

# Oral Hygiene Habits, Dental Home, and Toothbrushing among Immigrant and Native Low Socioeconomic Class Populations

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*About 45,000 people immigrated to Israel from Ethiopia over the last 30 years. The purpose of this study was to compare oral hygiene habits in preschool children from low socioeconomic neighborhoods offspring of immigrants from Ethiopia to offspring of native Israelis. Method: Parents of children attending 21 nursery schools were asked to respond anonymously to 7 questions about their children's visits to a dentist and toothbrushing habits. Results: Parents of 719 children (382 Ethiopian and 337 native Israeli) responded. Of children aged 49-82 months, 15% offspring of Ethiopian and 25% of native Israelis were reported to have visited a dentist; and 45% and 65%, respectively, to brush their teeth at least once daily. More than 90% of children of both populations were reported to have toothbrushes. Of children aged 18-48 months, 28% of Ethiopian and 65% of native Israelis were reported to brush their teeth at least once daily. Conclusion: After more than 20 years residence in a new country, the dental home of an immigrant population was significantly different from that of the native population, of the same low socioeconomic neighborhoods. Discrepancies in parental responses highlight the importance of addressing information bias.*

**Keywords:** Ethiopian, Immigrants, dental home, oral hygiene, toothbrushing

## INTRODUCTION

The American Academy of Pediatric Dentistry (AAPD) recommends twice daily brushing of children's teeth, starting from the time of their eruption.<sup>1</sup> A number of recent publications of studies conducted in African countries have shown levels of knowledge, attitudes, and practice (KAP) of oral hygiene to be far below those recommended.<sup>2-5</sup> While 92% of primary school children in Kenya reported brushing their teeth, 59% reported using the chewing stick rather than a commercial toothbrush, and only 48% reported brushing at least twice daily.<sup>3</sup> Once daily, rather than twice daily, may be a more informative measure of oral hygiene in African countries. Among Nigerian children, 52% reported brushing at least once daily.<sup>4</sup> In a multi-national study, 77.3% of 25,760 school children in nine African countries reported brushing their teeth at least once daily.<sup>5</sup>

In an era of high mobility, high numbers of individuals from African countries establish residence in countries around the world. Immigrant populations tend to bring to their new home, their cultural beliefs and their knowledge and habits about healthcare, including oral hygiene and healthy eating habits.<sup>6</sup> Parental beliefs and attitudes have been shown to play a key role in moderating oral health related behavior in young children,<sup>7</sup> and in determining whether they develop caries.<sup>8</sup> Thus, an appreciation of the impact of cultural and ethnic diversity seems important to the understanding of differences in parental attitudes to oral health.<sup>7</sup>

Over the past 30 years, about 45,000 people have immigrated to Israel from Ethiopia. The aim of the current study was to compare oral hygiene habits in preschool children of two low socioeconomic Israeli populations: offspring of immigrants from Ethiopia and offspring of native Israelis.

## MATERIALS AND METHOD

This study is part of a larger cross-sectional study, conducted during the years 2005-2008, of the oral hygiene status and needs of children of Ethiopian immigrants in Israel. Dental examinations were performed at 21 nursery schools and kindergartens located in low socioeconomic neighborhoods in which at least 25% of the children were offspring of immigrants from Ethiopia.

A structured questionnaire was distributed by one of the investigators (ED) to parents who brought their children in the morning to the participating nursery schools and kindergartens. Only children who were brought by a parent and who signed an informed consent form were included in the survey. The questionnaire accessed demographic information (children's age, gender and ethnic origin) and 7 questions about their children's visits to a dentist, the presence of toothbrushes and toothpaste at home, children's frequency of brushing, and the help children received during brushing. Parents were informed that there were no right or wrong answers.

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Table 1.

No. of participants		Younger children (%)18-48 months		
		Ethiopian	Israeli	Significance
		183	139	
Did your child ever visit a dentist?	yes	9 (4.9%)	5 (3.6%)	N.S.
	no	174 (95.1%)	134 (96.4%)	
Does your child have a toothbrush?	yes	153 (83.6%)	133 (95.7%)	0.016 *
	no	30 (16.4%)	6 (4.3%)	
Who has a toothbrush at home?	All family members	132 (72.1%)	127 (91.3%)	0.0001 *
	Some family members	19 (10.4%)	8 (5.8%)	
	no family members	32 (17.5%)	4 (2.9%)	
Use of toothpaste at home	yes	117 (64.0%)	119 (85.6%)	0.0001 *
	no	66 (36.0%)	20 (14.4%)	
Does someone help the child to brush his/her teeth?	Yes, mother	31 (16.9%)	32 (23%)	0.059
	Yes, father	4 (2.2%)	4 (2.8%)	
	No	148 (80.9%)	103 (74.2%)	
Frequency of the child's tooth brushing	At least once daily	51 (27.9%)	90 (64.8%)	0.0001*
	Occasionally or never	132 (72.1%)	49 (35.2%)	

\*Statistically significant

For purposes of analysis, children were classified into two age groups: younger (ages 18-48 months) and older (ages 49-82 months). Frequencies and percentages were calculated for the categorical variables. Frequencies of the categorical variables between pairs of subgroups were compared by the Chi square test (a parametric test) or by the "Fisher-Irwin exact test (a non-parametric test for small samples). The level of significance for all tests was  $p \leq 0.05$ .

The survey was approved by the Institutional Review Board for Research on Human Subjects of the Ministry of Health.

RESULTS

Parents of 719 children participated in the study .Six parents refused to participate. The population surveyed included 719 children, 382 of Ethiopian descent and 337 offspring of native Israeli parents; 322 were classified as younger and 397 as older children .

Younger group (18-48 months), Table 1

Fewer than 5% of the Ethiopian and native Israeli parents reported that their children had ever visited a dentist, with no statistically significant difference between the populations. The majority of parents of both populations, though significantly more native Israelis than Ethiopians, reported that children had toothbrushes, that all family members owned toothbrushes, that they used toothpaste at home, and that children brushed their teeth without any help. Of the Ethiopian parents, 28% reported that their children brushed their teeth at least once daily, compared to 65% of the native Israelis.

Older group (49-82 months), Table 2

More native Israeli than Ethiopian parents reported that their children had visited a dentist. For both populations, more than 90% of parents reported that their children had toothbrushes. More native Israeli than Ethiopian parents reported that all family members had toothbrushes, that they used toothpaste at home, and that their children brushed their teeth at least once daily.

A higher proportion of older than younger children was reported to have visited a dentist (15 vs. 5% for the Ethiopian children, and 25 vs. 4% for the native Israeli children). Among native Israeli parents, the same percentage, 65%, reported tooth brushing at least once a day by older as by younger children. Among Ethiopian parents, 45% reported tooth brushing at least once a day by older children, compared to 30% by younger children.

DISCUSSION

In this study, marked differences were reported in oral hygiene habits of preschool children and dental home between offspring of immigrant Ethiopian parents and offspring of native Israeli parents, all living in the same low socioeconomic neighborhoods. This difference is despite the fact that the parents of Ethiopian descent had lived at least 20 years in Israel.

Of the Ethiopian parents 15%, compared to 25% of the native Israelis, reported that their children, aged 49 to 82 months, had visited a dentist. These rates are low compared to other reports. In a recently conducted prospective study of the attendance of preschool children at the dentist, Leroy *et al.*<sup>9</sup> reported that by the age of 3 years, 38% and by the age of 5 years, 79% of children had visited a dentist. The authors concluded that parents of young children need to be informed about and motivated toward early dental visits, and that promotion campaigns should focus on firstborn children, children from less educated parents, and parents who do not regularly see a dentist. In a study recently conducted in Brazil, only 21% of preschool children had ever visited a dentist. The investigators found that children of mothers with a low level of education who did not regularly visit a dentist were at greater risk of not receiving dental care. Maternal perception of children's oral health was found to motivate visits to the dentist.<sup>10</sup>

Since reasons for visiting a dentist were not investigated in the current study we do not know how often the purpose was a checkup, rather than treatment of an emergency. However, we note that during

**Table 2.**

No. of participants		Older Children (%) 49-82 months		
		Ethiopian	Israeli	Significance
		199	198	
Did your child ever visit a dentist	yes	30 (15.0)	49 (24.8)	0.016*
	no	169 (85.0)	149 (75.2)	
Does your child have a toothbrush?	yes	183 (92.0)	188 (95.0)	NS
	no	16 (8.0)	10 (5.0)	
Who has a toothbrush at home?	All family members	117 (58.8)	144 (72.7)	0.0001*
	Some family members	36 (18.1)	42 (21.3)	
	no family members	46 (23.1)	12 (6)	
Use of toothpaste at home	yes	152 (76.4)	174 (87.9)	0.004*
	no	47 (23.6)	24 (12.1)	
Does someone help the child to brush his/her teeth?	Yes, mother	17 (8.5)	22 (11.1)	NS
	Yes, father	5 (2.5)	8 (4)	
	No	177 (89)	168 (84.9)	
Frequency of the child's tooth brushing	At least once daily	90 (45.3)	128 (64.6)	0.0001*
	Occasionally or never	109 (54.7)	70 (35.4)	

\*Statistically significant

the study period, all dentistry for children in Israel was privately funded. Since 2010, dentistry for all children up to age 10 years old is covered by the national public health system, and all treatments are without charge. In view of the fact that the study population is of low socioeconomic class and dental treatment was very expensive during the study period, we do not know whether the low percentage of dental visits reported was due to financial difficulties or to low dental care awareness.

The same percentage of Israeli native parents, 95%, reported that toothbrushes were owned by younger as by older children. For Ethiopian children, the percentage was 84 and 92% for younger and older children respectively. However, for both populations, considerably fewer children, especially Ethiopians, were actually reported to use a toothbrush at least once a day. Of the 153 Ethiopian children in the younger age group who were reported to have a toothbrush, only 51 (one-third) were reported to brush at least once daily, compared to 90 of 133 (two-thirds) of native Israelis. For older Ethiopian children, the discrepancy between owning and using a toothbrush was reduced. Of the 183 reported to have a toothbrush, 90 (49%) were reported to brush at least once daily, compared to 128 of 188 (68%) among same age native Israelis.

It seems that some children may have had toothbrushes that were not used, demonstrating that the presence of a toothbrush does not ensure tooth brushing, especially when there is no parental supervision of such. The majority of children in both populations, for both age groups, reportedly brushed their teeth by themselves. If someone helped them, it was generally the mother. We note that a preschool child can not be expected to acquire and master the habit of tooth brushing without supervision. Further, tooth brushing without supervision cannot be expected to be effective. Most studies recommend that preschool children, at least until the age of 5, be helped by an adult when brushing their teeth,<sup>11,12</sup> and that children should be given increasing responsibility from age 7 to 8 years, with parental help and advice recommended at least up to 10 years of

age.<sup>13</sup> Mothers have been found to play the principal role of introducing a child to oral hygiene habits.<sup>14</sup>

Attainment of incorrect information may also explain the higher number of children reported to own toothbrushes than reported to brush their teeth. While oral habits of children are generally reported by their mothers, information bias, resulting from reports of an individual's own or children's health, is known to compromise scientific outcomes.<sup>15</sup> In the current study, information bias may be due to parents not understanding the questions, even though all participating parents were fluent in the Hebrew language; to problems with recall; and to a desire of the participants to please the study investigators. We tried to minimize the effect of the latter by administering anonymous questionnaires. Nevertheless, information bias may explain why 32 Ethiopian parents of younger children reported that none of their family members owned a toothbrush, while only 30 reported that their children did not own a toothbrush. For older children, the contradiction was even greater, with 46 reporting that none of the family members owned a toothbrush, yet only 16 reporting that their children did not own a toothbrush. It appears that if parents tried to please the investigator with their responses, more of them recognized the importance of older children having toothbrushes than younger ones, even if the toothbrushes were not being used.

A possible reason that few Ethiopian children and family members were reported to have toothbrushes is that Ethiopian immigrants may use substitutes such as toothbrush sticks. According to Kassu *et al*<sup>16</sup> toothbrush sticks are used in Ethiopia by the vast majority of people who cannot afford buying commercial toothbrushes and toothpaste. Toothbrush sticks may be important for the oral and dental hygiene of the users, and hence may be useful in decreasing dental caries.

More native Israeli than Ethiopian children were reported to use toothpaste, concurring with Ekman's findings that immigrants use less fluoridated pastes than individuals of native populations.<sup>17</sup> This

may be due to a lack of familiarity with toothpaste, and to a lack of awareness of its role in decay prevention in children.

The proportion of offspring of Ethiopian immigrants who were reported to brush at least once daily, was less than half that of native Israeli children, 27.9% and 64.8%, respectively. Low awareness to tooth brushing at this early age among immigrant parents and over report among Israeli parents about tooth brushing at this young age may explain this difference. For the native Israelis, the percentage of older children reported to brush at least once a day was the same as for the younger children. In contrast, more Ethiopian older children were reported to brush at least once a day than younger children; nevertheless, the rate of 45% was still considerably less than that reported for offspring of native Israeli children.

Our observations among native Israeli children are similar to those of Khadri *et al* who found that 73% of a sample of preschool children in the United Arab Emirates brushed their teeth at least once daily and 23% occasionally or never brush their teeth; but they contrast with those of Martins *et al*<sup>18</sup> who found that 100% of a sample of preschool children in Brazil reportedly brushed their teeth at least once a day. Nevertheless, Martins *et al* found low agreement between observed tooth brushing and mothers' report. Similarly, Finlayson *et al*<sup>12</sup> reported that the number of times children's teeth were brushed during the week prior to interviewing is likely overestimated in mothers' retrospective report. They suggested that the association they detected could be distorted if the self-reported data are misrepresentations of actual behavior.

The current study did not investigate the effectiveness of tooth brushing. We note that higher reported rates of brushing do not necessarily reflect more effective plaque removal or better hygiene habits than less frequent brushing. Careful cleaning, and not only frequent brushing, is recognized as relevant for oral health.<sup>12</sup> Nevertheless, in a study of the same population, we found more dental defects in the offspring of Ethiopian than native Israeli children, 32 vs. 3.9%,  $p=0.0001$  for the younger children; and 31.2% vs. 5.8%,  $p=0.0001$  for the older ones (unpublished data). Among Nigerian children, socioeconomic status was found to correlate significantly with Oral Hygiene Index (OHI) and negatively with Gingival Index, but not with oral hygiene frequency.<sup>4</sup>

The marked differences in dental home among offspring of parents of Ethiopian descent who grew up in Israeli, compared to a native population living in the same neighborhoods, suggests that cultural background may affect dental home more than socioeconomic status and neighborhood residence, even a generation after immigration. Among Nigerian children, socioeconomic status was found to correlate significantly with Oral Hygiene Index (OHI) and negatively with Gingival Index, but not with oral hygiene frequency.<sup>4</sup>

Our findings highlight the importance of educating second generation immigrant populations in oral hygiene. Since immigrant populations comprise a large segment of the inhabitants in the United States, as well as many other countries worldwide, the degree to which second generation immigrant populations adapt oral hygiene habits of their parents and of the indigenous population is an important healthcare issue.

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