Ergoterapi ve Rehabilitasyon Dergisi, 9(1), 2021, 31-40

Araştırma Makalesi

Leisure Time Physical Activities in Adolescents and Adults with Cerebral Palsy

Adölesan ve Erişkin Serebral Palsili Bireylerde Serbest Zaman Fiziksel Aktiviteleri

Pınar KAYA CİDDİ[1], Öznur YILMAZ[2]

[1] Dr. Öğr. Üyesi, İstanbul Medipol Üniversitesi, Sağlık Bilimleri Fakültesi, Fizyoterapi ve Rehabilitasyon Bölümü, İstanbul, Türkiye
[2] Prof. Dr., Hacettepe Üniversitesi, Fizik Tedavi ve Rehabilitasyon Fakültesi, Ankara, Türkiye

ABSTRACT

Purpose: This study aimed to investigate the level of participation in leisure time physical activities (LTPA) of adolescents and adults with cerebral palsy (CP). **Material and Methods:** 35 individuals with CP at Gross Motor Function Classification System levels I (n=9), II (n=3), III (n=17), and IV (n=6); 15 female and 20 male, over the age of 16 (22.6 ± 5.5 years) were included in the study. A questionnaire has been prepared by researchers to investigate participation of individuals in LTPA. Individuals were asked whether they did any LTPA. If so, the type, frequency, intensity, duration were questioned. **Results:** It was determined 91.4% of individuals were interested in some form of LTPA, and they were interested in 8 activities (home exercises, walking, swimming, fitness, exercise bike, bowling, cycling and football) out of 14 activities offered to them, 74.2% of them did this activity once a week, and 65.7% of them wanted to do new activities, but couldn't perform them due to various barriers. **Discussion:** It was demonstrated that diversity and frequency of activities in adolescents and adults with CP were inadequate and interventions aimed at increasing community participation, and diversity and frequency of LTPA in adolescent and adult CP patients are needed.

Keywords: Adolescent; Adult; Cerebral palsy; Exercise; Leisure activities

ÖZ

Amaç: Bu çalışma adölesan ve erişkin serebral palsili (SP) bireylerin serbest zaman fiziksel aktivitelerine (SZFA) katılım düzeyini araştırmayı planlandı. **Gereç ve Yöntem:** Çalışmaya 16 yaş üstü (22.6 ± 5.5 yıl) 15'i kadın, 20'si erkek, Kaba Motor Fonksiyon Sınıflandırma Sistemi'ne göre I (n=9), II (n=3), III (n=17) ve IV (n=6) seviyelerinde 35 SP'li birey alındı. Araştırmacılar tarafından bireylerin SZFA'ya katılımını araştırmak için bir anket hazırlandı. Bireylere SZFA yapıp yapmadıkları soruldu. Eğer yapıyorlarsa tipi, frekansı, yoğunluğu, süresi sorgulandı. **Sonuçlar:** Bireylerin % 91.4'ünün bir çeşit SZFA ile ilgilendikleri ve kendilerine sunulan 14 faaliyetten 8'i (ev egzersizleri, yürüyüş, yüzme, fitness, egzersiz bisikleti, bowling, bisiklet ve futbol) ile ilgilendikleri, %74,2'sinin bu aktiviteyi haftada bir yaptığı, %65,7'sinin ilgilenmek istedikleri yeni aktiviteler olduğu ancak çeşitli engeller nedeniyle gerçekleştiremedikleri belirlenmiştir. **Tartışma:** Adölesan ve erişkin SP'li bireylerde SZFA'ların çeşitliliği ve sıklığının yetersiz olduğu ve bu bireylerde toplumsal katılımı, ve SZFA çeşitlilik ve sıklığını artırmaya yönelik müdahalelerin gerekli olduğu gösterilmiştir.

Anahtar kelimeler: Adölesan; Erişkin; Serebral palsi; Egzersiz; Boş zaman aktiviteleri

Sorumlu Yazar (Corresponding Author): Pınar KAYA CİDDİ **E-mail:** pkaya@medipol.edu.tr
ORCID ID: 0000-0002-7611-0527
Geliş Tarihi (Received): 04.06.2020; Kabul Tarihi (Accepted): 20.06.2021

Although Cerebral Palsy (CP) is a childhood disease, there is an increase in the number of individuals with adult CP due to the prolonged survival of children with CP and the increased survival rate of newborns with low birth weight (Usuba, Oddson, Gauthier et al., 2015). For this reason, understanding of medical status of CP has become important not only in childhood but also in adolescence and adulthood due to the increasing population (Usuba et al., 2015; Stewart, 2009). Although there has been an increase in the studies conducted in the early stages of adolescence and adulthood, there is not enough information about social participation (Stewart, 2009).

Adolescence is a process in which growth, maturation and identity development become evident (Stewart, 2009; Giarelli, Bernhardt, Mack et al., 2008). Chronic diseases and disability conditions affect the development of adolescents in many areas, as such more attention has been paid in recent studies to participation in social activities in adolescents with chronic disabilities (Giarelli et al., 2008).

In a study about young adult CP, the most important factors affecting participation were determined to be gross motor function, education level and age (Donkervoort, Roebroeck, Wiegerink et al., 2007). King et al. stated that the most important factors that determine the change in the participation of children and adolescent CP individuals in fun and physical activities over time are gender and age (King, McDougall, DeWit et al., 2009). Carlson and Mykelbust (Carlson and Mykelbust, 2002) mentioned that social activities vary according to personal and environmental characteristics and that wheelchair use alone has no effect on social integration. Alongside the fact that defining the phenomenon of social participation is quite complex, it also requires multi-faceted studies (Stewart, Lawless, Shimmell et al., 2012).

Physical activity (PA) is any body movement produced by skeletal muscles, resulting in an increase in energy consumption. Leisure time physical activity (LTPA) is defined as the physical activities that individuals choose for a purpose in their spare time (Usuba et al., 2015). When individuals perform these activities, they gain potential physiological benefits such as increased skeletal health, cardiovascular fitness and self-improvement, and decreased body composition, symptoms of depression and anxiety (Stewart, 2009; Trost, 2005; Saebu, 2011). In studies conducted with disabled individuals, it has been shown that life satisfaction, muscle strength, ability to perform daily social activities increase with LTPA application, meanwhile decreasing the development of secondary problems (Bania, Dodd, Baker et al., 2016; Reedman, Boyd, Sakzewski, 2017; Ross, MacDonald, Bigouette, 2016).

In recent years, problems such as functional losses, secondary conditions, and pain have been discovered as interest in individuals with adolescent and adult CP increased (Ando and Ueda, 2000; Gajdosik and Cicirello, 2002; Benner, Hilberink, Veenis et al., 2017; Opheim, Jahnsen, Olsson et al., 2009). In a study investigating the impact of personal and environmental factors directly related to the ICF model in adolescents and adults with CP, it has been reported that factors such as level of disease, accessibility, external companion services, adapted transfer services and perspectives of others influence leisure activities and participation (Boucher, Dumas, Maltais et al., 2010).

Although the literature mentions that the level of physical activity can be adversely affected in adolescent and adult SP individuals, there are also studies showing that these individuals participate in regular LTPA and PA at levels similar to healthy populations (Jahnsen, Villien, Aamodt et al., 2003; Van der Slot, Roebroeck, Landkroon et al., 2007). Given all these issues, it is important to have a comprehensive perspective on the health and life of young people with CP during their transition from childhood to adolescence.

The study was planned to examine the participation levels of adolescents and adults with CP in terms of frequency and intensity and to obtain information about the diversity of leisure activities in our country. This study will provide a perspective for future interventions to increase leisure activities by revealing existing physical activity barriers. As the hypothesis of the study, we assume that individuals with CP living in our country participate in various physical activities.

MATERIAL AND METHODS

This study was approved by the clinical ethical committee of Hacettepe University, Non-Interventional Ethics Committee (Approval Date: 14/03/2017, Approval Number: GO/16-488-02). This study was conducted at Başak and Özel Special Education and Rehabilitation Center, between Sep 2018 and Jan 2020. Written informed consent was obtained and signed by the individuals and parents of them before participation in the study.

Participants

The study included adolescents and adults with CP between 16-25 years of age whose functional levels were between I-V according to the Gross Motor Function Classification System (GMFCS) and who continued treatment at a rehabilitation center.

Inclusion criteria: The study included individuals with CP between the ages of 16-25, were able to communicate, understand commands, have good eyesight, and signed approval forms.

Exclusion criteria: Individuals who had an additional diagnosis or report on cognitive and mental problems that would prevent them from understanding the instructions and communicating were excluded from the study.

Assessments

Gross Motor Function Classification System (GMFCS): In our study, the Expanded and Revised GMFCS form of GMFCS, which is the most widely used scale in children with CP and which has proven validity and reliability in adults with CP, was used to classify the coarse motor function level (Russell, Avery, Rosenbaum et al., 2000).

Questionnaire Form:

In this study, a questionnaire has been prepared by researchers to investigate the participation of individuals in LTPA by taking living standards of Turkey into consideration and using similar studies as templates (Usuba et al., 2015). The questionnaire consisted of two parts:

1. Demographic and characteristic information of the individuals

This section consisted of age, gender, characteristics of the place where they live, people they live with, marital status, professional status.

2. Questioning the participation in LTPA, barriers and sedentary activities

The questionnaire form consists of 14 questions in total. Answering the questions consisted of 3 stages;

Stage a. Questioning participation in LTPA (Questions 1 to 11):

Individuals were asked whether they did any LTPA. If so, the type, frequency, intensity, duration of LTPA were questioned. In addition, it was recorded how, with whom and where they did the activity, how they reached the place where they did the activity, how long they have been doing it and their interest in the activity. Open-ended questions were asked for the purpose of the activity. In this form, sample LTPAs were presented to the participants and it was stated that they could benefit from the samples while answering the questions.

Stage b. Questioning of barriers to participating in a new physical activity (Question 12 and 13):

It was questioned whether there were any new types of physical activity they would like to do and what it was. Then they were asked what are the barriers that prevent them from doing new physical activities they want to do. A list of possible barriers has been drawn from previous studies in the literature (Usuba et al., 2015). This list was presented to them and asked what the potential barriers are to do new activities.

Stage c.

Questioning sedentary activities (Question 14): The time spent inactive in front of the screen and the technological devices used during this period were questioned: during the day they were asked about their time spent in front of PC / Tablet and TV.

Statistical Analysis

All analyzes were calculated using the SPSS 22.00 program. In the descriptive analysis, the ages of individuals were given as mean, standard deviation, minimum and maximum values with numerical data. Also ordinal and categorical variables; clinical type, gender, functional level, with whom and where they live, and their marital and work status, and results of answers to the questionnaire on leisure activities were presented in the tables as numerical data and frequency. Statistical significance value was accepted as $p < 0.05$ (Hayat, Powell, Johnson et al., 2017).

RESULTS

A total of 45 people with CP from 54 potential participants agreed to participate in the study, 9 people answered the questionnaire incompletely and 35 participants were included in the study. The mean age of the subjects was 22.6 ± 5.5 (range: 16-40), 15 were female and 20 were male.

12 of the participants were walking without support (GMFCS I; 9, GMFCS II; 3), 17 (GMFCS III; 17) were walking with support and 6 (GMFCS IV; 6) were wheelchair dependent. As the first part of the questionnaire; detailed demographic information of the individuals is presented in Table 1.

As the second part of the questionnaire;

Stage a: The percentages of the individuals with the primary LTPAs (most frequently participated in the last 3 months which have been maintained for at least 30 minutes) are shown in Table 2. 91.4% of the individuals primarily engaged in a physical activity and when asked about the type of activity, they were engaged in 'exercises at home' at a higher rate (28.5%) than the

others, other types of activity were walking (20%), swimming (14.2%). fitness (11.4%), cycling (5.7%), exercise class/aerobics (5.7%), bowling (2.8%) and football (2.8%) (Question 1, Table 2).

Table 1. Characteristics of individuals (Part I)

	Parameters (n=35)	**n**	**%**
Clinical type	Spastic Diplegic	15	42.8
	Spastic Hemiplegic	11	3.41
	Spastic Quadriplegic	5	14.2
	Ataxic	2	5.7
	Dyskinetic	2	5.7
Gender	Female	15	42.8
	Male	20	57.1
GMFCS	I	9	25.7
	II	3	8.5
	III	17	48.5
	IV	6	17.1
Where they live	with family	32	91.4
	alone	3	8.6
Who they live with	with family	34	97.1
	alone	1	2.9
Marriage status	Single	33	94.3
	Married	2	5.7
Working status	Not working and not looking for work	9	37.1
	Not working but looking for a job	9	25.7
	Continuing course or internship	3	8.6
	Not working but not looking for work	14	40

GMFCS: Gross Motor Function Classification System

Table 2. LTPA types presented to individuals and primary LTPA types and rates of interest of individuals in the last 3 months (Part II, stage a)

Question 1: Is there any physical activity that you mostly deal with in your free time? (Any activity that you have participated most frequently in the last 3 months and that you have been doing for a minimum of 30 minutes) (n=35)		
Featured Options	**n**	**%**
Yes	32	%91.4
No	3	8.6
- if so what? (n=32)		
Examples of LTPA types	**n**	**%**
Exercises at home	10	28.5
Walking	7	20
Swimming	5	14.2
Fitness	4	11.4
Cycling	2	5.7
Exercise class/Aerobics	2	5.7
Bowling	1	2.8
Football	1	2.8
Gardening	-	-
Popular/social dance	-	-
Running/jogging	-	-
Tennis	-	-
Fishing	-	-
Volleyball	-	-
Basketball	-	-

LTPA: Leisure Time Physical Activity; GI: Confidence Interval

Other questions related to LTPAs, separately indicated ordinal response scales and rates for each question are shown in Table 3 (Question 2 to 9).

The answers given to the question regarding the purpose of the LTPA differed for each individual. Similar answers were combined for the same purpose and listed in Table 4 (Question 10). Individuals expressed their interest in the activity, 42.8% as "Love it very much" 48.5% of them stated "No problem, that's enough for me" (Question 11).

Stage b: It was revealed that 65.7% (n=23) of the individuals wanted to get interested in a new LTPA. The new LTPA types and rates they want to participate in (Question 12) and the situations and rates that are barriers for them to perform these activities (Question 13) are shown in Table 5.

Stage c: It was determined that individuals spent 143.5 ± 76.4 minutes with computer / tablet and 184.2 ± 147.8 minutes with television during the day. In addition, individuals stated that they spent time in the sitting position during the following activities during the day: reading books and newspapers, solving puzzles, relaxing and lying on the sofa, studying, listening to lessons in the course and at school (Question 14).

Table 3. LTPA form questions, options offered to individuals and response rates given (Part II, stage a)

Questions in the LTPA Form	Featured Options	n	%
Question 2: How often do you do this physical activity? (n=32)	1-3 times per month	4	11.4
	Once a week	26	74.2
	Twice a week	2	5.7
	3 times a week	-	-
	4 times a week	-	-
	5 or more times per week	-	-
Question 3: How intense are you doing this activity? (n=32)	Requires average physical exertion (exhaling more than normal)	30	85.7
	Requires greater intensity of physical activity than normal (breathing more than normal)	2	5.7
Question 4: How many minutes / hours do you do this activity per day? (n=32)	30 minutes-1 hours	27	77.1
	1 hour-2 hours	5	14.2
Question 5: Do you perform this physical activity in a standard or modified way? (n=32)	Unsupported without using any device or support	18	51.42
	Supported with crutch, walker, wheelchair	14	40
Question 6: Who do you do this physical activity with? (n=32)	Friends	3	8.5
	Family	16	45.7
	Self	12	34.2
	With teacher or assistant	1	2.8
Question 7: Where are you doing this physical activity? (n=32)	At home	14	40
	At school	1	2.8
	Both at home and school	1	2.8
	Any place other than school and home; outside	16	45.7
Question 8: How do you achieve this physical activity? (n=32)	By public transport (Bus, minibus, metro)	7	20
	With special vehicle	15	42.8
	On foot	10	28.5
Question 9: How long have you been doing this physical activity? (n=32)	0 - 6 months	-	-
	6 months - 1 year	7	20
	1 year - 2 years	7	20
	More than 2 years	18	51.4

LTPA: Leisure Time Physical Activity

Table 4. New physical activity types that individuals want to deal with and barriers that cause individuals to be unable to perform new physical activities that they want to deal with (Part II, stage a)

Question 10: Why do you do this physical activity and what do you aim for? (5 open-ended reasons, e. g. maintaining physical fitness, keeping fit) (n=32)
5 open-ended reasons
Common answers
to maintain my physical condition
to increase my muscle strength
to make good use of my free time
to reduce my excessive contractions
to avoid my physical problems
for relaxation of my muscles
to meet my daily needs
to reduce my pain
to soften and loosen my feet
because I am more independent in the pool
to keep my body fit
to exert my extra energy
to make friends
to improve my physical performance
to walk unsupported
to be happy

Table 5. New physical activity types that individuals want to deal with and barriers that cause individuals to be unable to perform new physical activities that they want to deal with (Part II, stage b)

Question 12: Do you want to get interested in a new free time physical activity? If so what? (n=23)		
Types of activities	**n**	**%**
Sports in a wheelchair	7	20
Basketball	6	17.1
Swimming	2	5.7
Cycling	2	5.7
Football	2	5.7
Mountaineering	1	2.8
Dance	1	2.8
Walking on a treadmill	1	2.8
Dealing with hand exercises	1	2.8
Question 13. Do you have any barriers to the new free time physical activity you want to deal with? If so what? (n=23)		
Barriers presented as examples	**n**	**%**
Health situation	6	17.1
Difficulties in accessing (environmental deficiencies)	5	14.2
Monetary/economic reasons	4	11.4
Lack of time, inability to move unplanned, unable to plan spontaneously	3	8.5
Emotional, psychosocial situations	2	5.7
Political situations (no opportunity)	1	2.8
Attitudes and behaviors of non-disabled people, others	1	2.8
Lack of personal care worker	1	2.8

DISCUSSION

In our study, it was showed that the majority of individuals were interested in an LTPA, but the diversity of activities and frequency of activities were insufficient. Many individuals with chronic diseases and injuries can benefit from LTPA, similar to the healthy population (Usuba et al., 2015). However, information on participation in LTPA in adults with CP is limited, and studies describing the level of LTPA / PA have rarely included adults with CP (Usuba et al., 2015). This situation emerges as a gap in the literature because individuals with disabilities have a higher probability of having a physically inactive lifestyle compared to the healthy population and they have a higher risk of being negatively affected by the inactive lifestyle (Jahnsen et al., 2003; Maltais, Dumas, Boucher et al., 2010; Shkedy Rabani, Harries, Namoora et al., 2014; Balemans, Houdijk, Koelewijn et al., 2019).

In a Canadian study, 52% of adults with CP included in the study were reported to be at the level of GMFCS IV or V, similar to GMFCS level rates of adults with CP living in Ottawa (Usuba et al., 2015). In our study, 82.9% of the individuals with CP who participated in the study were at the levels of GMFCS I, II and III and were individuals who could walk with or without support. On the other hand, 17.1% of the individuals were at GMFCS level IV and couldn't be reached to adults who could be included in the study at GMFCS V level, who continue treatment in clinics. This situation has been associated with the fact that adult CP patients with poor functional efficacy experience transportation problems due to barriers such as health conditions and environmental problems, therefore they cannot continue their therapy and their social participation is insufficient. This suggests that there is a need for further studies investigating the factors leading to the limitations of participation of individuals with non-ambulatory CP in Turkey as well as the need for LTPA studies involving a comparable number of non-ambulatory individuals with ambulatory individuals.

Although the functional levels of adults with CP in the study were poor, it was found that the reported frequency and variety of LTPA was surprisingly similar to that of healthy individuals, but people with CP were less active (Usuba et al., 2015). In addition to the 21 activities offered to the individuals by the researchers, it was determined that individuals were interested in more activities such as zumba, hippotherapy, sailing, dodgeball and canoeing. In our study, it was found that individuals were only interested in 8 activities (home exercises, walking, swimming, fitness, exercise bike, bowling, cycling and football) out of 14 activities offered to them. It is thought that socioeconomic deficiencies, environmental barriers and differences in sociocultural structure in Turkey are meaningful reasons explaining the low number of LTPA varieties. In the literature, it has been shown that individuals with adult CP tend to be inactive, and in this group it has been suggested to focus on interventions to increase leisure activities (Usuba et al., 2015; Balemans et al., 2019). Considering the fact that the primary LTPAs of individuals are unvaried in our study, it is thought that special efforts should be made to increase the density and diversity of LTPA in order to provide health benefits in adults with CP in our country. During these interventions, it's important to note that during the conduct of these studies, the participants need to be carefully evaluated and monitored in order to prevent injuries caused by the excessive use of adults with disabilities, and it is thought that the interventions should be implemented slowly and progressively (Benner et al., 2017; Opheim et al., 2009; Gillett, Lichtwark, Boyd et al., 2018; Flanigan, Gaebler-Spira, Kocherginsky et al., 2020).

In a study conducted in Turkey, Erhan et al. found that the majority of adult individuals with CP, including those with ambulation in the community lived with their families and were financially dependent on their families and their social participation was insufficient (Erhan, Gündüz, Lakşe et al., 2006). Similarly, in our study, there were no 'full-time' individuals with CP, and 37.1% were 'non-employed and job-seeking' individuals. For this reason, it is thought that rehabilitation interventions involving vocational education are necessary for adults with CP in our country.

In children with CP, it is recommended to complete some form of a physical activity every day of the week for a total of 60 minutes due to motor problems (Yağmurdur, Yılmaz, Akel et al., 2018). In children with CP, activities such as walking, running and cycling (using technological support), swimming, dancing, gymnastics, virtual reality exercises, horse riding are recommended as leisure activities, as they are beneficial in terms of developing gross motor skills, balance and endurance (Yağmurdur et al., 2018). Meanwhile when the duration of LTPAs was examined in our study, it was seen that it was between 30-60

minutes for 77.1% of individuals, but when the frequency of activities was questioned, it was at most 2 days a week and was inadequate. In addition, it was observed that individuals do not use technological supports such as virtual reality and treadmills in their leisure time, the diversity of primary activities are low and they don't perform horse riding, dance and gymnastics activities. The results showed that there is a need for more diverse interventions in adults with CP, especially in terms of increasing technology-supported activities.

In our study, more than half of the participants with CP were eager to start new LTPAs and due to barriers such as health status, environmental / transport difficulties, economic inadequacies, lack of time, emotional / psychosocial problems, lack of opportunity, attitudes and behaviors of others, lack of family support, lack of a personal care worker, they were unable to do the activities they were willing. Previous qualitative research has identified a wide range of barriers, including environmental, economic conditions, emotional and psychological barriers, lack of equipment and information, lack of access to professional information, perceptions and attitudes of non-disabled individuals, and government policies for participation in LTPA (Dattilo, Estrella, Estrella et al., 2008; Rimmer, Riley, Wang et al., 2004). In our study, it was observed that many adults with CP in Turkey had difficulty in participating in LTPA for similar reasons as reported in other studies. In terms of ICF, health status and environmental factors have been identified as important barriers for adults with CP in Turkey. In this sense, it is thought that the existing barriers may be effective especially in the low diversity of activities and not participating in different activities such as horse riding, dance / gymnastics. This suggests that there is a need for interventions in order to overcome barriers to increase the participation of people with disabilities in our country.

Santiago and Coyle (Santiago and Coyle, 2004) reported that women with physical disabilities only participate in LTPAs 2.9 times a week and 39.4% never participate in LTPAs. In addition, Rimmer et al. (Rimmer, Rubin, Braddock et al., 1999) reported that only 8.2% of African American women with physical disabilities participate in LTPAs. Usuba et al. (Usuba et al., 2015) showed that 85% of adults with severely affected CP participate in LTPA. In the results of our study, LTPA participation rate (91.4%) was found to be higher than the study in adult individuals with CP, which may contradict the studies conducted in non-CP disabled individuals. Our results were found to be compatible with other studies showing that the rate of participation in exercise was high in adults with CP (Usuba et al., 2015; Lai, Lee, Kim et al., 2020). This was related to the fact that ambulatory individuals in our study were more than non-ambulatory individuals.

In our results, the low incidence of LTPAs (up to 2 per week) was found to be consistent with previous studies reporting low levels of activity in adults with disabilities (Usuba et al., 2015; Lai et al., 2020). However, it is difficult to compare with other studies due to evaluation differences and characteristics of individuals.

In our study, potential rehabilitation exercises such as home exercise were included as LTPA, similar to the study of Usuba et al. (Usuba et al., 2015), but not in Santiago and Coyle and Rimmer et al. (Santiago and Coyle, 2004, Rimmer et al., 2000). In our study, especially home exercises had the highest participation rate. However, it is controversial in the literature whether these activities are carried out for rehabilitation or for arbitrary leisure activities (Santiago and Coyle, 2004; Heller, Ying, Rimmer et al., 2002; Rimmer et al., 2000; Sandström, Samuelsson and Oberg, 2009). Given the barriers to participation in a new and different type of LTPA, its potential impact on rehabilitation and physical fitness, in Turkey, it is inevitable that home exercise is considered as a leisure activity and it is not excluded from LTPA varieties. Based on this situation, it is recommended to investigate whether it is a compulsory rehabilitation method, exercise or arbitrary activities within the scope of more detailed definition of LTPA.

The study has some limitations such as the small number of participants and the absence of a control group. In our country, adult cerebral palsy individuals' lack of continuity to physiotherapy is considered to be the reason for reaching higher number of participants; it is planned to continue the research by comparing more individuals with the healthy group in the future. Another limitation of the study is that a standardized or validated LTPA measurement was not used to collect data.

This study showed that most of the young and adult CP subjects living in our country were interested in some form of LTPA. However, it has been observed that the variety and frequency of LTPAs are insufficient. In addition, individuals stated that there were new activities they would like to be interested in and that they could not perform due to different obstacles. These results suggest that interventions to increase the

diversity of leisure activities in adolescent and adult patients with CP are required in our country. Considering that individuals cannot participate in a variety of physical activities, especially due to the unsuitable environmental conditions and the inadequacy of economic conditions, it is thought that facilitation interventions are needed for these obstacles.

References

Ando, N., & Ueda, S. (2000). Functional deterioration in adults with cerebral palsy. *Clin Rehabil,* 14(3), 300-306. https://doi.org/10.1191/026921500672826716

Bania, T. A., Dodd, K. J., Baker, R. J., Graham, H. K., & Taylor, N. F. (2016). The effects of progressive resistance training on daily physical activity in young people with cerebral palsy: a randomised controlled trial. *Disabil Rehabil*, 38(7), 620–626. https://doi.org/10.3109/09638288.2015.1055376

Balemans, A., Houdijk, H., Koelewijn, G. R., Piek, M., Tubbing, F., Visser-Meily, A., et al. (2019). A comparison of the physiology of sedentary behavior and light physical activity in adults with and without a physical disability. *J Phys Act Health*, 16(10), 894–901. https://doi.org/10.1123/jpah.2019-0059

Benner, J. L., Hilberink, S. R., Veenis, T., Stam, H. J., van der Slot, W. M., et al. (2017). Long-term deterioration of perceived health and functioning in adults with cerebral palsy. *Arch Phys Med Rehabil*, 98(11), 2196–2205.e1. https://doi.org/10.1016/j.apmr.2017.03.013

Boucher, N., Dumas, F., Maltais, D. B., & Richards, C. L. (2010). The influence of selected personal and environmental factors on leisure activities in adults with cerebral palsy. *Disabil Rehabil*, 32(16), 1328-1338. https://doi.org/10.3109/09638280903514713

Carlson, D., & Myklebust, J. (2002). Wheelchair use and social integration. *Top Spinal Cord Inj Rehabil,* 7(3), 28-46. https://doi.org/10.1310/4VAG-D0BF-QLU5-Y1LT

Dattilo, J., Estrella, G., Estrella, L. J., Light, J., McNaughton, D., & Seabury, M. (2008). I have chosen to live life abundantly: Perceptions of leisure by adults who use augmentative and alternative communication. *Augment Altern Commun*, 24(1), 16-28. https://doi.org/10.1080/07434610701390558

Donkervoort, M., Roebroeck, M., Wiegerink, D., van der Heijden-Maessen, H., & Stam, H. (2007). Determinants of functioning of adolescents and young adults with cerebral palsy. *Disabil Rehabil*, 29(6), 453-463. https://doi.org/10.1080/09638280600836018

Erhan, B., Gündüz, B., Lakşe, E., Coşkun, Ç. E., Hıncal, B. S., & Elbaşı, N. (2006). Serebral palsili adolesan ve genç erişkinlerin çalışma ve sosyal durumları. *Türk Fiz Tıp Rehab Derg,* 52(1), 37-38.

Flanigan, M., Gaebler-Spira, D., Kocherginsky, M., Garrett, A., & Marciniak, C. (2020). Spasticity and pain in adults with cerebral palsy. *Dev Med Child Neurol*, 62(3), 379–385. https://doi.org/10.1111/dmcn.14368

Gajdosik, C. G., & Cicirello, N. (2002). Secondary conditions of the musculoskeletal system in adolescents and adults with cerebral palsy. *Phys Occup Ther Pediatr*, 21(4), 49-68. https://doi.org/10.1300/j006v21n04_04

Giarelli, E., Bernhardt, B. A., Mack, R., & Pyeritz, R. E. (2008). Adolescents' transition to self-management of a chronic genetic disorder. *Qual Health Res*, 18(4), 441–457. https://doi.org/10.1177/1049732308314853

Gillett, J. G., Lichtwark, G. A., Boyd, R. N., & Barber, L. A. (2018). Functional Capacity in adults with cerebral palsy: lower limb muscle strength matters. *Arch Phys Med Rehabil*, 99(5), 900–906.e1. https://doi.org/10.1016/j.apmr.2018.01.020

Hayat, M. J., Powell, A., Johnson, T., & Cadwell, B. L. (2017). Statistical methods used in the public health literature and implications for training of public health professionals. *Plos One,* 12(6), e0179032. https://doi.org/10.1371/journal.pone.0179032

Heller, T., Ying, G. S., Rimmer, J. H., & Marks, B. A. (2002). Determinants of exercise in adults with cerebral palsy. *Public Health Nurs*, 19(3), 223-231. https://doi.org/10.1046/j.0737-1209.2002.19311.x

Jahnsen, R., Villien, L., Aamodt, G., Stanghelle, J. K., & Holm, I. (2003). Physiotherapy and physical activity experiences of adults with cerebral palsy, with implications for children. *Adv Physiother,* 5(1), 21-32. https://doi.org/10.1080/14038190310005779

King, G., McDougall, J., DeWit, D., Petrenchik, T., Hurley, P., & Law, M. (2009). Predictors of change over time in the activity participation of children and youth with physical disabilities. *Child Health Care*, 38(4), 321–351. https://doi.org/10.1080/02739610903237352

Lai, B., Lee, E., Kim, Y., Matthews, C., Swanson-Kimani, E., Davis, D., et al. (2020). Leisure-time physical activity interventions for children and adults with cerebral palsy: a scoping review. *Dev Med Child Neurol*, 10.1111/dmcn.14751. Advance online publication. https://doi.org/10.1111/dmcn.14751

Maltais, D. B., Dumas, F., Boucher, N., & Richards, C. L. (2010). Factors related to physical activity in adults with cerebral palsy may differ for walkers and non walkers. *Am J Phys Med Rehabil,* 89(7), 584- 597. https://doi.org/10.1097/PHM.0b013e3181d89f32

Murphy, K. P., Molnar, G. E., & Lankasky, K. (1995). Medical and functional status of adults with cerebral palsy. *Dev Med Child Neurol*, 37(12), 1075-1084. https://doi.org/10.1111/j.1469-8749.1995.tb11968.x

Opheim, A., Jahnsen, R., Olsson, E., & Stanghelle, J. K. (2009). Walking function, pain, and fatigue in adults with cerebral palsy: A 7-year follow-up study. *Dev Med Child Neurol*, 51(5), 381-388. https://doi.org/10.1111/j.1469-8749.2008.03250.x

Reedman, S., Boyd, R. N., & Sakzewski, L. (2017). The efficacy of interventions to increase physical activity participation of children with cerebral palsy: a systematic review and meta-analysis. *Dev Med Child Neurol*, 59(10), 1011–1018. https://doi.org/10.1111/dmcn.13413

Rimmer, J. H., Riley, B., Wang, E., Rauworth, A., & Jurkowski J. (2004). Physical activity participation among persons with disabilities: Barriers and facilitators. *Am J Prev Med*, 26(5), 419-425. https://doi.org/10.1016/j.amepre.2004.02.002

Rimmer, J. H., Rubin, S. S., Braddock, D., & Hedman, G. (1999). Physical activity patterns of African-American women with physical disabilities. *Med Sci Sports Exerc*, 31(4), 613-618. https://doi.org/10.1097/00005768-199904000-00020

Rimmer, J. H., Rubin, S. S., & Braddock, D. (2000). Barriers to exercise in African American women with physical

disabilities. *Arch Phys Med Rehabil*, 81(2), 182-188. https://doi.org/10.1016/s0003-9993(00)90138-2

Ross, S. M., MacDonald, M., & Bigouette, J. P. (2016). Effects of strength training on mobility in adults with cerebral palsy: A systematic review. *Disabil Health J*, 9(3), 375–384. https://doi.org/10.1016/j.dhjo.2016.04.005

Russell, D. J., Avery, L. M., Rosenbaum, P. L., Raina, P. S., Walter, S. D., & Palisano, R. J. (2000). Improved scaling of the gross motor function measure for children with cerebral palsy: Evidence of reliability and validity. *Phys Ther*, 80(9), 873–885. https://doi.org/10.1093/ptj/80.9.873

Saebu, M. (2011). Physical disability and physical activity: A review of the literature on correlates and associations. *EUJAPA,* 3(2), 37-55. https://doi.org/10.5507/euj.2010.008

Sandström, K., Samuelsson, K., & Oberg, B. (2009). Prerequisites for carrying out physiotherapy and physical activity-experiences from adults with cerebral palsy. *Disabil Rehabil*, 31(3), 161-169. https://doi.org/10.1080/09638280701850934

Santiago, M. C., & Coyle, C. P. (2004). Leisure-time physical activity and secondary conditions in women with physical disabilities. *Disabil Rehabil*, 26(8), 485-494. https://doi.org/10.1080/09638280410001663139

Shkedy Rabani, A., Harries, N., Namoora, I., Al-Jarrah, M. D., Karniel, A., & Bar-Haim, S. (2014). Duration and patterns of habitual physical activity in adolescents and young adults with cerebral palsy. *Dev Med Child Neurol*, 56(7), 673–680. https://doi.org/10.1111/dmcn.12394

Stewart, D. (2009). Transition to adult services for youth with disabilities: Current evidence to guide future research. *Dev Med Child Neurol*, 51(4), 169–173. https://doi.org/10.1111/j.1469-8749.2009.03419.x

Stewart, D. A., Lawless, J. J., Shimmell, L. J., Palisano, R. J., Freeman, M., Rosenbaum, P. L., et al. (2012). Social participation of adolescents with cerebral palsy: Trade-offs and choices. *Phys Occup Ther Pediatr,* 32(2), 167-179. https://doi.org/10.3109/01942638.2011.631100

Trost, S. (2005). Discussion paper for the development of recommendations for children's and youths' participation in health promoting physical activity. Retrieved from the Web June 11, 2020. https://www.ehealth.gov.au/internet/main/publishing.nsf/Content/ADC7120D750619E1CA257BF0001DE90A/$File/physical_discussion.pdf

Usuba, K., Oddson, B., Gauthier, A., & Young, N. L. (2015). Leisure-time physical activity in adults with cerebral palsy. *Disabil Health J,* 8(4), 611-618. https://doi.org/10.1016/j.dhjo.2015.05.006

Van der Slot, W. M., Roebroeck, M. E., Landkroon, A. P., Terburg, M., van den Berg-Emons, R. J., & Stam, H. J. (2007). Everyday physical activity and community participation of adults with hemiplegic cerebral palsy. *Disabil Rehabil*, 29(3), 179-189. https://doi.org/10.1080/09638280600747686

Yağmurdur, H., Yılmaz, Ö., Akel, B. S., Çarman, K. B., Elbasan B., Konuşkan, B., et al. (2018). Nörolojik hastalıklarda fiziksel aktivite ve egzersiz. In E. N. Özmert, A. A. Karaduman, & N. Kanbur (Eds.), *Çocuk Ve Ergen İçin Kronik Hastalıklarda Fiziksel Aktivite Rehberi,* (pp. 101-122). Ankara: Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü.