DOI: 10.4274/jarem.galenos.2023.28942
J Acad Res Med 2023;13(1):41-8

Determination of Physical Activity Level, Functional Capacity and Depression in Children with Digital Game Addiction

Dijital Oyun Bağımlılığı Olan Çocuklarda Fiziksel Aktivite Seviyesi, Fonksiyonel Kapasite ve Depresyonun Belirlenmesi

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Cite this article as: Karaaslan Y, Özyurt F, Karaaslan U. Determination of Physical Activity Level, Functional Capacity and Depression in Children with Digital Game Addiction. J Acad Res Med 2023;13(1):41-9

ABSTRACT

Objective: The aim of this study was to determine the physical activity level, functional capacity, and depression in children with digital game addiction (DGA).

Methods: Ninety-nine children (mean age: 10±1.53 years) with DGA were included in the study. Demographic, physical, and clinical characteristics were recorded. DGA was evaluated using the Digital Game Addiction Scale for Children, physical activity level with the Primary School Students' Physical Activity Questionnaire, functional capacity with the 2-Minute Walk test, and depression with the Depression Scale for Children.

Results: Of the children, 17.2% were in the low-risk group, 41.4% were in the risky group, 26.3% were in the dependent group, and 15.2% were in the highly dependent group. DGA had a high negative correlation with physical activity level (r=-0.659; p=0.001), a weak positive correlation with depression (r=0.342; p=0.001), but no correlation with functional capacity (p>0.05). Simultaneously, it was found that physical activity and depression were found to be independent factors of the DGA with 43.4% of the variance. Additionally, a significant difference was found in terms of physical activity level and depression in children with DGA at different levels (p<0.05).

Conclusion: In this study, a negative relationship was found between DGA and physical activity level, and a positive relationship with depression. It is important to raise the awareness of children and families about DGA. Additionally, children can be directed to various exercise programs to increase physical activity levels and reduce depression associated with DGA.

Keywords: Dependency, exercise, child, depression, physical activity, physical capacity

ÖZ

Amaç: Bu çalışmanın amacı, dijital oyun bağımlılığı (DOB) olan çocuklarda fiziksel aktivite düzeyi, fonksiyonel kapasite ve depresyonun belirlenmesidir.

Yöntemler: Çalışmaya DOB olan 99 çocuk (ortalama yaş: 10±1,53 yıl) alındı. Demografik, fiziksel ve klinik özellikler kaydedildi. DOB Çocuklar için Dijital Oyun Bağımlılık Ölçeği, fiziksel aktivite düzeyi İlköğretim Öğrencileri için Fiziksel Aktivite Soru Formu, fonksiyonel kapasite 2-Dakika Yürüme testi, depresyon Çocuklar için Depresyon Ölçeği ile değerlendirildi.

Bulgular: Çocukların %17,2'si az riskli grupta, %41,4'ü riskli grupta, %26,3'ü bağımlı grupta, %15,2'si yüksek düzeyde bağımlı grupta yer almaktadır. DOB ile fiziksel aktivite düzeyi arasında (r=-0,659; p=0,001) negatif yönde yüksek derecede ilişki, depresyon arasında (r=0,342; p=0,001) pozitif yönde zayıf derecede ilişki olduğu bulunurken, fonksiyonel kapasite arasında ilişki bulunmadı (p>0,05). Fiziksel aktivite seviyesi ve depresyon %43,4 varyans ile DOB'nin anlamlı ve bağımsız faktörleri olarak bulunmuştur. Ayrıca farklı seviyelerdeki DOB'li çocuklarda fiziksel aktivite düzeyi ve depresyon açısından anlamlı fark bulundu (p<0,05).

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Received Date/Geliş Tarihi: 14.12.2022 **Accepted Date/Kabul Tarihi:** 11.04.2023

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Sonuç: Bu çalışmada DOB ile fiziksel aktivite düzeyi arasında negatif yönde, depresyon arasında pozitif yönde bir ilişki tespit edildi. Çocukların ve ailelerin DOB konusunda bilinçlendirilmeleri önemlidir. Ayrıca, DOB ile ilişkili olarak fiziksel aktivite seviyesini artırmak ve depresyonu azaltmak için çocuklar çeşitli egzersiz programlarına yönlendirilebilir.

Anahtar kelimeler: Bağımlılık, egzersiz, çocuk, depresyon, fiziksel aktivite, fiziksel kapasite

INTRODUCTION

Digital game addiction (DGA) is defined as children's desire to play games in digital environments (such as computers, game consoles, mobile phones, and tablets), not being able to limit the duration of the game, considering digital gaming as their primary job, and avoiding daily life responsibilities (1). It is seen that the prevalence of DGA varies between 0.6% and 15% (2,3).

It is stated that DGA may be associated with a lack of reward and that the mesocorticolimbic pathway and dopamine play an important role in addiction (4). If people are addicted, there is an increase in the production of dopamine, which is responsible for the pleasure and reward systems in the brain, and the insufficiency of dopamine receptors leads the person to the addicted substance/behavior (5). DGA can cause many negative consequences such as physical inactivity, obesity, headache, and aggressive and anti-social behavior (6-8). However, the effects of DGA on children's health are still largely unexplored (9).

Physical activity is defined as body movement performed by skeletal muscles using energy (10). Some studies have stated that there is no significant relationship between DGA and physical activity levels (9,11). However, there are also studies in the literature indicating that the level of physical activity decreases with the increase in DGA (12,13). Based on these contradictory results, we believe that more studies are needed to investigate the relationship between DGA and physical activity level. The functional capacity is expressed as the ability of individuals to conduct activities in daily life independently and is often used synonymously with exercise capacity and exercise tolerance (14). To the best of our knowledge, there exists no study investigating DGA and functional capacity in children.

DGA can also cause psychological problems such as loneliness, depression, anxiety, tendency to violence, attention deficit, and a decrease in positive social behavior (15-17). Examination of DGA and intervening in this situation will be beneficial for people's mental health. Depression is a common type of psychological disorder in society and indicates abnormal emotional states such as sadness and distress (18). When the literature is examined, studies investigating the relationship between the type of digital games and psychosocial and behavioral problems stand out (15,19,20). Studies investigating the depression in children with DGA are needed.

Therefore, the aim of this study was to investigate the relationship between DGA and physical activity level, functional capacity, and depression in children and to compare these parameters in children with different levels of DGA. The hypothesis of the study is that there is a relationship between DGA and physical activity level, functional capacity, and depression in children, and there are differences between these parameters in children with different levels of DGA.

METHODS

Study Design

This cross-sectional and descriptive study was approved by the University of Health Sciences Turkey, Gaziosmanpaşa Training and Research Hospital Clinical Research Ethics Committee (decision no: 128, date: 05.10.2022). The study was conducted in October and November 2022 in accordance with the Declaration of Helsinki. After the study was explained to the participants and their families who met the inclusion and exclusion criteria and volunteered to participate in the study, the 'Informed Consent Form' was signed. Participants in the study were evaluated by the same specialist physiotherapist.

Participants

This study was performed out in children and their siblings presented to the University of Health Sciences Turkey, Gaziosmanpaşa Training and Research Hospital Child and Adolescent Psychiatry Clinic. Volunteering to participate and being 6-14 years old were the inclusion criteria. To have an orthopedic, neurological, or rheumatologic problem that may prevent physical activity, to have a chronic disease, to have vision and hearing loss, and to have cognitive or mental problems were the exclusion criteria. Written informed consent was obtained from the children participating in the study and their parents.

Evaluations

Demographic and physical characteristics of the children were collected face-to-face. In the evaluation form, age (year), gender, body mass index, diagnoses, education level, mother's education level, father's education level, digital gaming duration, and tool used for playing digital games were questioned.

DGA was evaluated using the Turkish version of the "Digital Game Addiction Scale for Children". The scale consisted of 24 items. It consists of 4 sub-factors: excessive focus and conflict toward digital gaming, development of tolerance for playtime and the value attributed to the game, postponing individual and social tasks/homework, psychological-physiological reflection of deprivation, and immersion in the game. A 5-point Likert-type scale was used to evaluate the expressions on the scale (1= Absolutely Disagree, 2= Disagree, 3= Undecided, 4= Agree, 5= Completely Agree).

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In this scale, a total score of 1-24 indicates normal-risk groups, a score of 25-48 indicates low-risk groups, a score of 49-72 indicates risky groups, a score of 73-96 indicates dependent groups, and a score of 97-120 indicates highly dependent groups (12).

Physical activity level was evaluated using the Turkish version of the "Primary School Students' Physical Activity Questionnaire" There are 10 items (the 10th item is excluded from the evaluation) in the form that questions the physical activity level of children in the previous week. The first item covers 21 activities, and each activity is scored between 1 and 5 according to the frequency of performing it. Items 2-8 question the frequency of physical activities at school, during break times, in the evening, and on weekends, and item 9 evaluates the frequency of physical activity. The total score was evaluated between 5 and 45. According to this scoring, children are classified as inactive/sedentary (5 points), low active (15 points), moderately active (20-25 points), active (35 points), and highly active (45 points) (18).

The 2-Minute Walk test (2MWT) was used to evaluate the functional capacity. According to this test, the children were asked to walk quickly (without running) and they were also instructed that they could stop in case of need, but the time would not be stopped. At the end of the time, the distance the children walked was recorded in meters. The 2MWT is a valid and reliable test for children (21).

Depression in children was evaluated with the Turkish version of the "Depression Scale for Children" (22). There are 27 items (3 statements for each item) in the scale. While marking the options, the children were asked to consider their experiences in the previous 2 weeks. The score that can be obtained from the scale varies between 0 and 54, and the cut-off point is 19 points. As the score obtained from the scale increased, the level of depression increases (22).

Statistical Analysis

In this study, the sample size was determined by the effect size calculated over the correlation values between children's DGA and physical activity levels. When the studies in the literature (12) were examined, it was seen that the effect size of the relationship was ρ=0.35. Accordingly, it was determined that 99 children should be included in the study to obtain 95% power with α=0.05 type I error and β=0.05 type II error. The sample size was calculated with the G*Power (Ver. 3.0.10, Franz Faul, Universität Kiel, Germany) package program.

A Pearson chi-square or Fisher's Exact test comparison test was used for the relationships between categorical variables. The Shapiro-Wilk test was used to evaluate whether the data were suitable for normal distribution. Relationships between quantitative variables were examined using the Pearson product-moment correlation test. Correlation coefficients >0.5 were considered a strong correlation; 0.3 to 0.5 was considered a moderate correlation; and 0.2 to 0.3 was considered a weak correlation. The stepwise multiple linear regression analysis was used to determine the variables that have the greatest influence on DGA. Significantly correlated variables with DGA were included in the regression model. Additionally, the regression equation formula of the study was also calculated. Cook's distance and centered leverage value were used to identify and treat outliers. A comparison of normally distributed DGA groups was performed with One-Way analysis of variance (ANOVA) and least significant difference multiple comparison tests. Within the scope of descriptive statistics, mean ± standard deviation was used for numerical variables, number and % values were used for categorical variables. Statistical analysis was performed using the SPSS Windows version 24.0 package program. Any p-value less than 0.05 was considered statistically significant.

RESULTS

Within the scope of the study, 105 children were reached. Six children were excluded because they did not meet the inclusion criteria. The study was performed out with a total of 99 children (Figure 1). The demographic and physical characteristics of the children are shown in Table 1. Of the children, 57 (57.6%) were males and 42 (42.4%) were females. The mean age was 10±1.53 years. According to the DGA scores, 17 (17.2%) children were in the low-risk group, 41 (41.4%) were in the high-risk group, 26 (26.3%) were in the addicted group, and 15 (15.2%) were in the highly dependent group. The mean score of DGA in children was 68.42±20.65; the mean physical activity score was 24.35±7.37; the mean depression score was 23.77±6.09, and the mean walking distance for 2 minutes was 185.21±16.27 m (Table 2).

DGA correlated negative with physical activity level (r=-0.659; p=0.001), a weak positive correlation (r=0.342; p=0.001) with depression, and no correlation with functional capacity (Table 3). There was a correlation between the DGA score and physical activity ($p\leq0.001$) and depression ($p\leq0.001$). In this context, physical activity and depression scores were included as independent variables in the regression model to determine the possible factors for DGA. The stepwise multiple regression analysis demonstrated that the physical activity and depression scores were significant

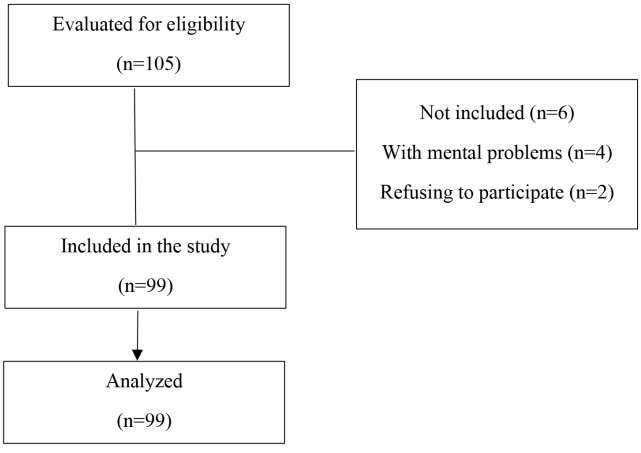

Figure 1. Flowchart of participants

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and independent factors of for DGA with 43.4% of the variance. The regression equation formula for the dependent variable (DGA) was calculated using explanatory variables (physical activity and depression scores) and coefficients. The regression equation formula for DGA is: DGA =95.083 + (-1.651 x physical activity score) + (0.576 x depression score) (Table 4).

Table 1. Demographic, physical, and clinical characteristics of children

Characteristics	
Age (years, $\bar{x}$ ± SD)	10±1.53
Gender (n, %)	
Male	57 (57.6)
Female	42 (42.4)
BMI (kg/m^2 $\bar{x}$ ± SD)	17.77±4.34
Diagnoses (n, %)	
Attention deficit and hyperactivity disorder	20 (20.20)
Oppositional defiant disorder	10 (10.10)
Nocturnal enuresis	4 (4.04)
Tic disorders	4 (4.04)
Siblings of children coming to treatment	61 (61.61)
Education level (n, %)	
Primary school	47 (47.5)
Middle school	52 (52.5)
Mother's education level (n, %)	
Primary-middle school	47 (47.5)
High school	37 (37.4)
University	13 (13.1)
Father's education level (n, %)	
Primary-middle school	43 (43.4)
High school	40 (40.4)
University	15 (15.2)
Digital gaming duration (n, %)	
Half an hour	13 (3.1)
1 hour	20 (20.2)
2 hours	26 (26.3)
3 hours and more	40 (40.4)
Digital gaming group (n, %)	
Low risk group	17 (17.2)
Risky group	41 (41.4)
Dependent group	26 (26.3)
Highly dependent group	15 (15.2)
Tool used for playing digital games (n, %)	
Computer	10 (10.1)
Game console	15 (15.15)
Telephone	52 (52.52)
Tablet	22 (22.22)
Physical activity level (n, %)	
Inactive	9 (9.1)
Low level	47 (47.5)
Moderately active	33 (33.3)
Active	10 (10.1)
Depression (n, %)	
Yes	84 (84.8)
No	15 (15.2)

n: number, $\bar{x}$: mean, SD: standard deviation, %: percentage, kg: kilogram, m: meter, BMI: body mass index

Demographic, physical, and clinical characteristics of children with DGA at different levels were compared. There was no difference between the groups in terms of gender, age, body mass index, and 2MWT. However, it was found that the education level of the father (p=0.014), the education level of the mother (p=0.033), and the duration of playing digital games differed between the groups (p<0.001). Additionally, significant differences were found between the groups in terms of physical activity level (p<0.001) and depression (p=0.002) (Table 5).

DISCUSSION

In this study, different levels of DGA were detected in children. It was determined that DGA had a negative relationship with physical activity level and a positive relationship with depression. It was found that physical activity level and depression have the greatest influence on DGA, whereas these variables explain 43.4% of the variance in the ultrasonography. No relationship was observed between DGA and functional capacity. Additionally, physical activity level was found to be markers of depression DGA. Differences were found in physical activity levels and depression in children with DGA at different levels. Additionally, there is a difference between the education level of the mother, the education level of the father, and the duration of playing digital games in children with DGA at different levels.

The person is diagnosed as "game addict" if they show 5 or more criteria (out of 9) according to the DSM V criteria of the American Psychiatric Association (23). These criteria are constant thoughts of the game in the mind; emotional status such as irritability, anxiety, and sadness when the game is not played; gradually increasing the amount of the game played; not being able to quit the game even if desired; loss of interest in the previously enjoyable activity; continuing to play the game despite the problems related to the psychological state; mislead people about the duration and frequency of the game played; misinformation about people; turning to the game to avoid negative emotions; work, education, and career are in jeopardy because of the game (23). DGA starts when the mind stays with the game even when the person is not playing (24). The number of studies is increasing day by day to understand DGA, which is an increasingly important problem, and to explain its causes and consequences (25,26). Digital gaming duration is an indicator of DGA, and there should be a relationship between DGA (26). In this study, a difference was found between the digital gaming duration in children with DGA at different levels.

Table 2. Descriptive statistics of parameters measured in children

Parameters	$\bar{x}$ ± SD	min-max
Digital game addiction	68.42±20.65	25-108
Physical activity level	24.35±7.37	10.57-41.29
2MWT (m)	185.21±16.27	155-222
Depression	23.77±6.09	8-44

$\bar{x}$: mean, SD: standard deviation, 2MWT: 2-Minute Walk test, m: meter, min: minimum; max: maximum

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Table 3. The relationship between DGA and physical activity level, functional capacity, and depression

		Physical activity level	Functional capacity	Depression
Digital game addiction	r	-0.659**	0.029	0.342**
	p	0.001	0.775	0.001
	n	99	99	99
Physical activity level	r	-	-0.210	-0.347**
	p	-	0.835	0.001
	n	-	99	99
Functional capacity	r	-	-	-0.060
	p	-	-	0.556
	n	-	-	99

DGA: digital game addiction, **the correlation coefficient is significant at the 0.01 level, *the correlation coefficient is significant at the 0.05 level

Table 4. Stepwise multiple linear regression model of DGA

Coefficients[a]						
Model		**Unstandardized coefficients**		**Standardized coefficients**	**t**	**p-value**
		B	**Std. error**	**Beta**		
1	(Constant)	112.909	5.536	-	20.396	<0.001
	Physical activity	-1.818	0.217	-0.648	-8.388	<0.001
2	(Constant)	95.083	10.088	-	9.425	<0.001
	Physical activity	-1.651	0.228	-0.589	-7.256	<0.001
	Depression	0.576	0.275	0.170	2.099	0.038

DGA: digital game addiction
DGA= 95.083 + (-1.651 x physical activity score) + (0.576 x depression score), [a]Dependent variable: digital game addiction, R=0.668; R^2=0.446; adjusted R^2=0.434; p=0.038

In studies on DGA, it is seen that variables such as gender, having/not having a computer, having/not having an internet connection, grade level, education level of parents, academic achievement, and age of the participants are examined (26). Şimşek and Yılmaz (26) found a positive relationship between parental education level and DGA in most of the studies they included in their systematic review (27,28), whereas few studies they reviewed either found no relationship or found a negative relationship (29,30). In this study, it was determined that DGA increased as the education level of the parents decreased. This may be due to the low educational level of the parents and their low technology literacy (30). Therefore, parents may not be aware of the content of the time their children spend in the digital environment and they may not be aware of their purpose (30). In this context, the results related to the education level of the parents cannot be generalized, and this issue should be investigated further with future studies. It is important to determine the factors that cause this outcome and to take preventive measures.

In the literature, studies examining DGA have found conflicting results regarding gender (31-33). While some studies have reported that men have more DGA than women (31,32), some studies have stated that gender is not effective in DGA (33). In this study, the DGA ratio was found to be similar in girls and boys. This may be due to both boys and girls playing games to get away from routine life in the 21st century. Additionally, the lack of significant gender differences may be because both genders have the same access to technological devices (33).

Basha (33) reported that age did not affect DGA in adolescents. Likewise, Frölich et al. (34) stated that DGA did not change with age in adolescents. The results of this study are also compatible with the studies in the literature, and it was observed that the DGA was high in a certain age range. The reason for this may be the easy access of children to technological devices with the developing technology, the sedentary life brought by the pandemic and the negative conditions such as the increase in screen exposure, the influence of individuals from each other and the similar social development (33).

The physical and mental development of active children is positively affected (35); however, it is stated that the rate of children not participating in physical activity is approximately 80% worldwide (22,23). Physical inactivity causes many health problems (cardiovascular diseases, diabetes, obesity, etc.). If the habit of being inactive from childhood continues as the age progresses, individuals become physically inactive in their lives (24). DGA is a risk factor for decreased physical activity level. Marufoğlu and Kutlutürk (11) stated with secondary school students that there was no significant relationship between DGA and physical activity level (11). Hazar et al. (12), on the other hand, found a significant

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negative correlation between DGA and physical activity level in secondary school students. According to Demir and Hazar (36), when the time to play digital games is not restricted, participation in physical activity decreases and performing tasks and meeting needs are disrupted. Additionally, Çakir (35) also stated that the increase in the time allocated to digital games affects the time left for other activities. In this study, it was found that as DGA increased in children, the level of physical activity decreased. With this result, the level of physical activity was found to be different in children with DGA at different levels. Additionally, it was found that the level of physical activity in the highly dependent group was even lower than the others. In this context, taking into account the effects of physical activity, children's physical activity level should be increased, and children's specific exercise programs should be created.

In this study, the 2MWT was used to assess the functional capacity. The results obtained in this test are like those of the 6MWT, and it is an effective evaluation method in terms of reducing fatigue by requiring less walking performance (37). Bohannon et al. (38) administered the 2MWT in 2707 healthy children aged 3-17 years and measured the mean distance as 122.9 m in the 3-year-old children, 200 m in those aged 10-12 years, and 209 m in 16-year-old children. In this study, the 2MWT result was 185.21±16.27 m in children aged 8-12 years. This result agrees with the results reported by Bohannon et al. (38). While studies on DGA generally examine physical activity; functional capacity has not been questioned to the best of our knowledge. In this study, no relationship was found between DGA and functional capacity. There was no difference in the functional capacity when children with different levels of DGA were compared. This result may be

Table 5. Comparison of demographic characteristics, physical activity level, functional capacity, and depression levels according to digital gaming risk groups

	Digital gaming risk groups				
	Low risk group (n=17)	Risky group (n=41)	Dependent group (n=26)	Highly dependent group (n=15)	p-value
Gender (n, %)					
Male	8 (47.1)	20 (48.8)	17 (65.4)	12 (80)	0.121
Female	9 (52.9)	21 (51.2)	9 (34.6)	3 (20)	
Age (years, $\bar{x}$ ± SD)	9.41±1.5	10.02±1.62	10.12±1.51	10.33±1.35	0.413
BMI (kg/m^2, $\bar{x}$ ± SD)	16.88±3.43	17.28±4.15	17.56±4.61	20.51±4.63	0.061
Mother's education level (n, %)					
Primary-middle school	9 (52.9)	18 (43.9)	15 (57.7)	7 (46.7)	0.033
High school	7 (41.2)	21 (51.2)	6 (23.1)	3 (20)	
University	1 (5.9)	2 (4.9)	5 (19.2)	5 (33.3)	
Father's education level (n, %)					
Primary-middle school	6 (35.3)	16 (39)	18 (69.2)	4 (26.7)	0.014
High school	6 (35.3)	20 (48.8)	4 (15.4)	10 (66.7)	
University	5 (29.4)	5 (12.2)	4 (15.4)	1 (6.7)	
Digital gaming duration (n, %)					
Half an hour	7 (41.2)	4 (9.8)	1 (3.8)	1 (6.7)	<0.001
1 hour	8 (47.1)	9 (22)	1 (3.8)	2 (13.3)	
2 hours	2 (11.8)	15 (36.6)	7 (26.9)	2 (13.3)	
3 hours and more	0 (0)	13 (31.7)	17 (65.4)	10 (66.7)	
Physical activity level (n, %)					
Inactive	0 (0)	0 (0)	6 (23.1)	3 (20)	<0.001
Low level	2 (11.8)	19 (46.3)	14 (53.8)	12 (80)	
Moderately active	8 (47.1)	19 (46.3)	6 (23.1)	0 (0)	
Active	7 (41.2)	3 (7.3)	0 (0)	0 (0)	
Functional capacity (m, $\bar{x}$ ± SD)					
2MWT	189.47±20.14	180.39±15.70	187.35±13.10	189.87±15.99	0.090
Depression (n, %)					
Yes	10 (58.8)	34 (82.9)	25 (96.2)	15 (100)	0.002

n: number, $\bar{x}$: mean, %: percentage, SD: standard deviation, BMI: body mass index, 2MWT: 2-Minute Walk test

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related to DGA duration. DGA, which continues for long periods, may result in decreased functional capacity. We think that the functional capacity should be questioned and examined in future studies, since the decrease in functional capacity may also affect the activities of daily living.

Although DGA is not defined as a psychiatric disorder by psychiatry authorities (4), prolonged digital game playing poses a threat to psychological health. Studies have shown that depression, anxiety, and stress accompany DGA (15,39). Mentzoni et al. (15) reported that the level of playing digital games increased with increasing depression and anxiety. Gentile et al. (39) investigated the relationship between DGA and depression in children and young adults and observed that the depression developed in gamers who became addicted. In this study, as DGA increases, the depression increases. Additionally, a difference was found between depression in children with different levels of DGA. In this context, children can be referred to appropriate health professionals for treatment via various methods involving mind-body unity (cognitive behavioral therapy, relaxation training, etc.) and various exercise programs (aerobic exercise, breathing exercise, etc.) for depression.

Study Limitations

This study had some limitations. First, the Primary School Students' Physical Activity Questionnaire was used to measure the physical activity level. For the results to be more objective, physical activity levels could be measured with an objective method such as accelerometry. However, the Primary School Students' Physical Activity Questionnaire was used because it was less costly and easier to apply. The second limitation is that the generalizability of the study results is affected due to the single-center nature of the study. This limitation can be avoided by conducting larger studies in the future.

CONCLUSION

In this study, it was seen that there was a negative relationship between DGA and physical activity level, and a positive relationship between depression. A difference was found between physical activity level and depression in children DGA at different levels. To increase the level of physical activity and reduce depression associated with DGA, children are referred to appropriate health professionals for treatment with various methods including mind-body association and various exercise programs. Families and children should be informed about the potential risks and associated problems of DGA. Additionally, with the results of this study, DGA awareness can be increased among health professionals, parents, and teachers.

Ethics Committee Approval: This cross-sectional and descriptive study was approved by the University of Health Sciences Turkey, Gaziosmanpaşa Training and Research Hospital Clinical Research Ethics Committee (decision no: 128, date: 05.10.2022).

Informed Consent: After the study was explained to the participants and their families who met the inclusion and exclusion criteria and volunteered to participate in the study, the 'Informed Consent Form' was signed.

Peer-review: Externally and internally peer-reviewed.

Author Contributions: Concept - Y.K., F.Ö., U.K.; Design - Y.K., F.Ö., U.K.; Data Collection and/or Processing - Y.K., F.Ö., U.K.; Analysis and/or Interpretation - Y.K., U.K.; Literature Search - Y.K., F.Ö., U.K.; Writing - Y.K.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Kesitsel ve tanımlayıcı tipteki bu çalışma, Sağlık Bilimleri Üniversitesi, Gaziosmanpaşa Eğitim ve Araştırma Hastanesi Klinik Araştırmalar Etik Kurulu tarafından onaylandı (karar no: 128, tarih: 05.10.2022).

Hasta Onamı: Dahil edilme ve dışlanma kriterlerini karşılayan ve çalışmaya katılmaya gönüllü olan katılımcılara ve ailelerine çalışma anlatıldıktan sonra 'Bilgilendirilmiş Onam Formu' imzalatıldı.

Hakem Değerlendirmesi: Editörler kurulu ve editörler kurulu dışında olan kişiler tarafından değerlendirilmiştir.

Yazar Katkıları: Konsept - Y.K., F.Ö., U.K.; Dizayn - Y.K., F.Ö., U.K.; Veri Toplama veya İşleme - Y.K., F.Ö., U.K.; Analiz veya Yorumlama - Y.K., U.K.; Literatür Arama - Y.K., F.Ö., U.K.; Yazan - Y.K.

Çıkar Çatışması: Yazarlar tarafından çıkar çatışması bildirilmemiştir.

Finansal Destek: Yazarlar tarafından finansal destek almadıkları bildirilmiştir.

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