

Feeding and Snacking Practices and their Related Factors among Preschool Children from Rural and Urban Areas of Tanzania

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ABSTRACT

Background: Feeding practices of children have been seen to influence their general oral health. Improper feeding practices of the children may predispose them to dental diseases like early childhood caries (ECC) that in turn affects not only their oral health but also their general health.

Aim: The purpose of this study was to determine the feeding and snacking practices and related factors in preschool children from rural and urban areas of Tanzania.

Materials and methods: This was a cross-sectional study which was conducted in preschools at Upanga East and Upanga West in Dar es Salaam as urban wards and Kisawasawa and Kibegere in Kilosa as rural wards. The sample size was comprised of 790 preschool children whose parents/caregivers filled out a special questionnaire on information regarding their children's feeding practices.

Results: A total of 790 preschool children's parents/caregivers participated in this study. Among these, 383 (48.5%) children were from urban areas and 407 (51.5%) were from rural areas. There were 414 (52.4%) boys and 376 (47.6%) girls with an age range of 28 to 60 months with a mean age of 51.81 (SD) months. Most (90.6%) children were reported to take snacks between meals. Snacks that were mostly taken by the children were both sticky and nonsticky sugary snacks. Most (60.8%) of the children were taking snacks once per day. Majority (92.6%) of children who were >48 months of age were reported to be taking snacks between meals. More (54.3%) children from rural areas were sleeping with the mother's breast nipple in the mouth than those from the urban areas ($p = 0.000$). Most (61.7%) of the preschool children with parents/caregivers with higher level of education were using bottle-feeding.

Conclusion: Reported feeding practices of preschool children from rural and urban areas of Tanzania were not healthy for children's oral health. So, there is a need for health workers to provide adequate information on proper feeding practices to the parents/caregivers of these preschool children.

Keywords: Feeding and snacking practices, Preschool children, Tanzania.

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INTRODUCTION

Feeding practices may influence the oral health of the children which in turn have a direct effect on their general health, i.e., growth and development.¹⁻³ Improper feeding practices have been seen to predispose to dental diseases like early childhood caries (ECC) which is a multifactorial condition whose etiology involves complex interactions between biological, social, and environmental factors.³ This condition is known to be a significant health problem in both developing and industrialized countries resulting in pain and when not timely treated may be a recipe for odontogenic infections with severe consequences.^{4,5}

Among the wrong feeding practices is frequency of consumption of sugary foods, drinks, and snacks; bottle-feeding, especially at night; breastfeeding on demand; and sleeping with the mother's breast nipple in the mouth.⁶⁻⁸

Exclusive breastfeeding in the first 6 months of life is important to the child because mother's milk contains nutrients that are basic for proper growth, development, and disease resistance in general.⁹ However, extensive breastfeeding at will beyond 1 year of age, especially when done for long periods of time (e.g., leaving the mother's breast nipple in the child's mouth at night), is associated with ECC.^{10,11} Similarly, if bottle-feeding is used extensively and is prolonged, it also predisposes to ECC. Sociocultural and

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socioeconomic backgrounds of the parents could be risk factors for ECC.¹²⁻¹⁵

It is advisable to breastfeed the child up to the age of 2 years. Nevertheless, if at or beyond this age the child is breastfed more than taking other foods, the risk of developing decayed teeth is increased.^{15,16}

In several studies, caries prevalence was reported to be high in children who were breastfed on demand, who were bottle-fed at night, and those who consumed snacks frequently between meals.¹⁷

The aim of this study therefore was to determine the feeding and snacking practices and related factors among preschool children in rural and urban areas of Tanzania.

MATERIALS AND METHODS

This was a cross-sectional study that was conducted in four preschool centers from Ilala district (two from Upanga East Ward and two from Upanga West Ward) as urban areas and eight preschool centers from Kilombero district (three from Kisawasawa Ward and five from Kibegere Ward) as rural areas of Tanzania.

This study included preschool children aged 28–60 months whose parents/caregivers provided information through a questionnaire. This age-group was chosen because normally it is at this age children start to get exposed to risky behaviors which may be detrimental to oral health.

Cluster sampling of the wards, then preschool centers, followed by a convenient sampling of the children was used. The sample size was calculated using a special formula that resulted in a total of 790 participants.

Ethical Consideration and Ethical Clearance

Ethical clearance was sought from the Muhimbili University of Health and Allied Sciences (MUHAS) Ethical Review Committee through the Department of Orthodontics Paedodontics and Community Dentistry (OPCD) and the School of Dentistry (SOD). Permission to conduct this study was sought from the District Education Officers and from the managements of the involved preschool centers. All the parents/caregivers were informed about the purpose of the study and were asked for their consent. It was made clear that information which was obtained was confidential and would be used for research purposes only. They were informed that participation or nonparticipation was not going to disadvantage their children in any way.

Instruments and Measures

Data collection was done by using a questionnaire. The questionnaire was designed in English and translated into Swahili. It was tested for clarity before it was adopted for use in the field. It consisted of questions on age and sex of the child,

sociodemographic factors of the parents, breast- and bottle-feeding practices, and snacking behavior of the children.

Data Management and Analysis

Data were entered into the computer and cleaned, processed, and analyzed using the Statistical Package for Social Sciences (SPSS) version 23.0.

Dichotomization of the variables was done as follows: Childrens' age into ≤ 48 months or > 48 months, residence into rural or urban, level of education of the parents/caregivers lower level up to primary education or higher level secondary school and above. The questionnaire included questions regarding the type of snack the child consumed and the frequency of snacking.

Frequency distribution of variables was generated. Association between variables was tested by using a Chi-square test with the level of significance set at $p < 0.05$. Multivariate analysis was done to assess the relationship between independent variables (age of child, residence, and level of education of the parents/caregivers) and dependent variables (breast- and bottle-feeding practices, type of snacks, and frequency of snacking).

RESULTS

This study included a total of 790 children (parents and caregivers were the respondents). Sixty-three percent of children were aged above 48 months, with a mean age of 51.8 ± 8.6 months. Slightly over 51% of the participants were residing in rural areas. The mean age of children from rural areas was 56.8 ± 4.6 months and that of children from urban centers was 46.5 ± 8.7 months (Table 1).

There were 414 (52.4%) male participants with a male-to-female ratio of 1.1:1. In the rural centers, there were slightly more (57.5%) male than female participants, whereas in urban centers, there were more (53%) females. In rural areas, 93.6% of parents/caregivers had lower level of education and 6.4% had higher level of education, whereas in urban centers, only 26.4% of parents/caregivers had lower level of education and 73.6% had higher level of education (Table 1).

Two hundred and one (25.1%) parents/caregivers reported that their children were breastfed beyond 24 months, and 85 (42.3%) children slept with the mother's breast nipple in their mouths. The difference between rural and urban dwellers regarding leaving the mother's breast nipple in the mouth was not statistically significant (Table 2). The age of the child and the level of education of the parents/caretakers of children were not statistically associated

Table 1: Distribution of participants according to their sociodemographic characteristics

Sociodemographic characteristics	Residence		p value
	Rural	Urban	
Age-group of children			
≤ 48 months	44 (10.8%)	248 (64.8%)	<0.001
> 48 months	363 (89.2%)	135 (35.2%)	
Mean age of children (months)	56.8 ± 4.6	46.5 ± 8.7	<0.001
Sex of the participants			
Male	234 (57.5%)	180 (47%)	0.003
Female	173 (42.5%)	203 (53%)	
Education level of the respondents (parents/caregivers)			
Lower level	381 (93.6%)	101 (26.4%)	<0.001
Higher level	26 (6.4%)	282 (73.6%)	

Table 2: The feeding and snacking practice of children according to their residence

<i>Feeding habits</i>	<i>Residence</i>		<i>p value</i>
	<i>Rural N = 407</i>	<i>Urban N = 383</i>	
Prolonged breastfed beyond 24 months	103 (25.3%)	98 (25.6%)	0.928
Nipple left in mouth	49 (47.6%)	36 (36.7%)	0.12
Bottle-fed	18 (4.4%)	227 (59.3%)	<0.001
Bottle used to induce sleep	12 (66.7%)	124 (54.6%)	0.322
Taking snacks between meals	380 (93.4%)	336 (87.7%)	0.007
Snacking frequency			
≤Twice	332 (87.4%)	302 (89.9%)	0.292
>Twice	48 (12.6%)	34 (10.1%)	
Type of snacks			
Maandazi/doughnuts	338 (88.9%)	105 (31.3%)	<0.001
Chocolates	24 (6.3%)	143 (42.6%)	<0.001
Kashata	3 (0.8%)	24 (7.1%)	<0.001
Baobab fruits (<i>Adansonia digitata</i>)	58 (15.3%)	8 (2.4%)	<0.001
Biscuits	196 (51.6%)	193 (57.4%)	0.116
Candies/sweets	148 (38.9%)	105 (31.3%)	0.03
Pop corns	10 (2.6%)	50 (14.9%)	<0.001
Crisps	1 (0.3%)	104 (31.1%)	<0.001

Table 3: The feeding and snacking practice of children according to child's age

<i>Feeding habits</i>	<i>Age of the child</i>		<i>p value</i>
	<i>≤48 months</i>	<i>>48 months</i>	
Prolonged breastfed beyond 24 months	77 (26.4%)	124 (24.9%)	0.647
Nipple left in mouth overnight	29 (37.7%)	56 (45.2%)	0.295
Bottle-fed (milk)	153 (52.4%)	92 (18.5%)	<0.001
Bottle used to induce sleep	88 (57.5%)	48 (52.2%)	0.415
Taking snacks between meals	255 (87.3%)	416 (92.6%)	0.015
Snacking frequency			
≤Twice	230 (90.2%)	404 (87.6%)	0.303
>Twice	25 (9.8%)	57 (12.4%)	
Type of snacks			
Maandazi/doughnuts	97 (38%)	346 (75.1%)	<0.001
Chocolates	99 (38.8%)	68 (14.8%)	<0.001
Kashata	17 (6.7%)	10 (2.2%)	0.002
Baobab fruits	5 (2%)	61 (13.2%)	<0.001
Biscuits	146 (57.3%)	243 (52.7%)	0.243
Candies/sweets	74 (29%)	179 (38.8%)	0.009
Pop corns	36 (14.1%)	24 (5.2%)	<0.001
Crisps	71 (27.8%)	34 (7.4%)	<0.001

with the practice of leaving the mother's breast nipple in the child's mouth at night (Tables 3 and 4).

A total of 245 (31%) children were reported to be bottle-fed, and in 136 (55.5%), the bottle was used for inducing sleep. There was no statistically significant association of residence, child's age, and parent's level of education with regard to the practice of using feeding bottles to induce sleep (Tables 2 to 4).

While 716 (90.6%) of the children were reported to be taking snacks between meals, the remaining 74 (9.4%) were reported to have never taken any snacks between meals. For those who took snacks between meals, most (35.6%) consumed only one type of snack, followed by 30.2% who consumed two types. The frequently consumed snacks by the children were doughnuts/maandazi (61.9%), biscuits (53.9%), and sweets (35.3%). In urban

Table 4: The feeding and snacking practice of children according to parents' level of education

Feeding habits	Parents/caretakers, level of education		p value
	Lower	Higher	
Prolonged breastfed beyond 24 months	113 (23.4%)	88 (28.6%)	0.107
Nipple left in mouth	51 (45.1%)	34 (38.6%)	0.355
Bottle-fed	55 (11.4%)	190 (61.7%)	<0.001
Bottle used to induce sleep	31 (56.4%)	105 (55.3%)	0.885
Taking snacks between meals	449 (93.2%)	267 (86.7%)	0.002
Snacking frequency			
≤Twice	399 (88.9%)	235 (88%)	0.730
>Twice	50 (11.1%)	32 (12%)	
Type of snacks			
Maandazi/doughnuts	384 (77.5%)	95 (35.6%)	<0.001
Chocolates	63 (14%)	104 (39%)	<0.001
Kashata	11 (2.4%)	16 (6.0%)	0.016
Baobab fruits	59 (13.1%)	7 (2.6%)	<0.001
Biscuits	234 (52.1%)	155 (58.1%)	0.123
Candies/sweets	185 (41.2%)	68 (25.5%)	<0.001
Pop corns	15 (3.3%)	45 (16.9%)	<0.001
Crisps	16 (3.6%)	89 (33.3%)	<0.001

centers, biscuits and chocolates were the most common snacks, whereas in rural centers, maandazi and biscuits were most commonly consumed snacks (Table 2). Children aged ≤48 months frequently consumed biscuits and chocolates, whereas those above 48 months preferred maandazi and biscuits (Table 3). Maandazi and biscuits were frequently consumed by children whose parents had lower level of education, whereas children whose parents had higher level of education mostly consumed biscuits and chocolates (Table 4).

There was a statistically significant relationship between bottle-feeding practice and residence, child's age, and parents/caretakers education level ($p < 0.05$). Bottle-feeding was 30 times more likely in urban children than in rural children [odds ratio (OR), 31.4 (95% confidence interval (CI), 18.9–52.61)]. Children aged ≤48 months were 5 times more likely to be bottle-fed compared to those aged >48 months [OR, 4.9 (95% CI, 3.52–6.71)]. Bottle-feeding among children whose parents had higher education levels was 12 times more than in their counterparts with parents with low education level [OR, 12.5 (95% CI, 8.7–17.97)].

The children from rural areas were twice more likely to practice snacking behavior than those children from urban areas [OR, 1.9 (95% CI, 1.19–3.23)]. Children aged above 48 months were twice more likely to practice snacking behavior than their counterparts who were aged 48 months or less [OR, 1.8 (95% CI, 1.11–2.92)]. Children whose parents had lower level of education were twice more likely to practice snacking behavior than their counterparts [OR, 2.1 (95% CI, 1.29–3.39)].

DISCUSSION

This study assessed the feeding and snacking practices of preschool children from rural and urban areas of Tanzania. It is considered that in any society, feeding is influenced by sociocultural, socioeconomic backgrounds of the parents/caretakers and environmental factors.^{12,13} Therefore, it was considered necessary to determine the

feeding and snacking habits of these two groups of children with an assumption that their differing environments might have influenced their predisposition to some common oral diseases like ECC.

The age range of the participants in this study was almost similar to that of participants in other studies done previously in Tanzania and other countries around the world.^{16,18–23} This age-group is often affected by ECC because of consuming sugary food items. This might be compounded by the fact that children of this age have not yet acquired adequate skills of performing appropriate oral hygiene. The education levels of the parents/guardians of these preschool children were generally low, more so in rural areas compared to urban areas (Table 1). A similar situation was reported from Brazil.²⁴ This, however, differed with findings from a previous Tanzanian study and several from other countries^{8,24–29} in which the education levels were comparatively higher. In Tanzania, the level of education of the parents/caregivers to a large extent determines their socioeconomic level which plays a key role in the general care of children and especially in the prevention of oral diseases.^{1,13}

Few (42.3%) parents/caregivers reported that their children slept with the mother's breast nipple in the mouth. This proportion was smaller compared to that reported from Spain, Brazil, and Nigeria.^{7,30,31} In Sri Lanka, it was reported that most of the preschool children were breastfed at night while bottle-feeding was also common.³²

In this study, only 31% of the children were bottle-fed similar to reports from Canada.³³ However, it was less compared to that reported from a previous Tanzanian study and reports from other countries.^{18,19,21,34} Nevertheless, higher rates of bottle-feeding have been reported in Hong Kong and China.^{35,36} There was a statistically significant difference in the proportion of children who were bottle-fed between rural (4.4%) and urban centers ($p < 0.001$) (Table 2). While in rural areas, only 4.4% of the children were bottle-fed in urban centers it was rather high (59.3%). This difference might be attributable to differences in purchasing power of parents/caregivers with regard to acquisition of bottles for feeding or purchasing milk.

Despite this disparity in bottle-feeding between rural and urban children, there was not any notable statistical difference in the habit of inducing sleep using feeding bottles between the two groups.

There was a significantly higher tendency of bottle-feeding practice in children of parents with higher level of education compared to those of parents with lower level of education ($p < 0.001$). Bottle-feeding among children whose parents had higher education levels was 12 times more than in their counterparts with parents with low education levels. More often the bottles are filled with sweetened tea or milk containing cariogenic sugar in different amounts which is a recipe for the development of ECC.^{14,37}

Slightly over 90% of the children took snacks between meals. The current proportion was almost similar to that reported from Nigeria and India^{31,38} but rather high compared to those reported elsewhere.^{8,10,19,39} Also, this level of consumption of snacks between meals was less compared to that reported from Bangladesh and India.^{22,38}

Buns (maandazi) and baobab fruits (*Adansonia digitata*) were consumed by rural schoolchildren more than the urban schoolchildren, whereas chocolates, and kashata were consumed by urban children more than rural children (Table 2). This might be influenced by the availability and capability to purchase. While maandazi are easily available in rural areas and can be prepared in many homesteads, chocolates, and kashata need special ingredients, skills, and facilities to prepare. On the contrary, baobab fruits are easily and freely available in many rural areas, and therefore, children and parents can easily access them. In urban centers, these fruits are purchased with money which might account for the difference in availability between rural and urban. In this study, however, generally there was no statistically significant difference in the frequency of consumption of snacks between rural and urban children most possibly because of the small variation in the age-group of the sample population.

In majority of the children who consumed snacks, the frequency was twice or less per day. This finding is different from the reports from the United Arab Emirates where a substantial number (33.4%) of preschool children were reported to be taking snacks more than six times per day.

The practice of sleeping with mother's breast nipple in the mouth overnight was slightly more in children above 48 months compared to the rest. Nevertheless, this was not statistically significant ($p = 0.295$). Leaving the mother's breast nipple in the mouth overnight may be detrimental to the child's oral health including predisposition to ECC as it was reported by Rwakatemala and Ng'ang'a.³⁴

A statistically significant difference ($p < 0.05$) in snacking behavior was noted in children who were aged above 48 months compared to the rest. Our findings showed that children who were aged more than 48 months consumed snacks between meals more often compared to the younger age-group. This might be attributable to the fact that children of this age are often given free money to buy confectionaries of their choice when they are away from home. Coupled with ignorance on predisposition to oral diseases and peer influence might be the reasons why these children buy the snacks.

Maandazi and baobab fruits were consumed by children aged above 48 months more than those aged 48 months and below, while it was the opposite for chocolates and kashata (Table 3). This is possibly so because of the lower sugar content and therefore less sweetness in maandazi and baobab fruits compared to chocolates and kashata which have more sugar and therefore more attractive to the younger group.

Regarding education level of parents/guardians and consumption of snacks, maandazi and baobab fruits were consumed by children of parents with lower level of education more than those of parents with higher level of education, whereas chocolates and kashata were mostly consumed by children of parents with higher level of education. This might to a great extent be influenced by the purchasing power of the parents/guardians.

In the current study, although we did not embark on clinical examination to establish the level of ECC of the participants, the results paint a picture of feeding and snacking habits that have been associated with the condition.

CONCLUSION

Generally, both rural and urban children consumed snacks majority of whom did so only once per day. There was a low proportion of children who slept with the mother's breast nipple in the mouth. Location (rural/urban) and education level of parent/guardian had an influence on the type of snacks consumed and feeding practices.

RECOMMENDATIONS

The parents/guardians should be educated on the appropriate feeding habits of these preschool children to safeguard their present and future oral health status.

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