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Oral health care for children attending a malnutrition clinic in South Africa

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Abstract: Most health problems dealt with at a primary care level have an oral health impact, making it vital for oral health services to find means to integrate with other facility-based programmes at primary health care (PHC) centres. *Aim:* 1) To determine the oral status of the children attending a facility-based nutrition programme and the oral health knowledge, attitude and practices of their parents/caregivers; and 2) To develop a framework for an oral health component to complement this programme. *Method:* A descriptive study of children and their parents/caregivers attending a facility-based nutrition programme (n = 60 children). A structured, administered questionnaire for parents/caregivers and an oral examination for the children was used for data collection. *Findings:* The response rate was 82% (n = 49). Most parents start cleaning their children's mouths between 12 and 24 months (64%), add sugar to food and feeding bottles, and visit a dentist only when the child is symptomatic. These factors clearly place this group at risk for developing dental caries and gingivitis. Their malnutrition status/history increases their risk of oral diseases. The oral examination found plaque deposits, gingivitis, caries and 'white spots'. *Conclusion:* This study clearly shows the need for an oral health component for children attending the facility-based nutrition programme. Promotion, prevention and therapeutical oral care can be maximized by the involvement of a wide range of stakeholders and an interdisciplinary approach. This shows an expanded role for the dental team with specific reference the oral hygienist in such an environment.

Key words: dental hygienist; hygiene practices; knowledge; malnutrition; oral health; oral status; primary health care

Introduction

Public health services in South Africa were offered as vertical programmes in the past, with a number of these under different administrations. This contributed to a fragmented health system and also a culture of limited collaboration between the professionals in various disciplines. South Africa has adopted primary health care (PHC) as an approach to implement the province-wide district health system (1). The horizontal integration required to implement this approach continues to pose a challenge for health care providers in various disciplines. Poverty and the effects thereof, such as malnutrition, infectious diseases and lifestyle-related chronic diseases are among the health issues dealt with at a primary care level. Malnutrition is highly prevalent, particularly in poorer communities with stunting noted as the most common nutritional disorder. A study in 1994 found 22.9% of children between 6 months and 5 years to be stunted (2). Most health problems dealt with at a primary care level have an oral health impact, making it vital for oral health services to find means to integrate with other facility-based programmes at PHC facilities.

Oral health and malnutrition

It is well documented that malnutrition at an early age predisposes children to oral health problems such as dental caries, developmental defects, enamel hypoplasia and gingivitis (3–6). Alvarez (3) reported a higher prevalence of dental caries, oral lesions, delayed eruption and enamel opacities in malnourished children. Cleaton-Jones (7) in a study of 4–5 year old malnourished children in South Africa, found that those who were stunted had a higher prevalence of caries.

Dental caries and gingivitis are common oral problems experienced by the young children irrespective of their nutritional status. The prevalence of dental caries in the nine provinces in South Africa for 4–5 year old ranges from 31 to 77% (8). The consequences of dental caries are progressive, and if not treated may result in pain, infections and ultimately tooth loss. This may impact upon a child's ability to eat as well as their food choices, further compromising their health and oral health. Poorer communities also experience a higher prevalence of oral problems and less access to dental treatment.

Research shows that parents are not well informed about the dental effect of sugared drinks in feeding bottles and cups (9, 10). Sugar is routinely introduced into the diet at infancy through feeding bottles and other foodstuffs (9, 11). Dental visits are mostly performed when children are symptomatic (11, 12). Such practices place the child at greater risk of dental caries and gingivitis, and may increase the burden of disease, if the child has a potentially compromised dentition as in the case of being malnourished. Children in poorer communities may thus experience the double burden of malnutrition and oral health problems in addition to the other consequences of poverty.

Context/background

The National Department of Health introduced an integrated nutritional programme (INP) directed at high-risk groups, in response to the high prevalence of malnutrition (13, 14). One component of the INP is a health facility-based nutrition programme to address under-nutrition and micronutrient deficiencies in children under 5 years. This is seen as an integral to the PHC package. Children on this programme attend once a month for food supplements, growth monitoring and promotion and nutrition education for their caregivers. The public health oral hygienist at a PHC facility was requested to provide oral health input into the health facility-based nutrition programme.

This project was a collaboration between the public health hygienist and the Oral Hygiene Department at the University of the Western Cape. Baseline data were collected for an oral health component to complement the facility-based INP. The project also served as a learning opportunity for the final year students completing a degree in Oral Health (3rd year). Their clinical practice, research and oral health promotion modules formed the basis for their clinical and other input. It further aimed to sensitize students to the health and the social problems experienced in South Africa and the challenges of implementing the PHC approach.

The facility is located in community in a lower socio-economic area, with high unemployment, most residents not having completed a secondary school education, most having access to the basic services such as safe water and sanitation and who live primarily in brick houses and/or informal structures.

The aim of this study was 1) to determine the oral status of children attending the programme and the oral health knowledge, attitude and practices of their parents/caregivers; and 2) to develop a framework for an oral health component to complement the facility-based INP.

Study population and methodology

This was a descriptive study of children and their parents attending a facility-based nutrition programme at a PHC facility (n = 60 children). A structured, administered questionnaire for

parents/caregivers and an oral examination of the children was used for data collection[1]. A mouth mirror and natural light were used for the oral examination. Oral health education was provided to the parents/caregivers after the examination and interview. Children were referred to the dental clinic for follow-up treatment, although this was not monitored in the present study.

Variables measured were: demographic data, the oral health knowledge, practices and attitude of parents/caregivers and the oral health status of the children (Table 1). The knowledge and attitude related questions were open ended and coded by the researchers. Parental consent was requested and parents/caregivers were advised that they could withdraw from the study at any time. Data were collected at the monthly visits when children attended the clinic. The SPSS statistical package was used to capture and analyse the data (SPSS, Inc., Chicago, IL, USA).

Results

Demographic information

The response rate was 82% (n = 49). A number of parents/caregivers (n = 11) did not present for the monthly appointment or opted not to take part in the study. Most respondents lived in brick houses (86%); 38% were employed; 55% were single parents; 96% of children were cared for by their mothers or family members during the day, the rest attended day care; and 65% had two or more children. Children's age ranged from 1 to 4 years (mean = 3 years), 53% were male. The PHC facility was reported as accessible by all respondents.

Table 1. **Variables measured**

Variable	Parameters of the variable measured
Demographic information	Type of housing, employment status, number of children
	Age of children, Accessibility to the PHC facility
Knowledge	Parents/caregivers awareness of their children's oral cavity
	Knowledge of caries and the prevention thereof
Attitude	Importance of daily oral cleaning
	Perceived value of the primary teeth
	Dental visit pattern
Practices	Oral hygiene aids used and age at which these were initiated
	Feeding practices
Oral health status	The presence or not of: plaque, gingival inflammation, oral soft tissue lesions, dental caries and 'white spots'

[1]Most parents were keen to take part in the study but reluctant to do so in the dental clinic. The interview and examination for some was carried out in a 'private' part of the waiting area and natural light was used. Many children were not compliant during the oral examination, limiting the extent of the examination. The factors of lighting and compliance may have caused the extent of oral problems to be under-reported.

Knowledge and attitude of parents/caregivers

Most parents/caregivers (98%) felt that mouth cleaning was important. Their reasons were grouped into three themes. The primary reason cited was for hygienic purposes, then to maintain health and to prevent disease (oral and general) and lastly for aesthetic purposes. Parents/caregivers do not appear to know at what age to start mouth cleaning. Most parents/caregivers (96%) felt that primary teeth were important. The most frequently mentioned reason was for dental function and a need for 'first' teeth, secondly to prevent disease and thirdly for social interaction and aesthetics.

The main causes of caries were reported as 'sweets' (76%) and 'sugar' (20%). A small number in this group (<10%) gave a multiple response where 'sugar' or 'sweets' were stated, along with poor oral hygiene and/or the use of medication and/or an improper diet.

Children were taken to see a dentist when the parent/caregiver could not manage the child's oral problem or they were concerned about what they observed in the mouth.

Practices of parents/caregivers

Almost 80% reported to clean their children's mouths at the time of the study (See Table 2). The majority of these parents (64%) started doing so between 12 and 36 months. Parents/caregivers (94%) reported that they 'looked' into their children's mouths regularly. Their general observations included the following: children had stains on their teeth, teeth were erupting, the teeth were rotten, deposits or 'stains' were seen on the tongue, ulcerations were seen, a 'sore' palate, there were 'no problems'. They responded to the oral problems that they identified by cleaning the mouth with a

Table 2. **Oral cleaning practices of parents/caregivers (n = 49)**

Age of child (months)	Tooth brush	Tooth paste	Cloth	Glycerine/ TCP	No cleaning
≤12 (n = 4)	2				2
13–24 (n = 19)*	8	7	2	3	5
25–36 (n = 18)	14	11	2		2
38–46 (n = 8)	7	4			1
N = 49	**31**	**22**	**4**	**3**	**10**

*One child: no information was provided.

cloth/toothbrush and water or toothpaste; or applying glycerine or TCP (an antiseptic gel that is purchased over the counter) for healing and pain relief (Pfizer Consumer Healthcare, Walton Oaks, UK).

The dietary practices that were focussed on in this study were bottle and breast feeding (See Table 3). For those who were bottle fed, the contents were milk and/or tea, juice and water. Forty-two children also ate foodstuffs such as cereal, vegetables, bread or food which the family consumed. Nineteen (45%) of these children had sugar added to their meals, mostly to the vegetables and cereals.

Only when children were 'difficult' or in pain were they taken to a dentist. Seven children had been to a dentist before, primarily for pain. Their treatment included extractions (n = 4), restorations (n = 2) and a check-up (n = 1).

Oral status of the children

The oral examination reported on the presence of visible plaque, gingivitis, caries and 'white spots' on the teeth (See Table 4). Because of the limitations of the examination, no distinction was made between enamel opacities and demineralized areas.

Table 3. **Breast and bottle feeding practices (n = 49)***

Age of child (months)	Breast	Bottle	Bottle and breast
≤12 (n = 4)		1	2
13–24 (n = 19)	5	1	10
25–36 (n = 18)	9	1	1
38–46 (n = 8)	1		2
N = 49	**15**	**3**	**15**

*Of the 18 children who used a bottle, 12 had sugar added daily and 8 slept with the bottle. Five children used a cup in combination with the breast or bottle. Forty two children were given foodstuffs such as cereal, vegetables, bread and other foodstuffs the family consumed – 16 only consumed foodstuff and the rest had food supplemented with bottle and/or breastfeeding.

Table 4. **Oral health status of children* (n = 49)**

Age of child (months)	Visible plaque	Gingivitis	Caries	White spots
≤12 (n = 4)	3			
13–24 (n = 19)	14	4	2	4
25–36 (n = 18)	10	4	6	2
38–46 (n = 8)	5		4	2
N = 49	**32**	**8**	**12**	**8**

*Dental caries was reported for visible cavitation.
Gingivitis was reported if the gingiva appeared red or swollen in any area of the oral cavity. Plaque was reported for visible plaque noted (anterior teeth – labial surfaces were most accessible). A white spot was reported for any demineralization or opacity noted.

Discussion

Demographics

The majority of parents/caregivers were unemployed, single parents with two or more children. These are indicators of individuals of a lower socio-economic status and shows that the respondents reflect the demographics of the area.

Knowledge and attitude

Parents/caregivers had poor knowledge of the causes of dental caries and when to start hygiene practices. The fact that caries was attributed primarily to sweets suggest that respondents are not aware that they place their children at risk of caries by adding sugar to feeding bottles and other foodstuff. However, parents are well informed about the changes in their children's oral cavity.

Parents/caregivers appear to adopt essentially a medicalized view of health that values cleanliness, dental function and the absence of disease, and to a lesser extent a cosmetic view of health that values aesthetics. They seek professional help only when the child is in pain, the child's discomfort causes inconvenience to them or when the teeth appear unsightly.

Practices

Parents are aware of and feel it important that their children's mouths be cleaned daily. However, this knowledge and positive attitude did not necessarily lead to the appropriate behaviour. Their reported practices of daily cleaning are clearly not consistent with the presence of plaque observed in the oral cavity during the oral examination. This demonstrates an accepted fact that there is not a linear relationship between knowledge, attitudes and practices.

The feeding practices adopted by most parents include sugar. Lopez (11) reported that children progressed through feeding stages based on the mother's experience, older relatives' advice and child readiness. This motivates for appropriate interventions addressing feeding practices that are located in the social and cultural reality of the mother/caregiver.

Reports from most parents were that they start cleaning their children's mouth between 12 and 24 months, add sugar to food and feeding bottles and visit a dentist only when the child is symptomatic. These factors clearly put these children

at risk for developing dental caries and gingivitis. Most children had plaque deposits around the gingival margin of the maxillary central incisors, a known indicator for early childhood caries, clearly showing that they are at risk of this problem. Their malnutrition status/history increases their risk of oral diseases.

Oral status of children

The extent of oral problems reported did not appear to be as extensive as would be expected from the literature (3, 5). This may be because of the limitations with respect to the extent of the oral examination and the examination environment. The absence of oral lesions may also be a result of improved nutrition as a result of being in the nutrition programme.

Minimal pain and discomfort in terms of oral problems were noted. Yet the histories that can be ascertained from the parents' observations suggest that these children may at some time have experienced oral lesions. Parents/caregivers appear to manage these based on the degree of discomfort to themselves and their children. The choice of care ranges from cleaning or other home remedies to over the counter antiseptic preparations. A dentist is consulted as a last resort, usually, when the child is in pain or becomes too difficult to manage.

A framework to integrate oral health with the malnutrition programme

The results of this study indicate a need for promotion, preventive and therapeutical dental care. Various strategies are required to meet the concerns highlighted in the results and discussion. For these strategies to be effective new partnerships need to be created and existing structures used to optimum effect. The framework below focuses on oral health but can be expanded to include other disciplines at the PHC facility. In so doing, it may promote increasing collaboration between professionals and ultimately a more horizontal integration of disciplines in line with the PHC approach. Weinstein (1998) reported on a number of public health interventions to address early childhood caries, clearly a risk for these children (15).

Conclusion

This study clearly shows a need for an oral health component for children attending the facility-based nutrition programme. Promotion, prevention and therapeutical oral care can be maximized by the involvement of a range of stakeholders and an

Framework to promote oral health of children on the nutrition programme

Level	Target Group	Strategy	Responsibility	Objective
Promotion	PHC staff: include all disciplines	Interdisciplinary workshops Human resource development	Co-ordination by the management of the PHC facility Dental services – for oral health discipline Other disciplines	Promote understanding of the role of various disciplines Explore interdisciplinary opportunities to provide comprehensive health care Identify issues for educational material development
	Parents/caregivers	Education though promotional material at PHC facilities	National Health Promotion Directorate (with input from oral health)	Age to start oral hygiene practices Not adding sugar to food/feeding bottle Promote use of feeding cup
	Parents/caregivers	Participatory education Training of volunteers as peer educators	Professionals at PHC facility (oral health and other)	Education to promote oral health for family. Role of the dental team Provide oral health and other education to clients/patients attending PHC facility
Prevention	Staff running malnutrition programme	Training to do oral screening	Dental services	Dental screening as part of monitoring process
	Children attending programme	Oral screening and monitoring	Staff running programme	Early detection of oral problems, referral to dental services
	Parents/caregivers	Role modelling of positive behaviours	Dental services	Early detection of oral problems, provide preventive treatment
	Parents/caregivers	Training to create oral awareness	Dental services	Dental screening and referrals for treatment
	Children attending programme	Food supplements to include a brush and fluoride paste	National /Provincial Department of Health	Regular oral examination of children Promote tooth-brushing Availability of fluoride as a preventive measure
Therapeutical	Children attending programme	Arrest early carious lesions Early treatment of carious lesions	Dental services	Reduce pain and sepsis and restore function, prevent further tooth destruction through: use of fluoride varnish, minimum intervention therapy, extraction of carious teeth where necessary

interdisciplinary approach. This shows an expanded role for the dental team with specific reference the oral hygienist in such an environment. The application thereof may provide a 'spill-over' effect to other health and social problems treated at PHC facilities.

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Patient interview

1. ID number				
2. Dwelling			Brick house	Inf. settlement
3. Marital status	S	M	D	W
4. Employment			Yes	No
5. Gender of child			Male	Female
6. Age of child in months				

7. Who takes care of your child during the day?

8 . Number of children and their ages

9. Do you have a clinic near where you live?	Yes	No
Can you get to the clinic easily?	Yes	No
10. Has your child visited a dentist before?	Yes	No

If yes, what was the reason for the visit?

What treatment was done during the last visit?

11. Have you ever looked into your child's mouth?	Yes	No

What did you see?

What did you do?

Why did you do the above?

12. What do you think causes decay in children's teeth?

13. Do you think milk teeth are important?	Yes	No

Please specify

14. Do you think cleaning of the mouth/teeth is important?	Yes	No

Please specify

15. How do you clean your child's teeth/mouth?

16. At what age did you start cleaning your child's teeth/mouth?

17. Do you breast and/or bottle feed your child?	Breast	Bottle	Both

What is the content of the bottle?

Do you add sugar to the bottle?	Yes	No
Does your child sleep with the bottle?	Yes	No

18. How many meals does your child have per day?

What is the content of the meals?

Clinical examination

Hard Tissue:

Caries	Fractured teeth	Stained teeth	Hypoplasia
Abrasion	Attrition	Erosion	Demineralisation
Delayed eruption	Other:		

Visible plaque	Mild	Moderate	Severe

Soft Tissue

Gingivitis	Glossitis	Stomatitis	Ulcers
Recession	Gingival hyperplasia	Other:	

General observations: