Unlu, E. (2019). Parent implemented program for teaching toileting skills for children with developmental disabilities. *International Journal of Early Childhood Special Education, 11*(2), 92-104. doi: 10.20489/intjecse.640348
Research Article-Received: 06.06.2019 Accepted: 30.10.2019

Emre UNLU [1]
ORCID: 0000-0003-0795-9022

Parent Implemented Program for Teaching Toileting Skills for Children with Developmental Disabilities

Abstract

Teaching toileting skills are among the most essential educational objectives for children with developmental disabilities; however, there are few investigations of the utility of various toilet training approaches for children with autism. The purpose of this study is to determine whether "Program for Supporting Home- and Institution-based Toileting Skills for Families" enables mothers to acquire the skill of teaching toileting control to their children and for children to acquire day-time toileting control. The results show that children attained toileting skills rapidly and consistently throughout the program. The procedures followed during these activities and the outcomes regarding each participant are discussed.

Keywords: autism spectrum disorder, parent training, toilet training, toileting problems.

Introduction

The skill to achieve nocturnal dryness is gained around ages 3-4 in children who show typical development (Blum, Taubman, & Nemeth, 2003). Even though cultural factors affect the age ranges in gaining toileting skills, it has been seen that children are ready to acquire the toileting skills between 2-3 age range and readiness age can decline until 18 months in some children (Schum et al., 2002). On the contrary to children with typically developing; children with autism are appeared to be slow in gaining toilet skills, and sometimes they are not acquired at all (Ando, 1977; Dalrymple & Ruble, 1992; Tsai, Stewart, & August, 1981; Whiteley, 2004; Williams, Oliver, Allard, & Sears, 2003). It is determined that although some children with autism spectrum disorder and children with intellectual disabilities receive a longer training, they might not acquire this ability or they acquire it after a few years of training (Keen, Branni-gan, & Cuskelly, 2007).

Children with autism and developmental disabilities have difficulties in the period of toilet training when compared with typically developing peers (Hong and Matson, 2018). This ability, named as toilet skill, in fact, is a complex ability, which includes performing a wide range of skills independently. Although the toilet skills include skills such as awareness of the need for toilet, sitting on closet, using toilet paper correctly and washing hands properly, toilet training in previous studies only include evacuating and controlling the urge to evacuate (Baker & Brigtman, 1997). Acquiring toilet skills

[1] Ph.D., Zonguldak Bulent Ecevit University, Faculty of Education, Department of Special Education, Zonguldak, Turkey.
e-mail: eskemre@gmail.com

is a very important mile stone for individuals with special needs, and it supports acceptance to society as well as personal responsibility and self -confidence (Cicero & Pfadt, 2002). Studies have shown that children with autism have problems with toilet skills and urinary incontinence (Whiteley, 2004; Williams, Oliver, Allard, & Sears, 2003). Performing successful toilet skills enhances the individual's quality of life besides preventing urinary and intestinal problems (Bakker, Vangool, VanSprundel, VanDerAuwera, & Wyendale, 2002; Barone, Jasutkar, & Schneider, 2009). In addition, having toilet skills make it possible for indirect contributions such as attending to social gatherings fully (Cicero & Pfadt, 2002).

Acquisition of toilet skills not only affect children but their families as well. Today, when we think about the laws and contemporary approaches drawing attention to the integration of children with special needs to society, the acquisition of toilet skills by children with developmental disabilities is regarded as an important goal in an educational environment (Dempsey, 2005). Macias, Roberts, Saylor and Fussel (2006) stated that families having children with toilet training encounter problems due to more stress than families having children with no toilet training, and drew attention to the importance of acquiring toilet skills for children with special needs. Research has shown that behavioral implementations based on applied behavior analysis principles are effective to teach the children with developmental disabilities toileting skills (Wingate, Falcomata, & Ferguson, 2017)

The first example, which is regarded as a foundation in the training for toilet skills of individuals with developmental disabilities and based on classical conditioning principle, was suggested by Ellis (1963). Although there are successful examples following the approach of Ellis, it is recorded that different groups especially children with autism did not acquire toilet skills by this approach, thus different training practices have been developed. It is seen that the behavioral intervention package which is called rapid toilet training -one of the most important practices developed by Azrin and Foxx (1971) is effective with children with intellectual disabilities and individuals with autism (Kroeger & Sorensen-Burnworth, 2009). The components of the original form of this intervention package which was prepared for adults with intellectual disabilities are listed as toilet schedule, reinforcing the evacuation into toilet, check for dry underwear, exces-sive liquid intake and over-correction in accidental cases. The intervention package has been modified in different studies by mak-ing changes in these components (Hanney, Jostad, LeBlanc, Carr, & Castile, 2012). Different modifications are made in rapid toilet training such as the intensity of the period of training and intervention procedures, re-moval of over-correction and punishment periods. Although there are effective practices such as rapid toilet training towards the acquisition of toilet skills, there are limited number of studies regarding the training of children with developmental disabilities for toilet skills, and that in limited studies, special attributes of attendants were not recorded and the procedures applied were not explained clearly (Keen, Brannigan, & Cuskelly, 2007).

It is seen that there are successfully resulted studies regarding the acquisition of toilet skills by children with developmental disabilities via Rapid Toilet Training program (Ardıç & Cavkaytar, 2014; Didden, Sikkema, Bosman, Duker, & Curfs, 2001; Doan & Toussaint, 2016; Foxx & Azrin, 1973; Kircaali-İftar, Ulke-Kurkcuoglu, Cetin, & Unlu, 2009). Besides the classical training for acquisition of toilet skills, there are technologically supported practices such as video model (Bainbridge & Myles, 1999; Keen, Brannigan, & Cuskelly, 2007; Lee, Anderson, & Moore, 2014) and mobile applications (Mruzek et al., 2017). Although there are studies showing successful acquisition of toileting skills, it is stated that people who are responsible for the care of the children may apply malpractices or deficient practices during the toilet training, and for this reason, it is important that they should be systematically trained regarding the toilet training procedures (Doan & Tous-saint, 2016).

It is seen that there are studies in which it is aimed that families teach their children toilet skills at home and children with developmental disorder have acquired toilet training successfully. In studies with regards to families, it is seen that families act as an agent in practices and that the real responsibility of practice is not handed to them (Kroeger & Sorensen-Burnworth, 2009). One of the most important components of efficient practices which will be offered to individuals with Developmental

Disability (DD) is the training and the con tribution of family. However, it is seen as an important issue in literature that there are limited number of studies regarding the participation of families having children with who spend most of their time at home and studies regarding generalization of inter-mediums (Leblanc, Carr, Crossett, Bennett & Detweiler, 2005; Kroeger & Sorensen, 2010). Kroeger and Sorensen (2010) reported that it is efficient to train children with developmental disabilities for toilet skills at home by their parents. Also, Ardıç and Cavkaytar (2014) suggested de-veloping and designing toilet training pro-grams for parent of individuals with devel-opmental disabilities. Studies found in the literature are centralized generally and that there are limited studies showing interventions with parents. In this study, it is aimed that mothers, two of whom have a child with ASD and one of whom have a child with intellectual disability, who are previously trained for teaching toilet skills, become successful in having their children acquire toilet skills. Within this context in this study, answers were sought after for these two questions: a) on what level do mothers can perform after the training regarding the acquisition of toilet skills? and b) how does the toilet training by the mothers effect the performance of children in acquiring toilet skills?

Method

This study was designed as a case study in order to be able to find answers for the research questions. Detailed data regarding the performances of the participants during the training period of the study were gathered in their natural environment and analyzed. Data achieved from the study were shown in graphic by using EU pattern of single-subject research patterns and analyzed. The independent variable of this study is the teaching program implemented by parents. There are two dependent variables in this study. The first dependent variable is parent's performance on teaching toileting skills to their child. The second dependent variable is child performance on discharging in to toilet.

Participants

Participants are composed of three children with developmental disabilities, their mothers, and advisor working in the center which the children are educated and the supervi sor of the study. The children attending to the study have been getting supportive education in a special education and rehabilitation center. The children received no education in another foundation or setting other than rehabilitation center. The fami-lies attending to the study have never taken a systematical toilet training before and have never implemented toilet training systematically.

The 1st Subject is a 2,5-year-old female child with Down Syndrome. She has gone to private special education institution since she was 1-year-old. She has self-care skills such as pulling of socks, removing hat, pull-ing down trousers, etc. She speaks with one-word sentence structures (such as mother, father, water, pee, etc.). Also she follows directions including single action. Mother of the 1st Subject is 25 years old, a high school graduate, mother of one child, and housewife. She has previously attended all family trainings given in the private special education institution. Although traditional toilet training was given before, it was not successful.

The 2nd Subject is a 3,5-year-old male student with autism. He has attended to individualized education program in special education institutions since he was 2 years old. The subject speaks with a one-word sentence structure; however, understandability of speech is low. He shows by gestures that he needs to urinate. He follows di-rections including single action. Mother of the 2nd Subject is 29 years old, a high school graduate, mother of two children, and housewife. She attended to presentation of toilet training made within the scope of the study. She decided to start giving toilet training after the general toilet training seminar.

The 3rd Subject is a 3-year-old male student with autism. He has attended to individualized education program in special education institutions since he was 2 years old. He follows directions including single action, gabbles, removes hat, and has self-care skills such as pulling of socks. Mother of the 3rd Subject is 30 years old, a secondary school graduate and housewife. She attended to presentation of toilet training made within the scope of the study. She decided to start giving toilet training after the general toilet training seminar.

Advisor

The role of the advisor was to provide communication and interaction between parents and supervisor. The advisor had 10 years-experience in working with individuals with autism and he had a bachelor degree on special education. Advisor has attended actively to the family meetings and activities which have been carried through with the supervisor. He took responsibility on determining the requirements of parents and their children, preparing the program that how the mothers teach toileting skills to their children, combining the data which came from parents' home implementations and teachers' school implementations, evaluating the suggestions and demands of parents. Advisor met with the each family twice a week and answered the families' questions about the process and supported them. Also, the advisor gave a report to the supervisor weekly about the meeting with the families. Besides the advisor interacted with the supervisor face to face or distant all the time and got information when needed a part from the weekly report or meetings. In the whole process the advisor was in contact with supervisor.

Supervisor

He had PhD degree on special education and had 10 years of experience in working with individuals with special needs. He was in contact with advisor via e-mail, phone and face to face interactions throughout the study. Supervisor participated in the study to present the group education for parents, inform and direct the parents and teachers after group education, make decisions related to the issues about the study process and manage the study. Supervisor of the study organized the processes of determining and implementing the components of the study, planning the family meetings and these meetings contents, interpreting and analyzing the data obtained from the study.

Process

In this study, a three-stage process was followed. At the first stage of the study, 33 parents who stated that they had been encountering problems with their children in the acquisition of toilet skills were given a 6 hour-seminar regarding the teaching of toilet skills to children with special needs. Training and support were given to three mothers who stated that they need support one week after the seminar. At the last stage, families who take individual support gathered data by teaching their children toilet skills. Activities realized in each phase and their contents are explained in detail below.

Toilet Training Seminar

Toilet skill training seminar is planned regarding the parents whose children receive special educational services in a special educational center. Parents of 33 children who have been educated at the center attended the training seminar. The subjects of the training seminar were: a) Importance of Toilet Skills, b) Components of Toilet Skills, c) Factors that harden the acquisition of toilet skills, d) Toilet training techniques, e) Traditional Toilet Training Method, f) Intensified Toilet Training Method. Training session was designed as 6 sessions for 45 minutes, and it was completed in one day. PowerPoint presentations, sample practices, role playing and question-answer techniques were utilized. Training documents used in the seminar and data record forms for toilet skill control and follow-up were distributed to the attendants, and they were taught how to use them via practice. It was requested that families who still encounter a problem with toilet skills after the family training seminar contact with the researchers via the special education center, and the seminar was ended.

Individual Parent Support

After the toilet training seminar which was given to a large group, 3 mothers indicated to the counsellor from the special education center that although they applied the practices they had been explained in the seminar, they did not become successful and they needed intense help. After an interview between the counsellor and the supervisor upon the request of the parents, it was decided that a more intense and individual support should have been given to the mothers. The counsellor interviewed the parents one by one and they exchanged information regarding the problems they lived during the toilet training and the level of toilet skills their children acquired. After the interview of the advisor with the par-ents, it was decided that the advisor should train individually the three mothers for teaching toilet skills and that data regarding the toilet control both at home and in the center should be collected. Data collected by the mothers were given to the counsellor periodically and the counsellor was always in con-

tact by face to face with the mothers during the study. Also, the advisor informed the mothers of the children constantly re-garding the toilet skill performance of the children.

Teaching toilet skills to children

In the study, the rapid toilet training inter-vention (Kircaali-İftar et al. 2009) which was modi-fied later was taken as a base with the three children whose mothers requested counselling. In the study, without the need to apply the second stage of the toilet train-ing period used by Kircaali-İftar et al. (2009), students acquired toilet training. At the beginning of the study, data regarding the dry periods were recorded on the form seen in Table 1 and the process of acquir-ing toilet skills were followed. In order to determine the baseline level of every child, the percentage of dry periods for three days were calculated. After the beginning level averages were determined, it was ensured that families provided toilet skill education at home and teachers provided toilet skill education at the special educational center.

During the intervention, every child was taken to the toilet every 30 minutes, their diapers are checked and it was ensu-red that they sit on the toilet for five mi-nutes. If a bowel movement happens in five minutes, it was ensured that children's be-havior is reinforced with social or food rein-forcements. The period to take the chil-dren to the toilet for mothers and teachers was gradually raised to 45 and 60 minutes. Whi-le increasing these periods, the dryness of the diapers 3 times over or having a bowel movement or urinating three times over were regarded as criteria. In this peri-od, mothers and teachers ensured that the children take lots of liquids and salty food in order to create the need for toilet often. Mothers and teachers used sentences such as "let's poop, let's pee, let's use the potty" or ensured that the children show between their legs with gestures before using the toilet. During the teaching period, if the child communicated his/her need to go to toilet verbally or via gestures, mothers and teac-hers reinforced socially this act in a joyful manner.

Teaching Mothers The Skill to Teach Toilet Skills

This process with the child and the respon-sibilities of parents in this process were told in individual training sessions with the mot-hers of the three children who attended the study. A presentation was shown to mot-hers in the initial training session, a written document was given to them regard-ing the activities they are required to make and the activities were shown with samples and practices. Also, questions of mothers were answered in these training sessions and the subjects that need to be repeated were repeated. These sessions were real-ized after the beginning level data were received from the children. The first session of indi-vidual sessions with mothers lasted 90 mi-nutes for each parents. Mothers did not request any other individual sessions after the first session and they asked their ques-tions while handing the previous day's data form. Skills the mothers were required to perform were gathered in 17 steps with the views of teachers and field specialists and studies in the literature, and a form was prepared. These 17 steps which the par-ents had to perform were also transformed into the data form in Table 1 and this form was used to determine the percentage of the performance of behaviors expected of them.

Gathering the data

Children were taken to toilet at the begin-ning of every hour at both the beginning level and during the teaching, their diapers were checked and 3 minutes were given to the children for a bowel movement. Data recording form in Table 2 was used to rec-ord the dry periods of the children during one day. These data received from the chil-dren were used to evaluate toilet skills of the children at the beginning level and dur-ing the teaching and these data were put into graphic form (Graph 1). The level of performance of mothers regarding their responsibilities during the study was gath-ered via the form in Table 2.

Table 1.
Data recording form for parent behavior

	Parent Behaviors	1	2	3	4	5
1	Using oral phrases (e.g. let's go to toilet, let's pee)					
2	Taking off child's clothes					
3	Checking child's diaper					
4	Making child sit on the closet					
5	Recording child's diaper condition whether it is wet or dry					
6	Using social and symbol reinforcement if child's diaper is dry					
7	Making child sit for 3 minutes on the closet					
8	If child excretes within 3 minutes allowing child to get out					
9	Using edible reinforces if child excretes within 3 minutes					
10	Making the child stand up after 3 minutes					
11	Dressing up the child					
12	Taking child to the toilet every 30 minutes					
13	If child's diaper is dry three times consecutively, changing toileting time (from 30 minutes to 45 minutes, then from 45 minutes to 60 minutes)					
14	If child excretes three times consecutively, changing toileting time (from 30 minutes to 45 minutes, then from 45 minutes to 60 minutes)					
15	Continuing the process till bedtime					
16	Starting the process again in the morning					
17	Giving daily data to child's teacher					

Table 2.
Data recording form for toileting skills of children

Date	Time	Diaper was clean		Urinated into the toilet		Defecated into the toilet	
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N
		Y	N	Y	N	Y	N

Y: *Yes,* ***N:*** *No*

Results

Two different kinds of data were collected in this study and these data were analyzed via graphics.

Results on Parent's Teaching Toileting Skills Behaviors

According to data obtained from interview at the pre-intervention phase, as it is seen in figure 1, it is understood that the first mother did not have information about accompanying the child to the toilet in compliance when the child's diaper was dry, toilet-ing activity, non-toileting activity and what should be done when there were accidents, the child wanted to go to the toilet on her own; and she accomplished sub-objectives of teaching the skill of day-time toileting control at level "0". In other words, the mother could not accomplished any sub-objectives related to teaching the skill of day-time toileting control which is shown in Table 1. Mother accomplished 14 of 17 sub-objectives of skill of teaching toileting control in the first teaching session, 16 of 17 sub-objectives in the second teaching session, and 17 of 17 subobjectives in the third teaching session during the intervention phase which she attended individual education sessions. Also, she accomplished all of 17 sub-objectives of skill of teaching day-time toileting control in all three end-of-teaching assessments including three ses-sions at the end of implementing teaching unit. When we analyze the graph, it's clear-ly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is analyzed it's seen that there is an upward trend at data points. All these graphical analyzing results (Richards, Taylor, & Ramasamy, 2014) show that there is a clear behavior change between two phases, in other words mother acquired the target skills after the interventions.

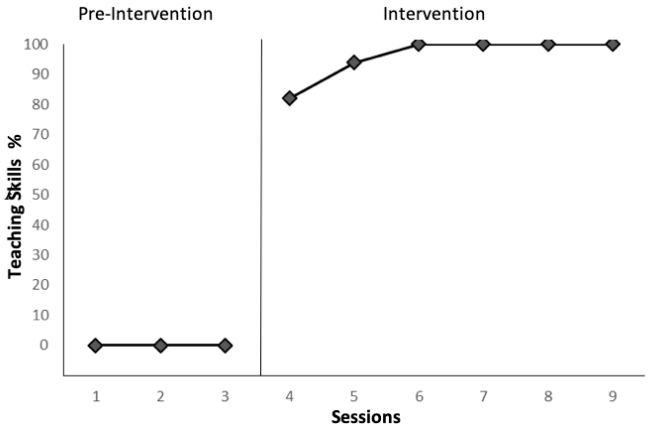

Figure 1.
First mother's performance

In figure 2, similar to the first mother, the second mother did not have information about accompanying the child to the toilet in compliance when the child's diaper was dry, toileting activity, non-toileting activity and what should be done when there were accidents, the child wanted to go to the toilet on her own; and she accomplished sub-objectives of teaching the skill of day-time toileting control at level "0". In other words, the mother did not accomplish any sub-objectives related to teaching the skill of day-time toileting control. The second mother accomplished 16 of 17 sub-objectives of skill of teaching toileting control in the first teaching session, and 16 of 17 sub-objectives in the second teaching ses-sion during the intervention phase which she attended individual education sessions. Also, she accomplished all of 17 sub-objectives of skill of teaching day-time toilet-ing control in all three end-of-teaching as-sessments including three sessions at the end of implementing teaching unit. When we analyze the graph, it's clearly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap be-tween the data points of baseline and inter-vention phases. Also, when trend in inter-vention phases is analyzed it's seen that there is an upward trend at data points. All these graphical analyzing results (Richards, Taylor, & Ramasamy, 2014) show that the-re is a clear behavior change between two phases, in other words the second mother acquired target skills after the inter-ventions.

According to data obtained from inter-view at the pre-intervention phase, as it is seen in figure 3, the third mother also did not have information about accompanying the child to the toilet in compliance when the child's diaper was dry, toileting activity, non-toileting activity and what should be done when there were accidents, the child wanted to go to the toilet on her own; and she accomplished sub-objectives of teac-hing the skill of day-time toileting control at level "0". In other words, the mother did not accomplish any sub-objectives related to teaching the skill of day-time toileting cont-rol. Mother accom-plished 14 of 17 sub-objectives of skill of teaching toileting cont-rol in the first teaching session, 15 of 17 sub-objectives in the sec-ond teaching ses-sion, and 17 of 17 sub-objectives in the third teaching session dur-ing the interven-tion phase which she at-tended individual education sessions. Also, she accomplis-hes all of 17 sub-objectives of skill of teac-hing day-time toileting control in all three end-of-teaching assessments in-cluding three sessions at the end of imple-menting teaching unit. When we analyze the graph, it's clearly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is analyzed it's seen that there is an upward trend at data points. All these graphical analyzing results (Ric-hards, Tay-lor, & Ramasamy, 2014) show that there is a clear behavior change between two phases, in other words the third mother acquired target skills after the interventions.

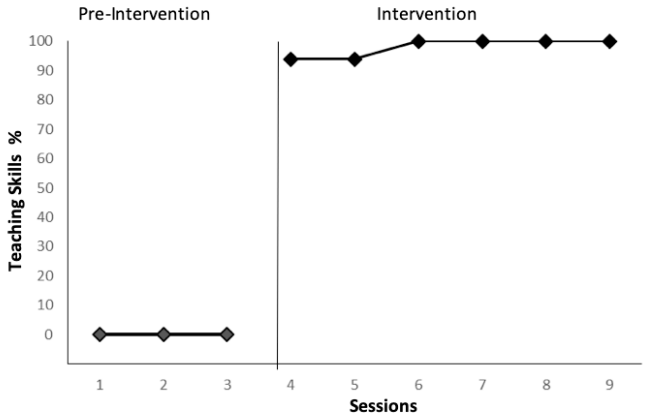

Figure 2.
Second mother's performance

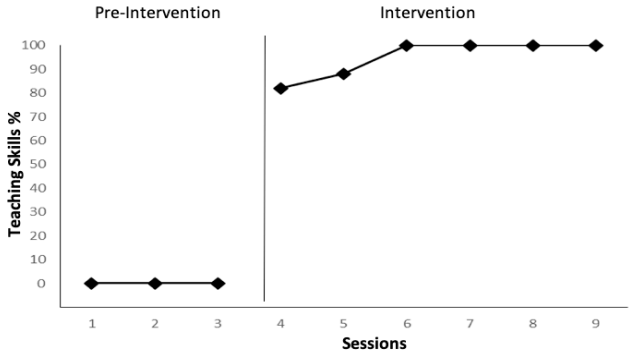

Figure 3.
Third mother's performance

In conclusion, all three mothers accomplished all objectives of the skill of teaching toileting control to their children in the end-of-teaching assessment at the end of implementing "Program for Supporting Home- and Institution-based Toileting Skills for Families". Accordingly, it is considered that the intervention of "Program for Supporting Home- and Institution-based Toileting Skills for Families" enables mothers to acquire the skill of teaching toileting control to their children.

Results on Child's Toileting Skills

On figure 4, it is seen in diaper controls of the first child at the baseline level that child urinated into his diaper during the day, in other words, percentage of urinating into the toilet was 0% while percentage of urinat-ing outside the toilet (in his diaper) was 100%. Considering the records kept by his mother 7 and 14 days after the program ended, it was seen that child always urinates into the toilet. In other words, he sustained toileting control he acquired at level 100%. Accord-ing to curve indicating rates of urination into the toilet, the percentage of urinating regu-larly into the toilet was 80% or higher since the day 15th. When we analyze the graph, it's clearly seen that there is a significant difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is ana-lyzed it's seen that there is an upward trend at data points. Although there are variabili-ties between the data points of intervention phases, the trend is consistent and there is an adequate number of data points to show this consistency. All these graphical ana-lyzing results (Richards, Taylor, & Rama-samy, 2014) show that there is a clear be-havior change between two phases, in oth-er words the child acquired the target skills after the interventions.

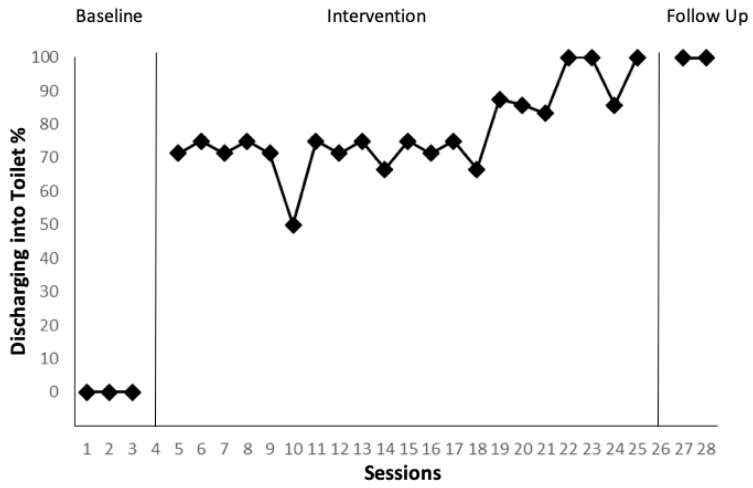

Figure 4.
First child's performance

When looking at the figure 5, it is seen in diaper controls of the second child at the baseline level that he urinated into his diaper during the day, in other words, percentage of urinating into the toilet was 0% while percentage of urinating outside the toilet (in his diaper) was 100%. Considering the records kept by his mother 7 and 14 days after the program ended, it was seen that he always urinated into the toilet. In other words, he sustained toileting control he acquires at level 100%. According to curve indicating rates of urination into the toilet, the percentage of urinating regularly into the toilet was 80% or higher since the day 12th. When we analyze the graph, it's clearly seen that there is a significant difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and inter-vention phases. Also, when trend in inter-vention phases is analyzed it's seen that there is an upward trend at data points. Although there are variabilities between the data points of intervention phases, the trend is consistent and there is an adequate number of data points to show this consistency. All these graphical analyzing re-sults (Richards, Taylor, & Rama-samy, 2014) show that there is a clear behavior change between two phases, in other words the second child acquired the target skills after the interventions.

According to figure 6, it is seen in diaper controls of the third child at the baseline level that she urinated into her diaper during the day, in other words, percentage of uri-nating into the toilet was 0% while percentage of urinating outside the toilet (in her diaper) was 100%. Considering the records kept by her mother 7 and 14 days after the program ended, it was seen that she always urinated into the toilet. In other words, she sustained toileting control she acquired at level 100%. According to curve indicating rates of urina-tion into the toilet, the percentage of urinat-ing regularly into the toilet was 80% or higher since the day 14th. Therefore, it is revealed that "Program for Supporting Home- and Institution-based Toileting Skills for Families" enables mothers to teach toileting con-trol to subjects. When we analyze the graph, it's clearly seen that there is difference between the mean points of baseline and intervention phases. However, there is no overlap between the data points of baseline and intervention phases. Also, when trend in intervention phases is ana-lyzed it's seen that there is an upward trend at data points. Although there are variabili-ties between the data points of intervention phases, the trend is consistent and there is an adequate number of data points to show this consistency. All these graphical analyzing results (Richards, Taylor, & Rama-samy, 2014) show that there is a clear behavior change between two phases, in other words the third child acquired the target skills after the interventions.

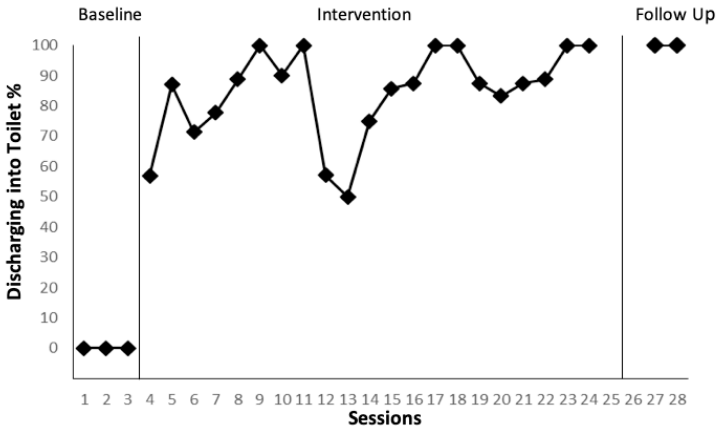

Figure 5.
Second child's performance

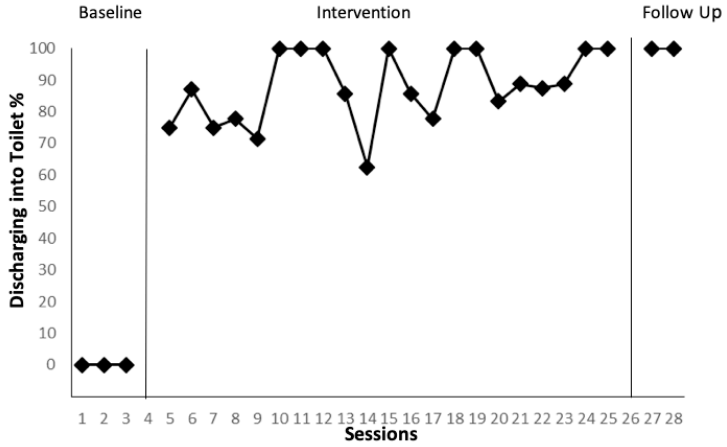

Figure 6.
Third child's performance

Discussion and Conclusion

The result of this study has shown that teaching the acquisition of toilet skills which is based on home and institution, and prepared for the mothers of three children two of whom have ASD and one of whom has intellectual disability is effective in teaching parents how to teach their children toilet skills. Data from both homes and the educational center, receiving data at home by parents only and practice at home by mothers made it easy for the children to generalize the acquired skill at home environment. It shows that the mothers performed as they are expected after approximately 3 sessions and they used these skills for their children successfully. Data from the mothers of the children show that they practiced the skills they learned and these skills affected the performance of the children in a positive and fast way.

Findings from this study are consistent with the past studies and it shows that parents are able to teach toilet skills to their children. During and after the study, mothers expressed their contentment to the teachers of their children, the counsellor and the supervisor about the process and their joy as their children acquired toilet skills and they help succeed this achieve-ment. Findings received from the parents are consistent with the result stated by Macias, Roberts, Saylor, and Fussel (2006) as "families having children with toilet train-ing encounter problems due to more stress than families having children with no toilet training". While determining the components of the training, underwear, dense sit schedule and interval reinforcement methods which are thought to be the most efficient components in successful toilet skills training periods were taken as basis. Comunication attempts of children were supported via gestures and verbal supports.

While it is observed that most of the studies included punishment processes, in this study, punishment was not included just like the studies realized only by Cicero and Pfadt (2002) and Keen, Brannigan, and Cuskelly (2007), and only verbal directions and warning after incidents were used.

When investigating the performance graphics of the mothers, it is attracted the attention that performances of the mothers and improvements are so close to each other and there is no difference among them. When investigated the performance data of the children, it has been seen that there are fewer fluctuations in the first participant's performance and progression is more linear. It has been thought that this situation results from second and third participants have the diagnosis of autism spectrum disorder.

In this study, acquiring toilet skills lasted for approximately 20 days. Although most of the children performed 80% successful after 5 days, data was continued to be collected due to variations in data, and at the end of approximately 20 days, the intervention was ended as the data became consistent. In different studies in the literature, in shorter or similar periods toilet skills can be taught (Luiselli, 1994; Hanney et. al., 2013; Ardıç, & Cavkaytar, 2014). In this study, rapid toilet training (RTT) practice by Kırcaali-İftar et al. (2009) was applied with a few modifications and dense toilet training day was not included. In the study, as the mothers were the main performers of practice, there were modifications; however, it is seen that the process resulted in successfully after the intervention. No toilet alarms which are present in the basic study were used in this study. Diapers of the students were checked often and as majority of the study was realized at homes (natural environment) of the children, no such requirements were necessary. Data from the parents show that a limited number of accidents happened at home environment and this situation did not cause any problems for the family. When we take the limited number of studies regarding the toilet training in which families are actively included, it is seen that the active contribution of families is the most important aspect of the studies.

In the study, taking children to the toilet every 30 minutes and sit 5 minutes were taken as basis. The duration of the class recess was gradually increased to 45 and 60 minutes, based on the fact that the diaper was dry three times or the discharge to the toilet was determined in the process. Demetriou and Toussaint (2016) stated that studies are necessary for different sitting and recess periods in their study. Furthermore, the study findings show that the increased duration of the 30-minute period and the later periods are accepted by the families and that the families are able to perform the practice appropriately.

Limitation of the Study

The present study can be criticized because of the use of the EU pattern and the weakness of this design in terms of experimental validity. Due to the fact that the study will be carried out in a natural environment, it is not possible to use experimentally stronger designs because the variables are difficult to charge and families want to start working quickly and get results quickly. However, the findings show the effect of the intervention and the effect is repeated in different subjects. However, in the new studies to be carried out, the study can be performed by using different experimental designs.

References

Ardıç, A., & Cavkaytar, A. (2014). Effectiveness of the modified intensive toilet training method on teaching toilet skills to children with autism. *Education and Training in Autism and Developmental Disabilities*, 263-276.

Ando, H. (1977). Training autistic children to urinate in the toilet through operant conditioning techniques. *Journal of Autism and Childhood Schizophrenia, 7*, 151–163.

Azrin, N. H., Bugle, C., & O'Brien, F. (1971). Behavioral engineering: Two apparatuses for toilet training retarded children. *Journal of Applied Behavior Analysis, 4*, 249–253.

Azrin, N. H., & Foxx, R. M. (1971). A rapid method of toilet training the institutionalized retarded. *Journal of Applied Behavior Analysis, 4,* 89–99.

Baker B. L., & Brightman, A. J. (1997). *Steps to independence: Teaching everyday skills to children with special needs (3rd ed.).* Baltimore: Paul H. Brookes.

Bakker, E., Van Gool, J. D., Van Sprundel, M., Van Der Auwera, C., & Wyndaele, J. J. (2002). Results of a questionnaire evaluating the effects of different methods of toilet training on achieving bladder control. *BJU international, 90,* 456-461.

Bainbridge, N., & Myles, B. S. (1999). The use of priming to introduce toilet training to a child with autism. Focus on Autism and Other Developmental Disabilities, 14, 106–109.

Barone, J. G., Jasutkar, N., & Schneider, D. (2009). Later toilet training is associated with urge incontinence in children. *Journal of Pediatric Urology, 5*, 458-461. doi:10.1016/j.jpurol.2009.05.012

Blum, N. J., Taubman, B., & Nemeth, N. (2003). Relationship between age at initiation of toilet training and duration of training: A prospective study. *Pediatrics, 111,* 810–814.

Cicero, F. R., & Pfadt, A. (2002). Investigation of a reinforcement-based toilet training procedure for children with autism. *Research in Developmental Disabilities, 23,* 319–331.

Dalrymple, N. J., & Ruble, L. A. (1992). Toilet training and behaviors of people with autism: Parent views. *Journal of Autism and Developmental Disorders, 22,* 265–275.

Dempsey, I. (2005). Legislation, policies and inclusive practices. In P. Foreman (Eds.), *Inclusion in action* (pp. 35–65). Southbank, Victoria: Thomson.

Didden, R., Sikkema, S. P. E., Bosman, I. T. M., Duker, P. C., & Curfs, L. M. G. (2001). Use of a modified Azrin-Foxx toilet training procedure with individuals with Angelman syndrome. *Journal of Applied Research in Intellectual*

Disabilities, 14, 64-70. doi:10.1046/j.1468-3148.2001.00047.x Doan, D., & Toussaint, K. A. (2017). A parent-oriented approach to rapid toilet training. *International Electronic Journal of Elementary Education*, *9*(2), 473-486.

Ellis, N. R. (1963). Toilet training the severely defective patient: An S–R reinforcement analysis. *American Journal of Mental Deficiency, 68,* 98–103.

Fox, R. M., & Azrin, N. H. (1973). *Toilet training the retarded: A rapid program for day and nighttime independent toileting.* Champaign, IL, US: Research Press.

Hanney, N. M., Jostad, C. M., LeBlanc, L. A., Carr, J. E., & Castile, A. J. (2013). Intensive behavioral treatment of urinary incontinence of children with autism spectrum disorders: An archival analysis of procedures and outcomes from an outpatient clinic. *Focus on Autism and Other Developmental Disabilities, 28(1),* 26-31.

Hong, E., & Matson, J. L. (2018). *Assessment of Toileting Problems. In Handbook of Childhood Psychopathology and Developmental Disabilities Assessment* (pp. 453-466). Springer, Cham.

Keen, D., Brannigan, K. L., & Cuskelly, M. (2007). Toilet training for children with autism: The effects of video model-ing. *Journal of Developmental and Physical Disabilities*, *19*(4), 291-303.

Kircaali-İftar, G., Ülke-Kürkçüoğlu, B., Çetin, Ö, & Ünlü, E. (2009). Intensive daytime toilet training of two children with autism: Implementing and monitoring systematically guarantees success! *International Journal of Early Childhood Special Education, 1,* 117-126. Retrieved from http://www.int-jecse.net/

Kroeger, K. A., & Sorensen-Burnworth, R. (2009). Toilet training individuals with autism and other developmental disabilities: A critical review. *Research in Autism Spectrum Disorders, 3,* 607–618.

Kroeger, K., & Sorensen, R. (2010). A parent training model for toilet training children with autism. *Journal of Intellectual Disability Research*, *54*(6), 556-567.

Levato, L. E., Aponte, C. A., Wilkins, J., Travis, R., Aiello, R., Zanibbi, K., ... & Mruzek, D. W. (2016). Use of urine alarms in toilet training children with intellectual and developmental disabilities: A review. *Research in developmental disabilities*, *53*, 232-241.

LeBlanc, L. A., Carr, J. E., Crossett, S. E., Bennett, C. M., & Detweiler, D. (2005). Intensive outpatient behavioral treatment of primary urinary incontinence of children with autism. *Focus on Autism and Other Developmental Disabilities, 20,* 98–105.

Lee, C. Y. Q., Anderson, A., & Moore, D. W. (2014). Using video modeling to toilet train a child with autism. *Journal of Developmental and Physical Disabilities*, *26*(2), 123-134.

Luiselli, J. K. (1994). Toilet training children with sensory impairments in a residential school setting. Behavioral Interventions, 9, 105-114.

Macias M. M., Roberts K. M., Saylor C. F., Fussell J. J. (2006) Toileting concerns, parenting stress, and behaviorproblems in children with special health care needs. *Clinical Pediatrics 45,*415–22.

McLay, L., Carnett, A., van der Meer, L., & Lang, R. (2015). Using a video modeling-based intervention package to toilet train two children with au-tism. *Journal of Developmental and Physical Disabilities*, *27*(4), 431-451.

Mruzek, D. W., McAleavey, S., Loring, W. A., Butter, E., Smith, T., McDonnell, E.,... & Taylor, C. M. (2017). A pilot investigation of an iOS-based app for toilet training children with autism spectrum disorder. *Autism*. doi:10.1177/1362361317741741

Richards, S. B., Taylor, R. L., & Ramasamy, R. (2014). *Single Subject Research: Applications in Educational and Clinical Setting*. Australia: Wadsworth Cengage Learning.

Schum, T. R., Kolb, T. M., McAuliffe, T. L., Simms, M. D., Underhill, R. L., & Lewis, M. (2002). Sequential acquisition of toilet training skills: A descriptive study of gender and age differences innormal children. *Pediatrics, 109*, E48.

Peeters, B., Noens, I., Kuppens, S., & Benninga, M. A. (2016). Toilet training in children with a functional defecation disorder and concomitant symptoms of autism spectrum disorder. *Research in Autism Spectrum Disorders*, *26*, 91-98.

Tsai, L., Stewart, M. A., & August, G. (1981). Implication of sex differences in the familial transmission of infantile autism. *Journal of Autism and Developmental Disorders, 11*, 165–173.

Whiteley, P. (2004). Developmental behavioral and somatic factors in pervasive developmental disorders: Preliminary analysis. *Child: Care, Health and Development, 30*, 5–11.

Williams, G., Oliver, J. M., Allard, A., & Sears, L. (2003). Autism and associat-ed medical and familial factors: A case control study. *Journal of Developmental and Physical Disabilities, 15*, 335–349.

Wingate, H. V., Falcomata, T. S., & Ferguson, R. (2017). In J. L. Matson (Ed.), *Clinical guide to toilet training children* (pp. 119–167). Cham: Springer Nature.

Yin, Robert K. (2014). *Case study research: Design and methods.* Los Angeles, CA: Sage.

Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan, 9*, 1-6.