favourable than girls' satisfaction (10).

The Hungarian results of the 2018 HBSC survey clearly show the differences between the sexes. In Hungary, nearly a third of students consume fruit on a daily basis, and the proportion of vegetable consumption is also similar. Girls consume a higher proportion of fruit and vegetables every day. More than a third of girls and a quarter of boys do very little or no physical activity (13). More than 20% of boys and girls aged 11–15 years are obese or overweight (10).

The study concerning disadvantaged children, their socioeconomic status, health related behaviour, and self-rated health of children living in Roma settlements in Hungary shed light on the unfavourable health behaviour among Roma children in Hungary, the frequency of harmful addictions is high, and their eating habits are unhealthy (14).

Among the most disadvantaged groups in Hungary is the group of people with disabilities, whose health status and health behaviour are less investigated. In this research, we describe the nutritional habits and physical activity of adolescents with disabilities and the background factors that influence it.

It is a known fact that the occurrence of all risk factors affecting health is more common among individuals with low education and/or low income, in which social groups health-damaging behaviours can be accumulated and lead to further social and economic inequalities related to health and life expectancy (6). The relationship between childhood and disability itself as a disadvantage is known. Children with disabilities are in a particularly vulnerable situation, on the one hand, because they are children, and on the other hand, because they live with a disability. Most children with disabilities encounter forms of social exclusion, different situations that will affect them to varying degrees, depending on the type of existing disability, the living environment, or even the class community to which they belong (3).

More than 1 billion people live with some kind of disability, which affects 15% of the world's population. People with disabilities have greater needs for health care, they have health problems, and difficulties in accessing health care. According to the Missing Billion report, people with disabilities are three times more likely to have diabetes mellitus, more likely to be malnourished, and three times more likely to be denied health care access (15). Based on the data of the Central Statistical Office, in 2016, 408,021 people lived with some type of disability in Hungary, which is 4.3% of the population. According to the 2011 Census data, there are 1,310 persons aged 12–18 living with disabilities in the Szabolcs-Szatmár-Bereg County, 44.58% of whom are girls and 55.41% are boys (16).

The overall goal of the research was to gain insight into the lifestyle and health behaviour of young people aged 12–18 with disabilities, and to learn about the factors shaping their health. This study aims to explore the eating habits and physical activity of young people with disabilities aged 12–18 and the background factors that influence it in the Szabolcs-Szatmár-Bereg County.

MATERIALS AND METHODS

Sample Selection

In the course of our research, within the framework of a group sampling procedure, the special schools were randomly selected. In possession of the existing National Scientific and Ethical Committee permit, in the first stage of the research, we asked the heads of the institutions and the presidents of the involved civil organizations for permission to conduct our research. The heads of institutions and civil organizations made available the number of staff that met the selection criteria (persons between the ages of 12 and 18 who live in the Szabolcs-Szatmár-Bereg County and are affected by a disability); 252 of the selected children agreed to participate in the survey with prior parental permission. Finally, 248 paper-and-pencil questionnaires were collected. During computer data recording and cleaning, we deleted another 9 questionnaires from the sample (e.g., not answering 50% of the questions or due to obviously frivolous answering). The final sample size consists of 239 questionnaires. During the recording of the questionnaires, the presence of an interviewer was required in the vast majority of cases.

Sample Characteristics

The sample consists of 239 young people aged 12–18 with disabilities in the Szabolcs-Szatmár-Bereg County, their average age is 16 years, standard deviation 2.20 years. Boys were overrepresented in the study (59.8% of boys, 40.2% of girls). Most of the interviewed young people have a mild degree of intellectual disability or a mild degree of autism spectrum disorder. The smallest proportion of the sample are hearing-impaired young adults. Many young people live with multiple disabilities. A more detailed presentation of the sample is included in Table 1.

Method of Data Collection

During the investigation, we combined theoretical research with empirical questionnaire research in an interdisciplinary approach. In our self-developed questionnaire, we adapted certain blocks of questions from the validated questionnaire of the HBSC research to assess eating habits, dental care, and physical activity. Data collection covered the following topics – demographic data: age, gender, parents' education, place of residence, and self-assessed financial situation. Questions about health behaviour concerned physical activity, eating habits and dental care, smoking habits, alcohol consumption, leisure time, age, gender, education, and place of residence. During the data analysis, the answers of different categories were joined for some variables.

Table 1. *The main characteristics of the sample (N = 239)*

Characteristics		%
Gender	Boys	59.8
	Girls	40.2
Type of disability	Intellectual disability	43.1
	Other	56.9
Intellectual disability (n = 168)	Mild	36.6
	Intermediate	52.6
	Serious	10.8
Mobility impairment (n = 31)	Mild	29.1
	Intermediate	63.0
	Serious	7.9
Visual impairment (n = 26)	Mild	19.5
	Intermediate	51.0
	Serious	29.5
Hearing impairment (n = 9)	Mild	52.4
	Intermediate	35.1
	Serious	12.5
Speech impairment (n = 30)	Mild	33.3
	Intermediate	23.3
	Serious	43.3
Autism spectrum disorder (n = 55)	Mild	58.2
	Intermediate	21.8
	Serious	20.0
Learning disorder (n = 34)	Mild	64.8
	Intermediate	26.5
	Serious	8.8
Type of settlement	City	56.9
	Village	43.1
Child's residence	At home with family	82.9
	In college	7.5
	In child's home	2.5
	With foster parent	7.1

Ethical Background of the Research

The questionnaire was completed anonymously, the persons participating in the research cannot be identified. The research was carried out in compliance with the applicable law, professional guidelines and recommended ethical codes. The rules for querying and collecting the questionnaire, processing, storage, and database management complied with the relevant legislation. The research was approved by the Scientific and Research Ethics Committee (No. IV/5706-1/2021/EKU).

Statistical Analysis

Proportions were calculated as descriptive statistics. Pearson's chi-squared tests were used to check associations between categorical variables, a p-value of < 0.05 was considered significant. Two proportion z-tests were used to compare proportions, and multiple binary logistic regression was used. The data was analysed using Intercooled Stata v17 (17).

RESULTS

Socioeconomic Status

About half of the mothers/foster mothers of children with disabilities have secondary school education while in case of fathers/foster fathers it is approx. 60%; 36.6% of mothers and 29% of fathers have primary education; 10.82% of mothers and 7.88% of fathers have higher education. Approximately 20% of the young people who took part in the survey considered their financial situation to be below average, half to be average, and one third to be above average; 56.90% of children live in cities and 43.09% in villages; 82.84% of adolescents live at home with their families, 7.53% live in student hostels, 2.51% in children's homes, and 7.11% are brought up by foster parents (Table 1).

Eating Habits, Physical Activity

Less than a third of the examined young people with disabilities eat fruits or vegetables at least 5 times a week, and 20% almost never. Although to a small extent, the number of youngsters who never eat fruit and vegetables is higher among those who have some intellectual disabilities. Sweets are consumed several times a week by both sexes. Boys consume cola or other soft drinks at a slightly higher rate than girls. The mother's education correlates with cola consumption, and its frequency is significantly higher among those whose mothers have a primary education. There is a significant difference between the financial situation and the frequency of cola consumption, adolescents with a below-average financial situation consume cola in a significantly higher proportion; cola consumption between primary and secondary level of education of the mothers ($p = 0.004$), low vs. middle 65.12% vs. 33.93% ($p < 0.001$), low vs. high 65.12% vs. 43.08% ($p = 0.025$). The consumption of dairy products correlates with the father's educational level, children whose fathers have low educational level consume less dairy products at least 5 times a week. The financial situation also affects the development of milk consumption, children of wealthier families consume a higher proportion of dairy products at least 5 times a week. The education level of the mother significantly affects the consumption of whole grains. Children of mothers with higher education reported a significantly higher proportion of whole grain consumption (Table 2). Physical activity is not popular among adolescents with disabilities. Girls pursue physical activity somewhat less frequently and do not play sports regularly. We found that the social circumstances are significantly linked to children's sports habits and physical activity. In terms of the frequency of physical exercise for the previous 7 days, children from wealthier families regularly (5–7 times a week) performed intensive physical exercise outside of physical education classes at a significantly higher rate. The frequency of intensive physical exercise outside of physical education classes is lower for those living in an above-average or average financial situation than the proportion of children who do not engage in (performed 0 or 1 day) intensive physical exercise very often. Among children raised in families with a below-average social status, there is a significantly higher proportion of those who exercise very little in their free time. If the father has a primary education, the proportion of young people who did not spend time doing physical exercise outside of physical education classes is significantly higher; 74.1% of boys

Table 2. *Eating habits of disabled adolescents and influencing factors*

		Gender			Mother's highest education				Father's highest education				Self-assessed financial situation				Type of disability		
Number of respondents		239			194				165				220				239		
Characteristics		**Boys (%)**	**Girls (%)**	**p-value**	**Primary (%)**	**Second-ary (%)**	**Higher (%)**	**p-value**	**Primary (%)**	**Second-ary (%)**	**Higher (%)**	**p-value**	**Below average (%)**	**Aver-age (%)**	**Above average (%)**	**p-value**	**Intel-lectual (%)**	**Other (%)**	**p-value**
Fruit	Less often, or never	26.6	23.9		32.4	17.7	38.1		33.3	19.23	30.8		34.9	25.0	20.0		29.1	22.8	
	1–4 times a week	49.6	46.9	0.641	47.9	49.0	42.9	0.069	43.8	50.0	53.8	0.312	48.8	49.0	43.1	0.146	49.5	47.8	0.298
	At least 5 times a week	23.8	29.2		19.7	33.3	19.0		22.9	30.8	15.4		16.3	25.9	36.9		21.4	29.4	
Vegetable	Less often, or never	26.6	22.9		33.3	20.2	30.8		24.0	21.6	42.9		30.2	25.0	21.5		28.2	22.8	
	1–4 times a week	45.4	47.9	0.815	45.8	48.1	30.8	0.287	53.5	43.1	33.3	0.108	46.5	45.5	44.6	0.775	48.5	44.9	0.282
	At least 5 times a week	28.0	29.2		20.8	31.7	38.4		22.5	35.3	23.8		23.3	29.5	33.9		23.3	32.3	
Sweets	Less often, or never	16.8	19.8		19.7	18.6	23.81		16.67	21.15	15.38		16.2	17.0	21.6		18.4	17.7	
	1–4 times a week	38.4	44.8	0.355	36.6	44.1	23.81	0.495	37.50	39.42	23.09	0.606	41.9	42.0	35.4	0.893	47.6	36.0	0.129
	At least 5 times a week	44.8	35.4		43.7	37.3	52.38		45.83	39.42	61.54		41.9	41.0	43.1		34.0	46.3	
Cola, soft drink	Less often, or never	20.3	32.3		15.5	27.4	42.8		16.7	26.0	38.4		11.6	25.0	33.8		24.3	25.7	
	1–4 times a week	35.0	28.1	0.106	26.8	37.3	28.6	0.011	25.0	32.7	30.8	0.219	23.3	41.1	23.1	0.001	33.0	31.6	0.958
	At least 5 times a week	44.7	39.6		57.7	35.3	28.6		58.3	41.3	30.8		65.1	33.9	43.1		42.7	42.7	
Milk, milk products	Less often, or never	16.8	16.7		23.9	14.7	23.8		22.9	17.3	23.1		16.2	21.4	12.3		20.4	14.0	
	1–4 times a week	32.9	36.4	0.836	29.6	31.4	42.9	0.318	47.9	25.0	30.8	0.021	55.8	29.5	27.7	0.005	27.2	39.7	0.102
	At least 5 times a week	50.3	46.9		46.5	53.9	33.3		29.2	57.7	46.1		28.0	49.1	60.0		52.4	46.3	
Whole grains	Less often, or never	53.8	47.9		59.1	53.0	23.8		58.3	49.04	23.0		62.8	46.4	52.3		59.2	45.6	
	1–4 times a week	18.9	27.1	0.325	16.9	24.5	23.8	0.024	16.7	24.04	38.5	0.239	16.3	23.2	23.1	0.465	18.5	25.0	0.113
	At least 5 times a week	27.3	25.0		24.0	22.5	52.4		25.0	27.0	38.5		20.9	30.4	24.6		22.3	29.4	

Table 3. *Physical activity of disabled adolescents and influencing factors*

		Gender			Mother's highest education				Father's highest education				Self-assessed financial situation			
Number of respondents		239			194				165				220			
Characteristics		**Boys (%)**	**Girls (%)**	**p-value**	**Primary (%)**	**Second-ary (%)**	**Higher (%)**	**p-value**	**Primary (%)**	**Second-ary (%)**	**Higher (%)**	**p-value**	**Below average (%)**	**Average (%)**	**Above average (%)**	**p-value**
60 minutes of physical activity in the last 7 days	0 or 1 day	46.9	50.0	0.488	54.9	48.0	33.3	0.357	64.6	42.3	38.4	0.357	65.1	50.0	35.4	0.020
	2–4 days	24.4	28.1		24.0	25.5	42.9		20.8	27.9	30.8		25.6	25.0	30.8	
	5–7 days	28.7	21.9		21.1	26.5	23.8		14.6	29.8	30.8		9.3	25.0	33.8	
Frequency of physical activity in free time	Monthly or never	42.6	52.1	0.358	50.7	41.2	38.1	0.521	54.2	37.5	30.8	0.182	65.1	45.5	32.3	0.020
	1–3 times a week	37.8	31.2		29.6	42.1	42.9		25.0	42.3	53.8		25.6	39.3	35.4	
	At least 6 times a week	19.6	16.7		19.7	16.7	19.0		20.8	20.2	15.4		9.3	15.2	32.3	
Number of hours of physical activity per week in free time	Nothing	39.2	40.6	0.973	46.5	32.3	42.7	0.383	54.2	28.8	38.5	0.005	58.1	38.4	27.7	0.007
	½–1 hour	37.1	36.5		33.8	39.2	38.1		37.5	35.6	38.5		27.9	40.2	35.4	
	At least 2–3 hours	23.8	22.9		19.7	28.4	19.1		8.3	35.6	23.1		13.9	21.4	36.9	
Regular sports activity	Yes	26.0	24.0	0.738	26.8	24.5	38.1	0.441	20.8	32.7	30.8	0.323	18.6	19.6	41.5	0.003
	No	74.1	76.0		73.2	75.5	61.9		79.2	67.3	69.2		81.4	80.6	58.5	

Table 4. *Potential influencing factors of regular sports based on multiple binary logistic regression*

Regular sport (yes/no)	OR	p-value	95% CI
Gender (girl/boy)	0.90	0.812	0.39–2.10
Age (years)	1.27	0.022	1.03–1.55
Cola (1–4 times a week/less often, or never)	1.09	0.886	0.35–3.39
Cola (at least 5 times a week/less often, or never)	1.50	0.432	0.55–4.09
Mother's education (secondary/primary)	0.14	0.001	0.04–0.43
Mother's education (higher/primary)	0.77	0.771	0.13–4.62
Father's education (secondary/primary)	4.00	0.028	1.17–13.75
Father's education (higher/primary)	4.24	0.185	0.50–35.78
Self-assessed financial situation (average/below average)	1.21	0.780	0.32–4.57
Self-assessed financial situation (above average/below average)	4.94	0.029	1.17–20.79

and 76.0% of girls do not play sports regularly. A significantly higher proportion of young people who do sports regularly is brought up in families with a better financial situation (Table 3).

Age was found a significant motivating factor (OR = 1.27, 95% CI: 1.03–1.55), 1–4 times a week. Cola consumption is established as a motivating factor (OR = 1.09, 95% CI: 0.35–3.39), furthermore at least 5 times a week. Cola consumption is also a motivating factor (OR = 1.50, 95% CI: 0.55–4.09). In terms of regular sports, the father's secondary (OR = 4.00, 95% CI: 1.17–13.75) or higher education (OR = 4.24, 95% CI: 0.50–35.78) was found to be a motivating factor (Table 4.)

DISCUSSION

The insufficient fruit consumption is not justified by the financial situation of the families, based on the results of the survey. The Ministry of Human Resources Decree 37/2014 on nutritional health regulations for public catering went into effect on 1 September 2015, and the implementation of the school fruit and vegetable programme has been also regulated by the Decree for 6 years. Despite this, students still consume very little fruit and vegetables (18). There are initiatives in Hungary to promote a healthy diet and lifestyle, such as the public health product tax. The purpose of the public health product tax is to reduce the purchase of products that have an adverse effect on health by paying additional tax (19). The importance of physical activity is preferred by the 2011 CXC Act on national public education, which declares that students must take part in at least one physical education lesson every school day (20). The Comprehensive School Health Development Programme has been a requirement for all public education institutions since 2012, focusing on healthy nutrition, daily physical education, acquiring health skills, and mental health protection (21). We can see that interventions are taking place in Hungary to protect the health and well-being of children, but their positive effect is not reflected in the health indicators as expected. Young people with disabilities form a group with special needs, who have different needs even within each type of disability, so it is necessary to differentiate programmes for the majority of child population. Communities have a significant role in shaping the state of health. Belonging to a youth organization in childhood increases the chances of good health in adulthood. Young people have access to resources and psychological capital that protect them from an early stage of life. Youth programmes outside the formal school system can improve social mobility. The aim is to widen social networks in order to obtain social benefits (22). The survey was made with the aim of need-driven intervention. With accurate knowledge of the health behaviour of the target group, our goal is to develop an intervention program based on complex community resources adapted to the needs of children with disabilities.

CONCLUSION

The eating habits of adolescents with disabilities in the Szabolcs-Szatmár-Bereg County are unsatisfactory. A bit larger proportion of boys never consumes vegetables and fruits, and a higher proportion of them often eats sweets (at least 5 times a week). Frequent cola consumption is also higher among boys, but the proportion of whole grain consumption is lower among them. The differences between the sexes in the population we studied are small, but they exist. The eating habits of girls are more favourable, which can be observed in the average Hungarian child population. Eating habits were less influenced by the type of disability and the financial situation. Parents' education was correlated with consumption of cola, whole grains and dairy products. Higher maternal education reduces the prevalence of cola consumption and increases the frequency of whole grain consumption. If the father has a higher educational level, the frequency of dairy product consumption is higher. Regular sports are clearly related to the financial situation. A significantly higher proportion of young people raised in wealthier families do sports regularly, which is the same as the international data of the survey. According to international data, in almost every country, boys perform sufficient physical activity. As for physical activity characteristics, a more secure social background, i.e., an above-average income, serves as a protective factor for physical activity. Experience and results show that differentiated health promotion of young people with disabilities is necessary.

Authors' Contributions

B.Á., J.E.R. – conceptualization; B.Á., M.G.A.K., P.V. – methodology; B.Á. – writing, original draft preparation; J.E.R., N.M., M.Z., M.K, V.S.,

M.M.B., J.P. – writing, review and editing; N.A. – statistical analysis. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

None declared

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