HEALTHY SMILE HAPPY CHILD: EVALUATION OF A CAPACITY-BUILDING EARLY CHILDHOOD ORAL HEALTH PROMOTION INITIATIVE

Robert J Schroth[1,2], Jeanette M Edwards[3,4], Michael EK Moffatt[1-3], Bernadette Mellon[4], Marion Ellis[5], Lavonne Harms[1], Members of the Manitoba Collaborative Project for the Prevention of Early Childhood Tooth Decay

[1]*University of Manitoba, Canada,* [2]*Manitoba Institute of Child Health, Canada,* [3]*Winnipeg Regional Health Authority, Canada,* [4]*Manitoba Health, Canada,* [5]*Burntwood Regional Health Authority, Canada*

ABSTRACT

Objectives: The burden of early childhood caries (ECC) in Manitoba led to the development of the Healthy Smile Happy Child (HSHC) partnership. This project used a community development approach to foster community solutions to ECC prevention. Emphasis was placed on building capacity within existing communities and local services to ensure oral health promotion was sustained. The objective is to report on evaluation aspects of the HSHC project.

Study design and methods: HSHC undertook evaluation projects on prevalence of and risk factors for ECC, assessing the effectiveness of community training workshops, as well as qualitative research with service providers, community members and different cultural groups.

Results: The prevalence of ECC was initially established in four communities. Knowledge of prevalence and risk factors was then shared with these communities. Results following years of community engagement reveal significant improvement in preschool oral health knowledge and behaviours, and a decline in dental caries rates. Workshop evaluations show improved knowledge of oral health and ECC prevention. Focus groups revealed positive experiences with HSHC and barriers to preventing ECC. Focus groups with cultural groups identified beliefs and practices pertaining to preschool oral health and ECC, which can be used to help tailor oral health education and promotion for these communities. These groups also demonstrated good understanding of oral health and provided examples for further community engagement.

Conclusions: Based on principles such as partnering with local stakeholders and health care professionals to empower communities to create sustainability, HSHC used mixed methods to evaluate this initiative.

Keywords: early childhood caries (ECC), health promotion, community development, oral health, child, preschool, dental caries, health education, dental, public health dentistry

INTRODUCTION

Oral health is essential to childhood health. Early childhood caries (ECC) or tooth decay in infants and preschoolers remains prevalent among many populations and has a complex etiology. While caries rates for school-aged children have declined, rates during early childhood have increased (1). Pediatric dental surgery under general anesthesia is the most common surgical day-procedure in hospital (2,3). Studies reveal that ECC may affect more than half of children in some communities (4–6).

Traditional oral health promotion has had little long-term success in reducing caries rates and improving oral health behaviours (7,8). Health promotion critically hinges on interdisciplinary (and intersectoral) partnerships (9); it must engage community members, service providers and organizations to build essential capacity (10,11).

Since 2001, a partnership has worked to prevent ECC using a community development approach. ECC is influenced by many determinants of health. Upstream approaches are essential to improve early childhood oral health. The purpose of this paper is to describe evaluation activities of this project and how they have guided oral health promotion efforts.

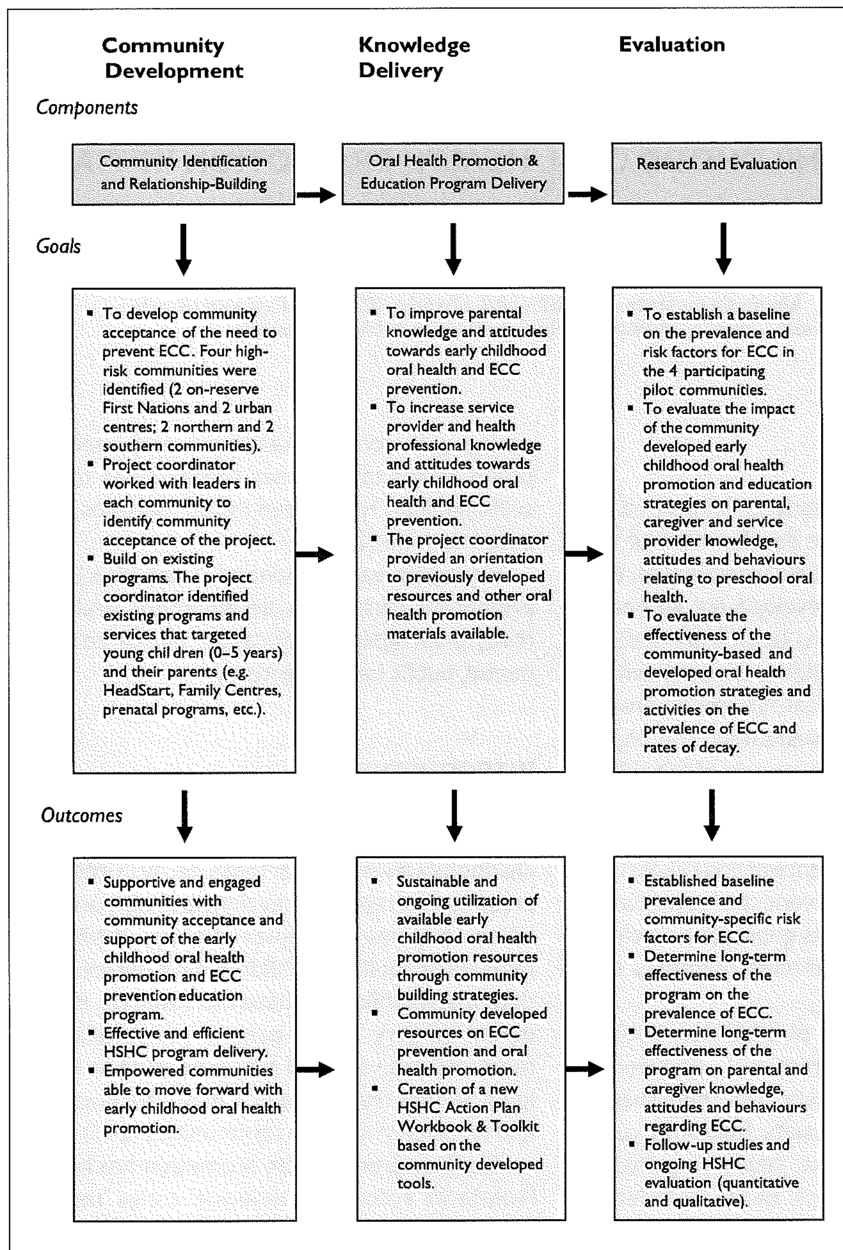

Figure 1. Initial logic model adopted by the HSHC project.

METHODS

The Manitoba Collaborative Project for the Prevention of Early Childhood Tooth Decay, commonly known as Healthy Smile Happy Child (HSHC), was formed in 1999 and adopted a population health and community-development approach to ECC prevention (2,6).

The methods used by HSHC similar to the PRECEDE-PROCEED model, were to engage the community as a key participant in prevention (12). HSHC wanted communities to understand the importance of early childhood oral health, proceed to obtain skills and capacity needed to act and ultimately develop ECC prevention strategies (13–16). Community development enhances

bonds between people and groups, leading to enhanced capacity to work towards common goals (17). HSHC began with a modified social, epidemiological and educational assessment of ECC, implemented a pilot program in partnership with four communities and included an evaluation component. A logic model guided the process and defined each of the components, objectives and anticipated outcomes (Fig. 1).

The project organizers developed contacts with community members and identified natural community leaders and service providers who were able to assist with strategies to reduce the incidence and severity of ECC. The three guiding principles were community identification and relationship-building, oral health promotion and education and research and evaluation.

Evaluation activities were approved by the university's Health Research Ethics Board. A chronology of HSHC research endeavours appears in Table I. HSHC initiated several projects in order to evaluate its effectiveness in oral health promotion and ECC prevention and to assist with ongoing and future tailoring of health promotion activities.

- Baseline Study of ECC Prevalence and Risk Factors
  A survey in pilot communities was needed to establish prevalence and risk factors for ECC and a baseline to help evaluate community-developed prevention initiatives. Children under 71 months of age underwent a dental examination while parents and caregivers completed a questionnaire. Findings have been published (6,18). Results were shared with each community to assist with their community-development strategies.

- Follow-up Epidemiological Study
  Five years after communities implemented their health promotion campaigns another cross-sectional study on ECC was conducted, using the same methods to measure changes in knowledge and awareness of ECC and any impact on childhood oral health.

- Evaluation of the Impact of Capacity-Building Workshops
  A convenience sample of service providers and community members attending HSHC workshops on ECC prevention completed a questionnaire before the workshop and again one month later.

- Qualitative Focus Group Evaluation with Service Providers and Community Members Familiar with HSHC
  Focus groups held with service providers and community members assessed knowledge and awareness of oral health and evaluated the impact of HSHC. Three sessions involved parents and caregivers of young children who attended regular community programs familiar with HSHC, while the other three involved service providers who previously attended a HSHC workshop and received resources.

- Qualitative Focus Group Evaluation of Cultural Perspectives on ECC
  Focus groups with parents and caregivers from four cultural groups were conducted to learn how each defined preschool oral health and viewed ECC. The intent was to use the findings to help tailor future oral health promotion with urban Aboriginal, Hutterite, immigrant and refugee populations.

RESULTS

- Baseline study
  Four hundred and eight children participated in the study, 53.7% of this total having ECC. Sharing findings (knowledge transfer) with communities proved to be a useful tool. It led to further engagement with community members and providers in identifying strategies to address the prevention of ECC. HSHC provided support in the form of a project coordinator who assisted communities in taking "ownership" of the issue and the development of innovative strategies.
  Capacity-building and educational activities were undertaken with existing programs and services reaching infant, preschool and prenatal populations, including pre- and postnatal programs, Aboriginal HeadStart, parenting programs and day cares. Capacity-building methods included informational meetings, presentations on the causes and

Table I. HSHC project chronology with emphasis on research and evaluation activities.

Year	Activity
1999	The Manitoba Collaborative Project for the Prevention of Early Childhood Tooth Decay partnership begins. It included representatives from different Manitoba Regional Health Authorities, the University of Manitoba, Manitoba Health, Health Canada and the Manitoba Dental Association.
2000	The project members developed a logic model for community-development activities. HSHC identified four pilot communities for the trial project and engaged their community leadership. Pilot communities included one northern FN, one southern FN, one northern urban centre and one southern urban centre (6).
2000–2001	HSHC conducted an epidemiological baseline study of prevalence and risk factors for ECC in each of the four pilot communities (6,18).
2001–2002	The results of the epidemiological baseline study were shared with participating communities (knowledge transfer). Community-specific profile reports were developed for each community on ECC prevalence and risk factors.
2001–2005	Capacity-building and early childhood oral health promotion activities occurred in each community. The project provided assistance to communities for developing educational resources and teaching tools (e.g., fact sheets, the Action Plan Workbook & Toolkit, games, anticipatory guidance bags, Think About Your Baby's Teeth poster, games, etc.). Resources were posted online for communities to download at: http://www.wrha.mb.ca/healthinfo/preventill/oral_child.php
2005–2006	An epidemiological follow-up study evaluating the effectiveness of the project in the four pilot communities was undertaken.
2006	The HSHC project is expanded beyond the four pilot communities to the entire province of Manitoba. A staff of five community facilitators and a project coordinator promoted the project in the different regions of the province.
2006–Present	Community facilitators and project coordinators worked to engage communities throughout Manitoba, conducted capacity-building workshops, built relationships with community members and service providers and shared teaching resources.
2007	The impact of the capacity-building workshops on improving early childhood oral health knowledge is evaluated in some communities.
2007–2008	Qualitative evaluation is done of the Healthy Smile Happy Child project with service providers and community members in targeted Manitoba communities.
2008	Qualitative study of cultural beliefs of early childhood oral health and ECC with urban Aboriginal, Hutterite, immigrant and refugee groups.

consequences of ECC and hands-on demonstrations on how to use resources developed by communities. The goal was to encourage community-developed promotional activities that could be sustained and integrated into existing services. Age-specific teaching tools were developed by the various communities (Table 1).

- Follow-up epidemiological study

Results following years of community engagement in the pilot communities revealed an improvement in oral health knowledge, attitudes and parenting behaviours. Parents were significantly more likely to report that baby teeth were important, children should see the dentist by their first birthday and bottle feeding after one year of age is harmful to teeth. While there was no change in prevalence, a significant reduction in the number of primary teeth with untreated caries was found (2.1±3.4 [standard deviation baseline] vs. 1.6±2.7 [follow-up], p=.017).

- Evaluation of the impact of capacity-building workshops
  Initially, many participants had limited understanding of early childhood oral health and ECC prevention. Uncertainty about first dental visits, caries risk assessment and early identification of ECC existed. Post-workshop evaluations indicated significant improvement in knowledge. More were aware of the importance of dental visits by 12 months of age, caries risk assessment, oral hygiene and supervised brushing. Capacity-building workshops increased oral health knowledge and self-reported behaviours, supporting the idea that non-dental HSHC staff can effectively provide oral health education.

- Qualitative focus group evaluation with service providers and community members familiar with HSHC
  Parents and caregivers stressed the importance of good nutrition and oral hygiene for oral health, but acknowledged that these choices can be difficult to implement at home. They indicated that hands-on activities and visual teaching methods are effective in providing information and that personal interaction was important to promote preschool oral health.
  Service providers focused on oral health practices like early initiation of oral hygiene routines and ensuring that nutritious choices are available for children. They commented that families have difficulty accessing dental care because of cost and the limited availability of dentists who will see young children. HSHC workshops increased their knowledge and awareness and they liked project resources. They were motivated to incorporate early childhood oral health information into their health promotion activities. Some felt more emphasis should be placed on practical suggestions on how to use HSHC resources and identifying key oral health messages for parents.
- Qualitative focus group evaluation of cultural perspectives on ECC
  Urban Aboriginal and Hutterite parents mentioned the link between healthy teeth and childhood well-being. Immigrant and refugee parents discussed the relationship between healthy baby and adult teeth. All agreed that oral hygiene and nutrition were important. The biggest challenge parents faced was getting their child to cooperate with oral hygiene. There was little mention of the cost of dental care or access issues. Aboriginal and Hutterite participants reported high rates of dental surgery whereas immigrant and refugee participants mentioned few significant oral health problems. All participants mentioned the importance of peer networks, interaction and personal relationships when promoting oral health in their communities. They suggested that activities could "piggy-back" on existing programs in the community. These results will assist in tailoring future oral health promotion activities for different cultural communities.

DISCUSSION

Oral health education must move beyond traditional health education approaches and address health determinants from a community perspective (19). HSHC worked to build capacity with community members and existing community services. The focus has been on strengthening communities rather than developing new services (20).

The success of oral health promotion is often measured by direct or short-term indicators, but others have proposed more realistic indicators of success (10,21). Process outcomes such as partnerships, developing community capacity, policy change, development of promotional tools, funding and engagement of service providers are important.

Recent partnerships have been formed to prevent ECC and promote childhood oral health (22–24). While some have formed alliances and consulted with communities (22,25,26), the HSHC partnership went further, including the community as a key participant. Partnerships must continually strive towards empowering the community to assume its role in promoting healthy living, including oral health (7).

There is no "magic bullet" to prevent ECC. Approaches must incorporate evidence-based strategies, policy development, community action, system and organizational change and education (7,27). These actions should foster sustainability (7).

Other researchers are using epidemiological evidence to plan community-development approaches to improve oral health (28). Several have implemented innovative programs to combat ECC (29–32). Some have embedded oral health promotion into existing services for expectant women and young children (29). Others have undertaken community participatory approaches, used community-based education, health fairs and even the media to spark community awareness and interest in oral health (30,32). Some population health campaigns have shown improved community awareness and knowledge of preschool oral health and have reported improved dental status (32). However, single strategies that focus solely on hygiene behaviours are insufficient to reduce the caries burden (33).

For oral health promotion to be successful on a large scale, it must be realized that a "one-size-fits-all" approach cannot suit all communities. Balance between providing timely dental treatment for those with ECC and evidence-based oral health promotion at the community level is needed.

Acknowledgements
Grant funding was obtained from Manitoba Health, the Winnipeg Foundation, the Manitoba Institute of Child Health, the Children's Hospital Foundation of Manitoba Inc., Healthy Child Manitoba, the Foundation of the Pierre Fauchard Academy, First Nations and Inuit Health Branch – Health Canada, the Burntwood Regional Health Authority, the Winnipeg Regional Health Authority, the Manitoba Dental Association and the University of Manitoba. The authors would like to thank the steering committee for their continued support and commitment to the partnership. Thank you to Eleonore Kliewer for her assistance with manuscript preparation.

REFERENCES

1. Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G et al. Trends in oral health status: United States, 1988–1994 and 1999–2004. Vital Health Stat 11 2007;(248):1–92.
2. Schroth RJ, Morey B. Providing timely dental treatment for young children under general anesthesia in a government priority. J Can Dent Assoc 2007; 73(3):241–243.
3. Canadian Paediatric Decision Support Network. Annual report April 2003–March 2004. Ottawa, ON: Canadian Paediatric Decision Support Network, Canadian Association of Paediatric Health Centres; 2004.
4. Schroth RJ, Smith PJ, Whalen JC, Lekic C, Moffatt ME. Prevalence of caries among preschool-aged children in a northern Manitoba community. J Can Dent Assoc 2005; 71(1):27.
5. Schroth RJ, Moffatt ME. Determinants of early childhood caries (ECC) in a rural Manitoba community: a pilot study. Pediatr Dent 2005; 27(2):114–120.
6. Schroth RJ, Moore P, Brothwell DJ. Prevalence of early childhood caries in 4 Manitoba communities. J Can Dent Assoc 2005; 71(8):567.
4. Watt RG. Strategies and approaches in oral disease prevention and health promotion. Bull World Health Organ 2005; 83(9):711–718.
8. Kay EJ, Locker D. Is dental health education effective? A systematic review of current evidence. Community Dent Oral Epidemiol 1996; 24(4):231–235.
9. Egger G, Spark R, Donovan R. Health Promotion Strategies and Methods. Second Edition. Sydney: McGraw-Hill Australia; 2005.
10. Watt R, Fuller S. Practical aspects of oral health promotion. In: Pine C, Harris R, eds. Community oral health. Second Edition. London: Quintessence Publishing; 2007. pp. 357–375.
11. Kreindler SA. Lifting the burden of chronic disease: What has worked? What hasn't? What's next? Healthc Q 2009; 12(2):30–40.
12. McKenzie J, Neiger B, Smeltzer J. Planning, implementing & evaluating health promotion programs: a primer. Fourth Edition. San Francisco: Pearson Benjamin Cummings; 2005.
13. Young TK. Population health: concepts and methods. New York: Oxford University Press; 1998.
14. Shah CP. Public Health and preventive medicine in Canada. Toronto: University of Toronto Press; 1998.
15. Hoffman K, Dupont J. Community health centres and community development. Ottawa: Health and Welfare Canada; 1992.
16. World Health Organization. Twenty steps for developing a healthy cities project. Third Edition. Copenhagen: World Health Organization; 1997.
17. Winnipeg Regional Health Authority. Community development and public participation framework. Winnipeg, MB: Winnipeg Regional Health Authority; 2007 [cited 2009 May 27]. Available from: www.wrha.mb.ca/community/commdev/files/CommDev_Framework_07.pdf

18. Schroth RJ, Brothwell DJ, Moffatt ME. Caregiver knowledge and attitudes of preschool oral health and early childhood caries (ECC). Int J Circumpolar Health 2007; 66(2):153–167.
19. Watt RG, Harnett R, Daly B, Fuller SS, Kay E, Morgan A et al. Evaluating oral health promotion: need for quality outcome measures. Community Dent Oral Epidemiol 2006; 34(1):11–17.
20. Crall JJ. Development and integration of oral health services for preschool-age children. Pediatr Dent 2005; 27(4):323–330.
21. Harrison R. Oral health promotion for high-risk children: case studies from British Columbia. J Can Dent Assoc 2003; 69(5):292–296.
22. Phelan C. The Blue Book oral health program: a collaborative partnership with statewide implications. Health Promot J Austr 2006; 17(2):109–113.
23. Jones CM, Tinanoff N, Edelstein BL, Schneider DA, DeBerry-Sumner B, Kanda MB et al. Creating partnerships for improving oral health of low-income children. J Public Health Dent 2000; 60(3):193–196.
24. Adenubi JO, Okoisor FE. Dental problems in 215 Nigerian children seen at the Lagos University Teaching Hospital. J Int Assoc Dent Child 1976; 7(1):3–9.
25. Harrison R, MacNab A, Duffy D, Benton D. Brighter smiles. Service learning, inter-professional collaboration and health promotion in a First Nations community. Can J Public Health 2006; 97(3):237–240.
26. Harrison R, Wong T, Ewan C, Contreras B, Phung Y. Feeding practices and dental caries in an urban Canadian population of Vietnamese preschool children. ASDC J Dent Child 1997; 64(2):112–117.
27. Watt RG. From victim blaming to upstream action: tackling the social determinants of oral health inequalities. Community Dent Oral Epidemiol 2007; 35(1):1–11.
28. Vachirarojpisan T, Shinada K, Kawaguchi Y, Laungwechakan P, Somkote T, Detsomboonrat P. Early childhood caries in children aged 6–19 months. Community Dent Oral Epidemiol 2004; 32(2):133–142.
29. Larson AK. The early childhood caries prevention program in Palau. Pac Health Dialog 2003; 10(1):106–110.
30. Watson MR, Horowitz AM, Garcia I, Canto MT. A community participatory oral health promotion program in an inner-city Latino community. J Public Health Dent 2001; 61(1):34–41.
31. Bruerd B, Kinney MB, Bothwell E. Preventing baby bottle tooth decay in American Indian and Alaska Native communities: a model for planning. Public Health Rep 1989; 104(6):631–640.
32. Bruerd B, Jones C. Preventing baby bottle tooth decay: eight-year results. Public Health Rep 1996; 111(1):63–65.
33. Livny A, Sgan-Cohen HD. A review of a community program aimed at preventing early childhood caries among Jerusalem infants – a brief communication. J Public Health Dent 2007; 67(2):78–82.

Dr. Robert J. Schroth
Assistant Professor
Faculty of Dentistry & Department of Pediatrics & Child Health
Faculty of Medicine, University of Manitoba
507 – 715 McDermot Avenue
Winnipeg, MB R3E 3P4
CANADA
Email: umschrot@cc.umanitoba.ca