

Factors that Affect Age of Initiation and Completion of Toilet Training

Tuvalet Eğitime Başlamayı ve Tamamlamayı Etkileyen Faktörler

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ABSTRACT Objective: The aims of this study were to determine the timing of initiation and completion of toilet training (TT) and affecting factors in a group of Turkish children aged 24-60 months. **Material and Methods:** This survey was performed in an outpatient clinic at Turgut Ozal University Hospital. A questionnaire containing 35 items were applied to the parents who have children aged 24-60 months. The children who couldn't completed TT and had developmental retardation or genitourinary and gastrointestinal system anomalies were excluded. **Results:** A total of 418 children were taken to the study. Mean the initiation and completion ages were 25.2±5.6 and 27.2±5.8 months, respectively. Mean of TT duration was 56.2±52.5 days. Only 6% of the children were started to the TT at under aged 18 months. Most parents had considered to child's age and readiness for TT. We didn't find any significant association between the age at starting and completion of TT and gender, gestational age, being first born, employed mother, family type, undergoing circumcision, applying reward and punishment during training. Later age of starting and completion TT were associated with higher education level of parents and consulting to an expert during TT. Later age at completion of TT was associated with attending daycare. **Conclusion:** This study showed that most Turkish families prefer to start on recommended time for the age at initiation of TT and implementing to child-oriented approach in Turkish families.

Keywords: Child care; toilet training

ÖZET Amaç: Çalışmanın amacı 24-60 ay arasındaki bir grup Türk çocuğunda tuvalet eğitimi (TE)'ne başlama ve tamamlama zamanlarını ve etkileyen faktörleri belirlemektir. **Gereç ve Yöntemler:** Çalışma Turgut Özal Üniversitesi Hastanesi Genel Çocuk Polikliniği'nde yapıldı. Otuz beş maddeden oluşan bir anket 24-60 ay arasındaki çocukları olan anne-babaya uygulandı. Tuvalet eğitimi tamamlamamış çocuklar, gelişimsel geriliği, ürogenital ve gastrointestinal anomalisi olan çocuklar çalışmaya alınmadı. **Bulgular:** Çalışmaya 418 çocuk alındı. Ortalama tuvalet eğitimine (TE) başlama ve tamamlama yaşı sırasıyla 25.2±5.6 ve 27.2±5.8 aydı. Ortalama TE süresi: 56.2±52.5 gündü. Çocukların yalnızca yüzde altısında TE'ne 18 ayın altındayken başlanmıştı. Çoğu anne-baba TE için çocuğun yaşını ve hazır bulunuşluğunu dikkate almıştı. TE'ne başlama ve tamamlama yaşı ile cinsiyet, doğum yaşı, ilk çocuk olmak, annenin çalışma durumu, aile tipi, sünnet olma, eğitim sırasında ödül ve ceza yöntemi kullanma arasında ilişki saptanmadı. TE'ne daha geç başlama ve tamamlama ile anne-baba eğitiminin yüksek olması ve TE sırasında bir uzmandan danışmanlık alma arasında ilişki vardı. TE'nin geç tamamlanması kreşe gitme ile ilişkili bulundu. **Sonuç:** Çalışma çoğu Türk ailesinin TE'ne tavsiye edilen zamanda başladığını ve çocuk odaklı yaklaşıma eğilimli olduğunu gösterdi.

Anahtar Kelimeler: Çocuk bakımı; tuvalet eğitimi

Toilet training (TT) is the process of teaching a young child to control the bowel and bladder and use the bathroom for urination and defecation independently. It is a developmental milestone in childhood, a complex process that can be affected by anatomic, physiological, behavioral, and relations between the caregiver and the child.¹ Infant voiding is

not merely a spinal reflex, as the sensation of bladder filling is relayed to the brain. However, the ability of the brain to inhibit bladder contractions, and to achieve coordinated bladder contraction with sphincter relaxation, matures over time.² Generally, children are developmentally ready for TT at 18 months of age on average.³

Various methods have been developed for TT in children. In the early 1960s two major theories on TT emerged: the parent-oriented and child-oriented approach. The former, the major contributors of which were Azrin and Foxx, is based upon structural-behavioral training and operant conditioning.⁴ The latter, proposed by Brazelton, suggests beginning TT only after certain physiological and behavioral criteria of readiness are met.⁵ There is no level-1 evidence to prove which method is better but most guidelines including those of the American Academy of Pediatrics closely reflect the child-oriented training model.^{3,6}

Literature gives neither a consensus about the optimal age for starting nor the expected mean age of completing TT. Previous studies have documented that some factors are related to the TT period.⁷⁻¹¹ The aim of this study was to determine the initiation and completion time for TT and the factors that affect this process in a sample of Turkish children.

MATERIAL AND METHODS

This survey was performed in an outpatient clinic at Turgut Özal University Training and Research Hospital between January 2010 and March 2013. The parents of children aged from 24 to 60 months who had completed TT were given a questionnaire containing items about the demographic data, criterion of starting TT and the problems encountered at that time, the age of achievement of certain developmental milestones, applying punishment or rewards, attending daycare and circumcision. If children were dry except for 1 or 2 incidents of wetting during daytime in one month over a total period of at least three months, it was accepted that they had completed TT. Those children who hadn't completed daytime TT and had developmental retardation or genitourinary and gastrointestinal

system anomalies were not included in this study. In addition, extremely and very preterm infants (gestational age less than 32 weeks) were not taken into the study. Written informed consent letters were obtained from each parent or legal guardian. The study was approved by the Ethical Committee of the Faculty of Medicine, Turgut Ozal University.

The Statistical Package for Social Science (IBM SPSS statistic version 21, SPSS Inc, Chicago, IL, US) was used for statistical analysis. All data was given as mean and standard deviation. Spearman test was used for correlation between the initiation age of TT and other parameters. The groups were compared for the initiation and completion ages of TT using Mann-Whitney U test and Kruskal Wallis test. The statistical significance was set at the 0.05 level.

RESULTS

In this study, 503 questionnaires were collected but 85 of these were not used in the analysis due to missing data. For this reason, the data from 418 questionnaires were evaluated. The characteristics of the study population are shown in the table (Table 1). A total of 418 children (197 girls, 221 boys) aged between 24-60 months were observed in the study. Mean initiation and completion ages were 25.2±5.6 and 27.2±5.8 months, respectively. Mean TT duration was 56.2±52.5 days. The age at initiation of TT and the age of completion of TT were linear association ($r_s=0.930$, $p<0.01$) but the duration of TT was reverse association ($r_s=-0.136$, $p=0.005$).

TABLE 1: Characteristics of study population.

	Mean ±SD (min-max)
Age, mo	43.3 ±8.2 (24-60)
Maternal age, years	31.9±4.9 (20-47)
Paternal age, years	35.5±5.2 (22-55)
Time of TT initiation, mo	25.2±5.6 (10-39)
Duration of TT, day	56.2±62.5 (7-365)
Time of TT completion, mo	27.2±5.8 (11-42)
Starting daycare center, age	32.7±11.2 (1-54)
Circumcision, mo	15.1±12.0 (1-48)
Walking, mo	12.5 ±2.4 (8-24)
Dressing by himself/herself, mo	31.2±7.2 (18-48)
Undressing by himself/herself, mo	28.1±7.9 (15-48)

mo: month; TT: Toilet training.

Only 6% of the children started TT under the age of 18 months. 98% of the mothers took into consideration the child's readiness and advised age for the initiation of TT. The explanations given by the mothers as to how they had decided on the initiation of TT were the child's age (66%), discomfort from diapers (30.6%), dry diaper when he/she got up in the morning (30%), expressing "the need to urinate or defecate" (27.7%), showing with mimics the need to urinate or defecate (25.7%). 67% of the mothers had taken into consideration the season: spring 25.3%, summer 73.2%, autumn 1.1%, winter 0.4%.

We found that there were positive correlations between the age of undressing and the age of starting TT ($r_s=0.113$ $p=0.036$) and the age of completion of TT ($r_s=0.107$ $p=0.047$), the age of putting on clothes and the age of starting TT ($r_s=0.114$ $p=0.038$), and the age of completion ($r_s=0.127$ $p=0.02$). Nevertheless, the age of walking and using a spoon were not related to the initiation and completion ages of TT.

The families in our study were using a flush toilet in 62% of cases, while 15% were using a squat toilet and 23% were using both types. 50% of the mothers mentioned having used helping tools during TT. 77% of them had used a potty chair, 18% an adaptor, 4% a potty chair together with an adaptor and 1% had used training underwear. When questioned about the methods used for cleaning the anal region, it was reported that 31.7% of them had used wet wipes, 17.5% toilet paper, 22% washing with water, 12% used both wet wipes and toilet paper, 13% washed with water and used toilet paper, 2.4% washed with water and used wet wipes and 1.4% had used all of these materials.

Any later age of starting and completion of TT were associated with a higher education level of the mother and father (Table 2). Later age of completion of TT was associated with daycare attendance (27.9 vs 26.4 months $p=0.015$, respectively) (Table 2). No relationship between the age at starting and completion of TT and factors like gender, gestational age, being the first born, the mother being unemployed or type of family structure (extended vs nuclear). 53% of these children had undergone circumcision when older than 1 year of age. There was no rela-

tionship between the age of circumcision (<1 year vs ≥ 1 year) and the duration of TT.

18% of mothers described having consulted an expert for TT. 41.7% of these had consulted a paediatrician, 37.5% a pre-school teacher, 19.5% a psychologist and 1.4% a nurse. Later age of starting and completion of TT were associated with the consultation of an expert during TT (for starting TT 26.7 vs 25.0 months $p=0.014$ and for completion TT 29.1 vs 26.8 months $p=0.003$, respectively).

81% of mothers involved in our study said that they had rewarded their children during TT by giving them candy, congratulating or kissing them. 15.5% of them described having punished their children when they accidentally urinated by shouting at them (60.4%), by the removal of something they liked (21%), spanking (9.5%), a combination of shouting and spanking (4.5%), leaving their children in a closed room (1%), not talking to them (1%) or saying that they were sad (1.6%). The age of completion of TT was not affected by applying such rewards or punishments and the concordance of caregivers (mother, grandmother or others) during training.

DISCUSSION

The starting age of TT has been affected over time, by socioeconomic status, race, ethnicity and culture.^{7-8,10} The American Academy of Pediatrics recommends that training should start after 18 months of age and conclude by 24 to 36 months of age.³ Its approach is depend on a child's level of physical and psychological maturation. Schum et al. supported that the age when healthy children achieve typical readiness skills range from 22 to 30 months.¹¹

Most studies show that the initiation age of TT has changed in the majority of the population during the past 60 years and is later when compared to the past.⁷⁻¹⁰ This situation may have arisen due to the introduction of disposable diapers and wider acceptance of child-orientated approach training techniques. On the other hand, there is some evidence to suggest that more disorders of elimination such as urge incontinence, daytime wetting, constipation, stool toileting refusal may develop in children who are trained later.¹²⁻¹⁴ Other disadvantages of later initiation of training include family

TABLE 2: Comparison of mean months at the initiation and completion of TT and some variables.

		N	Initiation time		Completion time	
			Mean±SD ¹	p	Mean±SD	p
Gender	Girl	198	25.0±5.2	0.289	27.0±5.6	0.456
	Boy	220	25.6±6.0		27.4±6.1	
Gestational age	Term	368	25.3±5.7	0.768	27.2±5.9	0.591
	Preterm	33	25.5±5.9		27.6±5.9	
Birth order	First	254	25.6±5.4	0.091	27.6±5.5	0.071
	Others	152	24.8±5.9		26.6±6.3	
Maternal education level	Primary school	44	24.0±5.7	0.028	25.6±5.9	0.004
	Secondary school	101	24.3±5.9		25.7±6.2	
	Higher school	272	26.0±5.4		28.0±5.6	
Paternal education level	Primary school	30	23.0±4.9	0.002	24.5±5.1	0.001
	Secondary school	83	23.8±6.1		25.5±6.5	
	Higher education	304	26.0±5.4		28.0±5.5	
Working mother	Yes	253	25.5±5.5	0.544	27.6±5.7	0.174
	No	162	25.1±5.8		26.7±5.9	
Attending daycare center	Yes	220	25.8±5.5	0.093	27.9±5.7	0.015
	No	196	24.8±5.8		26.4±6.0	
Consultation of an expert	Yes	75	26.7±5.1	0.014	29.1±5.4	0.003
	No	342	25.0±5.7		26.8±5.9	
Undergoing circumcision	Yes	58	26.6±6.2	0.059	28.4±6.3	0.121
	No	167	25.2±5.9		26.9±6.1	

¹ All data was given as mean and standard deviation.

² Mann-Whitney U test and Kruskal Wallis test were performed as continuous dependent variables (initiation and completion time of TT) were non-normally distribution.

stress, environmental pollution resourcing non-bi-gradable diapers and the increased risk of infectious diarrheal diseases from more diaper changes at day care facilities.¹⁰

The mean age at the initiation of daytime toilet training was 25.5±5.8 months in our study and it is within the range of those ages which have been reported in developed countries.⁷⁻¹⁰ However, the starting age is earlier in some developing countries than in Europe and the US. Probably, these populations tend to apply parent-oriented training methods (assisted infant TT, elimination communication).

We found that the age at initiation of TT and the age of completion of TT were linear association while the duration of TT was reverse association. These results were compatible with Blum and colleagues's study. They conducted the follow up study every 2 to 3 months until children had completed daytime TT. They found that later training (defined as TT occurring after 42 months of age) was associated with the initiation of TT at an older age.¹⁴

Koç et al. conducted a study in Turkish children living in three different sociocultural settlements.⁸ In this study, mean initiation and completion ages were 22.1±6.7 vs 28.1± 8.4 months, respectively. Their study showed that earlier initiation and longer duration of TT were observed among families living in rural and semiurban settlements, mothers educated for less than 5 years, unemployed mothers, children living in houses with an outside toilet, families using washable diapers or squat toilet. In addition, earlier initiation of TT (initiation of the child younger than 18 months) was associated with parents who used punishment methods and longer duration of training.

There are some studies supporting association family income, maternal education level and initiation and completion of TT. Joinson et al. reported that British mothers who were older and had a longer education were more likely to wait until 24 months to TT, whereas young, single mothers with a shorter educational experience were more likely

to TT at 15 months or earlier.¹² Horn et al. showed that the family income was independently associated with beliefs regarding the age at which to initiate TT as well as racial or cultural factors.⁷ Also, Tarhan et al. found that family income and maternal education level was associated with TT age in the a multicenter study from Turkey.⁹ In our study, family income was not evaluated but higher parental educational levels and consultation an expert were related in later initiation and completion of TT. Families reported that they commonly take paediatricians' and pre-school teachers's advice for this topic. That's why they have important role on TT.

Schum et al. have found that innate factors such as older age, non-Caucasian race, and female gender are the best predictors of completing toilet training rather than a child's temperament and developmental stage. They reported that the ages at which 50% of children were predicted to be toilet trained were between 35 and 39 months for girls and boys, respectively. In addition, they didn't find any relationship between attending daycare, maternal employment and completing TT.¹⁵ However, we found that a relationship between completion time and attending daycare. Approaches of discordance between child's caregivers and childcare workers may cause to take longer for toilet training.

One limitation of this study is that all data was dependent on parents' answers causing memory bias. Another limitation is that data from this study can not be generalized to all of the Turkish chil-

dren because the participants represented a single pediatric group involved in middle and upper-middle class families. Also, only controlling the bladder during daytime was considered in this study.

In conclusion, our study suggests that Turkish families prefer to start on recommended time for initiation TT and implement the child-oriented approach. It is important that pediatricians support and encourage parents for the child-oriented approach. Pediatricians should evaluate the readiness of their children for mastering TT during the routine 18 month well-child visit. The importance of patience and negative impact that pressure, punishment or maltreatment can have on a child's progress and development should be explained to parents.

Ethical Acknowledgment

Written informed consent letter were obtained from each participant and from a parent or legal guardian. The study was approved by the Ethical Committee of the Faculty of Medicine, Turgut Ozal University.

Conflict of Interest

Authors declared no conflict of interest or financial support.

Authorship Contributions

Conducted data collection, data analysis, data interpretation, and manuscript preparation: Emel Örün; **Involved in data collection, searching literature:** Naile Tufan Pekküçükksen; **Conducted statistical analysis:** Mehmet Kenan Kanbuoğlu. All authors read and approved the final manuscript.

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