

The Dental Knowledge and Attitudes of Medical Practitioners and Caregivers of Pre-school Children in Macau

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Abstract

The dental knowledge and attitudes of medical practitioners and caregivers of pre-school children in Macau were investigated. The caregivers of 353 children (2.8 ± 0.6 years) from seven nursery centers completed a questionnaire and their children's had their teeth examined. Thirty medical practitioners completed the same questionnaire prior to a dental health seminar. The dental knowledge and attitudes of the medical practitioners were found to be better than those of the caregivers. Topics, such as, "acid can cause caries"; "fluoridated water can prevent caries" and "primary teeth play a role in the development of the permanent teeth" were significantly associated with caries in the caregivers' children ($p < 0.05$). It is hypothesised that the medical practitioners had not conveyed their dental knowledge to the caregivers early enough so as to prevent the occurrence of caries in their children.

Key words

Dental attitude; Dental knowledge; Early childhood caries; Medical practitioner; Macau SAR

Introduction

Macau, which like Hong Kong, is located on the southeastern coast of China had a population of 454,000 in the year 2001 of which 98% were Chinese while the remainder were mainly of Portuguese origin. Currently, 28,000 of the children are under five years of age.

Although the public water supply in Macau is not fluoridated, fluoride containing toothpastes are widely available.

Most children who are prone to caries are also *Streptococcus Mutans* positive, whereas some children who are mutans positive do not have dental caries;¹ suggesting that factors beyond the mere presence of bacteria cause dental caries.² Cultural norms; psychosocial status and

health behaviour² are believed to be important factors contributing to the caries risk of pre-school children.

Approximately 200 medical practitioners work in public medical service centres providing infant health care and vaccination programs. These family doctors are the first health care professionals to be consulted by parents about the health of their infants.

Inadequate guidance regarding weaning and fluoride supplementation by health professionals are other risk factors of early childhood caries (ECC).³ However, the dentist is not always in a favourable position to prevent ECC because of not having the opportunity to make contact with the child in early infancy.⁴ Therefore, this important role may be played by pediatricians who can refer children to a dentist, for oral health counselling, preferably soon after birth, but no later than 12 months of age.⁵

Sadly, among the 913 members of the American Academy of Pediatric Dentistry (AAPD) who were surveyed recently, only 46.6% practiced the AAPD policy of performing the first oral evaluation at 12 months or younger.⁶ This suggests that even some oral health professionals do not appreciate the real value of early dental evaluations. Nevertheless, medical practitioners should be expected to have a sound knowledge and positive attitude towards oral health in order to provide accurate information

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to infant caregivers, and to motivate these caregivers to have positive dental attitudes.

This study sought to investigate the dental knowledge and attitudes of the Macau medical practitioners and the caregivers of pre-school children, then to determine if there were any associations with dental caries in the children under their care.

Materials and Methods

Part I

From the 33 nursery centers operating throughout Macau, eight were identified as being representative because they were located in different regions of Macau; one nursery center declined to participate in the study. The staff of the remaining seven centers were given an explanation about how the survey would be conducted. They were asked to distribute consent forms and questionnaires to the caregivers of each child prior to the oral examination. The completed questionnaires were subsequently returned in sealed envelopes to ensure confidentiality.

The questionnaire consisted of five parts, covering aspects of personal background, feeding habits, nursing habits, and the oral hygiene habits of the children plus the dental knowledge and attitudes of the caregivers.

Children for whom informed consent had been obtained were examined in the nursery centers by one of four calibrated examiners using a torch and disposable mouth mirror. Cavitation of the teeth was considered to be indicative of dental caries.⁷

Only the data for children who were under four years old, had received an oral examination and for whom a questionnaire had been completed, were included in the final analysis. The association between dental caries and the factors being investigated were analysed using the Chi-square test, in the SPSS software package.

Part II

Prior to the presentation of a seminar entitled "Children's Dental Health", which was part of a continuing education program for government medical practitioners in Macau, 30 participants completed an anonymous questionnaire, which was designed to investigate dental knowledge and dental health attitudes. Each questionnaire was collected immediately after completion. The content of the questionnaire was subsequently discussed during the seminar.

Results

There was a total 353 children who were under 4 years old and so were eligible for inclusion in this study. There were 186 males and 167 females, with an age range from 0.5 to 4 years and a mean age of 2.8 ± 0.6 years. The caries prevalence of the children was 18.4% and none of the carious teeth had been restored.

All of the medical practitioners advocated breast-feeding, only 5 (16.7%) considered that breast-feeding should cease by 12 months' and 25 (83.3%) considered that a child should be breast-fed on demand. Sixty percent (18) of the medical practitioners disagreed with giving a nursing bottle prior to going to sleep, they also thought that bottle-feeding should be stopped by 12 months, while 43.7% (13) of the medical practitioners and 36.7% (11) of the caregivers considered that a child should be bottle-fed on demand. Two (6.7%) of the medical practitioners thought that sugar could be added to the formula milk.

Generally, the medical practitioners had a better knowledge about the causes of dental caries than the caregivers (Figure 1). Less than 40% (140) of the caregivers knew that plaque, bacteria and acid were the causes of dental caries. There was a statistically significant relationship ($p=0.032$) between knowing that "acid was a cause of caries" and the occurrence of dental caries in their children.

Sixty-seven percent (20) of the medical practitioners and 68% (238) of the caregivers considered that taking less sugar could prevent dental caries. Although 250 (70.8%) of the caregivers considered tooth brushing to be a method of preventing dental caries, only 79 (22.4%) knew that fluoridated toothpaste played a role in caries prevention. In addition, only 8.8% (31/353) of the caregivers knew that fluoridated water could prevent dental caries (Figure 2). There was a statistically significant relationship ($p=0.026$) between knowing that "fluoridated water was a preventive method" and the level of caries in the children.

Ten, that is 33.3% of the medical practitioners and 23.5% (83) of the caregivers considered aesthetics to be a function of the primary teeth; while 66.7% (20) of the medical practitioners and 53% (187) of the caregivers knew that primary teeth play a role in the development of the permanent dentition (Figure 3). There was a statistically significant association ($p=0.027$) between knowing the "development of permanent teeth" to be a function of primary teeth and caries in the children. Children whose caregivers did not know this function of the primary teeth were more prone to caries.

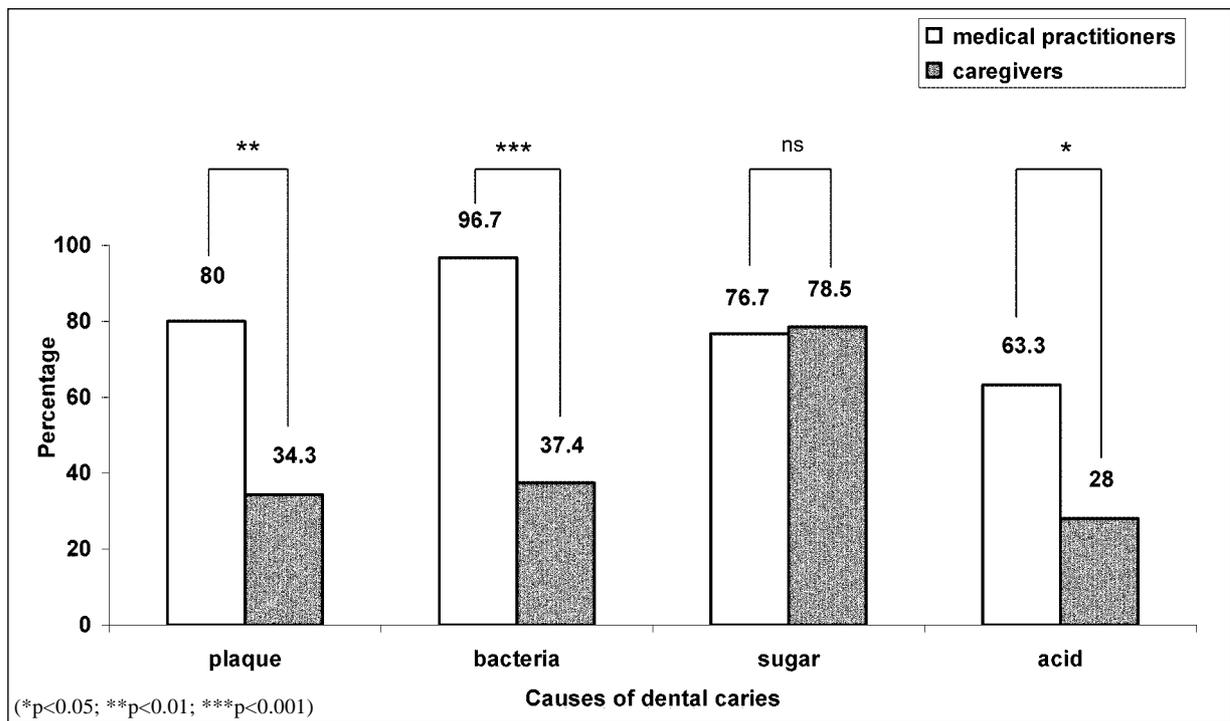


Figure 1 The percentage of 30 medical practitioners and 353 caregivers who gave positive responses to the questions about the aetiology of dental caries.

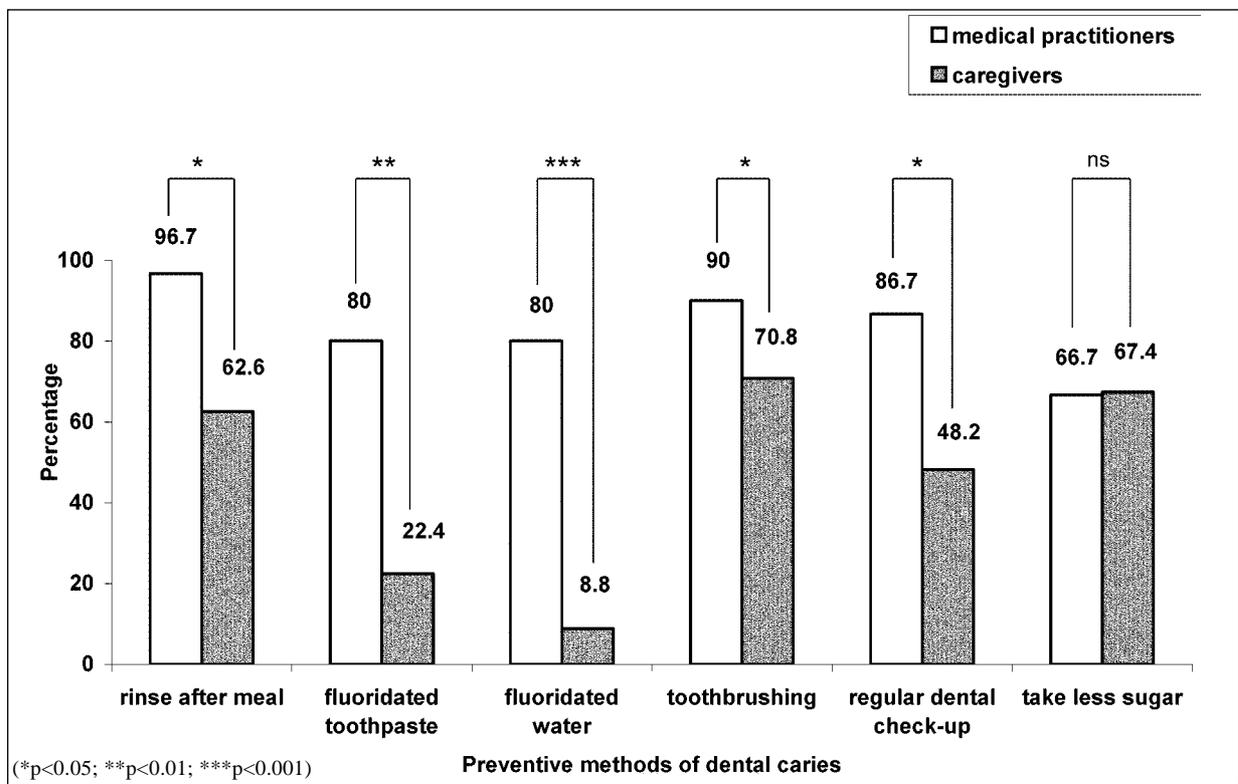


Figure 2 The percentage of 30 medical practitioners and 353 caregivers who gave positive responses to the questions on preventive methods for dental caries.

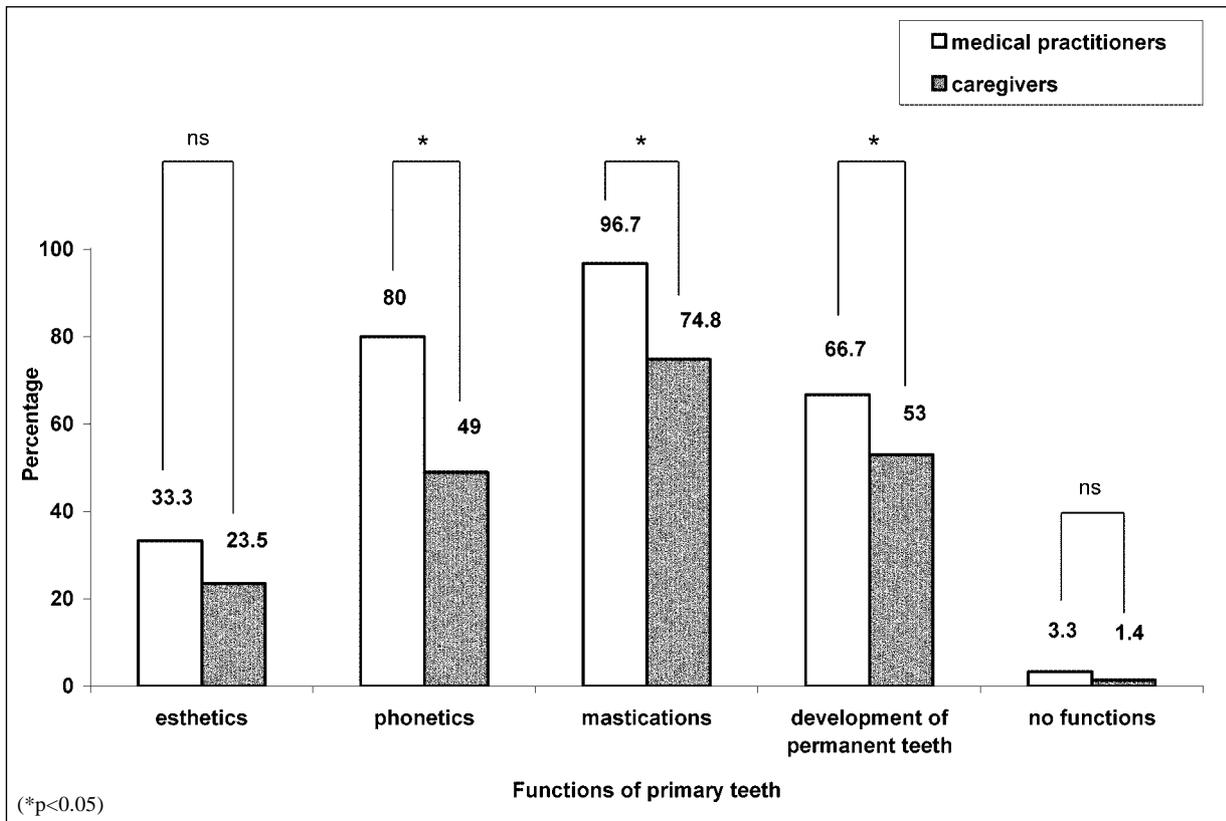


Figure 3 The percentage of 30 medical practitioners and 353 caregivers who gave positive responses to the questions about the functions of primary teeth.

The medical practitioners were more aware of caries preventive measures than the caregivers (Table 1). Amongst the caregivers' 42.8% (151) considered that carious primary teeth should be restored compared to 76.7% (23) of the medical practitioners. Although 86.7% (26) of the medical practitioners knew that regular dental check-ups could help

to prevent caries, compared to 48.2% (170) of the caregivers (Figure 2); only 26.7% (8) of the medical practitioners and 10.8% (38) of the caregivers had practiced this habit. Amongst the caregivers, 347 (98.3%) expressed a desire to learn more about oral hygiene for the benefit of their children.

Table 1 The percentage of medical practitioners and caregivers who gave positive responses to the questions on dental attitudes and habits

Dental attitudes and behaviour patterns	Medical practitioners		Caregivers		p-value
	N=30		N=353		
Primary teeth are important	29	96.7%	305	86.4%	NS
Decayed primary teeth should be restored	23	76.7%	151	42.8%	***
Infant's mouths should be cleansed from birth	20	66.7%	160	45.3%	**
Infant's first dental check-ups should be around one year old	21	70.0%	93	26.3%	***
I have regular dental check-ups	8	26.7%	38	10.8%	*
My oral hygiene knowledge is sufficient	7	23.3%	58	16.4%	NS
I want to have more oral hygiene knowledge for my children	-	-	347	98.3%	-

*p<0.05; **p< 0.01; ***p<0.001

The caregivers self-rated levels of the oral condition of their children, as shown in Figure 4, were strongly associated with the occurrence of dental caries in their children ($p=0.000$).

Discussion

When drawing conclusions from the presented data it should be remembered that while the nursery centers were not randomly selected, they were at least representative of the different regions of Macau so the data from the cohort can be expected to be representative for the general population. However, the cohort of medical practitioners would be expected to produce data that were biased positively towards oral health care because the doctors had voluntarily chosen to attend the seminar on "Children's Dental Health". As none of the carious teeth in the children had been restored; it can be assumed that there had been almost no contact between these children and the dentists in Macau. However, as all of the 30 medical practitioners were working in the government operated public medical

service centres they were frequently in contact with infants and their caregivers. Whilst it would have been desirable to have used a random sample it was not the intention in this study. Nevertheless, the information about the medical practitioner's dental knowledge, attitudes, and behavior can be adopted as an indicative reference for the future planning of caries preventive strategies in Macau and in other communities.

Generally, the medical practitioners had higher levels of dental knowledge and more positive attitudes than the caregivers. Since medical practitioners are usually the first health professionals to be consulted when a child has health problems, they can play an important guiding role in developing positive dental attitudes. However, the results of this study failed to show that the medical practitioners conveyed the correct dental knowledge and positive dental attitudes to caregivers.

Although the type of feeding; the period of feeding; and the taking of a nursing bottle at night do not have a direct relationship with ECC,⁸⁻¹⁰ it is widely accepted that inappropriate nursing habits such as feeding in bed, or the addition of sugar to milk should be avoided.¹¹⁻¹³ The medical

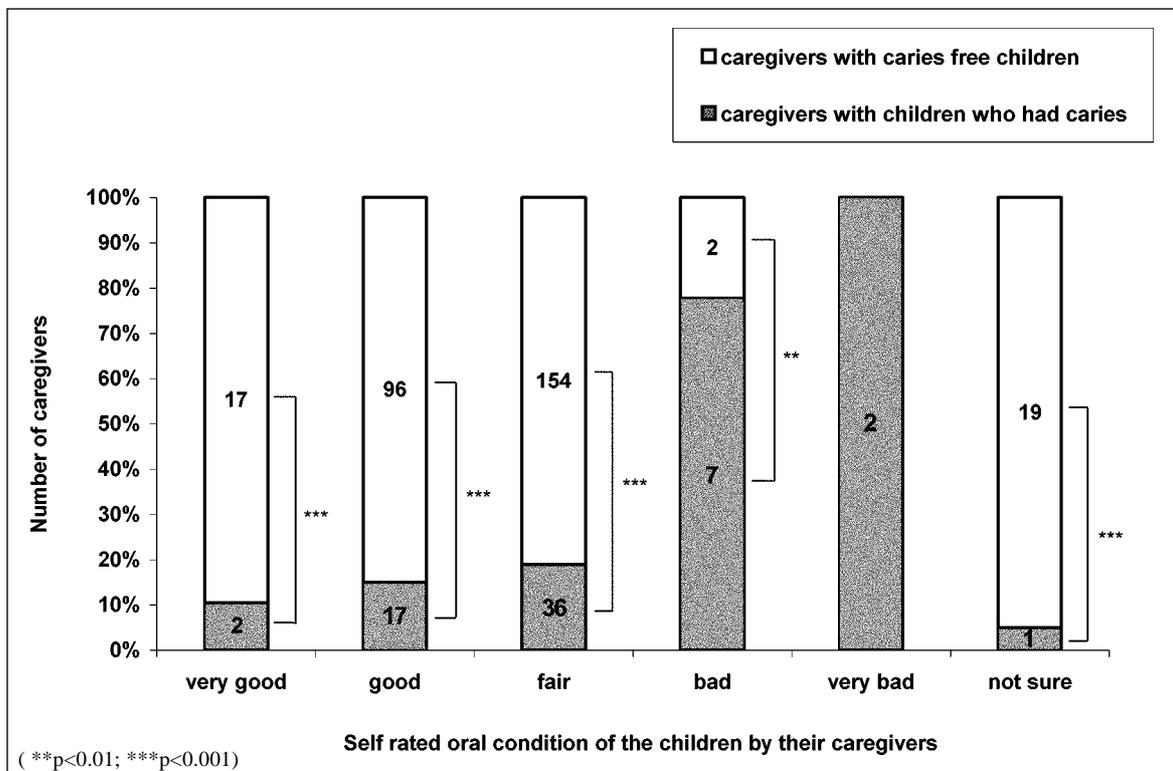


Figure 4 The relationship between self-rated oral condition of the children by their caregivers and the occurrence of caries in these children.

practitioners had different opinions on bottle-feeding habits possibly because of apparently contradictory findings about bottle-feeding, or as a consequence of a lack of awareness of the relationship between feeding with formula milk and dental caries. However, it is alarming that two medical practitioners approved of the addition of sugar to formula milk. Surprisingly, the number of the respondents who knew that "sugar can cause decay" and that "taking less sugar can prevent caries" were lower amongst the medical practitioners than the caregivers. The medical professionals need to be made better informed about dental caries and the value of developing new strategies for ECC prevention.¹⁴

The medical practitioners' knowledge and attitudes about breast-feeding were similar to the guidelines of the American Association of Pediatrics.¹⁵ According to which, breast-feeding should always be the first choice and that babies should be breast-fed on demand. In addition, there is no "right" weaning time and that the time of weaning will be different for each individual baby. However, it should be remembered that these guidelines were generated with an emphasis on the general rather than dental health of the child. Although the relationship between breast-feeding and ECC is unclear and there is no definitive age at which an infant should be weaned,¹⁶ parents should be simultaneously advised about the importance of the early implementation and consistent use of oral health care measures.¹⁷ Therefore, medical practitioners in Macau should be made aware of the potential risks of inappropriate breast-feeding practices on an infant's teeth.

It can be hypothesised that those caregivers who were more knowledgeable about the development of dental caries might also be more aware of the importance of oral health care and hence their children's oral condition;¹⁸ this is especially important for children in Macau because the public water supply is not fluoridated. Although most caregivers knew that sugar plays a part in the etiology of caries, they still allowed their children to eat snacks between meals and they gave sweets as a reward.¹⁹ Snacking may be such an integral part of a child's upbringing that caregivers may be reluctant to act on their knowledge and stop providing sugary snacks.

Sadly, not only were most of the caregivers unaware of the benefits of fluoridated water in caries prevention, but also of the benefits of fluoridated toothpaste. This was in spite of the caregivers saying that they considered tooth brushing to be a caries preventive measure. Therefore, the caregivers need to be educated about the importance of fluoridated toothpaste.

The numbers of medical practitioners and caregivers who

had regular dental check-ups were much less than those who indicated that they knew it was a caries preventive measure, indicating that both groups tended to go to dentists only when they have dental disease, rather than as a preventive measure which is consistent with the finding that regular dental check-ups are not the norm for southern Chinese.²⁰ Furthermore, the poor attitude towards preventive dental measures was reflected in the low level of the children's preventive care and that one third of the medical practitioners and half of the caregivers did not consider that infant oral hygiene practices and dental check-ups should start early in the child's life.

The findings that most of the caregivers that considered that their children's oral condition was good had caries free children and conversely, the caregivers who considered their children's oral condition to be poor had children with carious teeth, strongly suggests that the caregivers were aware of their own child's dental status; yet, none of the carious teeth had been restored. This was consistent with the data which showed that more than half of the caregivers, and a quarter of the medical practitioners, did not consider that carious primary teeth should be restored. This could be due to a lack of knowledge about the role primary teeth play in the development of the permanent dentition because both the medical practitioners and caregivers considered that caries in the primary teeth was only a transitory problem that has no adverse effects on the permanent teeth. This issue needs to be addressed, because this item of knowledge was significantly associated with the occurrence of caries. According to the Health Belief Model (HBM),²¹ for individuals to develop and perform preventive health habits, they must perceive the condition to be serious; that they are susceptible to the disease and that the available treatment therapies are effective in preventing and treating the disease. While the desire for better aesthetics can motivate people to seek preventive dental care;²² this would not apply to the caregivers in Macau because they were unconcerned about dental aesthetics in children.

As the medical practitioners did not consider caries in the primary teeth to be serious it is not surprising that they did not counsel the caregivers, or refer the children for restorative treatment. These findings also suggest that the lack of knowledge amongst members of the general public probably stems from the health professionals lack of knowledge and their appreciation of the value of early oral health evaluations. Thus, it is apparent that future research on a large sample and on different population cohorts, such as parents and school teachers, should be conducted to develop a better understanding of this issue.

As the majority of the caregivers showed a desire to increase their oral hygiene knowledge it is undesirable and unjustified for health professionals not to provide information about ECC. Although dental knowledge alone cannot directly lead to changes in behavior and the occurrence of dental caries, at least from the presented data, it is possible to demonstrate that certain pieces of dental knowledge do have significant associations with the occurrence of dental caries. However, having the knowledge does not guarantee that it will be effectively used; this requires effective campaigning within the community, which in Macau could be through the public medical service centers.

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