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PHYSICAL ACTIVITY IN PRESCHOOL CHILDREN WITH INTELLECTUAL DISABILITIES

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Abstract

The aim of this paper is to examine the effect of socio-demographic factors, children's motor skills and parents' physical activity on the physical activity of preschool children with intellectual disabilities. The research sample included 47 children with intellectual disabilities, as well as 47 parents. For the examination of socio-demographic variables, a questionnaire was created, which included information about parents and children. The *Vineland Adaptive Behavior Scale* was used to assess adaptive behaviour in the domain of motor skills. For assessing the children's gross motor skills, the *Test of Gross Motor Development* was used, and the *Family Lifestyle Survey* was used for the assessment of the physical activity of parents, and children with intellectual disabilities. The results show that the majority of children with intellectual disabilities partake in some physical activity for at least 20 minutes, one to four times a week. Multiple linear regression analysis found that the independent variables explained 11.2% of the variance in children's physical activity. Gross motor skills represented the strongest individual contribution to the physical activity of children with intellectual disabilities.

Key words: physical activity, motor skills, intellectual disability, parents, preschool period.

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ФИЗИЧКА АКТИВНОСТ КОД ПРЕДШКОЛСКЕ ДЕЦЕ С ИНТЕЛЕКТУАЛНОМ ОМЕТЕНОШЋУ

Апстракт

Циљ овог рада је да испита утицај социо-демографских фактора, моторичких вештина деце и физичке активности родитеља на физичку активност предшколске деце с интелектуалном ометеношћу. Узорак истраживања укључио је 47-оро деце с интелектуалном ометеношћу, као и 47 родитеља. За испитивање социодемографских варијабли креиран је упитник који укључује информације о родитељима и деци. За процену адаптивног понашања у домену моторичких вештина коришћена је *Винеландова скала адаптивног понашања,* за процену грубомоторичких способности деце коришћен је *Тест развоја грубе моторике,* док је за процену физичке активности родитеља и деце с интелектуалном ометеношћу коришћена *Анкета о породичном начину живота*. Резултати показују да већина деце с интелектуалном ометеношћу учествује у некој физичкој активности, у трајању од најмање 20 минута, једном до четири пута у седмици. Вишеструком линеарном регресионом анализом утврђено је да су независне варијабле објасниле 11,2% варијације физичке активности деце. Груба моторика представља најјачи појединачни допринос физичкој активности деце с интелектуалном ометеношћу.

Кључне речи: физичка активност, моторичке вештине, интелектуална ометеност, родитељи, предшколски период.

INTRODUCTION

Regular physical activity (PA) contributes to better physical and mental health and is crucial for the formation of motor skills (Loprinzi et al., 2012). Creating opportunities for people with intellectual disabilities (ID) to have access and participate in regular PA has become an issue of great importance (Hinckson et al., 2013b). Research indicates that people with ID, as a population, are more likely to be in a worse condition in terms of general health, to be obese, and to devote very little time to physical exercise (Heller et al., 2011). Research has documented that people with ID most often have binding deficits in physical and motor functioning, and because of this, among other things, they spend more time engaged in sedentary activities (Memari et al., 2012). Physical inactivity is common in this population, and there is a lack of light, moderate and vigorous exercise (Bartlo & Klein, 2011).

People with mild, moderate, and severe ID show different degrees of developmental motor delay. Mild ID (MID) is characterised by motor functioning that is two to three standard deviations below the average. Moderate ID (MoID) is characterised by a greater limitation and is three to four standard deviations below the mean value, and severe ID is associated with below-average motor functioning, by about four standard deviations (Đurić-Zdravković, 2020; WHO, 2018). It is considered that the IQ score, due to the difficulty of precise measurement, is less valid and very often insufficient for assessing reasoning in real situations (APA, 2013; Cervantes

et al., 2019), and one of the most significant changes in DSM-5 was its removal from diagnostic criteria (APA, 2013). Instead, the ID category is diagnosed based on adaptive functioning. It was agreed that the upper limit of IQ for determining ID remains approximately around 70, i.e., two standard deviations below the mean (APA, 2013; Đurić-Zdravković, 2020).

Due to the health condition and limitations arising from the living environment, opportunities for people with ID to exercise regularly may be limited (Hamilton et al., 2007). Many people with ID live in supported living conditions or with their families, and it is precisely in these environments that very few of these people achieve the recommended daily level of PA (Rimmer et al., 2010). It is important to provide conditions for regular PA that suits the individual and that will be included in their daily activities. Identifying opportunities to participate in recreational activities and physical exercise, and developing collaborations with people with ID and their caregivers offer the potential to realise the benefits of regular exercise. This is vital for promoting and improving their general health condition, bettering their quality of life and well-being, and minimising health complications that may arise as a result of a lack of exercise (Haveman et al., 2010).

When it comes to children with ID, the World Health Organization recommends at least 60 minutes of moderate to intense PA every day, according to the specific abilities of the child (Bull et al., 2020), which is approximately 12,000 steps per day (Colley et al., 2012). Most of the research studying PA in the preschool population was conducted with children of typical development. A limited number of studies examines the determinants and correlates of PA within the population of preschool children with ID (Djuric-Zdravkovic et al., 2021). However, even within this small sample of literature, the benefits of PA are noted, and are reflected in the improvement of health and motor problems of children of this population (Collins & Staples, 2017; Wouters et al., 2019). Parental support and the mood set at home can encourage or limit a child's PA (Telford et al., 2004, according to Petrović et al., 2023). Parents are practically identified as carriers of PA in preschool children (Ninković et al., 2019). Considering that more frequent motor deficits and delays in motor development are registered in children with ID, it is certain that parental behaviour is also related to the PA patterns of these children.

Despite the differences in the design of the few available studies and the procedures used, it has been observed that sedentary activities increase as children with ID get older, especially if early intervention that forms appropriate behaviours within PA is not used (Hinckson & Curtis, 2013a). Therefore, it is necessary to study the factors related to the PA of young children with ID before the formation of wrong behaviour patterns and before the worsening of the symptoms of this clinical picture.

The aim of this paper is to examine the effect of socio-demographic factors, children's motor skills and parents' PA on the PA of preschool-age children with ID.

MATERIAL AND METHODS

Participants

The research sample included 47 children with ID (29 boys (61.7%), and 18 girls (38.3%)), ages four through seven years and two months (AS=5.78, SD=0.86). It was found that there are no significant differences in age between girls and boys (χ^2=2.816, df=3, p=0.714). The sample included children with mild, moderate, and severe ID. The sample included 47 parents – 43 mothers (91.49%) and four fathers (8.51%). The parents' age ranged from 26 to 52 years (AS=33.14, SD=7.22).

The inclusive criteria for this study were: children with ID, children of middle and older preschool age, regular attendance of the child in kindergarten in the current enrolment year, and one parent from the family of each child included in the sample. Exclusive criteria included: autism spectrum disorders, the existence of additional psychiatric or medical diagnoses, neurological diseases, or hearing or vision impairment in children. Other socio-demographic data on parents, as well as data on children, is presented in Table 1.

Table 1. Socio-demographic data on parents and children with ID

Parents		Children	
Data	M (SD) / N (%)	Data	M (SD) / N (%)
Age M (SD)	33.14 (7.22)	Age M (SD)	5.78 (0.86)
Mothers N (%)	43 (91.49)	Girls N (%)	18 (38.30)
Fathers N (%)	4 (8.51)	Boys N (%)	29 (61.70)
Education N (%)		Diagnosis N (%)	
Elementary	5 (10.63)	MID	14 (29.79)
High school	32 (68.09)	MoID	26 (55.32)
Bachelor	2 (4.26)	SID	7 (14.89)
Master	8 (17.02)		
Marital status N (%)		Kindergarten	N (%)
Married	30 (63.83)	Regular	8 (17.02)
Not married	17 (36.17)	Developmental	39 (82.98)
Employment N (%)			
Employed	15 (31.91)		
Not employed	32 (68.09)		

M – mean, SD – standard deviation, N – frequency, (%) – percentage, MID – mild intellectual disability, MoID – moderate intellectual disability, SID – severe intellectual disability.

Measures

A questionnaire was created for the purposes of this research in order to examine socio-demographic variables, which included information about parents and children. Variables related to parents included age, gender, level of education (elementary, high school, bachelor and master), marital status (married/not married), and employment status (employed/unemployed). The variables included in this study that related to children are age, gender, primary diagnosis, and belonging to a regular or developmental group within a preschool institution. The examiners obtained this information by surveying the parents.

The *The Vineland Adaptive Behavior Scales, Third Edition (VABS-III; Sparrow et al., 2016)* is the most commonly used measure of adaptive skills for the assessment of adaptive deficits in persons with ID and developmental disorders. In VABS-III assessment, informants may be parents. This instrument assesses adaptive behaviours in domains of communication, daily life, socialisation and motor skills. For the purpose of this research, the domain of motor skills/PA domain was used, which includes the subdomains for gross (use of large muscle groups for movement and coordination) and fine motor skills (use of small muscle groups for object manipulation). The subdomain for gross motor skills has 43 items, while the subdomain for fine motor skills has 34 items. Therefore, this domain was used to assess the child's use of gross and fine motor skills in everyday life. Items are rated on a 3-point Likert-type scale, on which '0' indicates that the individual does not perform assessed behaviour, '1' indicates that the individual performs the behaviour sometimes, and '2' indicates that the individuals perform assessed behaviour most of the time. VABS-III can be used to plan developmental intervention and monitor progress. In this study, the Cronbach's alpha coefficient for the VABS-III motor skills domain was 0.74 – 0.72 for the gross motor subdomain, and 0.75 for the fine motor subdomain.

In order to assess PA in children with ID and their parents, the *Family Lifestyle Survey (FLSS)* was used. It is a modification of a part of the *Family Check-Up questionnaire* (Dishion & Kavanaugh, 2003). Parents reported on the items of the instrument to provide information about the extent to which they and their children engage in PA within the family context. This form of the instrument consists of seven items that measure children's PA, one item that measures sedentary behaviour in children, and two items that refer to the measurement of the parents' PA. The scoring of the parents' PA is done on a five-point frequency scale ranging from 0 (almost never) to 4 (nearly always), while the PA of children is measured by the answers provided, which, for example, determine the number of minutes or hours related to different types of exercise. This instrument was perfected and used during work on projects (2014-2018, Prof. Dr. E. Stormshak) funded by the U.S. Department of Education. In

this study, the Cronbach's alpha coefficient for the FLSS was 0.81. The coefficient for children's PA was 0.77, while it was 0.83 for parents' PA.

The *Test of Gross Motor Development, Third Edition (TGMD-3; Ulrich, 2016)* is a standardised instrument for assessing the gross motor skills of children ages three to ten years and eleven months. It is used to identify children who are significantly behind their peers in the development of gross motor skills, and for individual planning of PA development programmes. The test consists of two subtests: *Locomotor* and *Ball Skills*. *Locomotor* measures gross motor skills that require fluid, coordinated body movement as the child moves through space. *Ball Skills* measure the gross motor skills of effective throwing, hitting and catching. TGMD-3 consists of a total of 13 items. *Locomotor* contains six items (run, jump, hop, skip, gallop, and slide), and *Ball Skills* includes seven object-control items (catch, kick, strike with a bat, strike with a racquet, underarm throw, overhand throw, and dribble). Points are determined for each assessment skill in relation to whether the criterion for its execution is met (score 1) or not (score 0). In this study, the average coefficient alpha is 0.81 for *Locomotor*, followed by 0.83 for *Ball Skills*, and 0.87 for the TGMD-3 composite score.

Procedure

In the form of a semi-structured interview, the researchers individually asked the parents questions while collecting data on the instruments VABS-III and FLSS, as well as when filling out the questionnaire related to socio-demographic variables. Standardised procedures related to the TGMD-3 include: (1) verbal and visual demonstration of each skill one at a time; (2) one practice test for each skill; (3) if necessary, a repetition of additional verbal and visual demonstration after practice, and (4) two attempts (by the child) without hinting or assistance from the researcher. It is important to note that, as the study was conducted, strategies were introduced to reduce distraction and to stimulate children's participation. These included reward systems, scheduling of activities, individual assessment, and the use of coloured markers to mark activities for positioning during demonstrations.

The diagnosis of the ID category, which is an integral part of the child's medical documentation, was previously performed by child psychiatrists and child neurologists within competent paediatric institutions in Serbia.

The testing itself was conducted between October 2022 and January 2023, in public and private, and regular and developmental kindergarten groups in the wider territory of Belgrade. The Administration of each kindergarten and parents gave their written consent for the inclusion of children in this research and the inspection of the accompanying medical documentation, and the children gave their verbal consent before the test.

It was also explained to both parents and children that they have the right to refuse to participate in the research at any time. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Board of the University of Belgrade, Faculty of Special Education and Rehabilitation (number 134/2).

Statistical Analysis

Calculations within the study were done in the statistical programme IBM SPSS, version 25.0 software. Descriptive data is expressed as means (M) ± standard deviation (SD), frequencies and percentages. The reliability of the used instruments was checked using the internal consistency coefficient (Cronbach's α). Chi-squared was applied for appropriate comparisons. Correlations between variables were analysed using the Pearson correlation test. The level of statistical inference was determined at $p < 0.05$. Multiple linear regression was applied when determining the prediction of children's PA depending on socio-demographic factors, motor skills and the PA of parents.

RESULTS

VABS-III standard scores in the motor skills domain ranged between 32 and 107 (M=61.18, SD=14.83).

The assessment of children's PA led to the following results: in relation to children's activity level and their sedentary behaviour, 19.7% of the parents stated that their children usually sit while playing, colouring with crayons, watching TV or flipping through children's books; 43.2% of the children combine play with activities that involve movement and playing video games standing up; and 37.1% of the children do not stop moving/running from one part of the home to another/going up and down the stairs and jumping. In addition, 52.9% of the children engage in some PA (cycling, running, basketball, football, etc.) for at least 20 minutes, one to four times a week, 18.5% of the children exercise for at least 20 minutes five to seven times a week, and 28.6% of the children never exercise, not even 20 minutes a week. The majority of parents stated that their children play some sport at home or in kindergarten (69.8%), play outside (62.3%), walk (89.7%) and go to the park (82.5%) for less than an hour every day, except when the weather is extremely bad. The activity of riding a bicycle/tricycle is the least represented (18.9%) during daily physical activities (PAs) among children. Parents rated the items related to children's PA with 1 (15-30 minutes a day) and 2 (30 minutes to an hour a day) (M=1.42, SD=0.81), which indicates that children on average spend more than 30 minutes, but less than one hour on engaging in the mentioned PAs.

When it comes to the PA of parents, 57.7% of the respondents stated that they almost never participate in PA individually (M=0.56, SD=0.22), but 71.1% of the parents stated that they sometimes and often participate in PAs with their child (M=2.49, SD=1.23). All average score values on VABS-III, FLSS and TGMD-3 are given in Table 2.

Table 2. *The distribution of VABS-III, FLSS and TGMD-3 scores*

	M ± SD	Range
VABS-III		
Gross motor skills	34.56 ± 8.77	0 – 86
Fine motor skills	26.62 ± 6.06	0 – 68
Total Motor Skills	61.18 ± 14.83	0 – 154
FLSS		
PA of children	7.12 ± 3.45	0 – 20
PA of parents	1.53 ± 0.73	0 – 8
TGMD-3		
Locomotor	20.24 ± 7.67	0 – 46
Ball Skills	19.61 ± 9.51	0 – 54
Total TGMD-3 scores	39.85 ± 17.18	0 – 100

VABS-III: Vineland Adaptive Behavior Scales, Third Edition; FLSS: Family Lifestyle Survey; TGMD-3: Test of Gross Motor Development – 3rd edition, M – mean; SD – standard deviation; PA – Physical activity.

The results of the correlation analysis presented in Table 3 indicate different relations between the study variables (VABS-III, FLSS and TGMD-3) and socio-demographic variables. The parents' age is not related to any variable ($p>0.05$), except for children's PA and parents' PA ($p<0.01$, $p<0.05$, respectively). It is a matter of direct proportionality in this relation ($r=0.36$ and $r=0.30$). The gender of parents does not correlate with any of the tested variables ($p>0.05$), while the parents' education directly correlated with almost all variables ($r=0.27$ to $r=0.69$), except with the parents' marital status and the child's diagnosis ($p>0.05$). Marital status is weakly inversely correlated with the parents' employment ($r=-0.23$), and it is in weak direct proportionality with the PA of children and parents ($r=0.31$ and $r=0.33$). Employment in direct proportionality correlates only with the PA of children and parents ($r=0.42$ and $r=0.29$), as well as with the children's locomotor skills ($r=0.26$). The children's diagnosis correlates with all non-demographic variables of the study in direct proportionality ($r=0.44$ to $r=0.71$), except with the PA of the parents, where an inverse proportionality was found ($r=-0.42$). Gross motor skills in direct proportionality moderately and strongly correlate with all non-demographic variables ($r=0.42$ to $r=0.71$), while fine motor skills have weak correlations with motor variables ($r=0.25$ to $r=0.31$), except for the PA of parents where the relation is not statistically significant ($p>0.05$). The PA of both children and parents forms weak to strong directly proportional relationships with all motor variables ($r=0.25$ to $r=0.71$), as well as with children's locomotor and ball skills ($r=0.26$ to $r=0.71$).

Table 3. *The matrix of inter-correlations between study variables and demographic characteristics*

	1	2	3	4	5	6	7	8	9	10	11
1. Parents' age											
2. Gender of parents	0.06										
3. Education of parents	0.10	-0.17									
4. Marital status	0.04	0.14	0.12								
5. Employment	0.05	0.07	0.69**	-0.23*							
6. Diagnosis of the child	0.09	0.09	0.19	0.08	0.16						
7. VABS-III – Gross motor skills	-0.02	0.03	0.27*	0.07	0.12	0.68**					
8. VABS-III – Fine motor skills	0.08	0.06	0.44**	0.05	0.04	0.66**	0.48**				
9. FLSS – PA of children	0.36**	-0.08	0.37**	0.31**	0.42**	0.71**	0.59**	0.25*			
10. FLSS – PA of parents	0.30*	0.08	0.58**	0.33**	0.29*	-0.42**	0.42**	0.13	0.46**		
11. TGMD-3 – Locomotor	0.14	0.17	0.49**	0.19	0.26*	0.44**	0.68**	0.30*	0.71**	0.39**	
12. TGMD-3 – Ball Skills	0.11	0.18	0.56**	0.17	0.19	0.53**	0.71**	0.31**	0.69**	0.27*	0.45**

Note. $^{**}p < 0.01$, $^{*}p < 0.05$

VABS-III: Vineland Adaptive Behavior Scales, Third Edition; FLSS: Family Lifestyle Survey; TGMD-3: Test of Gross Motor Development – 3rd edition; PA – Physical activity.

Multiple linear regression analysis showed that a significant regression model was identified ($F = 19.072$; $p < 0.001$; $R^2 = 0.112$). Therefore, the results of the regression analysis indicate that the independent variables explained 11.2% of the variance in children's PA. Regression analysis indicates that there is no collinearity in the results, which suggests that the results have adequate statistical significance. Table 4 illustrates the significance, direction, and strength of the relation between individual predictors and the PA of children with ID. The child's diagnosis (β=0.099; p=0.003), as the first predictor with a positive standardised beta value, suggests that a more severe clinical picture (lower IQ, lower quality of motor skills) will more likely contribute to a lower quality of PA in children with ID. The quality of gross motor skills of children with ID contributes positively to their PA (β=0.236; p=0.000), as well as their locomotor abilities (β=0.092; p=0.004). In addition, within the observed predictors, it can be noted that children with ID whose parents are more physically active are themselves significantly more physically active (β=0.172; p=0.001). Gross motor skills represented the strongest single contribution to the PA of children with ID.

Table 4. Multiple linear regression of the prediction of children's physical activity

	Unstandardised Coefficients		Standardised Coefficients			
	β	Std. Error	β	t	Sig.	Partial R
(Constant)	2.078	0.081		27.136	0.000	
Education of parents	0.010	0.014	0.022	1.618	0.262	0.006
Diagnosis of the child	0.079	0.017	0.099	2.814	**0.003****	0.080
VABS-III – Gross motor skills	0.071	0.012	0.236	5.492	**0.000****	0.214
VABS-III – Fine motor skills	0.007	0.005	0.027	1.110	0.309	0.025
TGMD-3 – Locomotor	0.034	0.013	0.092	3.231	**0.004****	0.084
TGMD-3 – Ball Skills	0.031	0.022	0.065	1.706	0.134	0.054
PA of parents	0.054	0.011	0.172	4.284	**0.001****	0.182

Note. $^{**}p < 0.01$

VABS-III: Vineland Adaptive Behavior Scales, Third Edition; FLSS: Family Lifestyle Survey; TGMD-3: Test of Gross Motor Development – 3rd edition; PA – Physical activity

DISCUSSION

The aim of this study was to examine the effect of socio-demographic factors, children's motor skills and parents' PA on the PA of preschool children with ID. Taking into account the percentage of realisation of PA in children with ID, it is clear that the examined sample does not follow the recommendation of the World Health Organization of at least 60 minutes of moderate to intense PA per day. On average, children with ID spend between 30 and 60 minutes engaging in the aforementioned PAs, and most parents state that PAs are mostly carried out within preschool institutions. Previous papers in this area also indicate a reduced level of PA in children with ID (Hartman et al., 2015; McGarty et al., 2017). It is observed that more than a third of the children within the examined sample very often move, jump and run in a stereotypical, dysfunctional manner. Such actions appear in the repertoire of behaviour of children with ID and can interfere with the performance of functional activities related to self-care and household/kindergarten tasks, as well as involvement in play and typical kindergarten interaction with other children and adults (Đurić-Zdravković, 2020; Joosten & Bundy, 2010). The individual PA of parents of children with ID is not frequent either, because more than half of the respondents state that they almost never engage in these activities. The reasons for this can be numerous, and some of the most often mentioned reasons relate to the daily implementation of various activities by parents that include the care for, and support of, a child with ID, and there is little time and energy left to engage in physical exercise (Diaz, 2020). Nevertheless, the information that is encouraging

refers to the joint participation of parents and children in PAs, which is practiced by more than 70% of the parents. This is optimistic data, because it is clear that children with ID are under the influence of their parents when it comes to carrying out PA, while the adult population, people with MID for example, is more independent and therefore more physically active in performing daily life activities (Wouters et al., 2019). Forming the habit of conducting PA, as well as gradually increasing the intensity and frequency of exercise and reducing sitting time, should be implemented from the earliest age within the early intervention programme, depending on the abilities of the child with ID (Djuric-Zdravkovic et al., 2021).

In the correlation analysis, the parents' level of education and the type of the child's diagnosis correlated with all non-demographic variables in direct proportionality. This means that parents with a higher level of education were more physically active than parents with a lower level of education, as well as that their children had better gross and fine motor skills, and locomotor and ball skills, and were significantly more physically active. Parents who are more educated may be more informed about the symptoms and specifics of ID, which allows them to seek professional support and initiate intervention much earlier than parents with a lower level of education. Children with ID who have a more severe clinical condition have a worse quality of all motor skills and participate less in PAs, which was also confirmed by previous research (Wouters et al., 2019). This could be partly related to the negative influence of cognitive deficits on engaging in PA (Hartman et al., 2015).

When it comes to predicting the PA of preschool children with ID, motor activities (gross motor and locomotor) were singled out as very important components. The study showed that children with low gross motor development were less physically active than children with more developed gross motor abilities. The low quality of gross motor and locomotor skills in children with ID resulted in low participation in PAs. The inter-connection between low gross motor skills and low participation in PAs has already been found, but in the population of children with ID of primary school age (Westendorp et al., 2011). The diagnosis of the child and the PA of the parents also proved to be significant predictors. Thus, the level of ID was another potential factor influencing the extent of PA, but so far it has been mainly studied in adults with ID (Hilgenkamp et al., 2012). It has been shown that parents have a significant influence on the level of PA of their children with ID. Children with ID often rely on parental support, role models and interaction when engaging in PA, because they generally cannot identify informal opportunities for engagement, as a result of their physical or cognitive deficit (Njelesani et al., 2015).

It is necessary to conduct more research in order to determine whether and how the quality of motor development in children with ID can be increased, and whether better motor development has a positive effect on the structure of PA directly (in childhood) and in the future (in adulthood), as was found to be the case with children with typical development (Loprinzi et al., 2012). Likewise, increased access and opportunities for PA in children with ID should be investigated. Given that parental modelling has been identified as a key facilitator of PA in children, there is a need for dyadic interventions targeting the parent as well as the child with ID.

Local officials, special education teachers and parents should pay more attention to the PA of children of all categories of ID. It is necessary to monitor the range of usual functional PA, as well as its quality. The findings of this study emphasise the importance of stimulating the development of motor skills, in order to increase the volume of PA. In preschool children with ID, this can be realised as part of IEP 1, which is implemented in preschool institutions. It is important to note that within this document, legally, no special development area related to motor development or physical activity is planned (Regulation on detailed instructions for determining the right to an individual educational plan, its application and evaluation). Therefore, a detailed plan should be created to support the stimulation of children's physical activity development through a pedagogical profile and individualisation measures that would be applied within the IEP 1 (Đurić-Zdravković et al., 2021).

Although this study produced interesting results, it has several important limitations. First, this is a cross-sectional analytic study, and it does not include a longitudinal follow-up. When examining the relations between PA in children with ID and other variables (taking into account children's age, diagnosis, and other family factors), it is important to understand that they represent relations that occur over a period of time. Therefore, it is not possible to generalise the results, or the predictive or causal relations. The results of this study, in relation to the part referring to the PA of parents and children with ID, may be subject to informant bias, where there is a possibility of giving excessively positive answers. Therefore, it is recommended that future researchers apply empirically based research methods (e.g., observation in kindergarten) in order to more comprehensively look at the quality of PA of children with ID.

CONCLUSION

Given the evidence-based recommendations on the health benefits of meeting the recommended 60 minutes of PA per day, the low percentage of children with ID in Belgrade who meet the guidelines is of great concern. The results of this study determined that children with ID spend

an average of more than 30 minutes, but less than one hour, engaging in physical activities. Parents of children with ID almost never participate in physical activity on their own, although they do participate in physical activity with their children. Within the prediction of physical activity of children with ID, motor activities (gross motor and locomotor) were singled out as very important components. This study suggests that Serbian educational institutions and decision-makers in the Government of the Republic of Serbia should make more efforts to ensure that children with ID and their parents are given increased access to and opportunities for engaging in and effectively performing PA.

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ФИЗИЧКА АКТИВНОСТ КОД ПРЕДШКОЛСКЕ ДЕЦЕ С ИНТЕЛЕКТУАЛНОМ ОМЕТЕНОШЋУ

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Резиме

Редовна физичка активност доприноси бољитку физичког и менталног здравља, и кључна је за формирање моторичких вештина. Особе с интелектуалном ометеношћу склоније су да мање времена посвећују физичком вежбању. Циљ овог рада је да испита утицај социо-демографских фактора, моторичких вештина деце и физичке активности родитеља на физичку активност предшколске деце с интелектуалном ометеношћу. Узорак истраживања укључивао је 47-оро деце с интелектуалном ометеношћу различитих степена, као и 47 родитеља. За испитивање социо-демографских варијабли креиран је упитник за потребе овог истраживања који је укључивао информације о родитељима и деци. За процену адаптивног понашања у домену моторичких вештина (домен физичке активности) коришћена је Винеландова скала

адаптивног понашања, за процену грубомоторичких способности деце коришћен је Тест развоја грубе моторике, док је за процену физичке активности родитеља и деце с интелектуалном ометеношћу коришћена Анкета о породичном начину живота. Резултати показују да већина деце с интелектуалном ометеношћу учествује у некој физичкој активности (вожња бицикла, трчање, кошарка, фудбал и сл.) у трајању од најмање 20 минута, једном до четири пута у седмици. Већина родитеља деце с интелектуалном ометеношћу изјавила је да скоро никада не учествују самостално у физичкој активности, али да често учествују у физичким активностима заједно са својим дететом. Вишеструком линеарном регресионом анализом утврђено је да су независне варијабле објасниле 11,2% варијације физичке активности деце, као и да тежа клиничка слика (нижи IQ, нижи квалитет моторичких способности) доприноси нижем квалитету физичке активности деце, док локомоторичке способности и физичка активност родитеља позитивно доприносе дечијој физичкој актвности. Груба моторика представља најјачи појединачни допринос физичкој активности деце с интелектуалном ометеношћу.