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THE EFFECTS OF GAME AND PHYSICAL ACTIVITY LESSONS IN CHILDREN WITH LEARNING DISABILITIES

UČINKI IGRE IN TELESNE DEJAVNOSTI PRI OTROCIH Z UČNIMI TEŽAVAMI

ABSTRACT

The aim of this study is to investigate the effect of participation in game and physical activities lesson on the students with learning disabilities (LD) on academic achievement and exercise self-efficacy levels. Thirty male children with LD were included in the study. Two groups were formed from the participants. The first group was tthe Game and Physical Activity (GPA) Lesson (n = 15) and the second group was the control group (n = 15). The exercise self-efficacy levels of the group were determined by using the Exercise Self-Efficacy Scale (ESS) and the academic achievement was evaluated by using the "Academic Performance Evaluation Scale". T-test was used to examine differences between groups. To determine groups' exercise self-efficacy levels and the impact of GPA lesson on academic achievement Cohen's d was used. There was no statistically significant difference between the age and height values of LD children who participated in the GPA lesson and who did not participate in the GPA lesson. But, it was observed that there was a significant decrease in body weight and body mass index. However, There was a significant difference ($p < 0.001$) in the final test comparisons of exercise self-efficacy and academic achievement of students with special education who participated in the GPA lesson. Conclusion: The games and physical activities lesson of seems to be as effective means of increasing the exercise self-efficacy and academic success of children with learning disabilities.

Keywords: physical Activity, Academic Achievement, Learning Disability, Exercise

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IZVLEČEK

Namen te raziskave je preučiti učinek sodelovanja učencev z učnimi težavami (UT) v igri in telesni dejavnosti na šolski uspeh in raven samoučinkovitosti pri vadbi. Raziskava je zajela 30 učencev z UT. Razdelili smo jih v dve skupini. Prva skupina je izvedla uro 'Igra in telesna vadba' (ITV) (n = 15), druga skupina pa je bila kontrolna (n = 15). Ravni samoučinkovitosti vadbe v skupini smo ugotavljali s pomočjo lestvice za ocenjevanje samoučinkovitosti pri vadbi (EES), šolski uspeh pa z lestvico za ocenjevanje šolskega uspeha. Razlike med obema skupinama smo ugotavljali s t-testom. Za določitev ravni samoučinkovitosti pri vadbi obeh skupin ter učinka vaje ITV na šolski uspeh smo uporabili Cohenov d. Med vrednostmi starosti in višine otrok z UT, ki so sodelovali v vaji ITV, in tistimi, ki v njej niso sodelovali, ni bilo statistično značilnih razlik. Opazili pa smo, da sta se indeksa telesne teže in telesne mase značilno povečala. Statistično značilna razlika ($p < 0,001$) je bila ugotovljena v zadnjem testu, in sicer med samoučinkovitostjo pri vadbi in šolskim uspehom učencev s prilagojenim izobraževanjem, ki so sodelovali v vaji ITV. Sklep: igra in telesna vadba sta se izkazali kot učinkovito sredstvo za povečanje samoučinkovitosti pri vadbi ter šolskega uspeha otrok z učnimi težavami.

Ključne besede: telesna dejavnost, šolski uspeh, učne težave, vadba

INTRODUCTION

Many factors do not fully explain how learning disabilities arise (Arteche & Murray, 2011) and are thought to adversely affect the development of children. Students with learning disabilities have difficulties especially in the skills that include academic areas. Many of the students can show individual differences in terms of their qualifications and inadequacies appropriate to their age level in terms of developmental patterns (Belsky & Pluess, 2012). Children with learning disabilities have a significant neurological disorder in terms of listening, reading, writing, reasoning, self-expression, social perception, mathematics, motor skills, and organizational skills (Silver et al., 2007; Judge & Bell, 2010; Judge & Watson, 2011). Therefore, the importance of academic success has increased for these children. Physical activities, typically, have been shown to promote physical, mental and psychosocial health in students (Bertills et al., 2018). The perceived competence in physically active students with physical disabilities is higher than in non-active students (Barg et al., 2010). Reduced physical activity is associated with low emotional self-efficacy in students whoperform less physical activity than recommended (Valois et al., 2008). Due to functional restrictions, students with learning disabilities typically have limited opportunities to participate in extracurricular physical activities compared to their developing peers (King et al., 2009). For these students, the school-based GPA lesson can serve as an important context for obtaining the benefits of physical activities (Block & Obrusnikova, 2007; Bråkenhielm, 2008). Self-efficacy means the belief in the ability to carry out the course of action required for the desired goals (Klassen, 2010). Self-efficacy beliefs are vital for all students, but they may be critical determinants of the ability to attend GPA lesson for students with learning disabilities (Haegele & Hodge, 2016).

Students with learning disabilities have less access to four sources of self-efficacy. As a result of the comparison of the results of the national tests, self-efficacy reported that students with learning difficulties had lower levels than those without difficulties (Jungert & Andersson, 2013). Having any source of self-efficacy is probably associated with higher self-efficacy beliefs and higher academic achievement (Hampton & Mason, 2003). The structure of GPA lesson is important in terms of both body and social cohesion. Different adaptations and modifications are required depending on the type of disability for the participation of students with disabilities in the school-based GPA lesson.

The meaningful learning experiences for students with disabilities in the GPA lesson are largely dependent on their attitudes towards communicating and structuring teachers' teaching skills and teachings in a comprehensive direction (Jordan, Glenn & McGhie-Richmond, 2010). If the activity is not adapted for students who need special support, participation restriction may occur (Smith, 2004; Coates & Vickerman, 2010; Healy, Msetfi & Gallagher, 2013). The importance of GPA lesson in the protection and development of health is becoming increasingly. Students are required to participate in the GPA lesson at least one hour per day in order to protect their health (Janssen & Leblanc, 2010; WHO, 2010). In this respect, it is important that students develop regular attendance habits to the GPA lesson. The aim of this study was to investigate the effect of participation in the game and physical activity lesson on exercise self-efficacy levels and academic achievement in children with LD.

MATERIALS AND METHODS

Participants

All participants and their parents read and signed an informed consent form which was approved by the institution before the assessment. The study ethics review board was approved by Mersin University, Ethics Committee of Social Sciences (30/04/2018-008). The study included 30 male students diagnosed with mild learning disabilities aged 9-11 years. The participants were determined as the GPA lesson group (n = 15) and the control group (n = 15) in . The GPA group consisted of students attending a course for 1 semester, 5 days a week, 40 minutes a day, and the control group consisted of students who did not attend the classes of GPA.

Study protocol

Ministry of Education play and physical activity lesson program for all groups 5 times a week; strength, flexibility, quickness, mobility, coordination, strength, rhythm and sports-specific skills. Participants received basic movement skills training 3 times a week for 18 weeks in addition to the routine GPA lesson schedule (Table 1). For the same period, the control group only routinely followed the curriculum except for the GPA lesson. In order to determine whether the subjects received a positive response from the curriculum of the GPA lesson, the participants were administered the academic performance assessment scale with the exercise self-efficacy scale.

Data collection instruments

Exercise Self-Efficacy Scale (ESS);

Exercise Self-Efficacy Scale measures a person's perceived self-efficacy confidence. The scale is a measure of self-statement and consists of 18 self-efficacy items that require the subjects to show their confidence in performing the physical activities and exercises. Exercise Self-Efficacy Scale was developed by Bandura and its validity and reliability studies were carried out by Bozkurt with the patients with breast cancer in Turkey. The test-retest reliability coefficient was found 0.968 (Bandura, 1997; Bozkurt, 2009). ES Scale consists of 18 items that can be scored between

Table 1. Game and physical activities lesson basic movement skills curriculum programme (MEB, 2018)

I. Relocation Movements	II. Balancing Movements	III. Object Control Requiring Movements	IV. Consolidated Movements
Walking I	Bending	Ball a adjustment studies	Tail catch
Walking II	Stretching	Throw- Retention	Ball Collecting Games
Running	Rotation- Oscillation	Catch	Flag Race Games
Jump - Bounce	Weight Transfer	Foot hit	Target Game
Step - Skipping	Jump- Landings	Rounding	Throwing- Strike Games
Galop - Slip	Start- Stop	Stop- Control	Rounding- Hold Games
Rolling	Dynamic Static Balance	Dribbling	Caterpillar Burning Ball
Climbing	Posture- Sitting	Racket hit	Moving Target Shooting Games
	Push- Pull	Long handle vehicle hit	

0% and 100%. The participants are scored by 100 points with 10-unit intervals ranging from 0 to 50 ("Moderately certain can do") and 100 ("Highly certain can do") according to the level or power of confidence in their self-efficacy. The internal consistency reliability was found 0.94 (Bozkurt, 2009).

Academic Performance Assessment Scale (APAS);

Academic Performance Assessment Scale is a 19-item scale developed to reflect the perceptions of teachers about their academic performance and abilities in the classroom (Kinsbourne & Swanson, 1979) and social response reduction (Whalen, Henker and Granger, 1989). Teachers, for students with learning disabilities each item 1 (never or weak) and 5 (very often or excellent) using the 5-Likert scale format responded.

Statistical analysis

All statistical analyzes were performed with SPSS version 20.0. In order to investigate the difference between groups, Cohen -s d analyzes were used to determine the effect of GPA on exercise self-efficacy levels and academic achievement of the groups by t-test. P value less than 0.05 was considered significant.

RESULTS

There was no statistically significant difference between the pretest age, height, body weight and BMI values of children who had participated in the GPA lesson and who did not participate in the GPA lesson (Table 2). But, there was a significant decrease in body weight and body mass index among the final test values ($p < 0.05$) (Table 3). These results suggest that students who participate in GPA lesson have a positive effect on academic achievement of body weight index reduction.

It was determined that there was no significant difference in the pre-test comparison of exercise self efficacy and academic achievement of the students need special disabilities training in GPA lesson (* p> .05) (Table 4).

Table 2. Descriptive statistics for game physical activity lesson and control groups Pre- test Results

	Group	N	M	SS	df	% df	t	Sig	Cohen's d
Age (Years)	CG	15	8,27	0,96	-	-0,72	-,182	,857	M.D.
	GPAG	15	8,33	1,05	0,06				
Body Height (cm)	CG	15	144,07	5,64	2,87	2,03	1,538	,135	M.D.
	GPAG	15	141,20	4,51					
Body Weight (kg)	CG	15	40,40	4,42	0,73	1,84	,356	,724	M.D.
	GPAG	15	39,67	6,64					
Body Mass Indeks (BMI)	CG	15	25,51	2,44	-	-1,76	-,353	,727	M.D.
	GPAG	15	24,86	2,92	0,35				

CG=Control Group, GPAG= Game Physical Activity Group, Difference (df)

Table 3. Descriptive statistics for game physical activity lesson and control groups Post-test Results

	Group	N	M	SS	df	% df	t	Sig	Cohen's d
Age (Years)	CG	15	8,27	0,96	-0,06	-0,72	-,182	,857	M.D.
	GPAG	15	8,33	1,05					
Body Height (cm)	CG	15	144,07	5,64	2,87	2,03	1,538	,135	M.D.
	GPAG	15	141,20	4,51					
Body Weight (kg)	CG	15	40,20	4,00	2,27	5,98	1,297	,005*	M.D.
	GPAG	15	35,93	5,46					
Body Mass Indeks (BMI)	CG	15	25,45	2,42	0,38	2,00	,447	,028*	M.D.
	GPAG	15	19,02	2,04					

P<0.05, CG=Control Group, GPAG= Game Physical Activity Group, Difference (df)

Table 4. Game physical activity lesson and control groups comparison of exercise self efficacy and academic success pre-test results

	Group	N	M	SS	df	% df	t	Sig	Cohen's d
Exercise Self-Efficacy	CG	15	1,33	0,49	-0,07	-5,00	-,367	,716	M.D.
	GPAG	15	1,40	0,51					
Academic success	CG	15	1,80	0,68	0	0,00	,000	1,000	M.D.
	GPAG	15	1,80	0,56					

CG=Control Group, GPAG= Game Physical Activity Group, Difference (df)

Table 5. Game physical activity lesson and control groups comparison of exercise self efficacy and academic success post-test results

	Group	N	M	SS	df	% df	t	Sig	Cohen's d
Exercise Self-Efficacy	CG	15	1,40	0,51	-1,07	43,32	-5,060	,000**	1,85‡
	GPAG	15	2,47	0,64					
Academic success	CG	15	1,93	0,46	-1,27	-39,69	-5,027	,000**	1,84‡
	GPAG	15	3,20	0,86					

‡ P < .001, CG=Control Group, GPAG= Game Physical Activity Group, Difference (df)

A significant difference was found in the post-test comparison of exercise self efficacy and academic achievement of the students who need special training in GPA lesson (p <0.001) (Table 5). Cohen's d values suggest that regular participation in the GPA lesson has a major impact on the development of self-efficacy and academic achievement in children with LD.

DISCUSSION

The aim of this study was to investigate the effects of learning and physical activities lesson on students' self-efficacy levels and academic achievement. The game and PA lesson is rich, interesting and exciting; Running, jumping, bounce, tab etc. It has a great potential in terms of

the development of individuals who are attracting LD by means of movements and coverage of individual and group games. Thus, the game and PA lesson fulfills a very important function for academic performance aimed at achieving in education (Özer, 2010). According to some studies (Shepard, 1996; Darla et al., 2007; Virginia & et al., 2009), it is important to understand the relationship between academic achievement and physical activity and physical education. It is recommended that students increase their daily physical activity levels for at least 1 hour a day to increase academic success. Most of the studies in this area; Buck et al. (2008), statistically controlled for age, BMI, and IQ and reported that fitness was predictive of cognitive performance. Jacob et al. (2011), controlled for sex and BMI and found that fitness was predictive of comprehension and block design performance; Davis and Cooper (2011), controlled for race, gender, and education level of the primary caregiver and reported that fitness was predictive of planning scores on the Cognitive Assessment System (CAS). In conclusion, these studies confirms that physical fitness is generally associated with academic performance in elementary school children. Aerobic fitness and BMI were associated with achievement in reading and mathematics. According to our findings; It was observed that there was a significant decrease in body weight and body mass index among the final test values of children with LD who participated and did not participate in the GPA lesson. In addition, it was found that there was a significant difference in the comparison of the post-test results of the exercise self efficacy and academic achievement of the students in need of special training. Cohen's d values suggest that regular participation in the GPA lesson has a major impact on the development of exercise self-efficacy and academic achievement in children with LD.

The positive effects of exercise self-efficacy directly and indirectly on academic achievement are well known (Pajares, 2003; Schunk, 2003; Klassen, 2007; Gustafsson et al., 2010; Kitsantas, Cheema & Ware, 2011).The perceived self-efficacy of the GPA lesson was first examined in relation to motor skills (Caprara, Alessandri & Eisenberg, 2012). Researchers link the relationship between physical activity and academic achievement with physiological and psychological variables. Increased blood and oxygen in the brain during physical activity, decreased stress, improved mood and synaptic flexibility are potentially variables that increase academic achievement (Burrows et al., 2014). Sibley and Etnier (2003) in their study, high levels of physical activity; perceptual skills, intelligence, academic achievement, verbal and mathematics tests, memory, academic readiness and development level is positively associated with such variables. According to the findings of our study; it is concluded that children with high self-efficacy contribute to successful outcomes. The LD focused on how students are physically active, strengthening student motivation and the role of content and how it is presented (Rink, 2013). In inclusive practices, it is recommended that the most influential teachers clearly communicate high and adapted expectations, create routines that allow small group activities, and make individualized interactions designed to encourage all students to participate actively in their learning and understanding (Bertills, 2018). The GPA lesson structure is important in terms of both physical education and social harmony. GPA lesson depending on the type of disability, different adaptations and modifications are required. The meaningful learning experiences for GPA lesson-impaired students are largely dependent on teachers' attitudes towards communicating and structuring their teaching skills and teachings in a comprehensive direction (Jordan, Glenn & McGhie-Richmond, 2010). If the event is not adapted for students who need special support, participation restriction may occur (Smith, 2004; Coates & Vickerman, 2010; Healy, Msetfi & Gallagher, 2013).

For Students with learning disabilities, long-term planning is required by teachers for adaptations that GPA lesson provide meaningful participation and learning experiences.Teachers' inadequate knowledge and skills to adapt their training can explain the reasons why students who need special support are not as fully included in the GPA lesson (Coates & Vickerman, 2008). Research on grading students with disabilities is scarce (Mong, 2014), but shows that there is a need to create adaptive standards, adaptations and modification of activities, and to establish rating criteria according to these standards (Guskey & Jung 2009).

In conclusion

It can be concluded that; according to a curriculum based on criteria, it shows that better teaching skills benefit most students in terms of teaching, but they do not include disabled and disadvantaged students. Our study shows that students with disabilities who do not attend GPA lesson have lower self-efficacy than their peers and have a low academic achievement. Being a disabled person can be an obstacle for students to be successful. Considering that the participation of students with disabilities in extracurricular physical activities is limited, it is seen that the students participating in the lesson have high self-efficacy and academic success compared to the students with disabilities. Basic content movement where physical skills are required, high quality GPA teaching is necessary to narrow the existing self-efficacy gap between student groups. The Teachers should not only look at what they should do but how they will perform according to the intended learning outcome. However; A long-term plan with standards tailored to students who need special support is required. But, teachers need guidance, training and support on how to transform curriculum intentions into meaningful learning experiences for students who need special support. Therefore, given the potential positive effects of physical activity, exercise self-efficacy levels and academic achievements of LD students may be supportable with increased duration of the game and physical activities lesson. It can be asserted that game and physical activities lessons are an effective tool for children with learning disabilities to increase their self-efficacy and academic success.

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