

## The Effect of Game on Peer Bullying and Emotions in Physical Education and Game Lesson\*

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### Abstract

The aim of this study is to examine the effect of educational games on peer bullying and emotion in physical education and game lessons. The study group consisted of 19 4th-grade primary school students (9 girls and 10 boys) from the 2023-2024 academic year, selected through criterion sampling. A game-based activity was implemented in physical education and game lessons for eight weeks. The Games and Emotions Scale for Children and the Peer Bullying Scale were used for data collection. The study followed a within-group experimental design, with pretest, posttest, and follow-up measurements. In data analysis, one-way ANOVA for repeated measures, one-way ANOVA for independent samples, and independent samples t-test were applied. The findings revealed that playing games in physical education and game lessons reduced peer bullying among children but did not have a significant impact on their emotional states. This effect was sustained in the retention measurements. Furthermore, no significant differences were found in peer bullying and emotional states based on gender and participation in sports courses outside school. Except for the bully sub-scale, no significant difference was observed in peer bullying concerning time spent on the internet. As a result, the study highlights the importance of educational games in reducing and preventing peer bullying. Additionally, integrating traditional games into the curriculum may help decrease peer bullying while improving students' social skills and empathy levels.

**Keywords:** Peer bullying, Emotions, Educational games, Physical education and games

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## INTRODUCTION

In addition to providing children with fun time, digital games contain elements of violence, negatively affect children's behaviour and children can access these games more easily every day. In studies, it has been observed that as a result of the problematic use of technology, the elements of violence in virtual games and social media cause negativities such as insensitivity to violence, less empathy and aggressive thoughts, increased bullying behaviours and psychological adjustment problems among students, negative effects on students' development and socialisation, and decreased social sensitivity (Çetin, 2023; Erdener et al., 2019; Funk et al., 2004). Similarly, teachers have stated that they have witnessed various negative behaviors in children, such as difficulty communicating with peers, inability to participate in games and groups, inability to express their emotions in a healthy way, inability to accept their mistakes, lack of empathy, screen addiction, and bullying their peers (Koç, 2022). Bullying or victimisation is defined as aggressive behaviours that occur repeatedly and over time by a person or group (bully) against a single person or group (victim) physically, socially or verbally by intentionally abusing power to hurt, injure or disturb another person (Lee, 2004; Olweus, 1993). Bullying includes behaviours such as name-calling, hitting, threatening, mocking and excluding. In general, bullying behaviours at school occur more frequently in corridors and washrooms where adult supervision is limited (Andreou et al., 2015).

Peer bullying causes students to feel insecure in school, to feel worthless and inadequate in social relationships, to have difficulty in revealing their own capacity, behaviours such as anger, anxiety and anxious behaviour are observed in students, it damages their self-confidence and self-esteem, and can lead people to depression (Gümüş-Selek et al., 2022; Yaman et al., 2011; Yelboğa & Koçak, 2019). According to Gökler (2009), bullying behaviours should be considered as a problem that hinders the development of self-regulation, the control of emotional states, the progress of human relations, the development of empathy skills, and the learning of skills such as problem solving and strategising.

High levels of depression, hyperactivity/ inattention and emotional behaviours are observed in individuals who are subjected to peer bullying in schools compared to other individuals (Berchiatti et al., 2022). According to Rigby (2003), children with low self-esteem attract the attention of the bully, and the resulting bullying further reduces the self-esteem of the victim student. It is seen that negative behaviours such as teasing, gossiping, hitting, fighting, intimidating and threatening, which are frequently encountered in schools, adversely affect the social interaction of the student with his/her environment (Kalkan et al., 2019). Since even just witnessing bullying behaviours can cause long-lasting negative effects on the person, it should definitely be noticed early and negativities should be reduced by using appropriate methods and plans (Gökler, 2009). In order to reduce bullying behaviours, it is extremely important for families and educators to receive training on these issues so that aggression can be identified and understood from an early age, and behaviours can be developed to improve students' social skills and create safe environments (Jansen et al., 2011; Repo & Sajaniemi, 2015; Rose et al., 2014). Some measures taken to prevent peer bullying include methods such as organising seminars for students, parents and teachers, and directing potential bullies and victims to social-cultural activities (Aksoy, 2019). There are studies in which school-based intervention programs

containing games have been developed to prevent peer bullying behaviors (Clarkson et al., 2016; Kartal & Bilgin, 2007; Midgett & Doumas, 2016; Takış, 2006). In their study, Toraman et al. (2021) conducted a systematic review of school-based intervention programs for preventing peer bullying and concluded that education programs implemented in schools across different cultures and educational systems have been effective in preventing bullying behaviors. In their study, Karatas and Ozturk (2020) evaluated the effectiveness of a bullying prevention program developed in primary schools and concluded that the program was effective in reducing the proportion of students who were either bullies or victims of bullying. In this context, educational game activities implemented in schools are among the studies carried out to prevent peer bullying. Play is the most natural learning method with or without a specific purpose, with or without a specific purpose, with or without certain rules, affecting all areas of development of the child, involving the person willingly and with pleasure, with or without tools (Koçyiğit et al., 2007).

Children develop language skills by communicating with their peers, relax emotionally, control their emotional reactions, get away from their problems, develop feelings such as trust, love and admiration (MEB, 2020), relax both physically and spiritually, and thus develop psychologically as well as physically (Küçükibiş et al., 2022; Ulutaş, 2011). The fact that there is no grade anxiety in the physical education and game lesson enables the student to be more active in the lessons and to reveal his/her simplest form. In this way, the teacher has the opportunity to observe behaviours such as shyness, anger control, aggressive behaviours in the student and make the necessary intervention (Yücekaya et al., 2023). With the intervention programmes aimed to be implemented in physical education and game lessons, it is aimed to improve students' feelings and behaviours such as respecting other individuals, helping, developing self-control and leader skills, feeling belonging to their environment, being fair, etc., and to reduce and eliminate negative feelings and behaviours such as being stressed, anxious, swearing, resorting to violence, harassment and similar negative feelings and behaviours (Yücekaya et al., 2023).

Participation in sportive activities in physical education and game lessons improves cooperation and solidarity among children and increases awareness of obeying rules, sharing, helpfulness, and tolerance (Karafil et al., 2017). The physical education and game lesson aims to develop primary school students' physical, mental, personal, emotional, and social skills through play and participation in physical activities (MEB, 2020). The program contributes to the improvement of students' fundamental movement skills, healthy living habits, and social skills. In terms of the future mental health of the society, emotional sharing of children during play is of great importance (Koçyiğit et al., 2007). The age range of 6-12 years is considered a period in which emotionally significant relationships are formed, cognitive and emotional development reaches a certain level, emotions and behaviors are regulated, and peer groups are established (Kadim, 2023). Since children in this age group have not yet entered the complexities of adolescence, the effects of interventions such as play can be observed, and strategies for preventing peer bullying can be developed. During play, children experience situations such as decision-making, social interaction with other students and get to know themselves (Ayranç & Aydın, 2022). One of the obstacles in front of the child's self-knowledge during play is peer bullying. Bullying behaviours affect the future of the student as well as shaping the future of the society. For this reason, it is important to increase studies to reduce peer bullying and contribute to the field. In general,

studies on preventing peer bullying have been carried out at kindergarten and high school levels, and studies at primary school level are limited. Studies conducted in the preschool period (Özen & Aslan, 2024; Yıldız et al., 2023) indicate that bullying behaviors are more physical and direct due to children's underdeveloped social skills. In middle school and high school, however, bullying (Aslan & Polat, 2023; Çakır, 2017; Polat & Sohbet, 2020) can manifest in more complex and relational forms. These differences necessitate the development of distinct intervention strategies for each age group. This study examined the effects of play on emotional states and peer bullying at the elementary school level.

In the light of this information, the aim of the study is to determine whether the game played in physical education and game lessons reduces peer bullying and to what extent it affects positive or negative emotional states in children. The study will seek to answer the question, "What is the effect of the games played in physical education and game lessons on peer bullying and emotional state in children?". Answers will also be sought for the sub-problems: "Is there a significant difference in students' pretest, posttest, and retention test scores on peer bullying and emotional state based on gender, participation in sports courses out side of school, and time spent on the internet?" As a result of the study, it is aimed to contribute to the studies to be carried out in schools to prevent peer bullying and to improve emotional states.

## **METHOD**

### **Research Model**

In this study, since the effect of the game played in physical education and game lessons on peer bullying and emotions in primary school students was examined, the research was designed in within-group experimental design. Within-group experimental design is also known as repeated measures design. These are the designs in which the same subjects are compared under different experimental conditions (Büyüköztürk et al., 2011).

### **Research Groups**

The study group of the research consists of 4th grade students studying in primary schools affiliated to the Ministry of National Education in Tokat in the 2023-2024 academic year. The study group consists of a total of 19 students, 9 (47%) of whom are girls and 10 (53%) of whom are boys, determined by criterion sampling, one of the purposeful sampling methods. As the criteria for inclusion in the study group, it was taken into consideration that the participants were students at the specified age and grade level, that they volunteered to participate in the 8-week game activity and that the informed consent form was signed by their parents, that they did not have any physical or psychological health problems that would prevent them from participating in the game activity, and that they were capable of understanding and correctly Buffer in the peer bullying, game and emotion scales used in the study. As the criteria for exclusion of the participants from the study group; the presence of serious physical health problems (for example, serious musculoskeletal system problems) that may prevent them from participating in the game activity, the presence of psychological health problems at a level that cannot fulfil the mental and physical activities required by the game activity (for example, severe depression, anxiety disorder), not meeting the minimum participation rate determined during the game activity (for example 75%) were taken into consideration. While determining the sampling, since there was

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no reference study in the literature for the study, the effect size was defined as medium level (0.50) according to Cohen et al. (2018), the power of the measurement tool was defined as the minimum reference value of 0.80 and the margin of error was defined as 0.05, and power analysis was performed with the Gpower 3.1 programme. Demographic findings about the participants are given in Table1.

**Table 1.** Demographic findings of the participants

Variables	Categories	N	%
<b>Gender</b>	Girl	9	47.4
	Boy	10	52.6
<b>Participation in Sports Course Status</b>	No Sport Course	10	52.6
	Sport Course Available	9	47.4
<b>Online Time Spent</b>	One Hour	9	47.4
	More than One Hour	10	52.6

### Data Collection Tools

Personal Information Form, Peer Bullying Scale and Games and Emotions Scale for Children were used to collect the data related to the study. Information about the measurement tools applied in the study is given under their titles.

#### *Personal Information Form*

In the personal information form, questions requiring a decision on whether the student should be included in the study, aside from demographic information (age, gender, etc.) such as serious musculoskeletal problems, psychological health issues that prevent fulfilling the mental and physical activities required by the game activity, etc., were answered by the student's guardian.

#### *Peer bullying scale*

The scale developed by Kutlu and Aydın (2010) to determine the bullying behaviours observed in children and adolescents' relationships with their peers consists of 19 items in 5-point Likert type. These 19 items are grouped into 3 subscales as neutral (buffer) items (4 items), victim items (8 items), bully items (6 items). Cronbach's alpha reliability coefficients of the subscales are .83, .86, and .70 for bully, victim, and buffer, respectively. In our study, Cronbach's alpha internal consistency coefficients of the subscales were calculated as .77 for buffer, .75 for victim, and .87 for bully. Examples of items for the subdimensions of the scale are provided below.

**Neutral (buffer):** *I like to sing.*

*I like to participate in class activities.*

**Victim:** *Other kids get angry/angry with me.*

*Other kids spoil my game.*

**Bully:** *I punch/hit other kids.*

*I threaten other kids to do what I want.*

#### *Games and emotions scale for children*

Ayrancı and Aydın (2022) adapted the "Games and Emotions Scale for Children (GES-C)" developed by Alcaraz-Muñoz et al. (2022) to Turkish culture in order to determine the emotional intensity and emotional experiences of students after the games they played. The measurement tool is capable of contributing to researchers, practitioners and teachers who investigate cognitive, affective and psychomotor skills of children aged 8-12 years in gamified learning

environments to determine the emotional intensity and experiences of students after learning and play activities. The scale consists of a total of 9 items rated on a 5-point Likert scale and two factors. When examining the distribution of the items according to the factors, the first factor consists of 4 items related to positive emotions (cheerful, happy, enjoyable, and passionate/enthusiastic), while the second factor consists of 5 items related to negative emotions (scared, sad, excluded, ashamed, and angry). When calculating the scale score, the average for each of the subscales is taken. After reliability and validity analyses, Cronbach's alpha internal consistency values of the scale consisting of 9 items were calculated as .81 for the first factor including positive emotions and .76 for the second factor consisting of five items and including negative emotions. In our study, Cronbach's alpha internal consistency coefficients of the subscales were calculated as .71 for the positive emotion sub-scale and .77 for the negative emotion sub-scale.

### ***The game applied to children in our research***

The game played by children in the research is "Rusty Tag," one of the traditional children's games. The game was played during one lesson hour of physical education and games class every week. Before starting the game, the children were instructed to do warm-up exercises for 5-10 minutes. "Rusty Tag" is an offense game. The game was played in groups of 8-9 people, divided into two different playing fields (one group in one half of the carpet field, and the other group in the other half). Two "taggers" were selected from each group, and all students, except the taggers, wore vests. The taggers passed the ball between themselves and tried to touch the ball to their friends wearing vests. The student who was touched by the ball removed their vest and joined the taggers, and the game continued until the last student who was not touched by the ball remained. The tagger can take a maximum of three steps with the ball and must then throw the ball to the other tagger. Taggers using wheelchairs can hold the ball in their laps for a longer period. Initially, a basketball was used in the game. After playing with the same ball for two weeks, the game switched to a smaller ball, a soccer ball, and the game became more difficult by switching to a smaller ball every two weeks. After playing the game each week, the game was evaluated, and tactics related to the game were developed. Various rules, such as "the player who steps on the line or goes out of the line becomes the tagger" and "the student who wins the game becomes the tagger in the next game," were added to the game by the students. The "Rusty Tag" game helps students develop their motor skills by performing movements that require speed and agility, strengthening basic movement skills such as balance, quick direction changes, and running. It can also aid in the development of social skills like cooperation, teamwork, and role-sharing. The game enhances students' decision-making and strategic thinking abilities. By facing situations of success and failure in the game, students can improve their ability to manage emotional reactions and cope with stress.

### **Ethical Approval**

Before the data collection process, permission was obtained from the ethics committee of Istanbul Topkapı University with number 2024/2 and date 05/03/2024. Informed consent was obtained from the school administration and parents before starting the research to include the students in the study. The purpose of the research was explained to the parents, data confidentiality was guaranteed, and it was clarified that participation in the study was voluntary. The students were informed that they could leave the activity at any time they wished.

## Collection of Data

In the first stage, the Personal Information Form to be applied to the students was prepared. Necessary information was given to the parents and consent forms were obtained from the parents. The students were given the necessary information before the application, and before the game activities, the Personal Information Form and the Peer Bullying Scale were applied and pretest application was made and preliminary measurements were taken. In order to protect personal information, the students assigned themselves pseudonyms consisting of fruits and vegetables and filled in the scales with their pseudonyms throughout the measurements. After the preliminary measurements were taken, the "Rusty Tag" game was played with the students in the physical education and game lesson for eight weeks. After the game activity in the first week, the Games and Emotions Scale for Children was administered. After the eight-week game activity was completed, the Peer Bullying Scale and the Games and Emotions Scale for Children were administered and posttest measurements were recorded. Four months after the end of the play activity, the Peer Bullying Scale and the Games and Emotions Scale for Children were administered again to determine the Retention Test of the results of the experimental process and to understand whether there was a change in peer bullying and emotional states. The data obtained were transferred to SPSS programme.

## Analysis of Data

Before the data analysis, the data were made ready for analysis. Firstly, missing data and erroneous data were checked for outliers. Then, the suitability of the data for normal distribution was analysed. Whether the data were normally distributed or not was analysed by considering the criterion of kurtosis-skewness coefficients being between -1 and +1 and it was determined that the data were normally distributed. Homogeneity of variance between groups was tested. After all the assumptions required for the analysis were met, one-way ANOVA for repeated measures, one-way ANOVA for independent samples and independent sample T test were applied in the data analysis.

## FINDINGS

The results obtained as a result of one-way ANOVA for repeated measures in order to answer whether there is a significant difference between the pretest, posttest and retention test peer bullying scores of the game in physical education and game lesson are given in Table 2.

**Table 2.** ANOVA test results of students' pretest, posttest and retention test scores for peer bullying scale sub-scale scores

Sub-scales	Variance Source	Sum of Squares	Sd	Squares Mean	F	p	$\eta^2$	Significant Difference
Victim	Measurements	13.19	2	6.59	20.99	.001*	.54	Pretest> Posttest
	Error	11.31	36	.31				
	<b>Total</b>	24.5	38	6.91				
Bully	Measurements	7.11	2	3.55	8.22	.001*	.31	Pretest>Retention> Posttest
	Error	15.56	36	.43				
	<b>Total</b>	22.67	38	3.9				
Neutral (Buffer)	Measurements	1.91	2	.96	4.65	.016*	.21	Posttest>Pretest
	Error	7.42	36	.21				
	<b>Total</b>	9.33	38	1.16				

\*p<0.05

According to the results of the analysis of whether the applied game changed the peer bullying sub-scale scores of the students, a statistically significant difference was found between the averages obtained from the victim sub-scale ( $F_{(2,36)} = 20.99, p < .05, \eta^2 = .54$ ). When the eta square value is analysed, it is seen that the effect size is high. According to the results of multiple comparisons regarding the measurement of the differentiation, it was seen that there was a significant difference between the posttest and the pretest. Mean posttest score of being a victim ( $M=1.65$ ) than the mean pretest score ( $M=2.49$ ) was lower. This finding shows that there was a significant decrease in the first calculated victimisation scores of the students as a result of the game played.

A statistically significant difference was found between the averages obtained from the bully sub-scale ( $F_{(2,36)} = 8.22, p < .05, \eta^2 = .31$ ). When the eta square value is analysed, it is seen that the effect size is high. According to the and retention test. Bully sub-scale pretest scores ( $M=2.33$ ) posttest ( $M=1.15$ ) and retention test scores ( $M=1.81$ ) was higher; at the same time, it was concluded that the retention test scores were higher than the posttest scores. It is seen that the mean pretest score of being a bully is higher than the mean posttest score. This finding shows that there was a significant decrease in the first calculated bullying scores of the students as a result of the game played. At the same time, the fact that the mean score of the retention test was higher than the mean score of the posttest showed that the effect of the game decreased over time and the bullying behaviour increased again. Multiple comparison results, there was a significant difference between the pretest, posttest.

A statistically significant difference was found between the averages obtained from the neutral (buffer) sub-scale ( $F_{(2,36)} = 4.65, p < .05, \eta^2 = .21$ ). When the eta square value is analysed, it is seen that the effect size is high. According to the results of multiple comparisons on which measurement the differentiation originated from, it was seen that there was a significant difference between the posttest and the pretest. The mean pretest score of being neutral ( $M=4.04$ ) than the mean posttest score ( $M=4.47$ ) was lower. This finding shows that there was a significant increase in the first calculated neutrality scores of the students as a result of the game played.

The results obtained at the end of the one-way ANOVA for repeated measures, which was conducted to find out whether there was a significant difference between the pretest, posttest and retention test scores for the sub-scale scores of the game and emotions scale, are given in Table 3.

**Table 3.** ANOVA test results of pretest, posttest and retention test scores of students' games and emotions scale sub-scale scores

Sub-scales	Variance Source	Sum of Squares	Sd	Squares Mean	F	p	$\eta^2$
Positive	Measurements	.04	2	.02	.078	.93	.004
	Error	8.05	36	.22			
	<b>Total</b>	24.5	38	6.91			
Negative	Measurements	.31	2	.15	.467	.63	.025
	Error	11.85	36	.33			
	<b>Total</b>	22.67	38	3.99			

\* $p < 0.05$



According to the results of the analysis of whether the applied game changed the sub-scale scores of the games and emotions scale of the students, no statistically significant difference was found between the averages obtained from the positive emotion sub-scale ( $F_{(2,36)} = .078$ ,  $p > .05$ ,  $\eta^2 = .004$ ). When the eta square value is analysed, it is seen that the effect size is low. No statistically significant difference was found between the averages obtained from the negative emotion sub-scale ( $F_{(2,36)} = .467$ ,  $p > .05$ ,  $\eta^2 = .025$ ). When the eta squared value is analysed, it is seen that the effect size is at a moderate level. This finding suggests that, as a result of the game-based intervention, there was no significant change in the initially measured positive and negative emotional states of the students over time.

The results obtained as a result of the independent sample T test, which was conducted to find out whether there was a significant difference between the students' peer bullying pretest - posttest - retention test scores according to gender, are given in Table 4.

**Table 4.** Independent sample T test results of peer bullying scale scores according to gender variable

Sub-scales	Gender	N	$\bar{x}$	S	Sd	t	p
Victim Pretest	Girl	9	2.42	.96	17	-.36	.72
	Boy	10	2.55	.64			
Victim Posttest	Girl	9	1.38	.44	17	-1.49	.15
	Boy	10	1.89	.94			
Victim Retention Test	Girls	9	2.31	.95	17	.30	.77
	Boy	10	2.18	.93			
Bully Pretest	Girl	9	2.02	1.18	17	-1.23	.24
	Boy	10	2.60	.87			
Bully Posttest	Girl	9	1.00	.00	17	-1.56	.14
	Boy	10	1.28	.55			
Bully Retention Test	Girl	9	1.67	.89	17	-.83	.44
	Boy	10	1.93	.46			
Buffer Pretest	Girl	9	4.06	.90	17	.08	.94
	Boy	10	4.03	.70			
Buffer Posttest	Girl	9	4.64	.59	17	1.14	.27
	Boy	10	4.33	.61			
Buffer Retention Test	Girl	9	4.50	.87	17	.77	.45
	Boy	10	4.23	.68			

\* $p < 0.05$

As a result of the examination of the students' peer bullying scale sub-scales pretest, posttest and retention test scores according to gender, no statistically significant difference was found between the averages of girls and boys ( $p > .05$ ).

The results obtained as a result of the independent sample T test, which was conducted to find out whether there was a significant difference between the students' games and emotions scale sub-scale pretest-posttest-retention test scores according to gender, are given in Table 5.

**Table 5.** Independent sample T test results of game and emotion scale subscale scores according to gender variable

Sub-scales	Gender	N	$\bar{X}$	S	Sd	t	p
Positive Pretest	Girl	9	4.28	.81	17	-0.76	.46
	Boy	10	4.50	.44			
Positive Posttest	Girl	9	4.64	.49	17	1.12	.28
	Boy	10	4.28	.86			
Positive Retention Test	Girl	9	4.56	.583	17	.91	.38
	Boy	10	4.25	.84			
Negative Pretest	Girl	9	1.42	.52	17	-1.44	.17
	Boy	10	1.92	.91			
Negative Posttest	Girl	9	1.56	.62	17	-0.15	.89
	Boy	10	1.60	.70			
Negative Retention Test	Girl	9	1.62	.78	17	-0.69	.50
	Boy	10	1.88	.84			

\*p<0.05

As a result of the examination of the pretest, posttest and retention test scores of the students' games and emotions scale sub-scales according to gender, no statistically significant difference was found between the averages of girls and boys (p>.05).

The results obtained as a result of the independent sample T test conducted to find an answer to whether there is a significant difference between the pretest, posttest and retention test scores of the students' peer bullying sub-scales according to their participation in out-of-school sports courses are given in Table 6.

**Table 6.** Independent sample T test results of peer bullying scale scores according to the variable of participation in sports courses outside school

Sub-scales	Sport Course	N	$\bar{X}$	S	Sd	t	p
Victim Pretest	None	10	2.34	.78	17	-0.87	.40
	There is	9	2.65	.79			
Victim Posttest	None	10	1.56	.67	17	-0.48	.64
	There is	9	1.74	.91			
Victim Retention Test	None	10	2.01	.92	17	-1.14	.27
	There is	9	2.49	.89			
Bully Pretest	None	10	2.08	1.10	17	-1.07	.30
	There is	9	2.59	.97			
Bully Posttest	None	10	1.22	.53	17	.75	.47
	There is	9	1.07	.22			
Bully Retention Test	None	10	1.72	.73	17	-0.59	.57
	There is	9	1.91	.68			
Buffer Pretest	None	10	2.34	.78	17	-0.67	.52
	There is	9	2.65	.79			
Buffer Posttest	None	10	1.56	.67	17	-0.36	.72
	There is	9	1.74	.91			
Buffer Retention Test	None	10	2.01	.92	17	-1.42	.17
	There is	9	2.49	.89			

\*p<0.05

As a result of examining the pretest, posttest and retention test scores of the students' peer bullying scale sub-scales according to the variable of participation in out-of-school sports courses, no statistically significant difference was found between the averages of students who participated in out-of-school sports and those who did not (p>.05).

The results obtained as a result of the independent sample T test conducted to find an answer to whether there is a significant difference between the pretest - posttest - retention test scores of the students' games and emotions scale sub-scales according to their participation in a sports course outside the school are given in Table 7.

**Table 7.** Independent sample T test results of games and emotions scale sub-scale scores according to the variable of participation in sports courses outside school

Sub-scales	Sport Course	N	$\bar{X}$	S	Sd	t	p
Positive Pretest	None	10	4.30	.76	17	-.68	.51
	There is	9	4.50	.47			
Positive Posttest	None	10	4.20	.81	17	-1.67	.12
	There is	9	4.72	.49			
Positive Retention Test	None	10	4.20	.86	17	-1.25	.23
	There is	9	4.61	.50			
Negative Pretest	None	10	2.04	.90	17	2.37	<b>.03*</b>
	There is	9	1.29	.32			
Negative Posttest	None	10	1.80	.78	17	1.66	.12
	There is	9	1.33	.35			
Negative Retention Test	None	10	1.84	.86	17	.46	.65
	There is	9	1.67	.77			

**\*p<0.05**

As a result of examining the pretest, posttest and retention test scores of the students' games and emotions scale sub-scales according to the variable of participation in out-of-school sports courses, no statistically significant difference was found between the averages of the students who participated and did not participate in out-of-school sports, except for the negative emotion pretest mean score (t= 2.372, p<.05).

The results obtained as a result of the independent sample T test, which was conducted to find out whether there was a significant difference between the students' peer bullying pretest - posttest - retention test scores according to the daily time spent on the Internet, are given in Table 8.

**Table 8.**Independent sample T test results of peer bullying scale sub-scales scores according to the variable of daily time spent on the internet

Sub-scales	Daily Time Spent on the Internet	N	$\bar{X}$	S	Sd	t	p
Victim Pretest	One Hour	9	2.38	.90	17	-.58	.57
	More than One Hour	10	2.59	.69			
Victim Posttest	One Hour	9	1.56	.47	17	-.47	.65
	More than One Hour	10	1.73	.99			
Victim Retention Test	One Hour	9	2.14	.78	17	-.43	.67
	More than One Hour	10	2.33	1.06			
Bully Pretest	One Hour	9	1.63	.63	17	-3.52	<b>.00*</b>
	More than One Hour	10	2.95	.95			
Bully Posttest	One Hour	9	1.06	.17	17	-.94	.36
	More than One Hour	10	1.23	.55			
Bully Retention Test	One Hour	9	1.56	.51	17	-1.56	.14
	More than One Hour	10	2.03	.78			
Buffer Pretest	One Hour	9	3.78	.87	17	-1.43	.17
	More than One Hour	10	4.28	.64			
Buffer Posttest	One Hour	9	4.39	.57	17	-.57	.58
	More than One Hour	10	4.55	.65			
Buffer Retention Test	One Hour	9	4.11	.84	17	-1.35	.20
	More than One Hour	10	4.58	.66			

**\*p<0.05**

As a result of examining the pretest, posttest and retention test scores of the students' peer bullying sub-scales according to the variable of time spent on the internet per day, no statistically significant difference was found between the averages of the students who spent one hour or more on the internet in the victim and neutral (buffer) sub-scales ( $p > .05$ ). However, in the sub-scale of being a bully, it was concluded that there was a significant difference in favour of the students who spent more than one hour on the internet daily in the pretest measurements ( $t = -3.52$ ,  $p < .05$ ). It is seen that the bullying levels of the students who spend more than one hour on the internet daily before the game are higher than the students who game for one hour a day, and the bullying levels after the game do not differ according to the time spent on the internet in the posttest and retention measurements. In other words, it is seen that the game reduces peer bullying in individuals who spend more time on the internet ( $p > .05$ ).

The results obtained as a result of the independent sample T test conducted to find an answer to whether there is a significant difference between the pretest, posttest and retention test scores of the sub-scales of the game and emotion scale according to the daily time spent on the internet are given in Table 9.

**Table 9.** Independent sample T test results of game and emotion scale sub-scales scores according to the daily time spent on the internet variable

Sub-scales	Daily Time Spent on the Internet	N	$\bar{X}$	S	Sd	t	p
Positive Pretest	One Hour	9	4.22	.78	17	1.14	.27
	More than One Hour	10	4.55	.45			
Positive Posttest	One Hour	9	4.33	.70	17	-.65	.53
	More than One Hour	10	4.55	.75			
Positive Retention Test	One Hour	9	4.19	.65	17	1.15	.27
	More than One Hour	10	4.57	.78			
Negative Pretest	One Hour	9	1.64	.68	17	-.21	.84
	More than One Hour	10	1.72	.88			
Negative Posttest	One Hour	9	1.62	.71	17	.27	.79
	More than One Hour	10	1.54	.61			
Negative Retention Test	One Hour	9	1.64	.75	17	-.58	.57
	More than One Hour	10	1.86	.86			

\* $p < 0.05$

As a result of examining the pretest, posttest and retention test scores of the students' sub-scales of the game and emotion scale according to the time spent on the internet per day variable, no statistically significant difference was found between the averages of the students who spent one hour or more on the internet ( $p > .05$ ).

## DISCUSSION and CONCLUSION

When the findings obtained in the study were examined, there was a significant difference between pretest, posttest and retention test in the sub-scales of peer bullying. According to the measurements, being a bully was high in the pretest measurement, being a bully was low in the posttest measurement, low in the follow-up measurement, but slightly higher than the posttest measurement. It was concluded that there was a significant decrease in peer bullying as a result of the 8-week educational game activity after the pretest measurement. However, an increase in

peer bullying was observed again in the four months after the educational game activity. The effect of the game on reducing peer bullying decreased. Based on the findings, it can be said that playing games reduces children's tendency to show bullying behaviour. In the victimisation sub-scale, while the students' victimisation levels were high before the game, it was observed that the level of victimisation decreased in the post-game measurements. In the neutral (buffer) sub-scale, the average of the students who were neutral before the game increased after the game. When the literature is examined, Arslan and Akin (2016) found a significant difference between the mean scores of peer bullying in the pretest, posttest and follow-up measurements in the experimental and control groups. These findings coincide with the findings of our study. Mancilla-Caceres et al. (2014) developed a new computer game-based method to examine peer aggression and victimisation in classrooms and revealed that aggressive individuals use various strategies in the game with different levels of success. Moazen and Zarech (2016), in their study to design educational games based on the concept of respect and to examine the effectiveness of these games in reducing physical bullying levels of primary school students, revealed that respect-based games are an effective strategy in preventing physical bullying in students. Kriglstein et al. (2020), in their study in which they developed two educational game prototypes that put them in the role of an observer in order to raise awareness about the consequences of bullying among adolescents, concluded that students who were victims of bullying were willing to talk about their feelings, share their experiences and were not afraid to seek help after the game. Different from the findings of our study, Kolic-Vehovec (2019) conducted an experimental study with 345 students between the ages of 12 and 14 to improve bystanders' helping behaviours in bullying situations. In an experimental study consisting of one experimental group and two control groups, no difference was observed in students' bullying situations after playing the game. This information shows that the initial success of educational games in changing children's bullying behaviors faces challenges in terms of sustainability after a certain period. It can be said that educational games are effective in the short term in reducing bullying and victimization, but it is uncertain whether this effect continues in the long term.

When the other findings of the study were analysed, it was concluded that negative and positive emotional states did not differ before and after the game. Game learning is an innovative strategy that encourages students to actively participate and develop their emotions (Jabbar & Felicia, 2015) and the reason for this is stated to be reward and feedback (Sadler et al., 2013). Positive emotions can encourage effort and Retention Test in the game, while negative emotions such as sadness, anxiety, frustration, and boredom can reduce engagement in the game (Pekrun et al., 2007). In addition, game and task difficulties may be perceived differently by each student. Excessive difficulty in the game may create a preventive effect instead of encouraging participation (Ke & Abras, 2013). Students may be disappointed when they make mistakes in the game or rejoice when they succeed. Therefore, it can be said that students experience distinctly positive and negative emotions with games. Students' emotions may change over time as the novelty of the game decreases and after playing a few games, or the effect may decrease. Therefore, it is important to consider whether the games actually maintain their effects and results over time (Jabbar & Felicia, 2015). In the light of this information, in our study, it can be said that the fact that the students played the same game for a long time due to their developmental periods caused them to get bored. In addition, it can be said that the game is not at a level of difficulty that will change the emotional states of the students. Çil and Sefer (2021) concluded in

their research that children get bored when they play the same games all the time and want to play different types of games.

As another finding of our study, when peer bullying was analysed according to gender, no significant difference was found between the averages of boy and girl students. Gender norms are defined by society as social expectations for appropriate behaviours for men and women (Hellström & Beckman, 2020). These gender norms often guide actions in society, school, sports clubs, or any other environment where young girls and boys are present. Boys and girls worry, react and experience differently when they face problems with the norms of society (Hellström & Beckman, 2020). When bullying is considered as a strong social control process, bullies may seek power and leadership in the peer group. In the sample of our study, it can be said that girls and boys have similar experiences and leadership characteristics against peer bullying. When the literature is examined, similar to the findings of our study, Kshirsagar et al. (2007) found no significant difference in the bullying of girl students compared to boys students. Hartati et al. (2020), in their study, stated that although there was no relationship between bullying behaviours and gender, boys were more likely to engage in physical bullying. There are other studies that support the findings of our study (Ural et al., 2022). Unlike the findings of our study, there are studies indicating that boys students are more likely to be bullies and victims than girl students (Totan & Kabakçı, 2010). Craig et al. (2009) compared the rates of bullying and victimisation by age between boys and girls in 40 countries and concluded that boys are bullied more than girls. Casper and Card (2017) revealed in their study that boys were more significantly victimised (directly, physically) than girls. In a meta-analysis study conducted by Cook et al. (2010), it was found that boys were more likely to be bullies than girls in gender and bully, victim and bully/victim roles. Gender norms may play an important role in the formation and transmission of bullying behaviors, but these findings indicate that gender alone is not a decisive factor in determining the intensity or frequency of bullying. This suggests that bullying is influenced by many other factors, such as social pressures, group dynamics, and individual characteristics, independent of gender. The impact of gender should be considered within a broader social context, interacting with other societal factors. Therefore, although differences may exist in the bullying experiences of boys and girl students, these differences are generally shaped by specific social structures and norms.

As another finding of our study, it was concluded that the pretest, posttest and retention test scores of students' emotional states did not differ according to gender. Regardless of gender, it is stated that regulation of emotions is related to social competence and students with social competence are children who can control emotions during play (Fabes et al., 1999). It has been stated that students who cannot cope with their negative and intense emotions exhibit more aggressive behaviours (Eisenberg, 2000). In our study, it can be said that the game did not make a difference in the social competences of the students to regulate their emotions and they were able to control their emotions in a similar way. Unlike the findings of our study, there is a predominance in boys in terms of negative relationship with peers, lack of sharing their feelings and tendency to bullying (Uğurlu et al., 2020). In Turkish culture, boys are supported in exhibiting more aggressive behaviours, while girls are more often left behind and passive. This causes boys students to exhibit the violent behaviours they have learned from their role models during socialisation against their peers (Atik & Kemer, 2008). The results obtained indicate that

emotional regulation is associated with social competence, and that students, regardless of gender, are able to control their emotions in a similar way. This suggests that the development of students' social and emotional skills shapes in similar ways, independent of gender norms and societal expectations. Additionally, in Turkish culture, the tendency for boys to display more aggressive behaviors reflects how socialization processes reinforce these behaviors, indicating that boys may be more prone to peer bullying in this context. These findings highlight that bullying is not solely a gender-related issue but should be considered within a broader societal framework.

It was found that peer bullying and emotional states of students did not differ according to their participation in sports outside of school. In sports environments, peer bullying levels vary according to the type of sport and participant role. High competition environments in sports, negative effects of coaches, lack of supportive club culture and problems in locker rooms may create more favourable conditions for bullying. In our study, the fact that the participation of the students in a sports course outside of school did not cause a change in peer bullying and emotional state can be explained by the continuation of the level of being a bully or victim in the course environment. When the literature is examined, it has been observed that team athletes have less depressive findings compared to individual athletes and individuals who do not do sports. In addition, thanks to team games, it is observed that multidimensional thinking, problem solving ability, positive interaction capacity increase benefits (Canan & Ataoğlu, 2010). There are studies indicating that games played in physical education and games lessons give happiness and develop positive emotions (Temel & Güllü, 2016; Yılmaz & Güven, 2015). Different from the findings of our study, Kazancı and İlci (2018) examined peer bullying in primary school second level students and found that peer bullying was higher in favour of those who were not licensed athletes according to the students' sporting status. Similarly, Coşkungönül (2020), in his study investigating the effect of sports participation on peer bullying, concluded that sedentary people were more likely to be bullied than active athletes. The literature indicates that team sports lead to more positive social and emotional outcomes compared to individual sports and those who do not participate in sports. However, it appears that extracurricular sports classes do not have a sufficiently strong impact in terms of social interaction and group dynamics. This suggests that the positive effects of sports may depend not only on the type of sport but also on the context of participation and environmental factors.

According to peer bullying and emotional state, no statistically significant difference was found between the averages of the students who spent one hour or more on the Internet in the sub-scales of victim, neutral (buffer), positive emotion and negative emotion, but in the sub-scale of being a bully, it is seen that the students who spent more than one hour on the Internet daily were more bullying before the game, and their bullying levels decreased in the posttest and retention measurements after the game. Regardless of the time spent on the Internet, it can be said that even the short time students spend on the Internet causes bullying. According to the findings obtained from some studies, a significant relationship was found between peer bullying and virtual addiction (Hazar & Ekici, 2021; Hesapçıoğlu & Yeşilova, 2020). Sipahi et al. (2019) concluded in their study that there is an increase in bullying behaviours in students who spend excessive time on the internet and computer games. It was observed that excessive use of social media affects aggression, and it was stated that children who spend most of their time with virtual

games and social media face problems in their social/emotional development (Harman et al., 2005). Excessive use of social media, which has an impact on the development and socialisation of children, can become harmful habits in the following years and affect the daily lives and behaviours of children and young people (Adelantado -Renau et al., 2019). It has been reported that students who spend excessive time on computer games have retarded social development, low school grades, low self-confidence, increased bullying behaviours, and increased anxiety levels (Sipahi et al., 2019). Peker (2015), in his study to analyse the risk factors predicting the cyberbullying status of secondary school students, stated that as the time the child spends on the internet increases, the risk of being a bully increases. Similarly, Gísladóttir (2016) found that adolescents who use the internet for 8 hours or more per week are more likely to be bullies. The literature indicates that excessive internet use and virtual addiction are linked to an increase in bullying behaviors (Hazar & Ekici, 2021; Hesapçioğlu & Yeşilova, 2020; Sipahi et al., 2019). This suggests that virtual worlds may negatively impact students' social development, and that limiting internet use could be an important factor in reducing its negative effects on social and emotional development. Therefore, it can be inferred that educational policies and family support aimed at monitoring and guiding students' internet usage should be strengthened.

### **Recommendations**

In accordance with the findings of the study, it can be concluded that educational games implemented in schools can be effective in reducing peer bullying in the short term; however, the sustainability of these effects in the long term may be weak. Therefore, to enhance the effectiveness of educational games, it is recommended to focus more on the content and frequency of game implementation. Additionally, integrating more specific strategies within the games aimed at developing students' emotional and social skills could yield more lasting results in preventing bullying behaviors.

It is important for games organized in schools to support students in developing empathy, enhancing emotional regulation skills, and engaging in healthy social interactions. In this context, providing awareness-raising training for teachers and educators regarding bullying prevention can increase the effectiveness of game-based interventions. Furthermore, the games should be planned not only as teacher-directed activities but also as group games in which students actively participate.

The findings suggest that internet usage may increase peer bullying and negatively affect students' social and emotional development. Therefore, greater control over students' internet usage by families and teachers could help limit the time students spend in the virtual world and allow for the development of their social skills. Providing digital literacy education in schools could help students navigate their internet use in a healthier way.

Moreover, it appears that game-based intervention programs should be customized to each student's developmental level and age. It should be emphasized that while games can be an effective tool at the elementary school level, they need to be diversified in accordance with students' developmental stages. Future studies could compare the effectiveness of similar educational game applications for different age groups, providing more comprehensive data.



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Finally, adopting an approach that supports children's emotional and social development in both schools and families can create long-term effects in reducing peer bullying. Developing a conscious attitude toward peer bullying will not only be possible through game-based interventions but also through broader social-psychological education programs implemented in schools.

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### **Ethical Approval**

**Ethics Committee:** İstanbul Topkapı Scientific Research and Publication Ethics Committee

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