

Age of Initiation and the Factors Associated with Toilet Training in Healthy Saudi Children

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Abstract

With the appropriate knowledge of the age to initiate toilet training and acknowledging the factors that influence it, parents can prevent many health issues related to voiding. Our study aimed to determine the average age of the initiation of toilet training among Saudi children and the factors that may affect this training. This study was carried out by distributing questionnaires to mothers who attended various clinics in our institute. A sample included 1000 healthy Saudi children. The mean age of the initiation of toilet training in healthy children was 25.6 ± 9.4 months while the median was 24 months, the mean duration of training was 6.3 ± 9.1 months. Most children (92%) were trained in the summer months. Mother's educational level, number of siblings, and socioeconomic status were significant factors that affected the age of initiation. However, mother's occupation, caregiver, and the order and gender of the child did not have a significant effect on the initiation of toilet training. The median age of toilet training among our children matched other studies. Summer seems to be the preferred season to initiate training.

Keywords

Toilet training; Educational status; Child development; Training activity; Age of onset

Introduction

Toilet training is one of the most crucial milestones in a child's development. In the recent years, the age of toilet training initiation has decreased tremendously with more parents leaning towards early training as it makes their children more self-dependent^[1-4]. Toilet training is a complicated process that requires time

and effort. There are multiple interplaying factors, including pathological, physiological, cultural, and socioeconomic status that could make the entire process even more challenging^[1,5-8].

With the appropriate knowledge of the age to initiate toilet training and acknowledging the factors

that influence it, parents would be able to prevent many health issues related to voiding, urinary tract infections, and enuresis^[1].

There is a lack of scientific information regarding this topic; when reviewing the literature, only a few studies were conducted to determine the appropriate age to initiate toilet training and the factors associated with it^[9]. No previous publication regarding this topic looking for healthy Saudi children. The lack of such scientific studies makes it difficult for mothers to plan an appropriate training program for their children. Thus, the aim of this study was to identify the appropriate age for initiating toilet training and assess the factors that could affect this learning process in Saudi Arabia.

Methods

This study was a cross-sectional study conducted in our institution. The study included mothers who attended

various clinics at our institute. We included all male and female healthy Saudi children who had finished their toilet training. All mothers with non-Saudi children or children with any chronic illness were excluded. A sample size of 1000 children was determined using the equation of the single mean value, $n = Z\alpha^2 S^2 / d^2 = (1.96)^2 (6.57)^2 / 0.5^2 = 663$; we expected a non-response of 20%, $663 + 132 = 795$ ^[10]. Ethics board approval was obtained for this study.

Data were obtained through self-administered questionnaires, which consisted of two parts. The first part included information and the demographic characteristics of the mothers. The second part included information about the child. The variables in the questionnaire were the mother's age, marital status, educational level, family income, child's age at the time of initiation, gender, number of siblings, and birth order (Fig. 1).

Kingdom of Saudi Arabia King Saud University College of Medicine Institutional Review Board				المملكة العربية السعودية جامعة الملك سعود كلية الطب مجلس أخلاقيات البحوث الطبية		
Age Pattern and the Associated Factors of Healthy Saudi Children Towards Training Initiation						
Principal Investigator: Dr. Hamdan Al-Hazmi						
Age	30 or less	30-45	More than 45			
Educational Level	High school	College	Else			
Nationality	Saudi	Else.....	*if your answer was Saudi ,please answer 1,2			
1	Residency					
2	Childhood residency/raised					
Social Status	Married	Divorced	Widow	Single		
If your answer was single, please answer the following two (2) questions then stop.						
1	When do you think is the appropriate age for a child to start toilet training?					
2	From where did you get this information?					
Number of Children	3 or less	3-6	6 or more			
Family Income- Monthly	SR5,000 or less	SR5,000- SR10,000	SR10,000 or more	Don't want to disclose.		
Mother's Job	Employee	Housewife	Student			
The following questions are specific for each child, if there is more than 1 child please fill a separate form for each one.						
Gender	Male	Female				
Child's order in the family	First	Middle	Last			
Caregiver	Mother	One of the family members	Maid			
Age when she/he started training?						
Time period in which the child completed toilet training?						
Season	Summer	Winter				
Who advised you to start at this age ?	My mother	A friend	A book	The internet	A doctor	
Did you face any difficulties?	Yes	No	*if your answer was yes , please answer the next question.			
Did you asked for help?	Yes	No	*if your answer was yes , please answer the next question.			
From whom?	A doctor	A friend/mother	Book/internet	Else		
Did your child suffer from bed wetting after toilet training?					Yes	No

Figure 1. Questionnaire distributed to the mothers.

After the data were collected, statistical analyses were performed using IBM SPSS Statistics for Windows, Version 21.0 (IBM Corp., Armonk, NY USA). The frequencies and percentages for all nominal variables were analyzed using one-way analysis of variance (ANOVA).

The mean age of the initiation of toilet training was compared with respect to all sociodemographic variables of mothers which included educational level, residence, and number of children, monthly income, and mother's occupation. A pilot study on 20 subjects was conducted to test the clarity and suitability of the questionnaire, and it took approximately 7-10 minutes to complete the questionnaire.

A clear and informed consent form was given to all participants explaining the purpose of the study and participant's right to withdraw at any time without any obligation towards the study team. Participant's anonymity was assured by assigning code numbers to each participant for the analysis only. No incentives or rewards were given to participants.

Results

Data were collected from the mothers of 1,477 child, and 477 children were excluded due to the following reasons: incomplete data, chronic health conditions, or those with a nationality other than Saudi.

The study participants were 50.5% females, and the remaining were males. Regarding the birth order, 52.4% (N=524) were middle children, 30.7% (N=307) were first-born, and 16.9% (N=169) were the youngest. Most of them were trained by the mother (96.2%), and 3.8% were trained either by a family member or a nanny (Table 1).

The subjects of the study were primarily raised by a coupled household. The monthly income was above SAR10,000 in 36.1% of the families. Majority of the mothers (65.2%) were housewives. More than half of the subject's mothers had a high school or college degree (63.6%). Most of the study sample (87%) resided in the central provinces of Saudi Arabia (Table 2).

For 60.1% of the mothers, the source of advice was a friend, book, the internet, or her own mother. The majority (92.9%,) of the children were trained in summer (Table 1).

Table 1. Characteristics of the child.

Variable	N (%)
Gender	
Male	495 (49.50%)
Female	505 (50.50%)
Order of Child	
First	307 (30.70%)
Middle	524 (52.40%)
Last	169 (16.90%)
Caregiver	
Mother	962 (96.20%)
Family Member	25 (2.50%)
Maid	13 (1.30%)
Season	
Summer	920 (92.00%)
Winter	70 (7.00%)
Advice	
Yes	601 (60.10%)
No	399 (39.90%)
Advice on when to start	
From mother	494 (80.06%)
From friend	65 (10.53%)
From a book	31 (5.02%)
From the internet	24 (3.89%)
From a doctor	3 (0.50%)
Difficulties	
Yes	336 (33.60%)
No	664 (66.40%)
Ask for help when faced by difficulties	
From a doctor	15 (11.28%)
From a friend/mother	104 (78.20%)
From book/internet	14 (10.52%)
Bed wetting	
Yes	240 (24.00%)
No	760 (76.00%)

With respect to initiation age, 66.4% of the children were trained with no difficulty and by that we mean that they faced less bed wetting problem; a mean initiation age was 24.9 months and the mean duration of training was 5.1 months. Difficulty in training was seen in 33.6%; the initiation age was 26.9 months, and the mean duration of training was 8.6 months (Tables 1 and 3). For 920 children trained in summer, 62 (67.5%) were trained with no difficulties; less bed wetting problem. As for the winter season, 51.4% of the 70 participants were trained with no difficulties.

Of the 1,000 participants, 76% of them indicated no bed-wetting, with a mean initiation age of 25.1 months. For the remaining 24% of the participants who experienced bed-wetting, the mean initiation age was 27.2 months (Table 3).

Table 2. Characteristics of the mother.

Variable	N (%)
Educational Level	
Illiterate	80 (8.00%)
Primary School	142 (14.20%)
Middle School	142 (14.20%)
High School	235 (23.50%)
College	384 (38.40%)
Masters	17 (1.70%)
Residency	
Riyadh	870 (87.00%)
Outside Riyadh	130 (13.00%)
No. of Children	
Less than 3	252 (25.20%)
3-6	359 (35.90%)
More than 6	387 (38.70%)
Monthly Income	
Less than SR5,000	214 (21.40%)
SR5,000-SR10,000	224 (22.40%)
More than SR10,000	361 (36.10%)
Non-Disclosure	201 (20.10%)
Mother's Job	
Student	24 (2.40%)
Worker	324 (32.40%)
Housewife	652 (65.20%)

The age of initiation of toilet training was positively correlated with the number of siblings ($p \leq 0.0001$) and maternal education ($p = 0.009$). Factors such as the mother's occupation ($p = 0.754$), residence (p value = 0.886), birth order of the child ($p = 0.534$), caregiver (p value = 0.427), and child's gender ($p = 0.122$) were not significant (Table 3 and 4).

Finally, we found that age of initiation ($p = 0.002$) and the season during which the child was trained ($p = 0.006$) had a significant impact on the level of toilet training difficulty.

Discussion

The purpose of this study was to determine the appropriate age for initiating toilet training in healthy Saudi children and examine how different factors affect this training. After careful analysis of our data, we found that the mean age of initiation of toilet training in healthy Saudi children was 25.64 months, while the median was 24 months. Children who began training earlier—around the age of 25 months—faced fewer difficulties and bed wetting in comparison to those who started the training two months later (at 27

Table 3. Comparison of mean age of initiating toilet training and sociodemographic of the child.

Variable	Mean age (SD)	Median (SD)	F/t-value	p-value
Gender				
Male	26.12 (9.79)	30.50 (13.8)	1.58	0.122
Female	25.17 (9.15)	28.00 (11.3)		
Order of Child				
First	26.06 (9.55)	30.25 (11.8)	0.63	0.534
Middle	25.32 (9.34)	28.0 (12.8)		
Last	25.85 (9.79)	30.0 (13.5)		
Caregiver				
Mother	25.71 (9.44)	30.0 (12.5)	0.85	0.427
Family Member	23.32 (10.75)	26.0 (16.2)		
Maid	24.62 (10.44)	39.0 (12.3)		
Season				
Summer	25.86 (9.40)	30.0 (12.4)	2.49	0.590
Winter	22.96 (9.31)	29.75 (14.8)		
Advice				
Yes	24.63 (8.87)	30.0(12.6)	-4.18	<0.0001
No	27.16 (10.16)	30.0 (12.8)		
Difficulties				
Yes	26.93 (9.12)	32.0 (14.5)	3.09	0.649
No	24.98 (9.59)	27.25 (11.2)		
Ask for help				
Yes	27.42 (8.82)	35.0 (13.2)	1.34	0.832
No	26.01 (9.04)	30.0 (14.0)		
Bed wetting				
Yes	27.20 (9.36)	31.0 (14.6)	2.94	0.869
No	25.14 (9.47)	28.0 (11.8)		

Table 4. Comparison of mean age of initiating toilet training and sociodemographic of the mother.

	Mean Age (SD)	Median (SD)		p-value
Educational Level				
Illiterate	24.89 (11.52)	27.0 (11.19)	3.07	0.009
Primary School	25.05 (9.39)	30.0 (11.08)		
Middle School	23.61 (8.97)	27.0 (14.0)		
High School	25.86 (8.89)	26.0 (11.25)		
College	26.77 (9.41)	25.5 (11.9)		
Masters	22.35 (10.63)	28.0 (12.9)		
Residency				
Riyadh	25.81 (9.41)	28.0 (11.4)	0.02	0.886
Outside Riyadh	24.5 (9.91)	33.0 (13.8)		
Number of Children				
Less than 3	27.93 (9.79)	36.0 (11.9)	14.61	<0.0001
3-6	25.95 (9.57)	27.5 (11.25)		
More than 6	23.88 (8.84)	26.0 (11.5)		
Monthly Income				
Less than SR5,000	27.03 (9.88)	30.3 (12.8)	4.87	0.002
SR5,000-SR10,000	26.50 (9.64)	28.0 (9.7)		
More than SR10,000	25.30 (9.32)	27.2 (11.3)		
Non-Disclosure	23.81 (8.86)	27.0 (13.2)		
Mother's Job				
Student	26.38 (10.05)	30.0 (10.6)	0.28	0.754
Worker	25.90 (9.61)	24.0 (9.02)		
Housewife	25.48 (9.40)	27.0 (12.3)		

months). Chiozza *et al.*^[11] noticed a high prevalence rate of enuresis when the toilet training started after age of 36 months (17.1%) when compared to the age of toilet training before 25 (2.5%) months and between 25 and 36 months (508%) With these findings, we can conclude that 25 months is the appropriate age to initiate toilet training in healthy Saudi children. A previous study found that the training process is preferred to start at 24 months; which is one month earlier than what our findings show^[12]. These findings are highly supported by both The American Academy of Pediatrics and The Canadian Pediatrics Society^[13].

The factors affecting the age of initiating toilet training can be classified into maternal and child factors. We found that mothers with a low educational level as illiterate mothers and mothers who completed only their primary or middle school, train their children earlier in comparison to highly educated mothers who graduated from high school, college, or masters, which was similar to the result of Tarhan *et al.*'s study^[10]. Mother's occupation and the area of residence did not affect the age of initiating toilet training. We found that the more children the mother had, the earlier she started the training. This could be explained by mothers with more children having more

experience and knowledge about the toilet training process and therefore training their children at an earlier age. No previous studies have mentioned the effect of the number of children on the age of toilet training initiation. However, a study showed a strong correlation between toilet training and whether a parent had previously trained more than one child^[14]. Regarding family income and the age of toilet training, a previous study showed that family income is directly proportional to the age of toilet training initiation and this can be explained by the increased efforts of low-income families to avoid expensive diapers^[10,15]. Our study showed the opposite finding; family's monthly income and the age of starting toilet training were inversely related.

Regarding the child-related factors, a previous study showed a gender-specific effect on the starting age of toilet training, wherein females, on an average, were found to be three months ahead of males^[2,4]. However, in our study, gender had no effect. Furthermore, our study revealed no influence of who trained the child (mother, family member, or nanny). There have been no previous studies examining this factor, which need to be addressed in more future studies.

Several previous studies have reported links between late training and bladder trouble. Their results were that kids who suffered from bladder problems like bedwetting, and recurrent urinary tract infections at school age were trained for toilet training at an older age. One of these studies was a case-control study design to yield level 2 evidence. The objective of this study was to determine if later toilet training is associated with urge incontinence in children. The result was that initiation of toilet training after 32 months of age was associated with urge incontinence ($P=0.02$)^[16].

Finally, we examined whether different seasons have an effect on the training process. It is known that Saudi Arabia has a desert climate, which is characterized by very high temperatures. Usually, when the weather is hot, children tend to urinate less frequently which makes it easier for mothers to initiate toilet training during this time. This could explain why 92% of the mothers in our study trained their children during summer.

Our study has some limitations, which include the presence of recall bias in the parents and the difficulty to remember the mother's age and family income at the time of toilet training period. Furthermore, the sample was collected from one institution, and most of the patients were from the central province, which could have led to a selection bias. The strength of our study is the large sample size, which helped us obtain a variety of information from families with different backgrounds, making our findings more applicable to our general population.

Conclusions

The mean age of toilet training among healthy Saudi children was similar to those reported in international studies. Summer was the preferred season to initiate training. Maternal education, the number of children, and socioeconomic status were found to play a major role in the initiation age of toilet training.

Conflict of Interest

The authors have no conflict of interest.

Disclosure

None of the authors received any type of commercial support either in forms of compensation or financial for this study. They have no financial interest in any of the products or devices, or drugs mentioned in this article.

Ethical Approval

Obtained.

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عمر المبادرة والعوامل المرتبطة بتدريب الأطفال السعوديين الأصحاء على استخدام المراض

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المستخلص. مع توافر المعرفة بالعمر الأمثل للشروع في التدريب على استخدام المراض واعتبار العوامل المؤثرة، سيكون بإمكان الوالدين منع العديد من الأضرار الصحية المتعلقة بالتبول. تهدف دراستنا إلى تحديد متوسط العمر المناسب للبدء في التدريب على استخدام المراض بين الأطفال السعوديين والعوامل التي قد تؤثر على هذا التدريب. أجريت هذه الدراسة المقطعية من خلال توزيع استبيانات للأمهات اللواتي حضرن مختلف العيادات في مدينة الملك سعود الطبية الجامعية. شملت العينة ألف طفل سعودي. بلغ متوسط عمر البدء في التدريب على المراض لدى الأطفال الأصحاء ٢٥,٦ ± ٩,٤ شهرًا، وبلغ متوسط مدة التدريب ٦,٣ ± ٩,١ شهرًا. تم تدريب معظم الأطفال (٩٢٪) في أشهر الصيف. وكان المستوى التعليمي للأم وعدد الأشقاء والحالة الاجتماعية والاقتصادية من العوامل الهامة التي أثرت على سن البدء لدى الاطفال. في المقابل لم يكن لوظيفة الأم ومقدم الرعاية الصحية وترتيب الطفل بين اخوته ونوع جنسه تأثير كبير على البدء في التدريب على استعمال المراض. تطابق متوسط عمر التدريب على المراض بين الأطفال السعوديين الأصحاء مع ما ذكر في الدراسات الدولية. واعتبر فصل الصيف كأفضل موسم للبدء في التدريب على استخدام المراض. المستوى التعليمي للأم وعدد الإخوة والوضع الاجتماعي والاقتصادي لهم دور كبير في سن البدء في التدريب على استعمال المراض.