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Comparison Of The Volume And Intensity Of The Physical Load Of People With Intellectual Disability, Implemented In A Sports Camp And In Common Daily Conditions

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Abstract
Introduction
The topic is relevant to healthy life style of persons with intellectual disability. The aim of this follow-up study was to compare the volume and intensity of physical activities in camp (CAMP) with the values achieved in the weekly regime of the identical persons in their home environment (COMMON) one year later.
Methods
Presented follow-up study which assessed participants in home living environment (COMMON) involved 16 males (average age 38.9 years), 19 females (average age 37.4 years) who participated in CAMP. The survey took place in 12 locations in the Czech Republic. The home living conditions of the participants were very heterogeneous. To measure volume and intensity, the GT3X Actigraph and the IPAQ report form were used in weekly mode (6 days in CAMP, 7 days in COMMON). Used instruments, the GT3X Actigraph, IPAQ report were identical in both assessments.
Results and Conclusion
Despite the decrease in moderate and vigorous activity [MVPA] in the COMMON mode, adults with ID in the Czech Republic have adequate physical activity. At CAMP the participants achieved 17,638 steps per day, at COMMON 17,146.1 steps. Usual norm is 10,000 steps for general population. Differences between male – female were found, as well as decreasing activity in COMMON. In addition to the general group findings in the heterogeneous population case studies are essential where the increase or decrease in COMMON compared to the values in CAMP is related to geographical and social conditions, especially family or support from the field of social care and Special Olympics.

Keywords: *intellectual disability, daily activity loading, pedometers and Actigraphs, housing conditions, social environment*

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I. Introduction

Monitoring the volume and intensity of physical activities is an intensely monitored topic, as it is related to many aspects of the physical and mental health of the general population of different age categories. Attention to this topic has been associated since the 80s of the last century with the name Sallis (e.g. Sallis, Hovell, & Hofstetter, 1989) and his colleagues, who also developed international cooperation (Kerr, Sallis, Eds. 2013 - [Journal of Physical Activity and Health, 10, 581-601]). Increasing interest in the topic of movement and health, the research became focused on the quality of measuring instruments such as pedometer, actigraph types, etc. (Chen, & Basset, 2005; McGarty, Penpraze, & Melville, 2014;). Authors draws attention to the detailed difference of measured results by different measuring instruments.

The Czech Republic was also incorporated into the cooperation with Sallis and the IPEN Group (International Physical Activity and Environment Network) and intensively devoted to the topic at FTK UP in Olomouc [Faculty of Physical Culture - (ftk.upol.cz/IPEN)].

E.g. Baďura, Madarasová–Gecková, Sigmundová, Sigmund, Van Dijk, & Reijneveld, 2017; 2018; Jakubec, Frömel, Chmelík, & Groffik, 2020. Essential was the contact with the development of the methodology of surveying the volume and intensity of physical activities (pedometers, accelerometer, actigraph, polling based on IPAQ - International Physical Activity Questionnaire), as well as monitoring the proportions between the intensity of physical load and sedentary activity, the type of social or

geographical environment, etc. (Frömel, Mitáš, & Kerr, 2008; Jakubec, Frömel, Chmelík, & Groffik, 2020; Jakubec, Groffik, Frömel, & Chmelík, 2013).

Attention was also gradually turned to the evaluation of physical activity of the population with different types of disabilities on a global scale (Johnson, 2009). The principle was again to investigate the number of steps or daily chronometry of the difficulty of movement on the cardiovascular system in a defined period, etc. (Dandan, Lei, & Xueping, 2021; Frey, Stanish, & Temple, 2008; Peterson, Janz, & Lowe, 2008; Tudor-Locke, Washington & Hart, 2009).

The first task was to find out whether the techniques of pedometers, Actigraphs and records of daily activities can be applied to people with ID, or under what conditions, which Pitteti presented at the EUCAPA [European Conference in Adapted Physical Activity] in Finland workshop (2010). At the same time, the IPAQ [International Physical Activity Questionnaire] form was modified and unified, as well as the conditions for the involvement of parents or educators in filling in the forms of daily time sessions (Beets, Cardinal, & Alderman, 2010; Beets, & Pitetti, 2011; Chen, & Basset, 2005; McGarty, & Melville, 2018).

Other studies have pointed to the effects of physical activity of people with ID due to their environmental or school characteristics or involvement in leisure activities (Cameron, Tonge, & Gray, 2021; Zull, Tillmann, Froboese, & Anneken, 2019), on the proportions between activity intensity and sedentary activity (Dandan, Lei, & Xueping, 2021; Huang, Yu, & McKenzie, 2019; McGarty, Penpraze, & Melville, 2014; Zhang, Zhu, Haegele, Wang, & Wu, 2021). Also, Frey, Stanish and Temple (2008) found lower physical activity in young people with ID than in their non-disabled peers. The adult population with ID was found to have lower physical activity (1,200 – 8,800 steps per day) than the non-disabled population (2,000 – 9,000 steps per day), with neither group meeting the recommended daily activity of 10,000 steps per day (Tudor-Locke, Washington, & Hart, 2009). But at the same time, Temple et. al (2019) commented that with support, people with ID were able to participate in higher volumes or pass the 6MWT (six-minute walking test). The problem of the use of instruments (pedometers, move-bands, types of Actigraphs) and the accuracy in monitoring the required indicators are highlighted, for example: Beets and Pitetti (2011), Chen and Basset (2005) or Johnson (2009). Prince et al. (2019) associate this with sedentary time [ST], light intensity physical activity [LPA], moderate-to-vigorous intensity physical activity [MVPA], and the number of steps in the context of the profession.

When using Actigraph GT1M in a 5-day work week, it was found that adolescents with ID in separate classes are less active at school during breaks than their non-disabled peers and associated inclusive classes, i.e. adolescents with IP and intact classmates (Pan et al., 2015). In the Great Britain, they used an Actigraph GT1M) for 7 days to compare people with ID with Down syndrome and without Down syndrome aged 12-70 years. People with Down syndrome had significantly less physical activity compared to individuals with ID but without Down syndrome. None of the examined persons with ID met the recommended physical activity. Men were more active than women. A trend has been found that with increasing age and with a heavier degree of ID. People with ID increased more sedentary mode and decrease physical activity (Philips, & Holland, 2012).

Current national recommendations from different countries are focused on MVPA (Moderate-intensity and Vigorous-intensity Physical Activity), or medium to high intensity physical activity. For the adult population, it is recommended to perform at least 150 minutes of moderate physical activity per week. This corresponds to physical activity of 30 minutes of medium intensity 5 times a week, or high-intensity physical activity of at least 75 minutes per week, and this corresponds to 25 minutes of high intensity 3 times a week (Good Clinical Practise Network, 2016; Štědroňová, 2015). In the study Válková, Lu Qu and Chmelík (2014), 75 athletes with a mental disability, Special Olympians, (50 males and 25 females) were examined. Participants wore a GT3X ActiGraph to record their physical activity levels for two days during the Special Olympics Athletics Games. The physical activity levels of the athletes met the published guidelines. It means, conditions of motivation and support are necessary to keep recommended physical activity.

In the weekly scanning of the volume and intensity of physical activities during the 14-day summer sports and recreation camp of people with ID, it was found that the participants generally achieved higher values in the number of daily steps: 1.7 times more than the norm 10.000 steps per day. Higher intensity than the general intact population was found, too, even in the age cohort of 35-60 years (Válková, Králíková, & Dygrýn, 2018, p.538-549). The abstract of the publication is in Appendix 1.

The intention to compare physical activities between the beginning and the end of the school year was repeatedly measured in children with light and medium degree ID aged 6-20 years, attending a special school. It was found that their physical activity reaches 74% - 122% of the norm (for children, the norm is 12,000 steps per day). Children with light ID were even above the norm, their physical activity was 101 to 122% of the norm. In the Czech Republic, children with ID have much higher physical activity than children with ID in the USA and Australia, where their physical activity is about half the recommended norm (Kampasová, & Válková, 2021). We can deduce that in the environment of families with ID, car transport is used less. Since these were controlled physical activities, the conclusions raised the question of what values the same participants would achieve in the habitual common weekly regime in the home environment.

II. Strategy, logistics and process

The aim of the follow-up study was to compare the volume and intensity of physical activities of the participants in camp (here in after CAMP) with the values achieved with identical participants in the weekly regime of their home environment (here in after COMMON) more than a year apart.

The first step was the creation of a directory, as the participants were recruited from 12 localities in the Czech Republic (the East Bohemian Region and area under the mountains of the Giant Mountains [Podkrkonosi]), both in weekly or one-day social care centres, in transformed housing or assisted work or in households, including housing in out-of-the-way locations. *The second step* – ensuring the consent to the participation of both participants and guardians or workers of the centres in the continuing weekly participation. This was followed by an agreement on the date for the handover of the Actigraphs (third step). *The third step* – selection an adequate week of seasonal season, comparable to the camp season, and at the same time a week of normal daily routine had to be agreed, without extra-activity interventions (trips, balls, local competitions, etc.). Cooperation among ID participants , centres leaders, educators and parents/guardians was necessary, confirmed with written agreement. *The fourth step* was the actual implementation of the measurement week, i.e. transport of the same instruments Actigraph GT3X that were used during CAMP, interpretation and training of ID participants, educators and parents/guardians again: even participants remembered this system, we repeated it how to use use Actigraph for educators and parents personally (attaching a small box behind waist, protected it from water, putting it away for the night). Filling the IPAQ form was the part of the training, too. Also identical to CAMP forms, i.e. to record their physical activity levels for 7 COMMON days approx. from 7 a.m. to 10 p.m. (Appendix 2). *Finally*, filling in the contractual administration (the participants were rewarded with a specific research project of FSpS MU in Brno). The whole process took 2 months (May – June). After the completion of the data collection and evaluation, the participants were informed about the results in text and graph (Appendix 3-6). As the participants are used to be assessed by the Special Olympics Healthy Athlete Program and like it there is no problem to cooperate with families and centres.

III. Methods

Participants

Table 1 presents the characteristics of the camp and COMMON sets under investigation. Only the participants that participated in both investigations are included, so they were the same parties, identical participants. The decrease in the number in the follow-up study was influenced by the inappropriate time for family, disagreement with consensus, unavailability in the new location, etc. The final number was 16 men and 19 women, 35 in total. Their average age in CAMP was 38.5 years and in COMMON 39.8 years.

Table 1: Characteristics of the sample of the participants

CAMP				COMMON			
	Number	**Age - mean**	**SD**		**Number**	**Age - mean**	**SD**
Men	**16**	**39,9**	**± 16,0**	**Men**	**16**	**41,6**	**± 16,0**
Women	**19**	**37,4**	**± 13,1**	**Women**	**19**	**38,4**	**± 13,4**
Total all	**35**	**38,5**	**± 14,3**	**Total all**	**35**	**39,8**	**± 14,5**

Note: mean = arithmetic mean*; *SD = standard deviation in years

Data collection

The process of the data collection was identical in CAMP as so as in COMMON. Support with using Actigraph GT3X and filling IPAQ form were provided by trained educators (Válková, Králíková & Dygrýn, 2018), in COMMON it depended on the participants´ way of living (residents, family conditions). *See 2, strategy, The fourth step.*

Data processing

The data was processed in Microsoft Excel and Statistics. Based on all three available normality tests (Kolmogorov-Smirnov, Liliefors, Shapiro-Wilks), it was found that these are parametric data that correspond to a Gaussian normal distribution curve. Descriptive statistics were used and a paired T-test for dependent data was used to determine statistically significant differences between the data in CAMP and COMMON mode, which compares 2 files at a time, as they were the same group of participants. The T-test shows statistically significant differences at a 5% significance level, or for $p \leq 0.05$ values. Furthermore, the size effect was detected using Cohen's d, which shows great substantive significance for values of 0.8 and greater.

IV. Results

Comparison of physical activity in all participants

Table 2 shows (Table 2) that at CAMP participants wore an accelerometer for an average of 6 days, while in COMMON for 7 days. Sedentary activity was 403 minutes in CAMP participants and slightly increased to 414 minutes per day in COMMON mode. Moderate physical activity was higher in COMMON at 287 minutes per day compared to 260 minutes at CAMP.

Table 2: Physical activity in CAMP and in COMMON

	CAMP		COMMON		Difference of means in COMMON
	Mean	SD	Mean	SD	
Calendar days	6,3	±1	7,2	± 1	0,9
Sedentary Per Day (min)	403,5	±72	414,3	± 77,1	10,8
Light Per Day (min)	260,5	±53,3	287,3	± 77,8	26,8
MVPA Per Day (min)	77,7	±31,1	48,3	± 27,9	-29,4
Steps	17 638,2	±5 776,4	17 146,4	± 4 401,1	-491,8

Note: mean = arithmetic mean; SD = standard deviation

The most important indicator of MVPA, or moderate to high-intensity health-promoting activity, was about 78 minutes a day for CAMP participants, compared to only 28 minutes a day for COMMON mode. At the same time, the recommended norm is 30 minutes a day. In common mode, participants had only half the time spent in the healthy activity MVPA compared to CAMP. And this difference is statistically significant (see Table 8).

In terms of the number of steps, the physical activity is quite balanced. At CAMP, participants had 492 more steps per day, while at both CAMP and COMMON mode, participants have about 1.7 times more movement than the norm (which is 10,000 steps per day).

From Table 3 (Table 3) we can see that the time when participants did not wear an accelerometer was lower by 2.9% in COMMON, and sedentary activity was also 3.1% lower in COMMON per day than in CAMP. Light activity of moderate intensity was higher in COMMON by 8.8%. MVPA's health-promoting activity was lower by 2.8% in COMMON.

Tab. 3: Physical activity in CAMP and in COMMON (data as a percentage - %)

	CAMP		COMMON		Difference of means in COMMON
	Mean in %	SD in %	Mean in %	SD in %	
Sleep - without accelerometer (min)	48,4 %	±3,3	45,5 %	±5,8	-2,9 %
Sedentary Per Day (min)	27,2 %	±5,9	24,1 %	±6,4	-3,1 %
Light Per Day (min)	19,3 %	±4,6	28,1 %	±38,5	+8,8 %
MVPA (min)	5,1 %	±2,2	2,3 %	±1,8	-2,8 %

Note: mean = arithmetic mean; SD = standard deviation

Comparison of physical activity in men

The men (Table 4) wore accelerometers comparatively for about 7 days in both CAMP and COMMON. Sedentary activity was higher in men in COMMON by 67 minutes per day, and light activity was also higher by 2.8 minutes per day. Healthy MVPA activity was higher at CAMP by 36.8 minutes per day, and this difference is statistically significant (see Table 8). Also, the number of steps per day was higher in CAMP by an average of 1,595 steps.

Tab. 4: Physical activity in CAMP and in COMMON – male

	Males - CAMP		Males - COMMON		Males -Difference of means in COMMON
	Mean	SD	Mean	SD	
Calendar days	6,7	±0,5	6,9	±1,2	+0,2
Sedentary Per Day (min)	373,1	±82,0	440,1	±92,7	+67,0
Light Per Day (min)	273,8	±63,9	276,6	±88,8	+2,8

MVPA Per Day (min)	**93,1**	**±37,8**	**56,4**	**±29,4**	**-36,8**
Steps	**18 247,6**	**±6 624,5**	**16 652,6**	**±4 326,1**	**-1 595,1**

Note: mean = arithmetic mean; SD = standard deviation

From Table 5 (Tab 5) we can see the percentage expression of the difference between CAMP and COMMON in men in the dimensions of intensity of physical activity. In addition, from the table there is an indication of the time when the participants did not wear the Actigraph (sleep – without accelerometer). Two percent higher at CAMP, consider that swimming was also included, when the Actigraph instrument is postponed, which is not usual in COMMON.

Tab. 5: Physical activity in CAMP and in COMMON – male (data as a percentage - %)

	Males - CAMP		**Males - COMMON**		**Difference of means in COMMON**
	Mean in %	**SD in %**	**Mean in %**	**SD in %**	
Sleep - without accelerometer (min)	**48,4 %**	**4,0**	**47,0 %**	**6,8**	**-1,4%**
Sedentary Per Day (min)	**25,3 %**	**6,5**	**27,2 %**	**6,9**	**1,9 %**
Light Per Day (min)	**20,8 %**	**5,3**	**22,4 %**	**6,4**	**1,6%**
MVPA (min)	**5,4 %**	**2,6**	**3,4 %**	**1,8**	**-2,0 %**

Note: mean = arithmetic mean; SD = standard deviation

Comparison of physical activity in female

Female (Table 6) wore accelerometers 1.4 days more in COMMON. In women, we see the opposite trend than in men, as their sedentary activity was lower by 25.7 minutes per day in COMMON and moderate intensity physical activity was higher in COMMON by 42.4 minutes per day, and this difference is statistically significant (see Table 8). Even in women, the healthy activity of MVPA was higher in CAMP, by 24.6 minutes per day, and this difference is statistically significant (see Table 8). The number of steps per day for women was higher by about 1,600 in COMMON.

Tab. 6: Physical activity in CAMP and in COMMON - female

	Females - CAMP		**Females - COMMON**		**Females -Difference of means in COMMON**
	Mean	**SD**	**Mean**	**SD**	
Calendar days	**6,0**	**±1,1**	**7,4**	**±0,8**	**+1,4**
Sedentary Per Day (min)	**423,2**	**±59,1**	**397,5**	**±62,5**	**-25,7**
Light Per Day (min)	**251,9**	**±45,1**	**294,2**	**±71,8**	**+42,4**
MVPA Per Day (min)	**67,7**	**±21,6**	**43,1**	**±26,5**	**-24,6**
Steps	**15 985,4**	**±6 082,7**	**17 585,3**	**±4 544,5**	**+1 599,9**

Note: mean = arithmetic mean; SD = standard deviation

In Table 7, the interpretation of the data from Table 6 is given in the percentage difference: in COMMON, an increase of almost 7 % of light activity, but also a slight decrease in MVPA and a 4.6 % decrease in sedentary activities.

Tab. 7: Physical activity in CAMP and in COMMON – female (data as a percentage - %)

	Females - CAMP		**Females - COMMON**		**Difference of means in COMMON**
	Mean in %	**SD in %**	**Mean in %**	**SD in %**	
Sleep - without accelerometer (min)	**48,6 %**	**2,7**	**47,9 %**	**4,8**	**-0,7 %**
Sedentary Per Day (min)	**28,8 %**	**5,0**	**24,2 %**	**5,5**	**-4,6 %**
Light Per Day (min)	**17,8 %**	**3,4**	**24,7 %**	**6,4**	**6,9 %**
MVPA (min)	**4,8 %**	**1,7**	**3,2 %**	**1,9**	**-1,6 %**

Note: mean = arithmetic mean; SD = standard deviation

T-test and Cohen´ d for all dimensions of healthy intensity of physical activities

The T-test analysis (Table 8) found a statistically significant difference in the 5% significance level between the CAMP and COMMON data in all dimensions of the healthy intensity of MVPA (in all participants, in both men and women). Furthermore, the T-test found statistically significant differences in moderate intensity

physical activity in women. Cohen's d found a significant size effect for physical activity in the regular mode and in the camp for all participants, for women and for men (values are above 0.8 everywhere).

Table 8: Differences in dimensions of healthy intensity of physical activities

Category	T- test	Cohen
	p	d
COMMON - Sedentary- All	0,62	-0,14
CAMP – Sedentary - All		
COMMON – Light - All	0,06	-0,40
CAMP - Light-All		
COMMON - MVPA- All	**0,00**	**1,00**
CAMP - MVPA- All		
COMMON – Steps - All	0,70	0,10
CAMP - Steps- All		
COMMON - Sedentary - Male	0,05	-0,77
CAMP – Sedentary - Male		
COMMON - Light - Male	0,91	-0,04
CAMP - Light - Male		
COMMON - MVPA - Male	**0,01**	**1,08**
CAMP - MVPA - Male		
COMMON - Sedentary - Female	0,33	0,42
CAMP - Sedentary- Female		
COMMON - Light - Female	**0,02**	-0,71
CAMP - Light - Female		
COMMON - MVPA - Female	**0,00**	**1,02**
CAMP - MVPA - Female		
COMMON - Steps- Female	0,42	-0,30
CAMP - Steps - Female		

V. Discussion

A general overview of the use of instruments such as Actigraphs, accelerometers, etc. and the conditions of their use is essential for obtaining objective indicators on the volume and intensity of physical activities even in people with ID (Ballenger, Schultz, Driskill, Richardson, Du, Motl, & Agiovlasitis, 2022; McGarty, Penpraze, & Melville, 2014; Philips, & Holland, 2012; Pitetti, & Fernhall, 2004; Prince, Elliot, Scott, Visintini, & Reed, 2019; Stanish, & Draheim, 2007; Válková, Králíková, & Dygrýn, 2017-2018).

The results are presented here as an average of all participants, or as average values of a group of 16 men and a group of 19 women. From this point of view, it can be noted that the women had 1,600 steps a day more movement in COMMON than in CAMP. It can be inferred from observations (the authors participated in CAMP) that women in CAMP participated more in activities or walks within the CAMP environment or the surrounding area (popular shopping) and handicrafts, and in COMMON they are more likely to participate in household chores with moderate movement. Men in CAMP were more involved in voluntary activities, participating in trips and movement games, where the step frequency is higher. At COMMON, we conclude that the offer of activities for men is not so varied. Our finding that participation in physical activities is lower in both intact and disabled women is a general fact, as is the higher percentage of sedentary activities in women (Dandan, Lei, & Xueping, 2021; Westrop, Melville, Muirhead, & McGarty, 2019; Zhang, Zhu, Haegele, Wang, & Wu, 2021).

It should also be noted that the average age of participants in CAMP was 38.5 years and in common mode almost 40 years. The purpose of the study of Beets and Pitetti (2011) was to identify steps per minute thresholds corresponding to MVPA for youth with ID and recommend on average, 122 steps·min^{-1} as the minimal threshold for MVPA which is more proper than report IPAQ. Height- and age-specific steps·min^{-1} ranged from 135 steps·min^{-1} to 112 steps·min $^{-1}$. We collected MVPA data only by reporting authorized persons.

The increase in the time of sedentary activity in our population with MD in COMMON also corresponds to the findings in the intact population as well as in the disability population (Frey, Stanish, & Temple, 2008; Johnson, 2009; Lobenius-Palmér et al., 2018; Van Kann, de Vries, Schipperijn, de Vries N. K., Jansen, & Kremers, 2017). The fact that measurements in CAMP and in COMMON were carried out by the same instruments is considered to be an essential fact of standardization of the comparison conditions, as pointed out by e.g. Beets, & Pitetti, (2011); Philips, & Holland, (2012); Pitchford, Ketcheson, Hyun-Jin Kwon, & Ulrich, (2017).

Environmental conditions are considered to be important factors, such as the possibility of transport to physical activities, a program in the centre or at school, a family in secluded localities, fragmented assisted living, lifestyle and family support (Bassett-Gunter, Tanna, Arbour-Nicitopoulos, Rhodes, & Leo, 2020; Brooker, Van Dooren, McPherson, Lennox, & Ware, 2015; Huang, Yu, & McKenzie, 2019; Jeffrey, McCaughtry, Murphy, Flory, & Wisdom, 2011; Rhodes, Berry, Craig, Faulkner, Latimer-Cheung, Tremblay, 2013; Trost, Sallis, Pate, Frewedson, Taylor, & Dowda, 2003). This was also confirmed in our results of the follow-up study, COMMON.

The living environment and social conditions underlined by Lake et al. (2022) in recent COVID-situation from the point of view to participate in virtual courses oriented on mental health of family members, caregivers of persons with intellectual disability.

Therefore, the presentation of group results should be considered as a theoretical averaged summary view, because the groups of both men and women were very small (16 M and 19 F – size effect), very heterogeneous in age and, even especially in the environment. This fact is a weakness of this research study, but it was necessary to include identical pairs for comparison. It is transparent as because the original number of participants will decrease one year apart. That is why we add some case data. In six women (ages 33–58), MVPA decreased by 1-3%, but light activity increased by 6-9%, which is a relatively significant percentage. All of them live in one social care home, but on the bases of assisted living, in the centre they work in the kitchen and during cleaning, they are members of CHSO with training 2 times about 60 minutes a week.

Woman – 39 years old, lives in the household only with her mother (72 years old), who is after knee surgery with limited mobility. This woman therefore copies the physical inactivity of the mother, she has no other support. Due to her age, the mother of a pensioner no longer has either the strength or the finances to provide her adult daughter with more intensive activities. On the contrary, she likes her and connect her so that she does not feel lonely. Her participation in CAMP once a year is the main activity that they are looking forward to. The difference in MVPT was minus 3% and in light minus 6%. The average number of steps per day minus 4,040 (12,401 – 8,361).

All men also experienced a percentage decrease in MVPT, but three had a 6-9% increase in light activity. Ages 49 – 59. They live in medium-sized cities in functional families with attendance at a day centre with a job opportunity as waiters-cooks, the third works in a wood workshop. Members of CHSO with bowling and bocce training. Example of the difference in average daily steps: CAMP 18.974 – COMMON 24.94. The opposite example: a man of 26 years, lives in a family on the outskirts of the village, the family feeds on breeding small animals. He does not own and does not have time to commute to the city to some centre or to the CHSO club. Man – helps occasionally in the economy. Decrease in light activities minus 3%, MVPT minus 7% and increase in sedentary activities by 10%. Steps: CAMP 20.550, COMMON 10.215.

The above examples show that people with ID, even at an older age, have the capacity to comply recommendations for healthy physical activities. However, under adequate conditions of motivation and social support. The family plays a key role, preferably with the support of social service centres and SO clubs (Brooker, Van Dooren, McPherson, Lennox, & Ware, 2015; McGarty, & Melville, 2018; Rhodes, Berry, Craig, Faulkner, Latimer-Cheung, Tremblay, 2013). Our results are identical to those of the authors. However, the conditions of family support are not balanced in all respects and the social and community sphere should also take over. The role of special schools or centres is significant (Huang, Yu, & McKenzie, 2019; Jeffrey, McCaughtry, Murphy, Flory, & Wisdom, 2011; Pan, Liu, Chung, & Hsu, 2015).

There is also an offer to participate in the Special Olympics (Ciocan, Alexe, & Mares, 2016; Coreen, Harada, & Siperstein, 2009; Rintala, Asunta, Lahti, & Loovis, 2016; Temple, Alston, Elder, Stuart-Hill, 2019; www.specialolympics.org/training). Also for home exercises are offered programs (Brooker et al., 2015; Jeffrey et al., 2011), virtual program then by Lotan, Yalon-Chemovitz and Weiss (2009). Program ideas are available on www.specialolympics.org and www.specialolympics.cz. It's about informing the ID community and practicing them in the programs.

VI. Conclusion

Surveys of the volume and intensity of physical activities using GT3X Actigraph - Accelerometers in people with medium degree ID are real, verified for use in the Czech life context. This finding can be considered as a strength of the research, as it allows to be continued for similar research in the population with ID. Our participants with ID manage and are interested in them, as well as their caregivers. However, it is necessary to support trained persons (parents, guardians, social workers) by checking the use of the instrument and filling in reports according to the IPAQ formulation. It is also necessary to monitor the trends of improvement of these devices, as well as the input of reports using computer software. Supporting persons and processors of results must comply with GDPR regulations. Researchers must then comply with the transmission of results to the participants if they are interested in them.

The volume and intensity of a group of 16 men and 19 women were compared in 6 days assessment during their participation in the 14-day summer recreational sports camp (CAMP) and a year later in the daily routine activities in the individual home environment – 7 days assessment (COMMON). The group results of participants at an average age of 39.9 years (males) and 37.4 years (females) were in accordance with the general facts found in the intact population. Males reach higher values than females in all indicators (see table 4 and 6). In the CAMP environment, people with ID were able to achieve recommended and higher values in health-promoting activities in daily steps (in CAMP male 18,247.6, female 15, 985,4). In the COMMON environment, the volume of sedentary activities in minutes per day increases only in male group (male in CAMP 373,1,

COMMON 440,1). The results of female group show a more varied picture: less minutes of sedentary activities per day in COMMON (female CAMP 432,2 min, COMMON 397,5 min), slightly increased light activity and 26,5 min large drop in MVPA activities. The differences between male and female in the COMMON environment are notice able. Group evaluation of results should be taken with a grain of salt, as individual results vary widely. It is evident that they are not so much influenced by the physical or cognitive potential of the participants, but by the geographical and social environment, especially the support of the family or the available social support centres and participation in Special Olympics programs. They are also related to involvement in the assisted work process. To improve the situation, it is also necessary to use virtual video opportunities, but above all it is necessary to address these conditions of support, for which it is not enough research, but political and community will.

Appendix 1 – Article CAMP, abstract
Appendix 2 – form, reports of daily activities
Appendix 3 – Graph: balanced activities CAMP – COMMON
Appendix 4 – Graph: decreased activities in COMMON
Appendix 5 – Graph: increased activities in COMMON
Appendix 6 – Graph: typical for female

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Conflict of Interest

The authors declare no conflict of interest.

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