Bowel toilet training: a cross-sectional study in children between 3 and 6 years old

Treinamento esfincteriano anal: estudo transversal em crianças de 3 a 6 anos de idade

Entrenamiento del esfínter anal: estudio transversal en niños de 3 a 6 años de edad

José Eduardo G. B. de Miranda[1], Nilton Carlos Machado[2]

ABSTRACT

Objective: To assess the practice of children's toilet training through interviews with parents and caretakers.

Methods: A cross-sectional study of healthy children using a questionnaire applied to parents or caretakers of 100 consecutive children aged 3 to 6 years old.

Results: 97% of the children were home-trained by their mothers and 92% of them used their intuition, previous experience with an older child and grandmothers' experience. Bowel and bladder toilet training started simultaneously in 84% of the cases, whereas 41% of the children mastered stool control earlier. Mothers with lower educational level and of social classes C, D and E initiated the training earlier and one of the related reasons was the cost of disposable diapers. Age in initiation or duration of toilet training was similar for boys and girls. Children presented most of the "readiness symptoms" for toilet training and only a small number of them used a seat reducer or a foot support. There was no increase in constipation prevalence after toilet training and there was no encopresis.

Conclusions: Mothers were responsible for bowel toilet training and initiated it with no specialized help. In C-D-E social classes, the cost of diapers was determinant to initiate bowel toilet training.

Key-words: toilet training; child development; child, preschool.

RESUMO

Objetivo: Avaliar o treinamento do controle esfincteriano anal em crianças, por meio de entrevista aplicada aos pais ou cuidadores.

Métodos: Estudo de corte transversal em crianças sadias, aplicando-se um questionário estruturado para 100 responsáveis por crianças entre três e seis anos de idade.

Resultados: 97% das crianças foram treinadas em casa pelas mães e 92% delas utilizaram a intuição, a experiência com o filho anterior e o aprendizado com as avós. O treinamento do controle esfincteriano anal e vesical foi iniciado simultaneamente em 84% dos casos, sendo o controle anal adquirido primeiramente em 41% das crianças. As mães com escolaridade menor e das classes C-D-E iniciaram o treinamento mais precocemente, sendo um dos fatores relatados o custo das fraldas. Não houve diferença entre meninos e meninas para idade de início e duração do treinamento. As crianças apresentavam a maioria dos "sinais de prontidão" para o início do treinamento e, das crianças que foram treinadas no vaso sanitário, uma pequena parcela utilizou redutor e apoio para os pés. Não houve aumento significativo de constipação intestinal após o treinamento e não foram observados casos de encoprese.

Conclusões: As mães foram as responsáveis pelo treinamento esfincteriano anal e o iniciaram sem auxílio especializado. Nas classes sociais C-D-E, o custo das fraldas foi determinante para o início do treinamento esfincteriano anal.

Palavras-chave: treinamento no uso de toalete; desenvolvimento infantil; pré-escolar.

Instituição: Faculdade de Medicina de Sorocaba (CCMB) da Pontifícia Universidade Católica de São Paulo (PUC-SP), Sorocaba, SP, Brasil

[1]Doutor em Pediatria pelo Departamento de Pediatria da Faculdade de Medicina de Botucatu da Universidade Estadual Paulista "Júlio de Mesquita Filho" (Unesp); Professor Assistente Doutor da Disciplina de Pediatria do Departamento de Medicina da Faculdade de Medicina de Sorocaba da PUC-SP, Sorocaba, SP, Brasil

[2]Livre-docente pela Faculdade de Medicina de Botucatu da Unesp; Professor Adjunto do Departamento de Pediatria da Faculdade de Medicina de Botucatu da Unesp, Botucatu, SP, Brasil

Endereço para correspondência:
Nilton Carlos Machado
Campus Universitário Rubião Júnior, s/n
CEP 18618-970 – Botucatu/SP
E-mail: nmachado@fmb.unesp.br

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RESUMEN

Objetivo: Evaluar el entrenamiento del control del esfínter anal en niños, mediante entrevista aplicada a los padres o cuidadores.

Métodos: Estudio de corte transversal en niños sanos, aplicando un cuestionario estructurado para 100 responsables por niños entre 3 y 6 años de edad.

Resultados: El 97% de los niños fueron entrenados en casa por las madres y el 92% de ellas utilizaron la intuición, la experiencia con el hijo anterior y el aprendizaje con las abuelas. El entrenamiento de los controles del esfínter anal y vesical fue iniciado simultáneamente en 84% de los casos, siendo el control anal adquirido primeramente en 41% de los niños. Las madres con escolaridad menor y de las clases C-D-E inician el entrenamiento más temprano, siendo uno de los factores informados el costo de los pañales. No hubo diferencia entre niños y niñas para la edad de inicio y duración del entrenamiento. Los niños presentaban la mayoría de las "señales de estar listos» para el inicio del entrenamiento y, en los niños que fueron entrenados en el retrete, una pequeña parcela usó reductor y apoyapiés. No hubo aumento significativo de constipación intestinal después del entrenamiento y no se observaron casos de encopresis.

Conclusiones: Las madres fueron las responsables del entrenamiento del esfínter anal y lo iniciaron sin ayuda especializada. Las principales contribuciones de este estudio fueron: 1) la definición de "señales de estar listo" más frecuentes para el inicio del entrenamiento del esfínter anal; 2) en las clases sociales C-D-E el costo de los pañales fue determinante para el inicio del entrenamiento del esfínter anal.

Palabras clave: entrenamiento en el uso de retrete; desarrollo infantil; pre-escolar.

Introduction

Toilet training is an area of pediatric care that offers an excellent opportunity for clinical guidance and prevention. Toilet training is a developmental milestone for children since it takes place during a period when they are discovering or increasing their physical abilities, understanding and responding to the dynamics of relationships with other people and confronting and reacting to external pressures. Toilet training can cause conflicts and anxiety, can have a negative impact on parent-child relationships and can be accompanied by the following complications: refusal to be trained, constipation and encopresis[1-3].

An article published in 1962 by Brazelton investigated toilet training practices in Boston in the United States[1]. The study reported that 26% of 1170 children with upper-middle class parents with a good educational level had achieved fecal and urinary continence by 24 months of age, 52.5% by 27 months, 85.3% by 30 months and 98% by 36 months. Brazelton[1] stated that the control needed for vesical and intestinal continence is the result of the child achieving sufficient neurological maturity to voluntarily accept the responsibility of taking part in the process. This approach considers toilet training to be a process in which parents and/or carers systematically respond to "signs of readiness". Brazelton's recommendations[1] are still being recommended today.

Therefore, considering the need for data on toilet training practices in our country, in particular those "signs of readiness" that should indicate to pediatricians when it is time for parents to start toilet training for bowel control (TTBC), and considering the consequences of inappropriate training, both for children and their families, the objective of this study was to investigate training for bowel control in healthy Brazilian children aged 3 to 6 years, by interviewing their parents or carers.

Method

This was a cross-sectional study conducted by means of an interview-based survey of consecutive children who were seen at the pediatric clinic at the *Conjunto Hospitalar de Sorocaba* (74% of interviews) or at a private pediatric clinic (26% of interviews) run by one of the authors (JEGBM). The children came from a range of different socioeconomic backgrounds and were recruited between June of 2005 and August of 2006. In order to be eligible for inclusion, children had to be healthy, had to be aged from three to 6 years and had to have achieved full bowel control, according to their parents. Exclusion criteria were as follows: diseases that present with soiling, anorectal malformations, prior gastrointestinal surgery, spinal column abnormalities or problems compromising growth and development. Data analyzed included demographic variables related to the children, their parents and the environment and variables related to TTBC.

The following definitions were used for this study:

a) Age at start of TTBC - the age at which parents or carers first showed a potty or toilet to the child and began to

discuss subjects related to toilet training;

b) TTBC completed - when parents or carers reported that the child was no longer using diapers and regularly defecated in the potty or toilet;

c) Constipation -passing hardened, scybalous and/or overlarge feces, with or without pain, during the majority of evacuations, or twice or fewer times per week for a period of more than 2 weeks[4]. Weight (kg) and height (centimeters) were measured according using the methods described by Barros & Victora[5]. Epi-Info 2002 was used to calculate z scores for weight and height (stature) and BMI.

Table 1 - Demographic data for children investigated for toilet training for bowel control

	Mean±SD	Confidence interval for mean (95%)
Boys: Girls	49:51%	
Age of all children (months)	54.8±11.0	52.5-56.9
Age of boys (months)	52.8±11.3	49.5-56.0
Age of girls (months)	56.6±10.5	53.6-59.5
Age of mothers (years)	27.8±6.5	26.5-29.1
Age of fathers (years)	30.7±7.6	29.2-32.2
Mother's education (years' schooling)	10.2±4.3	9.4-11.1
Father's education (years' schooling)	10.1±4.7	9.1-11.0

The data collection instrument was specially designed for this investigation on the basis of an extensive review of the literature[1-2,6-22]. A pilot test was performed on a sample with varying socioeconomic levels and the definitive data collection instrument was produced after evaluation of interviewees' responses and any difficulties they had with understanding. The majority of questions elicited either a "yes" or "no" response. Socioeconomic level was classified according to the 2003 Brazilian Association of Market Research Companies criteria (ABEP - *Associação Brasileira de Empresas de Pesquisa*)[23]. The interviewees were the children's carers, defined as the person responsible for taking care of the child's basic needs. After the study had been explained to participants, each interview was conducted by the researcher in an average of 15 minutes.

Sample size was estimated on the basis of Brazelton's dataset[1], in which 85.3% of children had achieved

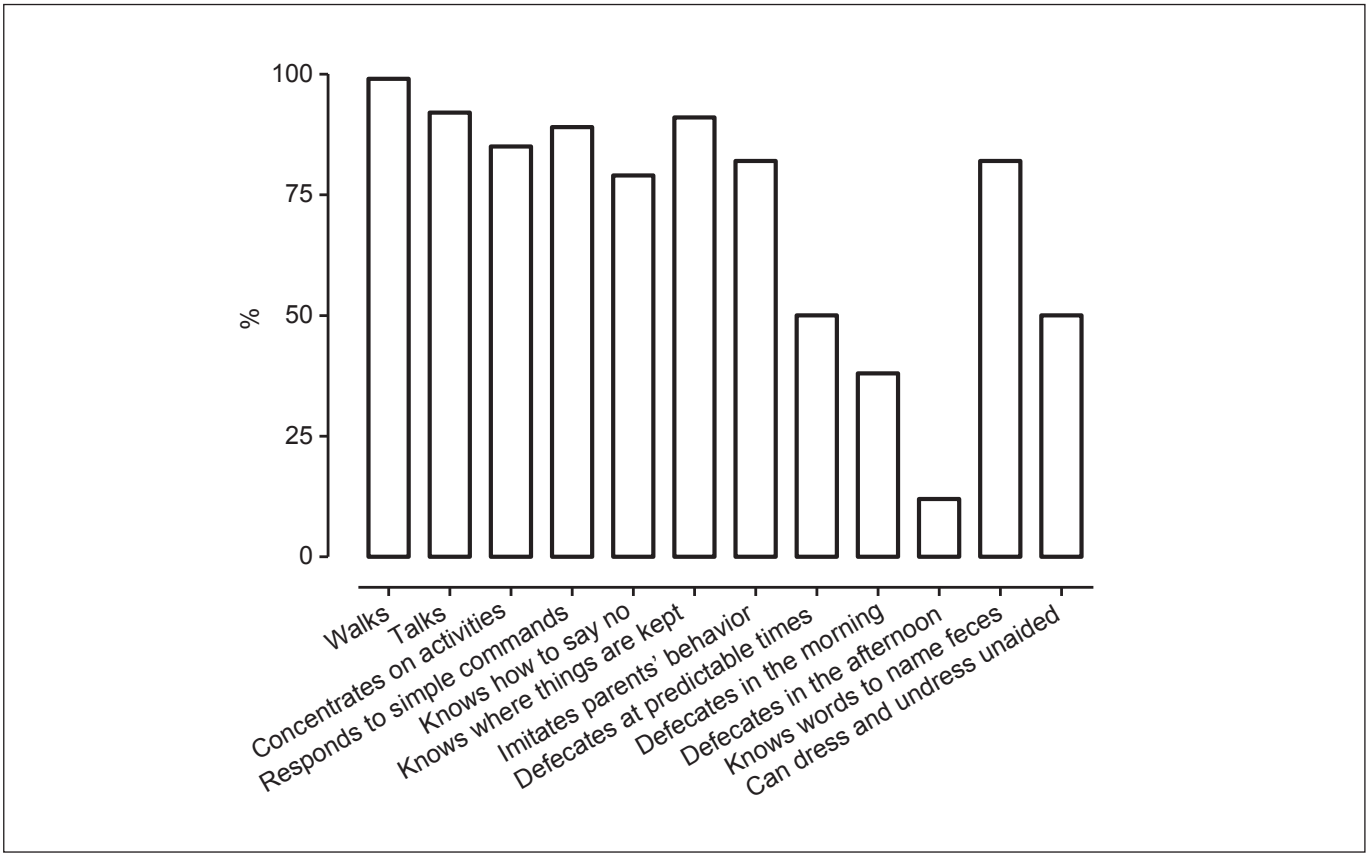

Figure 1 - Signs of readiness for toilet training for bowel control.

Table 2 - Variables associated with toilet training for bowel control, for entire sample and broken down by socioeconomic category (classes A+B *vs* C+D+E)

			Total (%)	Classes A-B (%)	Classes C-D-E (%)
Sources of information	1.	experience from previous children	36	16	20
	2.	intuition	35	15	20
	3.	grandmothers	21	9	12
	4.	medical advice	7	6	1
	5.	others	1	0	1
Training time	1.	morning	43	25	18
	2.	no set time *	42	11	31
	3.	afternoon	15	10	5
Method of taking child to defecate	1.	discussion/persuasion	59	26	33
	2.	takes when child asks	38	20	18
	3.	others	3	0	3
Refusal to train and location of refusal	1.	refusal to sit on toilet	50	23	27
	2.	refusal to sit on toilet and on potty	35	17	18
	3.	refusal to sit on potty	15	7	8
Pressures to stop using diapers	1.	cost of diapers *	45	15	30
	2.	not under pressure	23	10	13
	3.	grandmothers	19	11	8
	4.	husbands	7	0	7
	5.	other members of family	6	3	3
Mother's response to refusal of training	1.	discussion/persuasion	77	34	43
	2.	verbal warnings	20	12	8
	3.	physical punishment	3	0	3

*$p<0.05$.

continence by 30 months. The sample size was exactly 100 patients for a 95% confidence level and absolute precision of 7 percentage points (78% to 92%). The descriptive analysis of the study variables is presented in the form of means, standard deviations, 95% confidence intervals for means and percentages. The chi-square test was used to compare variables and values of $p<0.05$ were defined as significant. GraphPad Prism, Version 30 (1999) was used for statistical analysis. The study was approved by the Ethics Committee at the *Faculdade de Medicina de Sorocaba* (PUCSP)

Results

In 97% of the 100 interviews, the child's mother responded to the questionnaire. The ages of the children and their parents and the parents' educational level are shown in Table 1. Other demographic characteristics of the study population were as follows: white mother - 94%; 1st marriage or stable relationship - 90%; Catholic religion - 66%, Evangelical Protestant - 24%; mother employed away from home - 61%. The children's positions in their families were as follows: 57% were firstborns, 25% were second offspring and 18% were the third child or later, while 37% were single children. The families' socioeconomic classes were as follows: A=24%; B=23%; C=28%; D=22% and E=3%; therefore A+B=47% and C+D+E=53%. All of the children were healthy from a nutritional perspective, according to their z scores for weight, height and BMI.

Table 3 - Age at start and duration of toilet training for bowel control

	Age in months	%
Start	<18	31
	18-30	58
	>30	11
Duration	<3	43
	3-6	34
	>6	23

Figure 1 illustrates the "signs of readiness" for TTBC in the order that the carers were asked about them. Eight of the 12 signs had a frequency greater than 75% at the start of toilet training. Table 2 lists the TTBC characteristics of

the sample studied, broken down by socioeconomic category (A+B or C+D+E). It will be observed that a significant number of C, D and E mothers stated that the price of disposable diapers contributed to the pressure to start TTBC earlier and that they trained their children without setting fixed times for defecation ($p<0.05$). Other findings related to TTBC were that for 97% of children TTBC took place at home, 89% had no problems with training and 23% were already going to daycare when they started training. In 84% of cases, bladder and bowel control were trained simultaneously, with bowel control achieved first by 41% of children. Training was started with a potty for 56% of children, while 44% used a toilet and just 8% of these were given a reducer seat and only 1% a footrest. There was no statistically significant difference between training time using toilet or potty ($p>0.05$). There was also no difference in the percentage with constipation before (18%) and after training (20%) and there were no cases of encopresis.

Table 3 lists the percentages for age at start of TTBC and duration of TTBC, showing that there were no statistically significant differences between the variables ($p>0.05$). There were no statistically significant differences in the relationships: age at start of TTBC, duration of TTBC and sex or for age at start of TTBC, duration of TTBC and single child *vs* child with siblings. For age at start of TTBC, duration of TTBC and mother's educational level (≥11 years *vs* <11 years), mothers with less education began TTBC earlier ($p<0.5$). For age at start of TTBC, duration of TTBC and socioeconomic category, classes C, D and E began TTBC earlier ($p<0.05$).

Discussion

The 3-to-6-year-olds age group was chosen because the intention was to reinforce the memory effect in an interview-based study. In an interview, the interviewer may clarify questions, request that responses be more logical, obtain more complex responses, minimize lost and incomplete responses and control the order of questions. We consider this to have been an appropriate sample since 97% of the interviewees were the children's mothers; all of the interviews were conducted by the same interviewer; the majority of the mothers were less than 30 years old and had one or two children; the majority had graduated from primary education; and 90% were married or in a stable relationship. It was observed that 92% of the mothers gained experience with no specialist help, only 7% of them had been given information by a pediatrician and just 3% of informants had acquired toilet training information from the press; all of which indicates very little of the advance guidance that is recommended[13,22,24].

In a similar study, Shum *et al*[15] investigated 11 "signs of readiness" for toilet training at 24 months and found that girls had mastered just two of the signs and that boys were not proficient in some signs, while median ages for starting training were 25.5 months for girls and 30.5 months for boys. These authors recommended that training should be begun when the child is between 22 and 30 months old. In the present study, 89% of children were beginning to go without diapers by 30 months of age. This shows that, from the chronological point of view, the majority of them began training during the recommended period and with "signs of readiness" present – i.e. when the child was motivated. Taubman[2] found that when training was started before 24 months of age, 68% of children were trained by 3 years of age whereas, if begun before 24 months of age, just 54% were trained by 3 years of age. Blum *et al*[18] reported that starting TTBC at an early age makes training take longer. In this study the majority (77%) were trained in less than 6 months and there was no statistically significant relationship between age at start of TTBC and duration of training.

Blum *et al*[21] observed that constipation was more often a cause of refusal to go to the toilet than a consequence of training. Levine[25] noted that 43% of children with primary encopresis and 69% of those with secondary encopresis had started TTBC before 2 years of age. In the present study, the prevalence of intestinal constipation did not change from before to after training and there were no cases of encopresis. There was also little difference in training duration when using toilet or potty and, when toilets were used, very few children were given reducer seats or footrests, demonstrating very little adaptation to make TTBC more effective.

The ages at start and completion of toilet training can apparently be partially explained by race/ethnicity[26], since while the children of Hispanic, African-American and Caribbean mothers are trained by 20.2 to 22.2 months, the children of European-descended American mothers are trained by 28.1 months. We did not analyze TTBC by race/ethnicity since 96% of the children were white.

In Brazelton's study[1], bowel control was achieved first in 12.3% of children, compared with 41% in our study. It has been demonstrated that girls complete toilet training before boys[1,7,10], but in this study there was no difference with relation to age at start of TTBC, duration of TTBC,

sex of child and whether or not the child had siblings. It is probable that mothers' knowledge about training comes from intuition, experience with previous children and grandmothers' experience.

Mothers with less education and those from socioeconomic classes C, D and E began TTBC earlier and more of them had no set time for removing diapers than mothers from classes A and B. Mothers from less privileged socioeconomic classes stated that the cost of diapers contributed to the pressure to start training, in contrast to those in the higher category. According to the Brazilian Consumer Defense Association (PROTESTE - *Associação Brasileira de Defesa do Consumidor*), one child uses an average of 4800 disposable diapers by 30 months of age[27], It is therefore very possible that the cost of disposable diapers plays a determinant role in starting training for bowel control. Horn *et al*[28] associated family income with starting TTBC, because parents with higher incomes reported that toilet training should start at 2 years of age, compared with 18 months for parents with lower incomes.

The results of this study should not be generalized for the entire Brazilian population since there may be regional differences in terms of sociocultural and socioeconomic conditions. Notwithstanding, the principal contribution of this study was to define the "signs of readiness" that are most relevant in our country and which pediatricians need to know in order to be in position to provide effective advice and guidance, either telling parents that their children are ready to start toilet training or recommending that they wait for their children to show the "signs of readiness" for TTBC[21].

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