Iran J Pediatr. 2017 June; 27(3):e9656. doi: 10.5812/ijp.9656.
Published online 2017 June 12. **Research Article**

Toilet Training and Influencing Factors that Affect Initiation and Duration of Training: A Cross Sectional Study

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Received 2016 November 10; **Revised** 2017 February 01; **Accepted** 2017 April 07.

Abstract

Objectives: Aim of this study was to determine the pattern of toilet training (TT) in Jordan, the factors that are related to the initiation age, duration and the methods of training used among different sociocultural groups.
Methods: Mothers of 1257 children attending pediatric clinics at Jordan University Hospital were directly interviewed.
Results: Mean initiation and completion ages were 22.5 ± 6.50 and 26.48 ± 9.37 months respectively. Families living in urban settlement, first child in family, child-oriented approach, working mothers and mothers with higher level of education started training later. The duration of toilet training was 5.80 ± 8.06 weeks and it was shorter in families who used the child-oriented approach. Intensive method was used in 59.4%, child-oriented in 40.6%. Young mothers used more frequently the intensive method. Constipation and stool toilet refusal developed in 15.4% and 15.1% respectively and there was a significant association between constipation and older age of starting toilet training.
Conclusions: Intensive method of training is more popular in our country and the initiation and completion age are earlier than in other countries. The age of initiation may be increased as parents are better educated and a child-oriented approach becomes more popular than the intensive approach.

Keywords: Toilet Training, Child-Oriented Approach, Intensive Method, Jordan,

1. Background

Toilet training is a challenging step for parents and children that comprises many steps and requires the right integration of neurological, muscular, emotional and behavioral elements. It is a developmental milestone in child's life where children discover their physical abilities and react to external pressure (1). Failure of TT results in physical and psychological consequences.

There are two methods of TT described in the last decade, a) the gradual child-oriented method designed by Brazelton (2) in 1962 where parents respond to the child's signals of toileting readiness and b) the structured endpoint parent oriented training method of Azrin-Foxx where caregivers actively teach toileting behavior (3). The American Academy of Pediatrics 1999 recommends the child-oriented way (1). There are many signs of readiness described in the literature that develop at different ages and indicate child's readiness for TT (4), but most children do not master readiness signs until the second birthday (5).

Many trials have been performed on the initiation age and duration of TT and these showed an increasing trend toward initiating TT at an older age (6). During the 40s, parents started TT before the age of 18 months, but nowadays this age increased to 21 to 36 months (5). At the end of the 90s, children were toilet trained 12 to 15 months later than children trained in the 50s (6). Most children now start training between 18 and 24 months. This may be attributed to the use of disposable diapers, many working parents have less time available to train their children, and consider their children young to be trained before 24 months if the child -oriented method was used (7, 8).

Most of the studies on TT were done on western populations (6). Few were done in Middle East countries as Turkey (9, 10) and Iran (11). None were done in Jordan, so this study was conducted to determine the pattern of TT in Jordan, the initiation age, the duration needed, the method used and problems encountered so that recommendations for proper methods can be obtained. The factors that might be related to the age of initiation and duration such as maternal demographics and method of training were also evaluated.

2. Methods

A cross sectional study was carried out between June and September 2014. A structured data sheet was used and data collected by direct interviews with mothers attending

outpatient pediatric clinics at Jordan University Hospital by a trained research assistant. A total of 1256 mothers were interviewed.

The data included: current age; gender; season of TT; age at starting the training; the duration needed; age of complete-day control and night-time control; ways of training used as "rewarding", "modeling", "punishment", "telling stories" or regularly putting the child on the toilet; type of toilet (regular or potty) and presence of family support. Two methods of TT were assessed. The child-oriented method was defined when the parents started TT after the child showed certain readiness signs, and the intensive method where parents started TT because they believed that the age was appropriate without considering how much the child was ready. Other socio-demographical information included mother's age, her level of education, number of siblings, maternal status (working or housewife), settlement and person who gave TT. The problems encountered during training as constipation and stool toilet refusal were also studied. Children with developmental delay and anomalies in the spinal cord or children with chronic kidney disease and overactive bladder were excluded. Oral verbal consent was obtained from the mothers who participated in the study after the approval of the hospital's local ethical committee.

2.1. Statistics

Data were collected, coded and entered into Statistical Package for Social Science (SPSS version 16, SPSS Inc, Chicago, IL, USA). Data were summarized as counts and percentages for categorical data and as means and standard deviation (SD) for continuous data. Normality of data was assessed by Kolmogorov-Smirnov and Shapiro Wilk tests. Homogeneity of variance was assessed by Levene's test.

Data of continuous nature among different groups were compared by parametric inferential statistics (t-test and ANOVA) or non-parametric inferential statistics (Mann-Whitney U and Kruskal-Wallis) as applicable. Alternatively, data of categorical nature were compared among different groups by chi square or Fisher exact test as appropriate. Correlation was assessed by Pearson or Spearman correlation tests. Statistical significance was considered as $P < 0.05$.

3. Results

3.1. Socio-Demographic Characteristics (Table 1)

Mean current age was 5.4 ± 1.9 years. 55.4% of children were under 5 years old. Average age of mothers was 30.1 ± 12.3 years. Average number of siblings was 1.7 ± 1.6.

Table 1. Socio-Demographic Characteristics of the Patients

Characteristic	No. (%)
Child's gender	
Female	600 (47.7)
Male	657(52.3)
Settlement	
Rural	136 (10.8)
Urban	1121 (89.2)
Mothers' level of education	
School	565 (44.9)
College	144 (11.5)
University	548 (43.6)
Maternal status	
Housewife	831 (66.1)
Working mother	426 (33.9)

TT was given by parents in 87.4% of cases. Family support by the presence of grandparents living with the children was present in 27.1%. 70.2% of children had training during the summer season. 354 (28.2%) of children were first siblings. 24.1% had previous attempts of training.

3.2. Initiation and Completion of Toilet Training

The mean age of initiation of TT was 22.50 ± 6.50 (range 9 - 48) months. 181 (14.4%) of children had training under 18 months, 835 (66.4%) between 18 and 30 months and 241 (19.2%) of them over 30 months. The mean completion age of daytime TT was 23.80 ± 6.70 months. Mean duration of daytime TT was 5.80 ± 8.06 (range 1 - 72) weeks.

Mean age of night time-control was 26.48 ± 9.37 months.

There was a statistically significant weak negative relationship between age of initiation and duration of training ($P < 0.0001$, $r = -0.128$). The duration of toilet training was statistically longer in families who started TT under 18 months, compared to families who started TT between 18 - 30 months (7.6 ± 8.40 vs 5.50 ± 7.70 weeks, $P < 0.007$).

In univariate analysis, the factors that were significantly associated with later initiation and completion age were presence of family support, first child, urban settlement, university degree for the mother's education, working mother, child-oriented method for training, use of punishment as a way of training (Table 2). There was no correlation between mothers' age, child's gender, use of potty and initiation age. The only factor that affected significantly the duration of training was the child-oriented method.

Table 2. Factors Associated with Initiation and Completion and Duration of Toilet Training[a]

	Factors Associated with Training (n = 1257)	Initiation Age, mo	Completion Age, mo	Duration of TT, w
Gender	Male (600)	22.8 ± 6.8	24.2 ± 7	6.1 ± 8.7
	Female (657)	22.4 ± 6.3	23.6 ± 6.4	5.6 ± 7.4
	P Value	0.2	0.12	0.2
Family support	Yes (341)	24 ± 6.3	25.1 ± 6.5	5.3 ± 7.8
	No (916)	22.1 ± 6.6	23.5 ± 6.8	6 ± 8.2
	P Value	< 0.0001	< 0.0001	0.18
Child rank	First child (354)	23.6 ± 6.4	24.9 ± 6.6	5.9 ± 8.7
	Not first child (840)	22.1 ± 6.5	23.4 ± 6.7	5.8 ± 7.9
	P Value	< 0.0001	< 0.0001	0.9
Settlement	Rural (136)	21.2 ± 5.9	22.6 ± 6.6	6.3 ± 8.2
	Urban (1121)	22.8 ± 6.6	24.1 ± 6.7	5.8 ± 8.1
	P Value	0.009	0.018	0.48
Level of education	School (565)	21.4 ± 7	22.7 ± 7.1	6 ± 7.7
	College (144)	22.8 ± 6.1	24.2 ± 6.8	6 ± 9.7
	University (548)	23.8 ± 5.9	25 ± 6	5.7 ± 7.9
	P Value	< 0.0001[b]	< 0.0001[b]	0.8
Maternal occupation	No (831)	21.9 ± 6.8	23.3 ± 7	6.1 ± 8.1
	Yes (426)	23.9 ± 5.8	25 ± 6.1	5.4 ± 7.9
	P Value	< 0.0001	< 0.0001	0.14
Reason for training	Intensive (747)	22.2 ± 6.4	23.7 ± 6.6	6.5 ± 8.7
	Child oriented (510)	23.2 ± 6.7	24.2±6.9	4.9 ± 6.9
	P Value	0.007	0.15	< 0.0001
Method of training	Stories (199)	22.5 ± 6.5	23.6 ± 6.7	5.3 ± 7.9
	Modeling (340)	22.5 ± 6.6	23.7 ± 6.6	5.7 ± 7.8
	Rewarding (156)	23.7 ± 6.1	24.9 ± 6.5	5.4 ± 7.3
	Punishment (121)	24.7 ± 6.8	26.5 ± 7.1	7.5 ± 9
	Regular taking toilet (441)	21.8 ± 6.4	23.1 ± 6.6[b]	5.9 ± 8.3
	P Value	< 0.0001[c]	< 0.0001[c]	0.17
Use of potty	Yes (404)	22.6 ± 6.5	23.9 ± 6.6	5.8 ± 8
	No (853)	22.6 ± 6.5	23.9 ± 6.8	5.9 ± 8.1
	P Value	0.98	0.96	0.96

[a] Values are expressed mean ± SD.
[b] Comparison between university level of education versus school
[c] Comparison between punishment and other ways of training

3.3. Toilet Training Methods

Intensive method was used in 747 (59.4%) children, while child-oriented method was adopted in 510 (40.6%) cases. Mothers who used intensive approach had a statistically significant lower age than mothers who used child-oriented method (29.4 ± 5.3 vs. 30.1 ± 18.2 years, P = 0.008). No correlation was found between children's gender, living area, maternal education or occupation and method of training.

Regular visits to toilet by observing the child and taking him to toilet was the most commonly (35.1%) used way. Modeling an older sibling or parent was seen in 27%, telling

stories in 15.8%, rewarding as buying gifts or chocolate in 12.4%, punishment methods such as scolding and spanking in 9.6%. There was no correlation between mother age, gender and ways of training. However mothers with more siblings used modeling more ($P < 0.0001$).

Potty training was used by 404 (32.1%) of cases and mean age of transfer to toilet seat was 16.3 ± 20.29 weeks.

3.4. Problems Encountered

Constipation was present in 15.4%, stool toilet refusal in 15.1%. There was a significant association between presence of constipation and older age of starting TT (age of initiation 23.70 ± 7.3 vs 22.2 ± 6.6, $P = 0.033$). There was no correlation between gender, duration of TT, or method adopted and development of constipation. Constipation was more frequently in children of parents who used punishment [OR (95%CI) = 3.2 (2 - 5), P = 0.006].

4. Discussion

Toilet training is an important but not well studied subject in Jordan. This is the first study conducted on Jordanian children. The mean initiation age was 22.5 ± 6.5 months, which is similar to that in Turkish children (9, 10), but lower than other countries (8, 12) where the average age was 27.5 months (8). Possible explanations for this could be that the intensive method that is associated with significantly earlier age of training was used more frequently than the child-oriented method. Additionally, in our study 66.5% of mothers were housewives in comparison to other studies (8) with a later initiation age where 72.2% mothers were working mothers. Non-working mothers have a significantly earlier initiation age than working mothers. Completion age similar to initiation age in our population was also earlier than that in Western societies (13).

In our study girls started and finished training earlier than boys as described in literature (5, 6). Girls show readiness signs earlier than boys (5) and they are influenced by socialization and desire to please parents, whereas boys depend on physiologic maturation (14), but that was not statistically significant as also seen in other studies (9, 10). Duration of daytime TT in our study was significantly shorter than in other studies; 5.8 ± 8.06 weeks vs 4.15 ± 4.48 months (9) and there was a negative correlation between age of initiation and duration implying that starting early may take longer time and that is also reported in other studies (9, 12).

In our study it was found that the presence of family support, first child rank, urban settlement, university degree for the mother education, child oriented method, working mothers, use of punishment as a way of training were associated with a later initiation and completion age. Koc et al. (9) also reported that higher maternal education, working mothers, people living in cities start TT later than others. Tahran et al. (10) also found that toilet training age increased as maternal education level increased.

Intensive method was used more frequently in our study and that is similar to a study in Iran, but different than in Belgium where 61.9% start training in response to signals from the child (8). No significant differences were found between the child-oriented and the intensive method of learning in terms of efficacy and adverse events (15). In another review on TT, it was difficult to draw definite conclusions on the superiority of one method over the other (16). However, American academy of pediatrics guidelines recommend child-oriented approach (1).

In our study problems as constipation occurred in 15.4%, stool toilet refusal in 15.4% and that is slightly lower than described in other studies (13, 17).

We found a correlation between presence of constipation and later age of starting training and Blum et al. (13) found that the presence of constipation and stool toilet refusal was associated with a later initiation age of TT. Other studies have also found a correlation between stool toilet refusal and late age of starting TT (13, 17).

The main limitation of the study was its cross sectional design as the collected data depended on the mother's statement about her child's toilet training making the data subject to recall bias especially in children above 5 years. We recommend conducting a prospective cohort study in future and addressing other problems such as daytime wetting.

4.1. Conclusions

In Jordan which is a developing country, intensive method is more commonly used and both the initiation and completion age of toilet training begin earlier than those in developed countries.

Housewives, people living in rural areas, mothers with a lower level of education, mothers who used the intensive method, start training earlier. Pediatricians and family practitioners should provide proper counseling to the mothers regarding the appropriate age and method of training. The use of the child-oriented method should be encouraged for this will lead to a later initiation age and shorter duration of toilet training. Other ways of training as rewarding, and avoiding of punishment should also be encouraged.

Acknowledgments

The authors acknowledge the dean of academic research at the University of Jordan.

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