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The Effects of Adapted Recreational Physical Activity on the Life Quality of Individuals with Autism

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ABSTACT The purpose of this study is to determine the effects of ARPA on the life quality of the individuals with autism. The sample consisted of 59 individuals diagnosed with autism according to DSM IV criteria. The participant ages were between 4 and 18 years, and they were involved in the eight-week ARPA programme. PedsQL supplementary form for parents was used as a data collection tool, which consisted of 4 sub-dimensions, and 23 items were developed by Varni et al. A t-test was used for the correlated samples and ANOVA was used for repeated measures. According to the results, there was a significant decrease in the PedsQL subdimensions scores of all participants in terms of physiological functionality and emotional functionality. As a conclution, ARPA can positively contribute to the emotional and physical development of the individuals with autism and it can be effective in supporting the life quality of autistic individuals.

INTRODUCTION

Every individual is entitled to and free to experience leisure time activities that are useful and satisfactory. During leisure time experiences, individuals seek and find opportunities for different psychological, physical and social benefits that affect his or her life quality and life satisfaction. The physical activities exercised during leisure time play an important role in maintaining physical fitness and health especially in the lives of children (Stumbo and Peterson 2004; Coyne and Fullerton 2014). In this respect, participation in leisure time activities carries significant weight in the lives of people with Autism Spectrum Disorder (ASD) who are diagnosed with a condition, which is often classified as a neurological disorder under the category of common developmental disorders (Hollander and Nowinski 2003). The neurological character of their condition causes these individuals to experience various hardships and problems in their communication and interaction with other people in the society (Baird et al. 2001; Elvin et al. 2010; Kürkçüoðlu 2009).

In their speech, for example, fifty percent of the individuals with autism use a language, which is 'peculiar-unique to the individual concerned' involving repeated fragments of speech, whereas forty percent of the individuals with autism develop their own speech intonation, which sounds abnormal to the other people (Howlin 2004). Although their physical appearance is not a distinguishing factor when compared to other individuals, differences in the development of motor skills and difficulties in motor and kinetic coordination are observed when compared with their peers in their age groups (MacDonald et al. 2014; Janet et al. 2011). These individuals usually have incapacities such as general muscle weakness and difficulties in movements that require balance and coordination, albeit these incapacities display different features for each individual with autism (Öztürk 2011). The various forms of physical incapacity these individuals experience can also be listed as a lessened sense of balance, lack of coordination, weakness in finger movements and walking on the tip of their toes (Sherill 2004; Darica et al. 2011). On another account, these individuals lack interest in the social world (Sherill 2004). At every age and developmental stage individuals with autism have difficulty in social interactions (Mesibov et al. 2005; Anagnostou et al. 2015), managing social relations and behaviors and they characteristically display stereotype behaviors (Orsmond et al. 2004). Besides these pecularities, psychological issues such as aggressiveness (Farmer et al. 2015) and self-destructive tendencies, anger fits and stress continue throughout

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their lives and negatively affect their quality of life (Villamisar et al. 2010).

The results of the studies in the literature reveal that there is a positive correlation between recreational activities that improve the everyday lives of individuals (Stumbo and Peterson 2004) and their life quality standards (Villamisar and Dattilo 2010). Therefore, participation in recreational activities affects life quality, which in turn affects the quality of recreational activities (Stumbo and Peterson 2004). Regular physical activities exercised during leisure time are closely related to the life quality of people in different health conditions, young and old alike (Dinç and Güzel 2012). Such exercises eliminate the causes and symptoms of several illnesses and thus, affect mental and physical health by decreasing danger risks of such diseases (Pastor et al. 2003). Nonetheless, it is widely known that regular exercise and physical activities have significant impacts in life, such as contributing to psychological well-being, increasing life satisfaction and positively affecting success in educational and work careers of people (Ardahan 2012). When such benefits of physical activity are taken into consideration, for sustaining healthier societies, individuals should be encouraged to participate in physical activities in the most suitable ways (WHO 2011). The necessity of promoting physical activity is essential for increasing life expectancy rates and helping people maintain quality lives (Stumbo and Peterson 2004).

For especially disabled people and individuals with ASD, physical activities are often ignored despite the significant role these activities constitute for a healthy lifestyle. Research shows that participation in physical activities helps individuals with autism regulate their social relations and behaviors (Orsmond et al. 2004) and reduce their stereotypical habits and moves (Öztürk 2011). Physical activities also play an important role in allaying negative conditions such as destructive and hyperactive behaviors, sleeping disorders, aggressive behaviors, anxiety and depression (Howlin 2004). Vilamisar and Dattilo's study (2010) demonstrated that recreational activities cause a meaningful decrease in the number of improper and inappropriate behaviors and stress levels of individuals with autism. The same study also revealed that such activities improved their social skills and therefore, caused an increase in their life quality levels. In another study, stereotypical, aggressive and evasive behaviors decreased after the application of physical activity program on the individuals with autism (Lang et al. 2010). Likewise, other studies also noted a reduction in the occurance of unwanted behaviors after the application of exercise schedules (Schleien et al. 1987; Elliot et al. 1994). In short, participation of people with ASD in recreational physical activities positively affects their life quality by increasing their physical functionality and improving their psychological wellbeing (Stumbo and Peterson 2004). Accordingly, the purpose of this study is to determine the effect of the Adapted Recreational Physical Activity (ARPA) program on the life quality of the individuals with ASD.

MATERIAL AND METHODS

Participants

In total, 59 individuals between the ages of 4 and 18 and diagnosed with autism according to *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition* (DSM IV) criteria participated in the Adapted Recreational Physical Activity (ARPA) program, which was designed according to the purposes of the study. Of these participants, 17 were females (28.8% of total participants) and 42 were males (71.2% of total participants). These participants were the members of the Ankara Association of Individuals with Autism and their voluntary participation in the program was assured by their parents' written consent. Also, the Pediatric Quality of Life Inventory (PedsQL) was employed in the research and this inventory's supplementary form for the parents was applied to the parents of the participants (31 mothers and 28 fathers) both, before and after the program.

Instruments

In the study, the Personel Demographic Information Form (PDIF) and the PedsQL's supplementary form for parents were employed as data collection tools. The PDIF was first developed in order to learn about individuals with autism and their parents. The PedsQL, on the other hand, was originally designed by Varni, Sein and Rode (1999) to determine the life quality levels of children and adolescents between the ages of 2 and 18 years. The PedsQL consists of 23 items and four subdimensions. The four

subdimensions of the inventory are as follows: 8 items for physical functionality, 5 items for emotional functionality, 5 items for social functionality and 5 items for school functionality. The items in the inventory are rated using a five-point Likert Scale, wherein the response "0" corresponds to "never", "1" to "rarely", "2" to "sometimes", "3" to "frequently" and the response "4" is for "always". The higher the decrease in the mean scores gathered from the total score of the scale and the subdimensions, the higher is the increase in the life quality of the individuals. In Turkey, this scale's validity and reliability was tested by Çakin Memik et al. (2007). In this study, internal consistency coefficients of the scale were 0.76 for the subdimension of 'physical functionality', 0.77 for 'emotional functionality', 0.70 for 'social functionality' and 0.71 for the 'school' subdimension respectively and 0.80 for the total scale.

Procedure

The ARPA program was executed for eight weeks. The sessions were implicated twice in a week for two hours. The program, which involved activities directed towards improving basic motor skills, was developed under the management of five academic experts on "autism and physical activities". The individuals who participated in ARPA were subjected to the Sherborne Developmental Movement Program activities as well as basic physical skill exercises such as balance activities, jumping, hopping, throwing, catching and climbing. The physical activities were modified and adapted towards the physical and mental characteristics of the individuals with autism. The program was executed by the voluntary trainers selected among the Physical Education and Sports Department students who participated in the course of "Autism and Physical Activity". The volunteers accompanied and directed the participants in each activity involved in the program.

Data Analysis

The descriptive statistical methods were used in the analyses of the demographic data obtained from the study. In order to test the statistical difference between the scores of pre-test and final test a paired samples t-test was employed. Finally, a One-Way ANOVA for repeated measures was used for determining the differences between the scale scores according to the variables of age and gender.

RESULTS

Out of the participants of the ARPA program for this study, seventy-one percent were male and twenty-nine percent were female individuals with ADS. Among the participants, 25 individuals were 10 years old or younger, 17 were between the ages of 11 and 15 years, and 17 of them were between 16 and 18 years old. 49.2 percent of the parents of the individuals responded that the program applied had positive effects in reducing the stereotypical behaviors of their children, 35.6 percent of the parents observed little change in the behavior of their children, and 15.3 percent of the parents observed no change in their stereotypical behaviors.

The results of the t-test analysis with respect to pre-test and final test are illustrated in Table 1.

The pre-test and final test scores of the participants demonstrated a significant difference in terms of 'physical functionality' ($t_{(58)}$ =3.40; $p<0.01$). The final test mean scores of the participants were lower than the pre-test mean scores in this dimension. The results of the analyses

Table 1: t-test results the pre-test and post-test of PedsQL sub-scales

Sub-dimensions		*n*	*Mean*	*Ss*	*Sd*	*t*	*p*
Physical Functionality	Pre-test	59	1.94	.77	58	3.40	.00
	Post-test	59	1.45	.63			
Emotional Functionality	Pre-test	59	1.86	.65	58	2.63	.01
	Post-test	59	1.54	.55			
Social Functionality	Pre-test	59	2.21	.79	58	1.05	.30
	Post-test	59	2.01	.93			
School Functionality	Pre-test	59	2.00	.62	58	1.20	.24
	Post-test	59	1.82	.76			
Total	Pre-test	59	1.99	.51	58	3.21	.00
	Post-test	59	1.66	.49			

also showed significant differences between pre-test and final test scores in the 'emotional finctionality' dimension ($t_{(58)} = 2.63$; $p<0.05$) and total scale scores ($t_{(58)} = 3.21$; $p<0.01$).

The ANOVA findings displayed a statistically significant difference according to the gender variable between the pre-test and final test scores only for the 'emotional functionality' dimension ($F_{(1-57)} = 8.028$; $p<0.05$). Table 2 shows the female participants' comparatively higher scores than the male participants. According to the age variable, however, no significant difference was observed.

DISCUSSION

This study was designed to determine the effect of Adapted Recreational Physical Activity program on the life quality of the individuals with autism. About half of the individuals (49.2%) who participated in the study, stated that the ARPA program had a positive influence in reducing stereotype behaviors. This outcome conforms to the findings of the similar studies in the literature such as Schlleien et al. (1987), Elliot et al. (1994) and Lang et al. (2010).

The findings of the study revealed that after the application of the ARPA program, some improvements were observed in the life quality levels of the individuals with autism in terms of 'physical functionality'. This outcome overlaps with the findings of Kuhltau et al.'s (2010) study that was designed to determine the life quality levels and the factors affecting the life quality of the individuals with autism. Likewise, Obrusnikova and Miccinello (2012) and Todd and Reid (2006) arrived at similar findings by observing that applied physical activities positively influence the 'physical functionality' levels of the individuals with ASD. Sowa and Meulenbroek (2012) reported in their study that sport or exercise always has a significant effect on people with ASD.

After the application of the program the participants from the study demonstrated an improvement in the 'emotional functionality' aspect of their life quality levels. This result also conforms to the findings of the similar studies in the literature. For example, Zhong (2011) observed decreases in the 'emotional functionality' scores of the individuals after they participated in the same program. This meant an improvement in the condition of the individuals with autism. When the final test scores of the study for the total scale were analyzed, it was noted that the ARPA program had a considerable effect in improving the life quality of the individuals with autism. This outcome was in parallel with the conclusions of the previous studies conducted by Celiberti et al. (1997), Yilmaz (2004), Murphy and Carbone (2008) and Kuhltau et al. (2010) that proved the affect of physical activity programs on the life quality of individuals with autism.

The female participants of the study displayed higher levels of improvement in the 'emotional functionality' dimension compared to the male participants after the program. This is probably due to the fact that male and female individuals with autism possess physiological differ-

Table 2: Repeated measures ANOVA results of pre-test and post-test scores of PedsQL according to the gender

Sub-dimensions	*Gender*	*n*	*M*	*Ss*	*F*	*p*
Physical Functionality Pre-test	Male	42	1.93	.76	.576	.45
	Female	17	1.96	.84		
Physical Functionality Post-test	Male	42	1.51	.67		
	Female	17	1.30	.53		
Emotional Functionality Pre-test	Male	42	1.70	.62	8.028	.01
	Female	17	1.28	.54		
Emotional Functionality Post-test	Male	42	1.58	.57		
	Female	17	1.45	.51		
Social Functionality Pre-test	Male	42	2.20	.75	.071	.79
	Female	17	2.22	.92		
Social Functionality Post-test	Male	42	1.97	.77		
	Female	17	2.11	1.25		
School Functionality Pre-test	Male	42	2.03	.74	.010	.92
	Female	17	1.92	.83		
School Functionality Post-test	Male	42	1.87	.75		
	Female	17	1.72	.78		

ences (Darica et al. 2011). Regarding the dimensions of 'social functionality' and 'school' this study did not observe statistically significant improvements despite minor increases in these dimensions being noted. In the literature, Macdonald et al. (2013) indicated that children with weaker motor skills have greater social communicative skill deficits, and Ibrahim and Nasser (2010) and Pan (2010) asserted that recreational physical activities have a positive effect on the 'social functionality' levels of the individuals with autism. Therefore, it can be stated that the ARPA program is effective in increasing the life quality levels of the individuals with autism in the 'social functionality' and 'school' dimensions.

CONCLUSION

As a conclusion, although positive but insignificant differences in the values for the 'social functionality' and 'school' dimensions were observed in this study, there was the significant improvements in 'physical functionality' and 'emotional functionality' aspects that can be interpreted as the proof of the significant role that recreational physical activities can play in improving the life quality levels of the individuals with autism.

RECOMMENDATIONS

The researchers know that especially about Turkey where recreational physical activitiy participation levels of the individuals with autism are very low. The researchers' recommendation is that, the application of such kinds of programs like ARPA for a long period of time and with more individuals can be very instrumental and beneficial in establishing social awareness towards autism in Turkey and for improving the life quality of the individuals with ADS.

LIMITATIONS

The main limitations of this study were the shortness of the period allowed for the program and the age range of the participants. It might be the main reason for the positive but insignificant development in some dimensions of the PedsQL.

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