

Original Article

Improving maternal oral health knowledge and practices: an intervention from Sri Lanka

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ABSTRACT

Background: Oral health is one of the most common chronic diseases among school children in Sri Lanka. However, there is little or no priority given for oral health preventive strategies. The role of mother or the primary carer of children was identified as significant in oral health promotion. In this context it was vital to empower mothers or care givers of preschool children to improve oral health of children.

Objectives: To develop and implement an intervention to promote the oral health of preschool children. To assess the oral health knowledge and selected oral health care practices of mothers or care givers of preschool children before and after the intervention.

Methods: A community based quasi experimental study was conducted in the District of Colombo, Sri Lanka. An intervention in the form of a lecture discussion based on a booklet developed for this study was implemented. An interviewer administered questionnaire was used to assess oral health knowledge and practices before intervention and six months after the intervention.

Results: At pre intervention, both intervention and control groups were similar except for Oral health practices and house hold food practices. Oral health knowledge, Oral health practices, tooth brushing practices of preschool child and Household food practices were significantly higher in intervention group at post intervention ($p < 0.005$).

Conclusion: Mothers/care givers of preschool children were able to improve and maintain positive practical oral health care behaviours after an educational intervention. However, changes in food practices could not be achieved at the same level of significance.

Key words: Oral health promotion, Preventive dentistry, Maternal educational, intervention

INTRODUCTION

Oral health status

Oral health is an essential and integral component of general health and wellbeing of people. Although largely preventable, many people across the world are still suffering unnecessarily from pain and discomfort associated with oral diseases. According to WHO Bulletins, in most developed countries, the prevalence rates of dental caries and the mean dental caries experience of children have declined. In contrast to this, increasing levels of dental caries among children are observed in developing countries; especially in countries where, community based preventive programs are not established [1]. Sri Lanka is one of those countries where record based evidence from School Medical Inspections suggests that; dental caries is the most common

health problem among school children at present due to lack of preventive programs. According to the Sri Lankan National Oral Health Survey results in 2002/2003 the prevalence of dental caries of 6 year olds' deciduous teeth was 65.31% and the prevalence of active caries was, 63.51%. Only 1.8% of 5 year old children have been treated for carious teeth. The percentage of healthy periodontal tissue among 12 year old children was 23%. Nearly 13% of the children of this age had bleeding gums. Among 5 year old children 83% had never visited a dental facility. Only 7% had visited a School Dental Clinic [2]. Majority of the Sri Lankan population (more than 60%) within age groups of 6, 12, 15, 35-44 and 65-74 were unaware of their oral disease status. Among the 6 year olds 48% has never received any type of dental treatment [3].

Over the last few years, dental service is gradually becoming aware of the health promotion principles: a concept that emerged opposed to the traditional dominant curative and high tech model of health practices. Hence, health educational interventions were focused as a core component of health promotion strategies [4]. Primary Prevention of oral diseases should target populations as early as possible, or when they are at a very young age. There is substantial evidence to prove that, the earlier the intervention the more effective the prevention efforts. Many researches and theories are put forward in support of this strategy [5]. Many studies have been conducted where it has been shown that, when children are given stimulation at early years of their lives, they learn habits easily. These early learning opportunities were provided by parents or care givers (*care giver is defined as the person who cares for the child continuously in the absence of the mother*) or teachers.

Role of mothers/care givers in the early years of a child's life in promoting oral health

Oral health status of children is associated with the parents' dental and oral health related behaviours [6]. It has been found that, parents' knowledge and attitudes about the importance of oral health care and their behaviours towards dental treatment influence their children's dental care and oral health status [7]. It has been found that, if parents' knowledge and beliefs regarding aetiology of dental caries, oral hygiene practices and oral health care seeking behaviours were poor, oral health status of their children were equally poor [8]. Healthful habits like tooth brushing were easy to be inculcated in children when they are young [9]. Mothers' or the care givers' misconceptions, level of knowledge and attitudes towards oral health have been identified as risk factors for poor oral health of a child. It has been shown that, by counselling and educating mothers the prevalence of dental caries can be reduced significantly [10].

A community trial revealed that, when the parents of children from ages 8 months until 4 years were given inputs to upgrade the oral health status of their children the prevalence of early childhood caries and the general caries experience was low compared to a similar control group [11]. Preference to food items, behaviours and healthy habits are primarily influenced by parents or care givers. As children's food preference practices initiate early in life (2-5 years), early intervention programs are effective. When healthful habits and preferences are learned, they are carried into adulthood. Care givers were identified as influential bodies in children's early eating and healthy hygienic practices [12]. Parents of 2-6 year old children can

be effectively utilized to influence the children in a way conducive to good health [13].

Objectives

- To assess the existing oral health knowledge and selected oral health care practices of mothers or care givers of preschool children.
- To develop and implement an intervention to promote the oral health of preschool children.
- To assess oral health knowledge and selected oral health care practices of mothers or care givers of preschool children after the intervention

METHODS

Ethical clearance to conduct the study was obtained from the Ethics clearance board of the University of Colombo, Sri Lanka. The study was conducted as a community based Quasi Experimental study [14-16] to evaluate the effectiveness of a health education intervention in Padukka and Boralesgamuwa Medical Officer of Health (MOH) areas in the Western Province of Sri Lanka. The Intervention Group (IG) and Control group (CG) were selected by drawing lots. The first drawn one was selected as the Intervention area and the other as the Control area.

Study population

Mothers/care givers who were permanent residents of the selected MOH areas and whose children attended preschools in the same MOH area was considered as being eligible for the study. A sample of mothers/care givers of preschool children was selected from the study population. The sample size of mothers/care givers was the minimum size of sample to detect the effectiveness of the intervention with a predetermined level of precision and confidence.

Sampling method

Selection of the study units was done in the same manner for both the IG and CG. Participant recruitment was done at field level and investigators went from house to house in both areas until they recruited the required sample size of eligible mothers.

Study instruments

An interviewer administered closed ended questionnaire was used to gather information on maternal oral health knowledge and practices after obtaining written informed consent. The contents of the questionnaire included questions on basic demographic information, knowledge on deciduous dentition, oral health practices and dietary practices. A combined score was given for each category in the questionnaire.

The intervention

The Education Intervention was a lecture discussion based on a booklet. The booklet was developed for the purpose of the study with experts on health education, oral health promotion and adult education. It contained information on the importance of deciduous teeth, common childhood oral diseases, oral health friendly practices and oral health care services. The informal lecture was conducted by a team which included a dental public health specialist, a health education officer and a dental surgeon. This was followed by a discussion with the group of mothers. Participants were given information during the lecture and were allowed to ask questions and view their opinions on childhood oral diseases. A follow up program was done after three months from the first intervention. Six months after the intervention, data was collected to evaluate the effectiveness of the intervention.

RESULTS

Demographics

219 mothers from the intervention group and 211 from the control group in the study. Almost all the participants were mothers of the preschool children. Majority of mothers were between the age groups of 31-40 years in both groups with two children in a family. Almost 65% of mothers of preschool children in the IG and nearly 60% of mothers in the CG were educated, whereas the least number of mothers belonged to the category that has done higher studies in both groups. Only 5% of mothers/care givers in both IG and CG had university or other higher education qualifications.

Oral health knowledge and practices

The final marks for the questionnaire were calculated as a percentage for each participant. Kolmogorov-Smirnov Test Statistic for normality

was performed to assess the normality of data, and relevant statistical tests were performed accordingly.

Pre intervention stage

At pre intervention stage, there were no significant differences between both IG and CG in terms of oral health knowledge and tooth brushing practices. Oral health practices and house hold food practices were significantly different between the two groups ($p < 0.05$). (Table 1)

Post intervention stage

Six months post intervention, there was a significant difference between IG and CG in relation to oral health knowledge ($p < 0.005$), Oral health practices ($p < 0.005$), tooth brushing practices of preschool child ($p < 0.005$) and Household food practices ($p < 0.005$) (Table 2).

Comparison between pre and post intervention stages (Intervention group)

In the IG, there was a significant increase in the mean scores for oral health knowledge, oral health care practices, oral health care seeking practices, tooth brushing practices and household food practice ($p < 0.005$). Food practices of the preschool child however, have not improved and were not statistically significant (Table 3).

Comparison between pre and post intervention stages (Control group)

Oral health knowledge of the CG has significantly increased post intervention ($p < 0.005$). All the other variables of oral health knowledge and practices did not show a statistically significant difference although the mean scores have improved at post intervention except for food practices of the preschool child (Table 4).

Table 1: Oral health knowledge and oral health care practices of mothers/care givers at Pre Intervention stage

Variable	IG (N= 219)		CG (N= 211)		Significance
	Mean Median	SD	Mean Median	SD	
Oral health knowledge <i>KS-1.075/Sig0.198</i>	68.1	6.88	68.42	6.95	t = -0.485 p= 0.628
Oral health practices <i>KS-6.483/Sig<0.005</i>	28.65 30	6.59	26.66 30	7.93	z = -2.698 p = 0.007
Oral health care seeking practices <i>Ks-4.277/Sig<0.005</i>	12.16 12	4.34	13.10 15	4.06	z = -1.819 p = 0.069
Tooth brushing practices of preschool child <i>KS-5.766/Sig<0.005</i>	16.64 15	3.64	16.47 15	3.41	z = -0.807 p = 0.420
Household food practices <i>KS-7.144/ Sig<0.005</i>	13.43 14	0.918	13.21 14	1.021	z = -2.607 p = 0.009
Food practices of the preschool child <i>KS-1.809/Sig0.003</i>	89.04 90	14.118	89.83 90	16.771	z = -0.438 p = 0.661

KS-Kolmogorov-Smirnov Test Statistic for normality, t= independent sample t test has been performed, z-Mann-Whitney test has been performed

Table 2: Oral health knowledge and oral health care practices of mothers/care givers at Post Intervention stage

Variable	IG N= 219		CG N=211		Significance
	Mean Median	SD	Mean Median	SD	
Oral health knowledge	85.94	4.99	75.52	8.48	t=15.574 p <0.005
Oral health practices <i>KS-5.685/Sig<0.005</i>	33.68 35	4.84	27.01 30	7.09	z = -11.103 p <0.005
Oral health care seeking practices <i>KS-6.024/Sig<0.005</i>	14.79 15	1.66	13.48 15	3.73	z = -1.599 p = 0.110
Tooth brushing practices of preschool child <i>KS-9.339/Sig<0.005</i>	19.95 20	0.47	16.87 15	3.37	z = -11.943 p <0.005
Household food practices <i>KS-8.774/Sig<0.005</i>	13.78 14	0.50	13.31 14	1.14	z = -4.567 p <0.005
Food practices of the preschool child <i>KS-2.858/Sig<0.005</i>	86.99 85	8.33	87.56 90	14.5	z = -0.830 p = 0.407

KS-Kolmogorov-Smirnov Test Statistic for normality, t= independent sample t test has been performed, z-Mann-Whitney test has been performed

Table 3: Oral health knowledge and practices of mothers/care givers of IG at Pre Intervention and Post Intervention stages

Variable	Pre	Intervention N=219	Post	Intervention N=219	Significance
	Mean Median	SD	Mean Median	SD	
Oral health knowledge	68.10	6.884	85.95	4.99	t=-31.379 p<0.005
Oral health practices	28.65 30	6.594	33.68 35	4.844	z =-8.374 p<0.005
Oral health care seeking practices	12.16 12	4.359	14.79 15	1.661	z =-7.201 p<0.005
Tooth brushing practices of preschool child	16.64 15	3.684	19.95 20	0.477	z =-9.476 p<0.005
Household food practices	13.43 14	0.918	13.78 14	0.507	z =-4.351 p<0.005
Food practices of the preschool child	89.04 90	14.118	86.99 85	8.339	z =-1.886 p=0.06

t= paired sample t test has been performed z=Wilcoxon Signed Ranks Test has been performed

DISCUSSION

The knowledge and practices of mothers/care givers of preschool children were assessed using an interviewer administered questionnaire, which is considered as suitable for data collection in a heterogeneous group like mothers/care givers of preschool children with different socio-demographic characteristics, ensuring the accuracy and reliability of the responses received. Majority of participants were educated past secondary school and were Sinhalese hence the questionnaire and the intervention was administered in Sinhala language. The composite score given to assess the oral health knowledge included knowledge on the importance

of deciduous teeth, commonest oral health problems among preschool children, causes for the most common oral diseases and identification of those oral diseases.

Oral health knowledge of mothers

At pre intervention stage, the two groups were similar in relation to oral health knowledge as there was no significant difference. Following the intervention, oral health of the IG has improved and mothers of the CG also showed improved oral health knowledge. Nevertheless, the difference between the groups was statistically significant at post intervention stage. When the two groups were separately analyzed for comparison at pre

intervention and post intervention stages, the improved knowledge in both groups were found to be statistically significant. It was explained in literature that the observed pre-post bias may affect the outcome of an Educational research [17]. Therefore, the scores at the post intervention assessment could be better than those at the pre intervention assessment even in the CG. Pre-post bias could be due to the possibility that, the feeling of “not knowing” could have motivated them to seek new knowledge. The maturation effect is another important factor, which help the trainees to perform

better during the post intervention assessment, because, the post intervention assessment was held after 6 months [18]. Media, such as newspapers, especially women’s weeklies, newsletters, radio and television could have led to increased opportunities for the CG to absorb knowledge related to oral health as “Health” is considered a marketable subject which captures the general public’s interest. This may have created this difference of marks of the pre intervention and post intervention in the CG.

Table 4: Oral health knowledge scores and oral health practice scores of mothers/care givers of CG at Pre Intervention and Post Intervention stages

Variable	Pre	Intervention N=211	Post	Intervention N=211	Significance
	Mean Median	SD	Mean Median	SD	
Oral health knowledge	68.42	6.953	75.52	8.489	t=-9.489 p<0.005
Oral health practices	26.66 30	8.934	27.01 30	7.904	z=-0.537 p=0.592
Oral health care seeking practices	13.10 15	4.056	13.48 15	3.736	z=-0.866 p=0.387
Tooth brushing practices of preschool child	16.47 15	3.412	16.87 15	3.370	z=-1.171 p=0.241
Household food practices	13.21 14	1.021	13.31 14	10148	z=-1.115 p=0.265
Food practices of the preschool child	89.83 90	16.771	87.56 90	14.576	z=-1.819 p=0.069

Oral health practices of mothers

Oral health practices of mothers have a direct influence on the preschool child’s oral health status [19]. In the present study, oral health practices of mothers/care givers and household food practices showed a difference between IG and CG at pre intervention stage, which was statistically significant. Both groups were similar with regard to other parameters of oral health practices. Mothers/care givers in the IG showed an improvement in their oral health practices at post intervention stage. The significant difference between the groups can be attributed to the intervention received by mothers/care givers in the IG which positively affected their attitudes towards oral health practices post intervention.

Tooth brushing practices of preschool children and household food practices showed a significant improvement ($p < 0.005$) in the IG, compared to CG at the post intervention stage. Careful cleaning, and not just frequent brushing, is relevant for oral health. Our study demonstrated that, mothers/care givers who were more knowledgeable about their children’s oral hygiene needs, felt more efficacious

and brushed their own teeth and had their children’s teeth brushed well [20]. Oral health seeking practices of the IG has improved after the intervention; however, the difference when compared with pre intervention was statistically not significant. This can be partially explained by the difficulty in obtaining regular access to oral health facilities in rural Sri Lankan regions as well as lack of reliable preventive resources such as topical fluoride application as an example.

It was surprising to note that, the food practices of the preschool child has not been improved in the IG compared to the CG, even after mothers/care givers of have been exposed to the intervention. Food practices of the preschool child have a significant effect on the oral health status of the child [21]. However, non-significant findings in improvement in food practices of the preschool children as a whole, merit further investigation. There could be many important factors that could have contributed to such a finding. Nutrition interventions in Sri Lanka have traditionally vested in Health Sector with many constraints to achieve success [22], yet improvements in existing nutritional status of

preschool children has not become amenable to health interventions per se. Food practices of preschool children strongly influence their nutritional status. In other words, malnutrition status of preschool children could be considered as a proxy indicator for their food practices. Such a scenario has been vividly described by the UNICEF country representative as "For a country that suffers no significant food shortage and provides extensive free maternal and child health services, it is paradoxical that malnutrition affects such a large proportion of population, including preschool children" [23]. Importantly, food practices of the preschool children are determined by an array of socio-cultural factors, status of household food security, and food choices of children, their parents and care givers as well as the comparatively high cost of food items in Sri Lanka, which could not be merely addressed by an intervention of this nature.

CONCLUSION

Mothers/care givers of preschool children were able to improve and maintain positive practical oral health care behaviours after an educational intervention. On the contrary, changes in food practices could not be achieved at the same level of intervention. Therefore, it can be stated that, it is easy to make improvements in the preventive care practices like tooth brushing and seeking of oral health care services at the correct time as was evident from the findings. Further investigations were deemed necessary to gain a better understanding and a deeper insight towards the necessary steps needed to be taken to positively influence food practices.

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