

Toilet training age and influencing factors: a multicenter study

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To determine toilet training age and the factors influencing this in our country, 1500 children who had completed toilet training were evaluated in a multicenter study. The mean age of toilet training was 22.32 ± 6.57 months. The duration it took to complete toilet training was 6.60 ± 2.20 months on the average. In univariant analysis, toilet training age increased as the parental education level, specifically that of the mother, increased. The training age of children whose mothers had over 12 years of education differed significantly from that of children of mothers with less education. There was no significant difference in toilet training age with regard to the education level of the father, or the employment status of the mother. We also found significant differences with respect to family income level, toilet type and training method. In multivariant analysis, family income >5000 TL and use of a potty chair were determined to be factors affecting toilet training age. In conclusion, toilet training age in Turkey, a developing country, was found to be lower than that in developed countries.

Key words: toilet training, bladder control, bowel control, child development, training activity.

Toilet training (TT) is an important milestone in child development. A number of studies have been conducted on this topic since Brazelton's study in 1960¹. It has been shown in these studies that toilet training age has been progressively increasing in the past 50 years^{1,2}. While the age of toilet training was under 18 months in the 1940s, it has increased to 21-36 months today^{3,4}. Suggested explanations for this fact include the use of disposable diapers and the increasingly widespread availability of information on child-oriented training techniques^{2,5}.

Most studies have shown differences in toilet training age and training methods with respect to race and families' sociocultural status^{5,6}. It has been reported that white Americans start

toilet training of their children at a later age than do black Americans⁶. In many African, Asian and South American countries, early toilet training has been indicated as a cultural preference⁷. In some studies, differences between generations in the same country have even been reported².

We aimed to determine the toilet training age in our country by means of a multicenter study. In addition, we investigated whether socioeconomic status, gender, toilet type and toilet training method had any influence on toilet training age.

Materials and Method

A total of 1500 children who had been seen

at the urology and pediatrics clinics of the Tepecik Training and Research Hospital, the pediatric clinic of the Katip Çelebi University Atatürk Training and Research Hospital, and the Aliğa Family Medicine Centers, and who had been stated to have completed toilet training between 2012 and 2013 were evaluated. The parents were asked to complete a questionnaire comprising 20 questions. These related to the gender, age, toilet training age and total training period of the child, the educational status of the parents, the monthly income of the family, and the toilet type and training method used in toilet training. Toilet training age was defined as full control of the bladder and bowel, without any failure in holding urine or stool during the day and night. The children, particularly those under the age of 5, were those who had completed toilet training at least 3 months prior to evaluation. Written and oral informed consent was obtained from the parents of the 1500 children who participated in the study, after the approval of the local ethics committee had been granted. Children with mental retardation, spinal cord anomalies, or genitourinary or gastrointestinal anomalies, as well as children who had completed toilet training less than 3 months previously, were not included in the study.

Statistical Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS version 10.0, SPSS Inc., Chicago, IL, USA). Data were given as mean and standard deviation. Groups were compared for mean completion age using the t-test and ANOVA. The independent contribution of the factors that might have influenced toilet training completion time was evaluated with logistic regression analysis. Statistical significance was considered to be $p < 0.05$.

Results

Of the 1500 children evaluated for the study, 1467 children who met the inclusion criteria were included in the study. The average age of the children was 80.4 ± 26.2 months (36-156 months); 719 (49.98%) were girls, and 748 (50.02 %) were boys. The average toilet training age was found to be 22.32 ± 6.57 months (12-60 months).

Looking at gender, toilet training age was found to be 22.56 ± 7.38 months for girls and 22.80 ± 8.57 months for boys ($p = 0.404$). Considering girls and boys separately with respect to toilet training age categories of under 18 months, 19-24 months, and 24 months and above, we found no significant difference between boys and girls within these groups ($p = 0.630$) (Table I).

Toilet training time was 6.60 ± 2.20 months on the average. With respect to gender, the average time was 6.75 ± 2.34 months for girls and 6.95 ± 2.31 months for boys ($p = 0.754$). Dividing the children into groups according to toilet training age, the average training time was 6.01 ± 2.0 months for the under-18-months group, 6.66 ± 2.22 months for the 19-24-months group, and 6.82 ± 2.26 months for the 24-months-and-above group ($p = 0.879$).

Regarding the effect of the educational status of the parents on toilet training age in univariate analysis, we observed that as the mother's education level increased, toilet training age increased as well. A significant difference was found, particularly between mothers with over 12 years of education and those with less education ($p = 0.03$, Table II). Toilet training age also increased as the father's education level increased, but a statistically significant difference was not evident ($p = 0.612$, Table II). Moreover, a significant difference in toilet training age was not found between the children of working and non-working mothers ($p = 0.635$, Table II).

As families' monthly income increased, toilet training age also increased ($p = 0.049$, Table II). When we evaluated age of toilet training for urination with regard to toilet type, it was determined that the urination training age was lower for those using a potty chair ($p = 0.042$, Table II). The method most frequently used in training was the rewards model. A significant difference was found in terms of toilet training age depending on the training model used ($p = 0.034$). We found that a punishment method was never used.

In multivariate analysis, however, when we used a cutoff value of 22.3 months (this being the mean toilet training age), we found monthly family income > 5000 TL [1.92; (1.01-3.63) 95% CI, $p = 0.04$] and use of the potty chair [1.73; (1.01-2.98) 95% CI, $p = 0.04$] to be the

only factors having an effect on toilet training age.

Discussion

The American Pediatric Academy (APA) recommends 18-24 months as the age to begin toilet training⁸. Although Brazelton in 1962 determined the age of achieving complete control of the bowel and urinary bladder as being 28 months, this age subsequently increased, to 36 months in the 1990s⁹. 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 years¹⁰. In their study on 745 children in our country, Koç et al.² 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. Briefly stated, toilet training is completed in our country at an earlier age than is the case in some other countries.

Toilet training is one of the most challenging issues of early childhood¹¹. For successful

Table I. Children Grouped by Gender and Age of Completing Toilet Training

Toilet training age	Girls n %		Boys n %		p value
≤ 18 months	209	29.2	202	27.0	
19-24 months	421	58.8	450	60.2	
≥ 24 months	87	12.0	96	12.8	p=0.630

Table II. Factors Affecting Toilet Training Age

		n	Toilet training age (months) Mean±SD	p value
Mother	No education	205	22.20±7.42	
	≤ 5 years	544	22.20±7.45	
	5-8 years	357	22.80±7.32	
	≤ 11 years	208	22.92±7.64	p=0.03
	12 ≥	153	24.24±8.08	
Father	No education	133	22.56±7.52	
	≤ 5 years	414	22.44±7.48	
	5-8 years	512	22.92±7.64	
	9-11 years	232	23.01±7.76	
	12 ≥	176	23.12±8.40	p=0.612
Mother's employment	Not working	970	23.04±7.44	
	Working	497	22.94±5.76	p=0.635
Monthly income	<1000 TL	399	21.60±7.22	
	1000-3000 TL	773	22.44±7.42	
	3000-5000 TL	186	23.16±7.72	
	>5000 TL	109	25.92±8.64	p=0.049
Toilet type	Turkish style	597	22.64±7.48	
	Western style	702	23.04±7.68	
	Potty chair	106	18.01±6.06	p=0.042
Training method	Reward	1400	23.31±7.76	
	Punishment	0	0	
	Modeling an older sibling or parents	167	25.08±8.30	p=0.034

training, children need to have gained certain skills⁴. Brazelton defined the parameters indicating that children were physically and behaviorally ready for toilet training as intentional control of the bowel and bladder (expected to develop at 9 months of age), sufficient ability to cooperate in training (expected to develop between 18-24 months of age) and sufficient neurological development (e.g., the ability to walk, to move from one room to another without any help and to take off his/her clothes easily) (expected to develop at 18 months of age)¹².

The findings indicating that they are ready for toilet training are the same in girls and boys¹³. Bowel control develops at about 22 months for girls and 25 months for boys. Ceasing to use diapers or training pants is the last skill acquired, and this takes place at 29.5 months for girls and 33.5 months for boys. Many skills develop earlier in girls than in boys⁴. This means that girls complete toilet training earlier than boys^{10,13}. In another study conducted in Turkey, the average age of completing toilet training was found to be 27.81 ± 8.37 months for girls and 29.04 ± 9.61 months for boys ($p=0.108$). In our study, however, the toilet training age was determined to be 22.56 ± 7.38 months for girls and 22.80 ± 8.57 months for boys ($p=0.404$).

On the other hand, significant differences between girls and boys in terms of the age of beginning toilet training have been found in previous studies. One study found that while 41.6% of the boys began toilet training after 24 months, this rate was 25.2% for girls ($p<0.001$). While the rate of girls beginning toilet training between 15 and 24 months was 54.6%, it was 44.9% for boys¹⁴. Family expectations regarding TT differ for boys and girls¹³. For boys, the beginning and completion of TT occur later than is the case for girls^{1,7,9,15}. When we grouped the girls and boys in our study, with regard to their toilet training completion age, into three categories (under 18 months, 19-24 months, and 24 months and older), we could not determine any significant difference in the rates of girls and boys ($p=0.630$). Regarding the completion of toilet training by 18 months of age, although we found rates of 29.2% and 27.0% for girls and boys respectively, there was no significant

statistical difference between these rates. The age range during which most children in our study, both girls and boys, completed toilet training was 19-24 months.

We found the average toilet training time to be 6.60 ± 2.20 months; we found no significant difference between girls and boys in this respect ($p=0.754$). Blum et al.¹⁰ found toilet training time to be 5.9 months for girls and 6.6 months for boys. In another study, the training period for bladder control was found to be 5.8 months for girls and 6.4 months for boys; for bowel control, the training period was 6.3 months for girls and 6.9 months for boys¹⁶. In our study, we did not evaluate bowel and bladder control separately, the reason being that parents were unable to retrospectively give accurate times for these two skills separately, in terms of exactly when they were acquired and how long it took.

As the educational level of the parents, particularly that of the mother, increases, toilet training age also increases. Koç et al.² found the toilet training age to be 29.84 ± 7.24 months in children of mothers with more than 12 years of education; they also found that this age was significantly higher than that of the children of less educated mothers ($p=0.019$). Another study likewise determined that as the mother's education level increased, toilet training age also increased⁶. Joinson et al.¹⁴ 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. In our study as well, toilet training age increased as the mother's education level increased. In particular, a significant difference was found between mothers with more than 12 years of education, and those with less ($p=0.03$). Similarly, as the father's education level increased, toilet training age also increased, but this increase was not statistically significant increase. ($p=0.612$). In addition, like Koç et al.², we determined that it did not make any difference whether the mother was working or not.

In the study by Horn et al.⁶, 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 ($p<0.001$). In our study, both univariant and multivariant analysis showed that toilet training age increased with increasing monthly family

income. We would speculate that as income increases, families can more easily afford disposable diapers, and thus toilet training age increases in parallel to income.

Our study also found that the toilet training age was lower for children using a potty chair. While Koç et al.² found that the age of beginning toilet training was lower for children using a potty chair, they did not determine any difference in completion of training with respect to toilet type. In their study of children attending day care, Kaerts et al.¹⁷ found that if a potty chair was used in toilet training, children were influenced by each other, hence completing toilet training at an earlier age.

In our study, in contrast to that of Koç et al.², no parents reported use of the punishment model as their toilet training method². While they found that toilet training was accomplished earlier using the punishment method, we found the toilet training age to be lower when the rewards method was employed. Koç et al.² in fact also found that the age was lower with use of the rewards model, as compared to modeling an older sibling or parents.

The present study has several limitations. Firstly, it is based on data obtained from the parents. Secondly, it is not a prospective study. However, we should not forget that we can obtain the most accurate data regarding toilet training by means of communicating with the parents. By virtue of asking detailed questions, we attempted to get the most accurate answers possible regarding information from the past.

Conclusion

We determined the toilet training age in our country, as a developing country, to be lower than that in developed countries. As the mother's education level as well as the family income level increased, toilet training age also increased. Even so, the age was still below that seen in developed countries. In addition, the toilet training age was found to be significantly lower when a potty chair was used. It should not be forgotten that toilet training in children is one of the most important issues for families, regardless of education level, family income or race. Since multiple factors influence toilet training age, more comprehensive studies are required in order to determine the right age ranges more accurately.

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