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Analysis of Toilet Training in Children with Speech-Language and Communication Disorders

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A B S T R A C T

Toilet training is an important developmental milestone in early childhood and it requires the integration of physical, cognitive, and emotional aspects in order to achieve toileting independence.

This study analyzes the impact of the intensive and gradual toilet training methods on the duration and complications in children with typical development and children with speech-language and communication disorders.

When comparing the two methods, the results show that the gradual method is significantly associated with a longer training duration (M=7.08, SD=6.04) and a higher frequency of complications (96.2%), while the intensive method has a shorter duration (M=1.67, SD=1.19) and minimal complications (8.3%). The age of starting the toilet training was identified as an important factor, so that the older children have longer training ($p<0.001$) and an increased risk of complications ($p<0.001$), and therefore intensive training is recommended for them.

The findings suggest that the choice of method should be adapted to the child's individual needs and its developmental age, as well as to the parents' expectations.

Keywords: Toilet Training, Disorders, Gradual Method, Intensive Method, Age, Complications.

1. Introduction

Toilet training is a developmental milestone that some parents who have high expectations for this process may find it very difficult (Fleming and MacAlister, 2016; Wilde, 2022). It is defined as the child being aware of the need to use the toilet without being reminded or prepared by the parents (Luxem and Christophersen, 1994; Mota and Barros, 2008). Using the toilet implies learning in order to understand the procedures, the language, and the routines involved in using the toilet, as well as development of the necessary skills and independence in managing (Cocchiola and Redpath, 2019). The objective empirical assessment of a child's readiness for toilet training becomes particularly critical when parents face real or perceived difficulties in initiating the process, especially when the child has a speech-language or communication disorder. For these reasons, it is essential that pediatricians, speech therapists, special educators, and psychologists assist in determining the most appropriate time for the toilet training (Frauman and Brandon, 1996). In some cases, the child theoretically meets many of the criteria for independent toilet use but when the child has speech-language or communication disorder that could affect the parents' expectations and hinder their full commitment to the training process. Initially, the typical parents' reasoning about the toilet training is based on empathy for the child, where the training would be seen as another challenge that the "poor little child" may not be able to endure. In some cases, parents are so preoccupied with the details of the child's condition that the possibility of potty training is not even considered (Frauman and Brandon, 1996).

The American Academy of Pediatrics and the Canadian Pediatric Society report that the most physiologically, cognitively, and behaviorally appropriate time to start toilet training is between 18 and 24 months (Choby and George, 2008), although Brazelton (1962) determined that the age of 28 months is the time when full control over the bowels and bladder is typically achieved. In the 1990s, this age was increased to 36 months (Blum, Taubman, and Nemeth, 2003). In 1993, a study conducted in the USA on 1192 children reported the age for complete control of the bowel and urinary bladder as 2.4 years1 (Blum et al., 2003). Koc and colleagues (2008) conducted a study on 745 children and determined the toilet training completion age to be 28.44±9.04 months. However, we found the average toilet training age to be 22.32±6.57 months. Toilet training is completed in some countries at an earlier age than is the case in some other countries. When it comes to children with speech-language and communication disorders, it is very important to determine the child's developmental age. If the child's developmental age is below 18 months, it is not recommended to start toilet training.

The readiness for toilet training can be evaluated via physical, cognitive, and emotional aspects. Physical signs encompass a child's physiological and motor abilities like control of sphincters and ability to perform gross motor skills such as walking, sitting, and squatting comfortably. Cognitive development accelerates as children begin to explore the outside world and themselves, these cognitive signs include understanding what is said, following simple instructions, and being able to say words related to the bathroom (toilet, sink, soap, toilet paper, etc.). Emotional aspects are signs such as the child being uncomfortable when his/her nappy is dirty, asking for it to be changed or trying to take it off himself/herself, wanting to be liked by the parents, striving to get reward or praise, turning towards the toilet or bathroom when he/she needs to use the toilet and wanting to use it (Brazelton, 1962; Kaerts et al., 2012; Wilson, 2011).There are various methods to teach a child how to use the toilet and establish hygiene habits, which represent a natural process that occurs spontaneously during development. At the beginning of the twentieth century, toilet training, which was expected to develop naturally in line with the mother's instincts, underwent a sharp transformation with the development of the behaviourist approach (Stendler, 1950).

Contemporary toilet training derives from two accepted models: child-oriented gradual training and structured-behavioral, endpoint-oriented training. The former approach views toilet training as a process by which a parent systematically responds to a child's signals of toilet "readiness," whereas the latter views toilet training as a process of eliciting a specific chain of independent toileting behaviors. Practically speaking, contemporary theoretic constructs of toileting behavior diverge with respect to training endpoints (ie, defined differently or deemphasized altogether), emphasis on self-esteem, development of goals, and timing of initiation. A scientific basis cannot be established for a universal timeline for toilet training, because each method has its own definition of the toilet training process (Berk and Friman, 1990).

The duration of toilet training is affected by multiple factors: sex and age of the child, age and educational status of the parents, psychological status of the child, socioeconomic status of the family, methods and tools used in toilet training, health conditions which may render the process, etc. (Taubman, Blum, and Nemeth, 2003; Koc et al., 2008; Frauman and Brandon, 1996). Recent studies found that the earliest achieved readiness skill occurred at a median of 22 months in girls and almost 25 months in boys. (Schum, 2002). As for the parents' educational status, studies have shown that as the education level of the mother increased, toilet training age also increased (Horn et al., 2006). Joinson et al. found that while 34.5% of mothers with less education were reporting toilet training before 24 months, this rate was 28.4% for graduates of higher education (Joinson et al., 2009). In the study by Tarhan and colleagues (2015) a significant difference was found between mothers with more than 12 years of education and those with less ($p=0.03$). Similar results were found for fathers. As the father's education level increased, toilet training age also increased, but this increase was not statistically significant ($p=0.612$). Horn and colleagues (2006) in their research found that while the toilet training age for families with annual incomes over 50 thousand dollars was 25 months, it was 18 months for the families with lower incomes ($p<0.001$). The question of the relationship between the time of initiating toilet training and undesirable effects revealed a higher incidence of incontinence and urinary tract infections when children were trained later (Bakker > 18 months; Taubman et al. > 42 months) (Bakker et al., 2002; Taubman, Blum, and Nemeth, 2003). Blum and colleagues concluded that toilet training at a younger age (18–26 mo) was associated with a longer training interval but no adverse events. The study by Barone, Jasutkar, and Schneider (2009) found that toilet training after 32 months was associated with a higher incidence of urge incontinence.

1.1. Subject and purpose of the study

The subject of this paper is the analysis of toilet training, referring to the age when it was started, how long it took to complete the training, which method was used during the process, and whether any adverse outcomes or difficulties have occurred.

The purpose of the paper is to determine which method of toilet training is more commonly used by parents and to assess its effectiveness.

2. Methodology

2.1. Sample

The research was conducted on a sample of 100 parents of children with speech-language and communication disorders (one parent of each child). Regarding the educational background of the parents, most of them are either secondary or higher education graduates (46% and 45 % respectively), while those with master's or doctoral degrees are less represented (7% and 2%, respectively). None of the parents had only elementary education. A significant portion of the participants are unemployed (45%), almost equal to those with permanent employment (44%). Parents who are employed part-time or on a freelance basis are fewer in number (7% and 4%, respectively). Regarding the place of residence, the sample is predominantly urban (76%). Most families from which the children come are nuclear families (62%), while the remaining families live with the father's parents (38%). None of the children live with their mother's parents or other relatives.

The exclusion criteria were parents whose children had not yet started or completed toilet training, as well as parents of children without any speech-language or communication disorders.

2.2 Instruments

There was a questionnaire administered with one parent of each child. In addition to demographic data, the questionnaire contained questions related to: the age at which toilet training was started and completed, the used method, as well as questions regarding any complications or difficulties encountered during the toilet training process.

The questionnaire was filled out by the parents in the presence of the examiner.

2.3 Data Analysis

The data were statistically processed using IBM SPSS version 26. The characteristics of the sample were expressed as the mean plus/minus the standard deviation (Mean±SD) for continuous variables and as frequencies and percentages for nominal variables. In order to examine the differences in the outcomes of toilet training based on the method used, an Independent Samples Test and One-Way ANOVA were employed. For examining the relationships between variables, Pearson correlation and Point-biserial correlation were used (depending on the type of variables). Prediction for a positive outcome based on the methods was conducted using Logistic Regression. All tests were performed with a 95% confidence interval, and p-values <0.05 were considered statistically significant.

3. Results and Discussion

The results obtained with the analysis are shown below.

3.1. Data Related to Toilet Training

The first analysed characteristic is the duration of toilet training. As shown in Table 1, the average duration of toilet training is 4.48 months, with a deviation of 5.182 months. The shortest training lasted 1 month, and most children completed the training within this period (38%), while the longest was 2 years, a period reported by the fewest parents (4%). A significant number of children underwent toilet training for 1 year (10%).

Table 1. Duration of Toilet Training

Duration of Toilet Training	**N**	**%**
1 month	38	38%
2 months	12	12%
4 months	23	23 %
6 months	13	13%
12 months	10	10 %
24 months	4	4%
Total	100	100%
Mean (months)	4.48	
SD (months)	5.182	

Table 2 presents the results referring to the used method for toilet teaching. The intensive method of toilet training refers to a process of eliciting a specific chain of independent toileting behaviors, whereas the gradual method refers to a process by which the parent systematically responds to the child's signals indicating the "readiness" to use the toilet. The table shows that the division regarding the application of methods in conducting toilet training is minimal, with the majority of parents using the gradual method (52%), which is oriented towards the child's readiness, and the remaining parents using the intensive method (48%), which is oriented towards encouraging independent behaviors.

Table 2. Used Method

Used Method	**N**	**%**
Intensive Method	48	48%
Gradual Method	52	52%
Total		

Another analysed characteristic of the toilet training is the child age at the initiation of the toilet training. As shown in Table 3, the average age of the children at the beginning of the training is 3.1 years, with a deviation of just under one year (0.6276). The majority of children with speech-language and communication disorders began toilet training at the age of 3 (40%), followed by those who started half a year earlier (30%). Two children began the toilet training at the age of 6, as the parents believed their child was physiologically ready at that time.

It should be noted that the training had begun simultaneously for both urination and defecation.

Table 3. Child Age at the Initiation of the Toilet Training

Child Age at the Beginning of Toilet Training	N	%
2.5 years	30	30%
3 years	40	40%
3.5 years	18	18%
4 years	10	10%
6 years	2	2%
Total	100	100%
Mean (years)	3.1	
SD (years)	0.6276	

The last analysed characteristic of the toilet training are the adverse outcomes i.e. complications related to the toilet training.

Fifty-four percent of parents reported some complication during the training, while the remaining 46% did not report any complications (Table 4).

Table 4. Complications during toilet training

Complications	N	%
No Complications	46	46%
Reported Complications	54	54%
Total	100	100%

Table 5 shows that in terms of age, all children over the age of 3.5 years encountered some problem, while the fewest issues were reported among the youngest children, specifically one-third of children at 2.5 years of age (33.3%), similar to children at the age of 3 (35%).

Table 5. Complications of Toilet Training by Age

Reported Complications by Age	N	%
2.5 years	10	18.5%
3 years	14	25.9%
3.5 years	18	33.3%
4 years	10	18.5%
6 years	2	3.8%
Total	54	100%

The most common issues were the refusal to use the toilet or potty (51.9%) and incontinence (33.3%), while the least common were oppositional behaviour (3.7%) and aggressiveness (1.9%). Other problems included tantrums (22.2%), children asking for diapers (18.5%), intense crying (14.8%), constipation (11.1%), and phobias, such as fear of the toilet or potty (7.4%). Some children experienced multiple types of complications. The reported types of adverse outcomes are presented in Table 6 below.

Table 6. Types of Reported Complications

Type of Complication	N	%*
Refusal to use toilet or potty	28	38%
Tantrums	12	12%
Constipation	6	23 %
Incontinence	18	13%
Crying	8	10 %
Request for diapers	10	4%

Phobia	4
Oppositional behaviour	2
Aggressiveness	1

* % of those 54 with reported complications

3.2. Data Related to Method of Toilet Training

Table 7 shows the duration and the adverse outcomes of toilet training when intensive and gradual method used, respectively.

The average duration of toilet training using the intensive method is 1.67 months (SD = 1.191). The majority of participants (66.7%) completed the training in the shortest period of 1 month, while a small number had longer training periods, with only 2.1% finishing after 6 months. Complications with this method are rare, suggesting that it is both effective and less risky. Only 8.3% of parents reported some complication for their children.

The average duration of toilet training using the gradual method is 7.08 months (SD = 6.042), indicating that the gradual method has a significantly longer average duration compared to the intensive method. The majority of participants (32.7%) completed the training in 4 months, while 19.2% completed it after 1 year. A significant portion (7.7%) extended the training for as long as 2 years. The gradual method is associated with a considerably higher number of complications, as 96.2% of children experienced some issues, which may suggest challenges or the method's potential unsuitability for some participants.

Table 7. Types of Reported Complications

Result by Method	**Intensive Method**		**Gradual Method**	
	N	**%**	**N**	**%**
Duration of Toilet Training				
1 month	32	66.7	6	11.5
2 months	9	18.7	3	5.8
4 months	6	12.5	17	32.7
6 months	1	2.1	12	23.1
12 months	0	0	10	19.2
24 months	0	0	4	7.7
Total	48	100	52	100
Mean	1.67		7.08	
Standard Deviation	1.191		6.042	
Complications				
No Complications Reported	44	91.7	2	3.8
Complications Reported	4	8.3	50	96.2
Total	48	100	52	100

Next, we examined the significance of these differences (Table 8).

Table 8. Differences Based on the Methods Used

Differences Regarding:	**p**
Complications	0.000
Age	0.000
Duration of Toilet Training	0.000

The coefficients in Table 8 confirm the previous results and present significant differences regarding complications, age, and the duration of toilet training depending on the method used (all $p < 0.001$).

Namely, there is a significant difference in the frequency or severity of complications depending on the method, meaning that the choice of method significantly impacts the occurrence of complications. The result for age suggests that certain methods may be more suitable for different age groups, highlighting the need for careful selection. The time required for successful completion of toilet training also differs significantly according to the method used, indicating that the method itself leads to differences in effectiveness.

From Table 9 we observe that the method shows a significant correlation with all variables, with the strongest correlation being with complications ($r = 0.880$, $p < 0.001$), indicating that the gradual method has a significant impact on the occurrence or frequency of complications. Additionally, the method strongly positively correlates with the duration of toilet training ($r = 0.524$, $p < 0.001$), meaning that the gradual method requires more time for a successful training outcome. These results are consistent with those presented in Table 4.

Table 9. Correlations Between Methods and Other Variables

Variable	Method	Age	Complications	Duration
Method	r = 1	0.458**	0.880**	0.524**
	p = 0.000	0.000	0.000	0.000
Age	r = 0.458**	1	0.469**	0.819**
	p = 0.000	0.000	0.000	0.000
Complications	r = 0.880**	0.469**	1	0.397**
	p = 0.000	0.000	0.000	0.000
Duration	r = 0.524**	0.819**	0.397**	1
	p = 0.000	0.000	0.000	0.000

Note: Correlation is significant at the 0.01 level (2-tailed).

The moderate positive correlation between the method and age ($r = 0.458$, $p < 0.001$) suggests that the gradual method contributes significantly to the success of training in older children and should be applied to this age group. Therefore, the choice of method should depend on the age structure of the children involved in the toilet training program.

Of 100 children undergoing toilet training with the gradual method and successfully completing it, 46 will be among the oldest, 88 will experience some complication, and 52 will have the longest training periods to achieve a successful outcome.

Age shows a strong positive correlation with the duration of toilet training ($r = 0.819$, $p < 0.001$), indicating that older participants face a longer training process. The moderate positive correlation with complications ($r = 0.469$, $p < 0.001$) suggests that older children are more likely to experience complications during training, and that age is an important factor influencing the complexity and challenges associated with the process. Starting training 1 year later leads to a delayed training duration of 0.8 years and a moderate increase in the number of complications, roughly half of what is typically expected.

There is also a moderate but significant positive correlation between complications and the duration of training ($r = 0.397$, $p < 0.001$), showing that complications extend the duration of training. All results have a 99% confidence interval.

Prediction allows for measuring and comparing the effectiveness of different methods, which can lead to improvements in the methods themselves. By predicting, we can identify which method will be more suitable for each child during toilet training. Guidance can be provided regarding which children are at higher risk of complications and who will have a longer treatment process, depending on the method used. Therefore, it helps identify risk factors for successful training and enables a personalized approach, as well as timely intervention to reduce complications and negative outcomes.

Such predictions can educate parents about the expected duration and the factors that influence complications, allowing them to feel more confident and informed. This will help them be better prepared to begin the training and achieve success in the shortest possible time. The forecast is shown in Table 10.

Table 10. Prediction Based on the Method Used

Method [a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Intensive	Intercept	-3.855)	7.825	0.243	1	0.622			
Method	Age	5.416	2.416	5.026	1	0.025	225.040	1.976	25634.199
	Complications	-10.241)	7.216	2.014	1	0.156	3.568E-5	2.573E-11	49.486
	Duration of Training	-1.404)	0.590	5.658	1	0.017	0.246	0.077	0.781

[a] The reference category is: Gradual Method

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	126.229			
Final	8.568	117.660	3	0.000

The results show that as age increases, the chances of using the intensive method is much higher compared to the gradual method, which is confirmed by the large odds ratio (225.040). For each additional increase in age, the chances of using the intensive method increase by approximately 225 times. The strong correlation between age and the method ($p = 0.025$) indicates that practitioners should consider age when deciding between intensive and gradual training methods. It is highly likely that older children will have more success in adopting new toilet habits if they undergo intensive training, compared to younger children, for whom better results may be expected with the gradual method.

Complications do not significantly predict the choice of method ($p = 0.156$), meaning that the possibility of complications should not strongly influence the choice of method. However, it is important to note that complications are less likely to occur with the intensive method compared to the gradual method.

The duration of toilet training is detected as a significant predictor. The prediction suggests that longer training duration reduces the chances of success when using the intensive method and points towards the use of the gradual method instead. The odds ratio (0.246) indicates that for each additional month of training duration, the probability of success with the intensive method decreases by approximately 75.4% (1 - 0.246). It is important to highlight that if parents want their child to maximize the efficiency of training in a shorter time (for any reason), then the training should be carried out using the intensive method.

The drastic decrease in the -2 Log Likelihood value from 126.229 to 8.568, along with the high X^2 value (117.660), suggests that the predictors adequately explain which method should be used. The predictors (age, complications, and duration of toilet training) collectively contribute to explaining the variability in the choice of method, that is, choosing the intensive method versus the gradual method ($p < 0.000$).

3.3 Discussion

Parents of children with speech-language and communication disorders face numerous challenges during the toilet training due to the prolonged need for support in helping their children to develop hygiene habits and use the toilet. Although toilet training presents a significant challenge for parents of children with speech- language and communication disorders, it is also one of the most important developmental milestones in early childhood. The initiation and completion of toilet training are influenced by various factors that either facilitate or inhibit this process (Van Aggelpoel et al., 2018).

The results of our study showed that parents of children with speech and language disorders began toilet training at child age ranging from 2 years and 6 months to 6 years. In terms of the duration of toilet training, the results varied significantly, ranging from 1 month to 2 years. The majority of parents applied the gradual method (52%), similar to the study by Blum et al. (2003), which found that many parents adopt a child-centered approach but face difficulties in assessing when their child is ready for training. In our study, only two parents believed that their child was physiologically ready for training at that time.

The results indicate a significant correlation between the method of toilet training and key variables such as complications, training duration, and the age of participants. The gradual method is associated with a higher frequency of complications compared to the intensive method and takes significantly longer, which is consistent with the assertion by Schum and colleagues (2002b) that longer toilet training methods may lead to increased risks of complications, including emotional stress and physical difficulties. This finding also aligns with the results of Horn and colleagues (2006), who suggested that gradual approaches, although more adaptable for children, often require more time to achieve successful completion.

We found that the occurrence of complications further extends the training duration, as complications such as resistance from the child or health issues require more time and resources to overcome.

These findings align with those of Taubman, Blum, and Nemeth (2003). Similarly, Brazelton (1962) reported a 1.4% incidence of problems after five years of age using his child-oriented method, and Fox and Azrin (1973) did not report on adverse events. One study of 4332 children found that children who had symptoms of incontinence or infections were more likely to have been rewarded and punished during toilet training, whereas children with no symptoms of the lower urinary tract were more likely to have been encouraged by their parents to try again later (Bakker et al., 2002).

Barutçu and colleagues (2024) conducted a study aimed to determine the factors affecting the duration of toilet training in children aged 0-5 years and to develop a tool to assess the child's readiness to start toilet training (TTRS; Toilet Training Readiness Scale). In this study, The mean age of initiation of toilet training was 26.8 months, which means that our participants were older (37.2 months). It was found that the TTRS score, mother's employment status, family type, child's first reaction, toilet type, and continuity of training were important predictors. They also found a significantly small negative correlation between the TTRS score and the duration of toilet training, as well as a significantly small positive correlation with the age at the start of toilet training (Barutçu et al., 2024). Taubman found that when toilet training was introduced before 24 months of age, 68% of children were toilet trained before 3 years of age, whereas when toilet training was introduced after 24 months, only 54% were toilet trained before 3 years of age. These findings are consistent with the results of our study, where we found that older children faced a longer duration of the process but also had a higher likelihood of encountering challenges during training, which may be due to already established habits or psychological resistance to change. Blum, Taubman, and Nemeth (2003) also emphasized that delayed initiation of toilet training could lead to increased complications. The prediction showed that for older children, the intensive method should be used to maximize results, as their increased cognitive maturity and motor skills allow for better adaptation to more structured and intensive approaches. These results are consistent with the research of Schum and colleagues (2002), who indicated that child's age is a key factor in the success of toilet training programs, with older children acquiring new habits more quickly.

Blum et al. (2003) examined the relationship between the child's age at the start of intensive toilet training, the age at which toilet training was completed, and the duration of the training. They did not find significant benefits in starting intensive toilet training before 27 months of age, but they also found no problems with starting intensive training before 27 months, except for a longer duration of training. These results are consistent with our findings, which show that the intensive method results in fewer complications and a shorter training duration. Blum et al. (2003) do not claim that 27 months is the correct age to begin toilet training, as they did not identify specific physiologic or developmental events that occur at this age. Similarly, we cannot point to a precise age limit for starting toilet training, but it is clear that the earlier the training begins, the easier and quicker the child will adopt new toilet practices. This aligns with the idea that early initiation of toilet training, while not necessarily having a specific optimal age, may lead to more successful outcomes, particularly with the intensive method. It seems that starting earlier allows for more favorable conditions for children to learn the necessary skills and habits, potentially contributing to a smoother and more efficient training process.

4. Conclusion

Successful toilet training is an important milestone in the development of every child and can be a source of pride and joy for every parent. For successful toilet training, small steps are required that lead to significant changes, such as: assessing the readiness of both the child and the parent to begin toilet training; familiarizing the child with the toilet (or potty) and mastering the space; removing diapers, creating a daily schedule for toilet visits, and establishing a routine for using the toilet; adopting other hygiene habits (undressing, using the toilet, using toilet paper, flushing, dressing, washing hands, and wiping). Since every child is different, some children may not be able to be trained according to the same physiological schedule, meaning the signs of readiness may appear a bit later. Therefore, guidance for parents and assistance from a professional in identifying these signs is very important. It is reasonable to expect that some children will not show readiness to cooperate or the ability to actively participate in the potty training process between 15-18 months of age, making an attempt to wean them off diapers too early. If the child is not ready for potty training by the 20th month, it is advisable to wait another 3 months. This pause in training offers certain protection from conflicts between parents and children that arise from premature demands for independent toilet use. On the other hand, it prevents the emergence of unwanted effects, which are difficult to fix and can block further progress (Christophersen, 1998). Practical experiences have shown that children with developmental difficulties may fail to use the toilet independently, even with the most complex training programs. Some may even experience regression when returning to their normal living conditions. In such situations, it is not advisable to increase training efforts. Instead, it is necessary not to interrupt the training or program but rather to reorganize the natural conditions for toilet use (Bettison, 1986).

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