

IN BRIEF

- Non-dental healthcare professionals consider dental decay to be a significant problem for pre-school aged children.
- Conflicting information provided by healthcare professionals creates confusion and discourages parents from accessing oral healthcare services.
- Differences in perception between GPs, dentists and community nurses in their roles and responsibilities are a significant barrier to improving the oral health of pre-school aged children.
- Despite strong evidence to support anticipatory guidance in general, the dental profession has yet to fully embrace this concept.

A qualitative study exploring barriers to a model of shared care for pre-school children's oral health

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Objective To explore the oral health beliefs and practices of primary health care professionals which may act as barriers to the development of a model of shared care for the oral health of pre-school children.

Design Qualitative focus group discussions and semi-structured interviews.

Setting Four rural local government areas in Victoria, Australia, 2003.

Subjects and methods Subjects: maternal and child health nurses, general medical practitioners, dental professionals and paediatricians working in the four local government areas. Data collection: discipline specific focus groups and semi-structured interviews. Data analysis: transcription, coding, clustering and thematic analysis.

Results Several strong themes emerged from the data. All participants agreed that dental caries is a significant health issue for young children and their families. Beliefs about the aetiology of dental caries and its prevention were variable and often simplistic focusing predominantly on diet. Dental professionals did not believe that they had a primary role in the oral health of pre-school aged children but that others particularly maternal and child health nurses did. However other health care professionals were not confident in assuming this role.

Conclusions This study has identified important barriers and possible strategies for the development of an integrated and shared approach to preventing dental caries in pre-school aged children. Clear and consistent oral health information and agreed roles and responsibilities need to be developed.

INTRODUCTION

Young children in many developed countries face significant morbidity concerns in relation to dental health; in some groups up to 70% experience dental decay, the majority of which remains untreated.¹ Indeed, dental caries remains one of the most common chronic diseases of childhood despite the fact that it is largely preventable.² Poor dental health in young children affects the growth and cognitive development of children,³⁻⁷ and may be a strong predictor of future dental problems.⁸⁻¹¹

In Australia, where this study was carried out, this pattern persists, with almost half of four to five year olds experiencing dental decay, most of which remains untreated.¹² Furthermore, significant inequalities in pre-school dental caries exist. In Victoria, for example, children living in rural areas experience at least twice as much dental caries than those in metropolitan areas¹² and are four times more likely to be hospitalised for general anaesthesia to treat this decay.¹³

The biological mechanisms and risk factors for dental caries are relatively well established. Frequency and duration of exposure to sugars, the age at which cariogenic bacteria colonise the oral cavity, the level of exposure to fluoride, and the quality of the tooth enamel are amongst the factors known to affect susceptibility to developing dental caries (see Harris, Nicoll, Adair & Pine¹⁴ for a systematic review). There is also increasing evidence that the earlier an infant is infected by cariogenic bacteria from their mother, the more likely they are to develop dental caries.^{15,16}

Given the above evidence, one of the best windows of opportunity for affecting oral health may therefore be in the first 6-18 months of life. However, most infants are not exposed to dental professionals during this time with only 12% of Australian two year olds having ever seen a dental professional.¹⁷ On the other hand, a survey in Victoria showed that infants are taken to primary health care service providers on average 35 times in the first year of life. Of these visits, 70% were to either general medical practitioners or maternal and child health nurses and none to a dental provider.¹⁸ The primary healthcare setting therefore presents multiple opportunities for health promotion, anticipatory guidance and early intervention.^{19,20}

There has been a professional call in recent years for the reconceptualisation of early childhood caries (ECC) as a child health

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issue rather than categorising and defining it as solely a dental condition.^{2,21} Defining it as dental problem 'limits the communities of interest and reduces the likelihood of meaningful attention.'²² In 2001 Mouradian² proposed a model of shared care (MSC) to engage and involve a wider community of healthcare professionals who have contact with children in oral health promotion.

In order for an MSC to be effective the oral health promotion practices and treatment programs used by health care professionals (HCPs) must be consistent, evidence-based and appropriate for the community in which they are to be delivered. This is a challenging proposition as, at least in the Australian context, there is often little communication between HCPs²³ and there is little or no oral health education in the undergraduate or postgraduate training of non-dental HCPs. Although most HCPs acknowledge the importance of oral health and the prevention of dental disease,^{24,25} many issues have been identified as barriers to the inclusion of health promotion activities in various primary and secondary health care settings. These include lack of time, resources and organisational support; lack of confidence and training; poor or little reimbursement; a focus on clinical treatment or acute problems; and scepticism regarding the efficacy of health promotion.^{26,27} A study was therefore planned to investigate the feasibility and effectiveness of an MSC applied to dental caries in relation to young children in disadvantaged communities.

In preparation for the development and implementation of a trial of an MSC, we sought to examine the oral health perceptions, beliefs and experiences of HCPs in the primary health care setting who provided services to pre-school aged children in rural Victoria. Where previous research has employed quantitative methods to collect comparable information, this study employed rigorous qualitative methods to identify the participants' perceptions of important issues associated with the oral health of young children, particularly those issues that may represent barriers (both perceived and actual) to the development of an MSC.

METHOD

Four rural, non-fluoridated geographical Local Government Areas (LGAs) in Victoria, Australia were selected to participate in the community trial, of which this study represents the first component. The participating LGAs were matched almost exactly for socioeconomic status using a multiple component index of socioeconomic disadvantage, IRSED (Indicator of Relative Socioeconomic Disadvantage), population density, birth rate >200, hospital dental admission rates (as a proxy for dental disease) and number of dentists per capita. Ethical approval for the study was obtained from the Royal Children's Hospital Ethics in Human Research Committee.

This study is based in rural communities of Victoria, Australia. The areas involved all included a large town, comprising approximately 10–15,000 in population. The population density is 22 people/km² in Victoria²⁸ compared, for example, with the UK with 244 people/km².²⁹ The social patterns in recent years include declining agricultural income and activity, high levels of migration of young adults to metropolitan areas and a redistribution or withdrawal (on economic grounds) of many essential public services including healthcare.³⁰ In addition, residents of rural towns are significantly more likely to receive a government welfare payment as their primary source of income when compared to those living in major urban areas.

Access to dental services is an example of the disadvantage experienced in these communities. Dentists tend to cluster in cities with relatively fewer practising in rural areas. In Victoria, the capital city Melbourne has a dentist:population ratio of 52.4 per 100,000 compared with 29.9 in all other areas.³¹ The model of dental service delivery in Australia is similar to that in the United States where the majority of dental practitioners are general dentists who

work independently in the private sector.³² In Victoria there is a publicly funded school dental service resourced by salaried dental therapists which is free of charge to low income families only, co-payment fees existing for all other families. Until 2005 this service did not extend to pre-school aged children and this highly vulnerable population was left to access services (essentially those available in the private sector) independently.

Focus group discussions or semi structured interviews were conducted with maternal and child health nurses (MCHNs), dental professionals (dentists, dental nurses and dental practice managers), paediatricians, and general medical practitioners (GPs) in the four LGAs. MCHNs were contacted through human service manager/team leaders in each of the four LGAs. Doctors, dentists and paediatricians were sent letters inviting them to participate in focus group discussions to be held at a convenient venue. Included were fax-back forms or freepost envelopes for returning an indication of interest form. Dentists, paediatricians and staff from the general medical practices who responded were telephoned and asked if they knew of or worked with other colleagues and peers who might also be interested but had not yet responded. Although focus group discussions were the preferred approach, some practitioners working in isolation were seen alone utilising semi-structured interviews. These two methods actually generate different forms of data, with focus groups producing a wider range of experiences and opinions whereas interviews generate more detailed individual data.³³

The focus group discussions/semi-structured interviews employed an experienced moderator and were audio-taped for later verbatim transcription. An assistant moderator was present to take field notes in order to enhance the quality of later data handling.³⁴ The moderator used a schedule of questions initially developed by the research co-investigators. These questions were modified and additional items were added iteratively as the groups/interviews progressed, in order to clarify and test emerging themes and concepts.³⁵ Focus groups/interviews were conducted with each professional group until data saturation was reached. Data saturation occurs when no new themes are emerging from subsequent focus group/interviews³⁵ and was determined on the entire body of the two data types.

At the conclusion of the discussions and interviews the moderator summarised the key points and confirmed these with participants. Participants were invited to add any other issue that they felt was important, where it had not been addressed within the discussion. A summary of the focus group/interview was sent to each of the participants with a replied paid envelope following transcription. Participants were asked to check the summaries for misinterpretation and make adjustments where necessary. These quality control mechanisms were built into the data collection process to ensure that the data analysis was systematic and verifiable.

Data Analysis

Data analysis was conducted prospectively as the focus groups proceeded. Transcriptions were converted into data files and imported into Ethnograph Qualitative Data Analysis Software Version 5.0.³⁶ Coding of the data at a statement level was carried out by the primary investigator/moderator (MG). Tapes were replayed as coding was conducted to assess the general climate of discussion and areas of hesitation, controversy, embarrassment or emphasis. Ideas that emerged during this coding process were entered as either file or text memos and used as search outputs in later stages of analysis. Reduction and display of data was achieved by simple frequency analysis and then a clustering of codes within and across focus groups to give a range and intensity of attitudes and experiences. Thematic analysis was then conducted. Coding of the relevant data and thematic interpretation was reviewed by a second

Table 1 Number of focus groups/semi-structured interviews by professional group

Professional group	Focus groups	Interviews	Number participants
MCHNs	4	-	18
General Medical Practitioners	1	3	9
Paediatricians	1	2	7
Dental Professionals	5	-	22
Total	11	5	56

investigator (NK) and discrepancies were discussed and either modified or discarded.

RESULTS

A total of 11 focus groups and five semi-structured interviews were conducted with HCPs working in each of the communities (see Table 1 for participant details).

The results of analysis of the focus groups (FG) and semi-structured interviews (SSI) are presented under thematic headings. These headings have direct implications for informing the content of the intervention of the subsequent community trial of the MSC: (1) perceived prevalence, pattern and impact of ECC, (2) perceived cause of problem and (3) potential solutions.

1. Prevalence, pattern and impact of ECC

Disease prevalence and pattern

Dental caries was clearly identified as a problem by all participants. There was concern about its negative affect on the health of the general population and more specifically on young children.

'Um, the first point I'll make is that we see lots and lots of caries, to the point that it's one of the most common things I will record in my records.' (Paediatrician, FG).

All groups identified that there had been a trend in the last two decades towards a reduction in the prevalence of dental decay in children but felt that a certain distinct subgroup within the rural population appeared to suffer disproportionately more than the general population. Associated with this idea was the 'all or nothing' concept that described a polarisation of most of the decay into this group.

'Yeah, there has been some improvement but I think that there is still a sort of residual group of people who sort of don't seem to be getting the same [improvement].' (MCHN, FG).

'Yeah it's rare to find just one cavity. Its usually three, four or five cavities.' (Dentist, FG).

Impact on child and family

From the initial question regarding the extent of the problem the discussions moved naturally to the perceived impact that decay has on young children and their families. These perceived impacts included pain and discomfort, future dental and orthodontic problems, negative effects on nutrition, concentration and learning, speech problems, lowered self esteem for the child and guilt and shame for mothers, family disruption through lost sleep and the expense and opportunity costs of seeking help for acute problems. Of these, pain was the most frequently cited consequence of decay, particularly by the dental and GP groups.

'Quite often it's pain [that brings them in] or the child being kept awake at night.' (Dental nurse, FG).

'It's not uncommon for mums to bring in two and a half year olds who are in pain and I've actually seen a few of them.' (Dentist, FG).

The MCHNs also frequently discussed pain but were more likely to focus on its effect on quality of life and other health and development issues. Such effects included the impact on the ability to concentrate and therefore learn, and the potential interference with eating and nutrition with obvious implications for optimal growth and development.

'Because a lot of people think 'oh they just fall out anyway' so to tell them that it is important to look after those teeth because they're important for nutrition and for speech and for appearance and self esteem and keeping the spaces for the second teeth to come through so it is important to look after them.' (MCHN, FG).

There was also a sense that the presence of caries in their children could elicit feelings of guilt, shame and embarrassment in parents.

'Most of these parents feel embarrassed... feel embarrassed and guilty about a lot of issues that we've been talking about. They often blame themselves for things that you wouldn't even understand why they would blame themselves for it – their own reasons.' (Paediatrician, SSI).

Some participants (particularly from the dental groups) were not always sympathetic to this reaction, with the occasional suggestion that parental guilt could and should be used to motivate behavioural and dietary change.

'I think seeing a little four year old and his mother's emotional impact... it's the embarrassment makes them go away and think about it.' (Dentist, FG).

2. Perceived causes of decay in young children

Two factors were perceived to be strongly associated with the increased risk of developing caries in this young population: diet and feeding practices, and dental service attendance.

Diet and feeding practices

Inappropriate dietary and feeding practices emerged strongly as the main cause of the problem in all groups. As expected, all participants were aware of the importance of sugars in the development of caries. Solid foods were mentioned briefly but most discussion centred on fluids such as milk and additions to milk, soft drink and fruit juices. For infants and very young children, night/sleep time and on-demand feeding were highlighted whereas for older children the exposure to soft drinks was emphasised.

'Like a bottle of milk is lasting them a couple of hours and they're just sucking away and it's just rotting their teeth rather than the bottle being drunk or sucking the mother in a short time.' (Dentist, FG).

Notably, the dental groups tended to explain inappropriate diets as a lack of discipline, parenting skills or imagination whilst the MCHNs and paediatricians were more likely to describe the use of sweet fluids as symptomatic of broader socio-cultural issues. Among these issues were inadequate food knowledge, poor skills

and confidence of many parents, inadequate resources to deal with other more immediate life-stresses, the influence of significant others in the child's diet (grandparents and child carers) and the pervasive 'culture of the bottle'.

'There are other issues here and often the parents have got more pressing needs than the bottle of Coke.' (MCHN, FG).

Breast-feeding proved to be a contentious issue, with confusion amongst all the HCPs as to the relative role played by breast-feeding in the development of dental caries. Whilst most participants supported breast-feeding and felt it was important for general health, concerns were expressed about certain breast-feeding habits. These concerns were expressed mainly within the dental groups, however a single MCHN also felt strongly that on demand breast-feeding was a risk factor for ECC. These beliefs were generally informed by particular cases participants had come across.

'Yes and I clearly remember one I saw recently and another, a mother who allowed the child to fall asleep while she was feeding, you know while the child was suckling and got dental caries without being fed a bottle.' (Dentist, FG).

Dental attendance

Failure on the part of the parents to seek dental care early enough for their child was the second most common explanation put forward across all groups to explain the level of caries in very young children. Amongst all HCP groups the expense of dental care emerged as the most likely reason for this.

'...certainly the level of problems you see, parallel to social class. People with, lower income groups...it's sometimes difficult because they can't afford the care.' (Paediatrician, FG).

'Sometimes a child has an abscess and [his or her parents] tell me 'we can't get into the dentist'. The parents may be unemployed... they can't afford... and there isn't a public dental clinic here.' (GP, SSI).

Although acknowledging the cost of care, some dental groups suggest that 'expense' was an expedient excuse used by some parents to explain non-attendance rather than the real reason, which was perceived to be fear or low value. Tied to this was the belief amongst all dental groups that increasing access to dental care would not appreciably increase dental attendance.

'Yeah, I reckon that's the biggest reason why these kids don't come, or come late. Mum or dad, it's usually the mum, they're too afraid themselves to bring their child in.' (Dentist, FG).

'Sometimes it's a convenient one [expense] for them to choose, look it's not cheap, but they would spend more on their video rentals...' (Dentist, FG).

MCHNs agreed that fear as well as cost could prevent regular attendance, but they also identified significant barriers at a higher system level. These barriers included limited services often located in distant communities, and extensive waiting lists in both public and private sectors. Many groups felt that these factors could discourage taking children for routine dental care and lead to irregular attendance based upon acute need, which in turn may lead to unavoidable traumatic surgical treatment such as extractions under general anaesthetic, directly contributing to the fear and negative attitude towards dental care.

'...and they'd get in, be seen and have the emergency treated, often just with a bit of temporary filling or whatever, and then they'd be put on a [waiting] list, so, if they're seen at two, they're going to be four before they have the rest of that work done. Usually there's been a series of emergencies between then.' (Dentist, FG)

There was a strong sense amongst all participants that parents of infants and toddlers were largely unaware of the need to seek dental care and advice early. Dental groups were generally at a loss to explain this 'ignorance', however some offered possible explanations including the dental attendance patterns of the parents and grandparents.

'Yum, lack of education, without a doubt and, um, the parents... their parents, um, of the... Mothers. Um, they ah, from... talking to them, um, usually [they say] ... 'oh my mum and dad had dentures when they were 20 or 19. All their teeth were rotten, so they would have them removed. They had pyorrhoea' ...um, so it's a really archaic background then drives their oral hygiene and their whole dental perception.' (Dentist, FG).

Non-dental HCPs expressed confusion and at times conflict regarding appropriate timing for the first dental visit. Many, particularly the MCHNs, reported instances in which they had followed guidelines in suggesting dental visits in the first or second year of life, only to have mothers feed back to them that the dentist did not want to see such young children.

'I say to the mothers 'take them to see the dentist' and the mother says 'he doesn't want to see them until they're at school.' (MCHN, FG).

3. Potential solutions

Water fluoridation was discussed by most participants, however as this intervention lay outside the scope of an MSC and was being addressed at a state government level, it is not pursued further in this paper.

The majority of the participants agreed that oral health should be part of routine anticipatory guidance provided for infants. Furthermore, in order to be effective any oral health promoting activities needed to begin well before most children first see a dentist.

'You need to start before the kid's born. You need to start with mum and dad.' (Dentist, FG).

However when and by whom this advice should be given was not clear. The dental HCPs felt that this care should be provided by MCHNs or (less often) others with contact with infants and their mothers, such as nursing mothers associations or child care providers.

'Yes, pre-natal and then maternal health delivery, in that maternal health environment and I'm not sure if they still have nursing mothers...' (Dentist, FG).

In contrast, non-dental HCPs including the MCHN's did not feel comfortable giving dental advice beyond general messages. They were particularly wary of giving advice concerning fluoride, some feeling they would be crossing professional boundaries if they did so, and in general suggested that they would rather refer to a local dental provider where possible.

'Because I don't feel that I am competent enough with the fluoride... I don't want it to cause fluorosis later on... you have to be careful and talk either with the chemist and the dentist because I just think it's a really dicey area.' (MCHN, FG).

Most non-dental groups reported recommending to parents dental visits at age one or soon after the primary teeth had all erupted into the mouth. However, dental groups were mostly reluctant to see children before the age of two. Instead they preferred to see children when they were sufficiently developed cognitively and emotionally to accept sitting in the dental chair and having their mouths examined.

'I'll say if there's anything you're particularly worried about or anything, then bring them and we'll have a look. But otherwise, bring them in when they're around kinder age [three to four years]

because when they're around kinder age, they're starting to socialise more and their language skills are good enough that you can talk to them...' (Dentist, FG).

DISCUSSION

This study has provided some new information from health care professionals. The significance and continuing concern for dental caries as a major problem for young children in their communities was reinforced by the total sample. Professional groups differed about the impact of caries on children, however these differences were not great. It is likely that this observation reflects the nature of service use and the scope of practice of individual service providers. That pain was most commonly discussed by the Dental and GP groups may be because children with dental pain are more likely to present at dental surgeries, general medical practices or hospital emergency departments than at MCHN or paediatrician's clinics. For these practitioners the pressures of time and the need to address immediate needs may have prevented an appreciation of the broader psychosocial impacts of caries in this young population. The greater emphasis placed on quality of life outcomes by MCHN and paediatricians perhaps may be underpinned by the observed differences in their practice experience where the majority of attendances are surveillance based and generally asymptomatic, as observed in other Victorian research.¹⁸

Beliefs held about the causes of ECC are important for discussions around the development of an MSC for young children because perceptions around aetiology will shape the design of interventions intended to help prevent the disease.¹⁴ It is interesting but not surprising that most discussions regarding the cause of caries in these communities centred on diet and dental attendance. These two factors are the focus of much literature and empirical research around ECC and yet may, at least in the current context, be the least amenable to change.^{37,38} Qualitative studies providing insights into feeding practices have suggested that parents are concerned about children receiving enough nutrition and in particular fluids, and so may act to encourage intake by the addition of sweeteners to bottles and diets.^{39,40} Countering these strongly held beliefs/practices with logical arguments designed to reduce the risk of dental decay may not be sufficiently powerful to alter such behaviours.

This study has highlighted significant variations in HCPs' (including dental) knowledge of the risk and protective factors for ECC. Sub-optimal fluoride exposure, transmission of cariogenic bacteria and poor plaque control did not feature strongly in the discussion regarding aetiological factors despite the strong and consistent evidence for their influence on the development of ECC. The role of breast-feeding in the development of caries in young children was the most contentious factor. In a recent systematic review of the relationship between breastfeeding and ECC the authors concluded that breast-feeding is not associated with caries.⁴¹

Differences in opinion between HCPs were expressed regarding the timing, function and setting for the first dental visit. An interesting point to note from these focus group discussions is that despite feeling that early intervention and anticipatory guidance was critical to preventing caries, particularly for high risk families, the dentists themselves preferred not to see the children until they were at least two years of age and often older. A recent international multi-centre study has demonstrated that this perception may be one of the most significant barriers to young children's access to timely and appropriate care.⁴² This reticence by dentists to see young children may not only discourage other HCPs from referring children at risk, but also reinforce the erroneous view among parents that young children do not need to see the dentist.

This issue is also unresolved in the international literature.

Various paediatric professional groups have developed policies and recommendations concerning the first dental visit. Some see this first visit as an opportunity to complete an oral examination, others for acclimatisation to the dental surgery and others as an opportunity to provide risk assessment and anticipatory guidance or a combination of these.⁴³⁻⁴⁶ The evidence base for such recommendations has been examined by Hashim-Nainar & Saffron.⁴³ From a caries prevention perspective, these authors suggest that only one in five children would benefit from a dental visit prior to the age of five years, limiting the cost effectiveness of universal one year visits. Using this evidence-based framework, these authors make a case for the selective targeting of children for early dental visits and management after initial caries-risk assessment.

The dental professionals participating in this study suggested that early anticipatory guidance should come from other HCPs who had higher levels of contact with very young children. This is encouraging and may facilitate the development of an MSC. However the current data suggests that HCPs, particularly the MCHNs, may not have the confidence or self-perceived legitimacy to assume such a role. Similar findings regarding roles and responsibilities were reported in a qualitative study exploring ways of incorporating oral health prevention activities into the primary care clinics in a university-affiliated medical teaching institution.⁴⁷

The preferred method of data collection was the focus group, which was used mostly in this study. Structured interviews were also used because of the location and personal preferences of some of the participants. The nature of these different types of data mean that for some groups (notably the GPs and paediatricians), a more personal view of issues was expressed rather than the broad range of views and experiences moderated by group discussions. Given the study context and the qualitative methods employed, caution should be exercised when generalising findings to other settings. Indeed, the purpose of this study was not to generalise findings to these professional groups as a whole, but to gain an in-depth understanding of the perceptions of primary health care professionals in a number of rural communities. Despite this general caveat, there does appear to be many parallels between the themes identified in this study and those found in other work in the field, both quantitative and qualitative.

CONCLUSIONS

This study has identified some of the barriers, both real and perceived, to the development of an MSC for pre-school children in rural communities. Attendance at the dentist to allow timely anticipatory guidance is unlikely to occur for those children who would benefit most from this. Most dentists seemed to practice within a medical/pathophysiological framework and saw themselves primarily as the clinician delivering treatment procedures, rather than playing a role in promoting oral health.

Dental professional groups did, however, see value in early preventive advice and appear to support MCHNs in particular, but others to a lesser degree, in providing anticipatory guidance. Additionally, dental professionals felt that they added value by treating dental caries once it had occurred. One potential MSC may therefore include non-dental HCPs referring only those children that they identify as at risk of or suffering from dental caries, whilst providing anticipatory guidance and support to all children. The current barrier to this is a primary care workforce which is currently not confident in this role for various reasons, including knowledge and skill deficits and feelings of illegitimacy in the oral health area. Tied to this is the need to promote the MCHN and others as credible sources of oral health advice and support to families.

Available evidence suggests that the oral health needs of very young children in rural Victoria are not being addressed effectively. There is a need to recognise that ECC is a paediatric health

condition which requires the concerted efforts of all primary health professionals who have contact with children. There is, however, a need to negotiate the roles and responsibilities of each health professional to eliminate the current gaps in preventive care and anticipatory guidance.

Additionally, there is a need for oral health information and advice that is not only clear, consistent and evidence based, but that is likely to be acceptable and beneficial. Oral health messages must be agreed upon by all HCPs and be sensitive to community norms of child rearing and wider health issues, such as breast feeding. This information/advice should be promoted and reinforced by all health professionals at each contact with parents and children.

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- Milnes A R. Description and epidemiology of nursing caries. *J Public Health Dent* 1996; **56**: 38-50.
- Mouradian W E. The face of a child: children's oral health and dental education. *J Dent Educ* 2001; **65**: 821-831.
- Acs G, Shulman R, Ng M W, Cussid S. The effect of dental rehabilitation on the body weight of children with early childhood caries. *Pediatr Dent* 1999; **21**: 109-113.
- Anderson H K, Drummond B K, Thomson W M. Changes in aspects of children's oral-health-related quality of life following dental treatment under general anaesthetic. *Int J Paediatr Dent* 2004; **14**: 317-325.
- Ayhan H, Suskan E, Yildirim S. The effect of nursing or rampant caries on height, body weight and head circumference. *J Clin Pediatr Dent* 1996; **20**: 209-212.
- Gift H C. Oral health outcomes research: challenges and opportunities. In Slade G D (ed) *Measuring oral health and quality of life*. pp 25-46. Chapel Hill, NC: University of North Carolina, 1997.
- Thomas C W, Primosch R E. Changes in incremental weight and well-being of children with rampant caries following complete dental rehabilitation. *Pediatr Dent* 2002; **24**: 109-113.
- Haugejorden O, Birkeland J M. Evidence for the reversal of the caries decline among Norwegian children. *Int J Paediatr Dent* 2002; **12**: 306-315.
- Heller K E, Eklund S A, Pittman J, Ismail A I. Associations between dental treatment in the primary and permanent dentitions using insurance claim data. *Pediatr Dent* 2000; **22**: 469-474.
- Litt M D, Reisine S, Tinanoff N. Multidimensional causal model of dental caries development in low-income preschool children. *Public Health Rep* 1995; **110**: 607-617.
- Powell L V. Caries prediction: a review of the literature. *Community Dent Oral Epidemiol* 1998; **26**: 361-371.
- AIHW Dental Statistics and Research Unit. *Child Dental Health Survey, Victoria 1999*. 2001.
- Department of Human Services, Victoria. *Ambulatory Care Sensitive Conditions Study*. Melbourne: Public Health Division, DHS, 2001.
- Harris R, Nicoll A D, Adair P M, Pine C. Risk factors for dental caries in young children: a systematic review of the literature. *Community Dent Health* 2004; **21** (Spec Iss): 71-85.
- Seow W K, Amaratunge A, Bennett R, Bronsch D, Lai P Y. Dental health of aboriginal pre-school children in Brisbane, Australia. *Community Dent Oral Epidemiol* 1996; **24**: 187-190.
- Seow W K. Biological mechanisms of early childhood caries. *Community Dent Oral Epidemiol* 1998; **26** (Spec Iss): 8-27.
- Slack-Smith L M. Dental visits by Australian preschool children. *J Paediatr Child Health* 2003; **39**: 442-445.
- Goldfeld S, Wright M, Oberklaid F. Parents, infants and health care: utilization of health services in the first 12 months of life. *J Paediatr Child Health* 2003; **39**: 249-253.
- Kowash M B, Pinfield A, Smith J, Curzon M E. Effectiveness on oral health of a long-term health education programme for mothers with young children. *Br Dent J* 2000; **188**: 201-205.
- Nirschl R F, Kronmiller J E. Evaluating oral health needs in preschool children. *Clin Pediatr* 1986; **25**: 358-362.
- Ismail A I. Prevention of early childhood caries. *Community Dent Oral Epidemiol* 1998; **26** (Spec Iss): 49-61.
- Edelstein B. Policy issues in early childhood caries. *Community Dent Oral Epidemiol* 1998; **26** (Spec Iss): 96-103.
- Mwili-Muleya C, Gunn J, Jenkins M. General practitioners: their contact with maternal and child health nurses in postnatal care. *J Paediatr Child Health* 2000; **36**: 159-163.
- Lewis C W, Grossman D C, Domoto P K, Deyo R A. The role of the pediatrician in the oral health of children: a national survey. *Pediatrics* 2000; **106**: 84-91.
- Lewis C W, Cantrel R N, Domoto P K. Oral health in the pediatric practice setting: a survey of Washington state pediatricians. *J Public Health Dent* 2004; **64**: 111-114.
- Burke L E, Fair J. Promoting prevention: skill sets and attributes of health care providers who deliver behavioral interventions. *J Cardiovasc Nurs* 2003; **18**: 256-266.
- Waters E B, Harby M M, Wake M, Salmon L A. Public health and preventive health care in children: current practices of Victorian GPs and barriers to participation. *Med J Aust* 2000; **173**: 69-71.
- Australian Bureau of Statistics. Year Book Australia 2005. <http://www.abs.gov.au/ausstats/abs@.nsf/0/3e4f78113770cde8ca256f7200832f48?OpenDocument>
- Office of National Statistics. <http://www.statistics.gov.au>
- Tonts M. The restructuring of Australia's rural community. In Pritchard B, McManus P (ed) *Land of discontent: the dynamics of change in rural and regional Australia*. Kensington, N.S.W.: UNSW Press, 2000.
- Teusner D N, Spencer A J. *Dental labour force, Australia 2000*. Canberra: Australian Institute of Health and Welfare, 2003, AIHW cat. no. DEN 116 (Dental Statistics and Research Series No. 28).
- Szuster F S P, Spencer A J. *Dental practitioner statistics, Australia 1994*. Adelaide: The University of Adelaide, 1997 (AIHW Dental Statistics and Research Series No. 11).
- Morgan D L. *The focus group guidebook*. Thousand Oaks, CA: Sage, 1998.
- Kreuger R A. Quality control in focus group research. In Morgan D L (ed) *Successful focus groups: advancing the state of the art*. USA: Sage, 1993.
- Crabtree B F, Miller W L. Clinical research: a multimethod typology and qualitative roadmap. In Crabtree B F, Miller W L (ed), *Doing qualitative research*. 2nd ed. pp 3-33. CA, USA: Sage, 1999.
- Ethnograph Qualitative Data Analysis Software Version 5.0*. Qualis Research Associates, 1998.
- Sgan-Cohen H D, Mansbach I K, Haver D, Gofin R. Community-oriented oral health promotion for infants in Jerusalem: evaluation of a program trial. *J Public Health Dent* 2001; **61**: 107-113.
- Slayton R L, Warren J J, Levy S M, Kanellis M J, Islam M. Frequency of reported dental visits and professional fluoride applications in a cohort of children followed from birth to age 3 years. *Pediatr Dent* 2002; **24**: 64-68.
- Baughcum A E, Burklow K A, Deeks C M, Powers S W, Whitaker R C. Maternal feeding practices and childhood obesity. *Arch Pediatr Adolesc Med* 1998; **15**: 1010-1014.
- Jain A, Sherman S N, Chamberlain L A *et al*. Why don't low income mothers care about their preschoolers being overweight? *Pediatrics* 2001; **107**: 1139-1146.
- Valaitis R, Hesch R, Passarelli C, Sheehan D, Sinton J. A systematic review of the relationship between breastfeeding and early childhood caries. *Can J Public Health* 2000; **91**: 411-417.
- Pine C M, Adair P M, Burnside G *et al*. Barriers to the treatment of childhood caries perceived by dentists working in different countries. *Community Dent Health* 2004; **21** (Spec Iss): 112-120.
- Hashim-Nainar S M, Saffron L H. Targeting of the year one dental visit for United States children. *Int J Paediatr Dent* 2003; **13**: 258-263.
- Widmer R. The first dental visit: an Australian perspective. *Int J Paediatr Dent* 2003; **13**: 270.
- Rayner J A. The first dental visit: a UK viewpoint. *Int J Paediatr Dent* 2003; **13**: 269.
- Poulsen S. The child's first dental visit. *Int J Paediatr Dent* 2003; **13**: 264-265.
- Graham E, Negron R, Domoto P, Milgrom P. Children's oral health in the medical curriculum: a collaborative intervention at a university-affiliated hospital. *J Dent Educ* 2003; **67**: 338-347.