

# The Effect of Peer-Mediated Adaptive Physical Activity Program on Problem Behaviors of Mentally Handicapped Students

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## Abstract

The aim of this study was to investigate the effect of peer-mediated adaptive physical activity program on problem behaviors of mentally handicapped students. Eight mentally handicapped students and eight peer students with normal development participated in this study, which was designed according to a sequential descriptive design. In the research, peer education program was applied to the peer students in line with the skills expected to be exhibited during the practices. In the study, Problem Behavior Sub-Scale (PBS), which is one of the subscales of Social Skills Rating System (SSRS) developed by Gresham and Elliot (1990) and Turkish adaptation by Sucuoğlu and Ozokcu (2005) was used as a quantitative data collection tool. As a qualitative data collection tool, semi-structured interview form was used. The Friedman test was used to analyze the quantitative data, and Wilcoxon Signs test was used to determine the source of the difference. Significance value was determined as 0.05. In the analysis of qualitative data, content analysis was applied. The quantitative findings of the study showed that the peer-mediated APA program was effective on the problem behaviors of mentally handicapped students and that the skills acquired as a result of the practice were maintained by the children three weeks after the completion of the practices. In the qualitative findings, the teachers stated that after the peer-mediated APA program, there were positive developments in the ability of mentally handicapped students to experience push-pull, touch discomfort, fear, trust, power control with their peers and to act in accordance with the instructions. The obtained qualitative and quantitative findings showed that peer mediated APA program had positive effects on the problem behaviors of mentally handicapped students.

**Keywords:** adaptive physical activity, peer-mediated, mentally handicapped, inclusive, physical education

## 1. Introduction

### 1.1 Introduce the Problem

Problem behaviors can be defined as behaviors that prevent an individual from learning a new skill, cause him/her to stay out of learning environments, harm himself/herself or others and also do not comply with the social norms of the society in which the individual lives (Zarkowska & Clements, 1994). Factors leading to problem behaviors appear in various ways; it is thought that mental disability is a major factor in explaining the reasons why these behaviors are exhibited and therefore individuals with this disability are likely to exhibit problem behaviors (Russell & Forness, 1985). As a matter of fact, the studies (Duker, Van Druenen, Jol, & Oud, 1986; Freund & Reiss, 1991; Semmel & Gao, 1992) show that mentally handicapped individuals exhibit more problem behaviors than normal developing individuals. In addition, some studies (Holden & Gitlesen, 2006; Jones et al., 2008; Lundqvist, 2013; Sigafos, Elkins, Kerr, & Attwood, 1994) state that estimated ratio of mentally handicapped individuals to have behavioral problems ranges from 10% to 19%. However, in addition to the dominant effects of mental disability, problem behaviors are more likely to occur in people with additional disorders such as visual impairment, hearing impairment (Cooper, Smiley, Jackson et al., 2009; Jones et al., 2008; Kiernan & Kiernan, 1994; Poppes, van der Putten, & Vlaskamp, 2010). Thus, it is clear that problem behaviors are not an undesirable type of behavior that occurs only due to mental disability.

Among the most common problem behaviors in mentally handicapped individuals are: off-duty behaviors, hyperactivity, dysfunctional repetitive stereotypic behaviors, aggressive behaviors towards oneself and others,

non-compliance with instructions, aggression, carelessness, anxiety, separation anxiety, pessimism, introvert, inappropriate speech, day and night wetting, crying, whining, lying, mocking others, sexual behaviors towards others (Acar & Batu, 2001; Antshel, Phillips, Gordon, Barkley, & Faraone, 2006; Bhatia, Kabra, & Sarpa, 2005; Çiftçi & Ince, 2002; Dykens, 2000; Freund & Reis, 1991; Kerker, Owens, Zigler, & Horwitz, 2004; Ozen, Colak, & Acar, 2002; Polloway, Epstein, & Cullinan, 1985; Rush, Bowman, Eidman, Toole, & Mortenson, 2004; Vatter, 1998; Kaner, 2009).

Problem behaviors are behaviors that negatively affect the acceptance of mentally handicapped individuals and their interaction with other individuals. When an individual is an adult, it is necessary to prevent, eliminate or control problem behaviors in order to live independently or least dependent in the society and to participate actively in the community life (Sucuoğlu, 2003). Therefore, many intervention programs have been developed and implemented in order to eliminate the problem behaviors of mentally handicapped individuals (Acar, 2000; Acar & Batu, 2001; Crnic, Hoffman, Gaze, & Edelbrock, 2004; Çiftçi & Tabak, 1997; Kerker, Owens, Zigler, & Horwitz, 2004; Matson, Minshawi, Gonzales, & Mayville, 2006). These include peer-mediated practices that bring together individuals with disabilities and those with normal development without limitation.

Peer-mediated practices create effective results on all areas of development of individuals with disabilities (Brown, Odom, & McConnell, 2008; Carter & Hughes, 2005; Zascavage & Winterman, 2009). In this method of practice, peer models support the learning of individuals with special needs and offer them the opportunity to repeat what they have learned. Individuals with special needs who spend time with their peers gain a sense of independence, see new behavior patterns and shape the concept of self more easily (Disalvo & Oswald, 2002; Leaf et al., 2009).

In the literature, peer-mediated implementation of many practices is considered important in terms of increasing the effectiveness of the practice. Another area of discipline that is suggested to have positive effects on mentally handicapped individuals is peer-mediated exercise. In a limited number of studies on mentally handicapped individuals, a positive correlation was found between sedentary lifestyle and problem behaviors (Dodson & Mullens, 1969; Elliott, Dobbin, Rose, & Soper, 1994; Nunley, 1965). In addition, Gabler-Halle, Halle and Chung (1993) concluded that there was a strong and consistent relationship between participation in an exercise program and changes in the behavior of mentally handicapped individuals. However, considering that only 4–9% of mentally handicapped individuals can participate in physical activities (Emerson, 2005; Messent, Cooke, & Long, 1998), this creates a negative picture.

In the national literature, no research has been found on the effect of peer-mediated APA program on behavioral problems of mentally handicapped individuals. Therefore, it is thought that the results obtained from the present study will make important contributions to the literature.

### *1.2 Purpose*

The aim of this study was to investigate the effect of peer-mediated adaptive physical activity program on problem behaviors of mentally handicapped students. For this general purpose, answers for the following sub-questions were sought.

- 1) Does the peer-mediated APA program make a significant difference between pre-test, post-test and follow-up test scores regarding the problem behavior level of mentally handicapped students?
- 2) What are the teachers' opinions on the problem behavior levels of the mentally handicapped students after the peer-mediated APA program?

## **2. Method**

### *2.1 Research Model*

Sequential descriptive design, one of the mixed research methods, was used in the study. Within the scope of this model, it was aimed to develop social skills levels of the mentally handicapped students by applying the peer mediated APA program to them and then to support the situation with qualitative data. Sequential Descriptive Design is a mixed method design in which quantitative data is collected and analyzed first, and then qualitative data is collected and analyzed in order to place the obtained data on solid foundations (Creswell & Clark, 2017). In the quantitative aspect of the study, pre-test and post-test measurements were obtained by applying APA program to mentally handicapped students. In the qualitative dimension, interviews were conducted to support the findings of quantitative analysis.

### *2.2 Study Groups*

The quantitative aspect of the study was carried out with sixteen children, eight mentally handicapped students

and eight normally developing children. In the qualitative part of the study, interviews were conducted with four teachers. In the following section, mentally handicapped students are defined as “special children” and normal developing children are defined as “partner children”.

### 2.2.1 Special Children and Selection Process

Eight children diagnosed with mental disability participated in the study. In addition, all special children continue their inclusive education. In the research, some prerequisites were sought in the process of determining the participating children. In addition, these prerequisites were met separately for each of the participating children. Participating children;

- 1) Must have been diagnosed with mental disability from official institutions,
- 2) Should show an inadequacy specific to the dependent variable (problem behavior) to be developed in the research,
- 3) Should not have any health problems in participating in practical training,
- 4) Should be open to sensual contact and interaction before, during and after the practice.

In the process of determining the children in accordance with the prerequisites listed above, necessary permissions were obtained from the administration of school administration, and interviews were conducted with the school counselors and classroom teachers. During the interviews, the teachers were informed about the purpose of the research, the ethical suitability and the practices to be performed. Then, it was asked to determine the children who were suitable for the prerequisites listed in the study. As a result of the evaluations of the school counselors and classroom teachers, nine children were determined in accordance with these prerequisites. However, as a result of the lack of permission from a child’s family, the study was conducted with eight children. The final selection was made by discussing the prerequisite features by meeting the families, class teachers and school counselors of the six selected children at the school.

### 2.2.2 Partner Children and Selection Process

Eight children with normal development who are the peers of special children participated in the study. In the research, some prerequisites were sought in the process of determining the partner children. In addition, these prerequisites are met separately for each partner child. Partner Children;

- 1) Should be open to communication and interaction with special children,
- 2) Should have high levels of social skills according to teacher opinions,
- 3) Should not have any health problems in participating in practical training,
- 4) Should be open to sensual contact and interaction before, during and after the practice,
- 5) Should not have any problem behavior.

### 2.3 Peer Education Process

Before the implementation of the peer-mediated APA program, peer education was conducted to teach the partner children the behavior that should be done during the practice. The related literature (Özaydin, Tekin-Iftar, & Kaner, 2008; Sazak & Tekinarslan-Cifci, 2003; Stanish & Temple, 2012; Temple & Stanish, 2011; Yarimkaya, İlhan, & Karasu, 2017; Yarimkaya, 2018) was used in the preparation of the peer education program. Peer education program consists of two parts. In the first part, information about the general development characteristics of special children was presented to partner children; in addition, theoretical information is given about how to interact with special children. In addition, the partner children were informed that they should not be afraid of the children exhibiting problem behavior and that this can be solved by the practices to be done. In the second part, the partner children were given information about how to present the instructions and how to manage the moments of starting and finishing the games during the practices. Peer trainings consisted of 4 30-minute sessions. Each part of the peer education consisted of two sessions.

### 2.4 Environment and Tools

The research was conducted in the multi-purpose playground. Necessary safety measures were provided for special and partner children in the playground which is approximately 25m<sup>2</sup>. The floor of the playground is rubber and the area is covered with soft cushions. Temperature and light arrangements were within normal acceptable values. Materials such as balls, miniature goal posts and basketball hoops, funnels, pet bottles, slalom sticks, trampoline, training ladder, etc. were used in the practice process.

### 2.5 Peer Mediated APA Program

In the study, the practices were carried out with special and partner children for twelve weeks and two days a week for 1 hour. In the process of determining the activities within the scope of the Peer-mediated APA program, the definition of the targeted dependent variable as well as the relevant literature (Meneer & Neumeier, 2015; Garcia-Villamizar & Dattilo, 2010; Todd & Reid, 2006; Staples et al., 2011; Srinivasan et al., 2014; Fragala-Pinkham, Haley, Rabin, & Kharasch, 2005; Kunzi, 2015; Gutman, Raphael-Greenfield, & Rao, 2012; Gutman et al., 2010; İlhan, 2007; İlhan, 2008; Özen, Çolak, & Acar, 2012; Ministry of National Education, 2009; Ministry of Youth and Sports (MYS), 2014; Emmons & Anderson, 2005) was considered. In order to eliminate the problem behaviors of the mentally handicapped students, factors such as interaction, communication, making the right contact and controlling uncontrollable power were included in the content of the activities. All practices were conducted by researchers.

### 2.6 Data Collection Tools

Data collection tools related to two different paradigms were used in the study.

#### 2.6.1 Quantitative Data Collection Tool

In the scope of the research, Problem Behavior Sub-Scale (PBS), which is one of the subscales of Social Skills Rating System (SSRS) developed by Gresham and Elliot (1990) and Turkish adaptation by Sucuoğlu and Ozokcu (2005) was used as a quantitative data collection tool. This subscale consists of the sub-dimensions of externalized behaviors, internalized behaviors and hyperactivity. In the sub-dimension of externalized behaviors, there are discussion, low anger control and unsuitable behaviors related to verbal and physical behaviors towards others, while the sub-dimension of internalized behaviors consists of low self-esteem, loneliness, anxiety. The sub-dimension of hyperactivity includes behaviors such as hyperactivity, inability to stand still and distraction. Zero (0) is marked if a student never does a problem behavior, one (1) is marked if s/he sometimes does it, and two (2) is marked if s/he does it very often. The total score to be obtained from PBS varies between 0 and 36. Afterwards, as a result of the factor analysis conducted by Sucuoğlu and Özokçu (2005), it was seen that the three-factor structure turned into a two-factor structure, externalized behaviors and internalized behaviors. Six items in the hyperactivity factor were included in the externalized behaviors factor. As a result of factor analysis, it was determined that two factors explained 61.79% of the total variance. In the final case of the scale, there are a total of 18 items, 12 items in the externalized behaviors factor and 6 items in the internalized behaviors factor. In addition, Cronbach's alpha coefficient was .90 for the total score of the scale, .93 for the first factor, and .86 for the second factor (Sucuoğlu & Ozokcu, 2005).

#### 2.6.2 Qualitative Data Collection Tool

In the study, semi-structured interview form was used as a qualitative data collection tool. Interviewing is a tool that enables to reveal what people think, what they think and why, what are their attitudes and feelings, and the factors that direct their behavior (Ekiz, 2009). In the process of creating the questions to be included in the interview form, the related literature was examined. The questions prepared in line with the literature were revised according to the findings obtained from the quantitative part of the research. The interview form in the draft format was submitted to the evaluation of three academicians specialized in physical education, special education and Turkish. As a result of scope validity based on expert opinions, semi-structured interview form took its final form.

### 2.7 Data Analysis

Quantitative and qualitative data were analyzed separately. In the following section, information on the analysis of quantitative and qualitative data is presented.

#### 2.7.1 Analysis of Quantitative Data

Before starting the analysis of the data, it was examined whether the data were suitable for normal distribution by considering Shapiro-Wilk and kurtosis-skewness coefficients. In the analysis, it was seen that the data did not have normal distribution. Therefore, the use of non-parametric tests in the analysis process was decided. Friedman test was used in the analysis of quantitative data and Wilcoxon Signs test was used to determine the source of the difference. Significance value was determined as 0.05.

#### 2.7.2 Analysis of Qualitative Data

Descriptive (thematic) analysis method was used in the analysis of qualitative data. First, voice recordings obtained from the interviews with teachers were transcribed. The data transcribed were converted into codes and categories in line with the findings of quantitative analysis.

### 2.8 Validity-Reliability

In order to provide for the quantitative and qualitative findings valid and reliable results, some precautions are presented in the following section. In this study, Cronbach Alpha internal consistency coefficient related to the general and sub-dimensions of the measurement tool was examined in order for quantitative data to give valid and reliable results. In qualitative research, validity and reliability are considered important in terms of the appropriateness of the results reached. For this purpose, the methods, which are used to provide validity and reliability in qualitative studies, of spending a long time in the working environment, presenting the data and analyzes to the control of the researched persons and presenting the data, analyzes and comments to the experts were applied (Ekiz, 2009).

### 3. Results

In this section, qualitative and quantitative findings obtained within the scope of the research are presented in line with the research questions.

#### 3.1 Findings Related to the First Sub Question

Does the peer-mediated APA program make a significant difference between pre-test, post-test and follow-up test scores regarding the problem behavior level of mentally handicapped students?

Table 1 shows pre-test, post-test and follow-up test scores regarding the problem behavior level of mentally handicapped students through the peer-mediated APA program.

Table 1. Friedman test results of pre-test, post-test and follow-up test scores on problem behavior levels of the practice group

	N	Mean Rank (SO)	Chi-Square (X)	Degree of Freedom (df)	Significance Value
Pre-test	8	3	14.857	2	<b>0.001*</b>
Post-test	8	1.25			
Follow-up test	8	1.75			

Note. \*p < 0.01.

When Table 1 was examined, it was determined that the peer-mediated APA program created a significant difference between pre-test, post-test and follow-up tests (Chi-square: 14.857; p < 0.05). The Wilcoxon Signs test was used as a non parametric post hoc analysis in order to determine which measurements were among these differences. Test results showed that there was a significant difference between pre-test - post-test (z: 2.527; p = 0.012 < 0.05) and follow-up test - pre-test (z: -2.552; p = 0.011 < 0.05). However, there was no significant difference between posttest - follow-up test scores (z: -1.89; p = 0.059 > 0.05).

#### 3.2 Findings Related to the Second Sub Question

What are the teachers' opinions on the problem behavior levels of the mentally handicapped students after the peer-mediated APA program?

In the study, peer-mediated APA program was applied to mentally handicapped students and as a result of this practice, a significant difference was found between pre-test and post-test measurements regarding problem behavior levels of special children. At the end of the practice, it was determined that the special children retain the acquisitions, which contribute to reducing the problem behaviors, three weeks after the end of the practices.

Table 2 shows the opinions of teachers about the changes in problem behaviors of special children after the applications.

Table 2. Teachers' opinions on the change in problem behavior of mentally handicapped students after the peer-mediated apa program

Categories	f
Increase in behavior appropriate to the classroom atmosphere	2
Getting on with peers without push-pull behavior	2
Elimination of touch-related discomfort	4
Confidence acquisition	4
Decreased fears based on peer and teacher relationships	1
Acquisition of power control	3
Acquisition of behavioral models according to the instructions	2

According to Table 2, after the APA program applied to the mentally handicapped students, the teachers defined the changes regarding the problem behavior levels of the children as “Increase in behavior appropriate to the classroom atmosphere”, “Getting on with peers without push-pull behavior”, “Elimination of touch-related discomfort”, “Confidence acquisition”, “Decreased fears based on peer and teacher relationships”, “Acquisition of power control”, “Acquisition of behavioral models according to the instructions”. In the following section, the opinions of teachers reflecting the raw form of the concepts included in the table above as a category are presented.

“...they were more often involved in behaviors that would disrupt the harmony of the lesson during the lessons in the classroom prior to practice. After the development of peer relations, the duration of adjustment within the class increased. After the practice, the problem behaviors reflected in the classroom atmosphere decreased due to the better relations with friends” (S1).

“...there was almost no moment when there was no push-pull with friends in any kind of activities in and out of the classroom. I think there is a decrease in the unwanted behavior to each other after discharging their energy after the practices” (S3).

“...they did not tolerate the long-term touch of classmates or teachers to them. However, playing skin-based games after the practices provided a significant softening of these reactions” (S4).

“...he could harm them thinking he were joking with his friends. He learned how to control his strength after practice” (S1).

“...he reacted with various behaviors in order not to obey our instructions. And these reactions often appeared as unwanted behavior. I think he understood that with the sense of accomplishment in the games, the instructions were not too bad” (S1).

#### 4. Discussion

The aim of this study was to examine the effect of peer-mediated adaptive physical activity program on problem behaviors of mentally handicapped students. In addition, one-to-one interviews were conducted with teachers of mentally handicapped students to support the quantitative findings.

In the quantitative aspect of the study, it was determined that the peer-mediated APA program created a significant difference between pre-test, post-test and follow-up tests related to problem behavior levels of mentally handicapped students. The Wilcoxon Signs test was used as a non-parametric post hoc analysis in order to determine which measurements were among these differences. Test results showed a significant difference between pre-test - post-test and follow-up test - pre-test scores. However, there was no significant difference between post-test - follow-up test scores. This showed that peer-mediated APA program contributed positively to problem behavior levels of mentally handicapped students. In addition, the lack of significant differences in the analysis conducted between the final test and the follow-up test revealed that these skills acquired by mentally handicapped students were maintained three weeks after the completion of the practices.

There are studies investigating the effects of exercise, physical activity and play on problem behaviors of mentally handicapped individuals in the literature (Bachman & Sluyter, 1988; Baumeister & MacLean, 1984; Gencoz, 1997; Güngör, Yılmaz, & İlhan, 2019; Cannella-Malone et al., 2011; Elliott et al., 1994; Jones et al., 2008; Kern et al., 1982; Lancioni et al., 1984; McGimsey & Favell, 1988).

In the study by Bachman and Sluyter (1988), it was reported that 30-day exercise program had positive effects on general behavior problems of mentally handicapped individuals. In their study, Baumeister and MacLean (1984) stated that the 6-week exercise program made a positive contribution to the self-harm behavior of individuals aged 19–23 years who were severely mentally handicapped. In the study of Gencoz (1997), it was stated that 7-week basketball program has contributed positively to the general behavior of mentally handicapped individuals aged from 10–14. In the literature, national and international studies have shown that exercise, physical activity and game-based interventions have positive effects on behavioral problems of mentally handicapped individuals. The quantitative results of the research in the literature and the current research are consistent.

In addition to the effectiveness findings, monitoring data were also obtained. When the qualitative findings of the study were examined, it was seen that the quantitative findings were supported and accordingly, the opinions became more prominent. It can be said that the effectiveness findings that were obtained by pre-test and post-test measurements were reinforced by positive changes in the behavioral problems defined by the teachers as “Increase in behavior appropriate to the classroom atmosphere”, “Getting on with peers without push-pull behavior”, “Elimination of touch-related discomfort”, “Confidence acquisition”, “Decreased fears based on peer

and teacher relationships”, “Acquisition of power control”, “Acquisition of behavioral models according to the instructions”.

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