

# Impact of the promotora model on the improvement of oral health knowledge of caregivers

## Impacto del modelo promotora en el mejoramiento del conocimiento sobre salud oral de los cuidadores

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### ABSTRACT

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**Objective** The objective of this quasi-experimental study was to determine the impact of the Promotora Model (PM) as an educational strategy to increase oral health knowledge in parents/caregivers of children aged 2–5 years at high risk for dental caries.

**Materials and Methods** Sixty-three caregivers who provided informed consent were included in the study. A structured 37-item survey was administered prior to conducting the Promotora educational intervention (PEI) that covered oral health topics and behaviors. Three (3) months after the PEI session, during their child's next dental visit, the same instrument was administered to 46 of the parents/caregivers that had completed the first instrument.

**Results** Most caregivers were Hispanic (73.9%) and 50% reported completing high school. Before PEI, 56.5% of participants scored as having "good" general knowledge. Three months after PEI, 82.6% achieved that score (paired sample T-test,  $p < 0.00001$ ).

**Conclusion** Based on the results, it was concluded that the PM significantly increased caregivers' oral health knowledge.

**Key Words:** Health educator; oral health; knowledge (*source: MeSH, NLM*).

### RESUMEN

**Objetivo** El propósito de este estudio cuasi-experimental fue determinar el impacto del Modelo Promotora (MP) como estrategia educativa para mejorar el conocimiento sobre salud oral de los padres y/o cuidadores de niños con edades comprendidas entre 2-5 años con alto riesgo de sufrir caries dental.

**Métodos** Sesenta y tres padres y/o cuidadores quienes dieron el consentimiento fueron incluidos en el estudio. Se administró un cuestionario estructurado de 37 preguntas antes de la intervención educativa (IE) con el Modelo Promotora (IEP) el cual cubría tópicos sobre salud oral y conductas. Tres (3) meses después de la sesión de IEP, en la próxima visita dental del niño, el mismo cuestionario fue administrado a 46 padres y/o cuidadores que habían completado el primer cuestionario.

**Resultados** La mayoría de los padres y/o cuidadores eran Hispánicos (73,9%) y 50% reportó tener bachillerato completo. Antes del IEP, 56,5% de los participantes presentó un nivel general de conocimiento "Bueno." Tres meses después de la aplicación del IEP, 82,6% obtuvieron el mismo nivel de conocimiento (T-test,  $p < 0.00001$ ).

**Conclusión** Se concluye que el MP mejora considerablemente el conocimiento sobre salud bucal de los padres y/o cuidadores.

**Palabras Clave:** Educadores en salud; salud bucal; conocimiento (*fuentes: DeCS, BIREME*).

Dental caries is the most prevalent chronic disease among children aged 2–5 years in the United States (23%) (1). Despite major efforts to improve oral health for the population as a whole, the prevalence of dental caries remains higher among children living in poverty than in more affluent children, and is also higher among Hispanics and non-Hispanic blacks than among non-Hispanic whites (1). Children from some racial/ethnic minority groups and large families, and whose caregivers have low levels of educational attainment, are at increased risk for suboptimal dental care (2,3). Hispanic populations frequently face significant barriers to oral health care due to language, poverty, level of education and acculturation (2-4).

In fact, oral health literacy among caregivers is one of the most consistent predictors of oral health disparities in children (5-8). In this context, healthcare providers need support staff that help improve caregivers' oral health knowledge, particularly among populations with low levels of education (9,10). Consequently, educational interventions based on the cultural and linguistic characteristics of the population are important considerations for improving knowledge and skills (11).

With the increasing size of the Hispanic/Latino population in the United States, there is a need to expand the availability of more comprehensive and culturally appropriate approaches for increasing oral health knowledge and skills (12). Ideally, that education should include information on caries initiation, as well as training on effective oral hygiene techniques, including behaviors and caries prevention, which could help caregivers to improve their children's oral health (8).

Promotora de salud (Health Promoter) is the term used to refer to a female community health worker (CHW) working closely with Spanish-speaking population (13). The Promotora Model (PM) has been considered an educational approach to improve the health of Hispanic/Latino communities, increase appropriate use of health care services, and modify health behaviors (14,15).

Through the incorporation of cultural values and customs, the use of PM has demonstrated a reduction of health disparities and improved health outcomes, especially chronic diseases (14,15-18). This model has proven to be effective for fostering behavioral changes related to chronic disease prevention and management, and for improving oral health, especially in Latin America and the United States (18-22).

The PM was instituted (23) in the University of Florida (UF)/Naples Children and Education Foundation (NCEF) Pediatric Dental Center in order to increase the knowledge of parents/guardians, as well as their tools for im-

proving their children's oral health. This pediatric dental care facility is staffed by UF College of Dentistry faculty members: 23 staff members and 10 residents in Pediatric Dentistry. Since opening in 2007, more than 4 200 children have received dental treatment under general anesthesia, intravenous sedation, or oral sedation. The large majority of the patients were Hispanic, many of whom spoke only Spanish, and about 90% of them were insured by Medicaid. The purpose of this study was to determine the impact of the PM as an educational strategy to increase oral health knowledge in caregivers of children aged 2–5 years at high risk for dental caries.

## MATERIALS AND METHODS

The research protocol of this study was reviewed and approved by the University of Florida Institutional Review Board (IRB) as exempted research, protocol number: 2015-U-0888. The study was conducted at the UF/NCEF Pediatric Dental Center in Naples, Florida. A quasi-experimental study design was used with parents/caregivers of children aged 5 years or younger and on the waitlist for dental care under general anesthesia or sedation. A convenience sample of parents/caregivers (n=63) who agreed to participate and provided their documented informed consent was considered for the study.

A structured questionnaire in English and Spanish, consisting of 37 questions, was developed. It was comprised of two parts: Part I included socio-demographic characteristics (e.g., age, level of education, country of origin and number of children), and Part II included 18 items regarding parents/caregivers' knowledge on oral hygiene techniques, fluoride use, diet, and caries etiology. The possible scores on the knowledge assessment ranged from 0 to 18. The participants' level of knowledge was classified as "Good" (14–18), "Fair" (9–13), or "Poor" (0–8).

The survey was administered to parents/caregivers in the education room in which the activities were conducted by the Promotora, immediately before the PEI and three months later, when children returned for their recall appointment. After the parents/caregivers finished answering the questionnaire, the Promotora conducted a 30-minute educational activity, in which she shared strategies following the risk assessment guidelines and protocols from the American Academy of Pediatric Dentistry (24). The session included information on caries initiation, transmission, fluoride benefits, early childhood tooth decay, and oral hygiene techniques.

Then, the Promotora answered all questions raised by the parents/caregivers. After their dental recall appointment at 3 months, parents/caregivers were administered

the post-intervention questionnaire. Only 46 parents/caregivers completed the two phases.

The data were analyzed by using IBM SPSS Statistics V21.0 software package. Descriptive statistics (frequencies, percentage distribution) were generated, and chi-square test was conducted to assess whether the distribution of categorical outcome variables differed based on the socio-demographic characteristics of the participants. A paired-sample t-test was used to compare pre-intervention and post-intervention scores, under the null hypothesis that the mean difference in those scores was zero.

## RESULTS

There were 63 participants in this study at baseline. Three months after the PEI, 46 participants (73.0%) completed the follow-up questionnaire. All but one were mothers or female caregivers of pediatric dental patients. The large majority (73.9%) of study participants were Hispanic and 41.3% had less than a high school education (Table 1). The mean age of their children was 3.6 years.

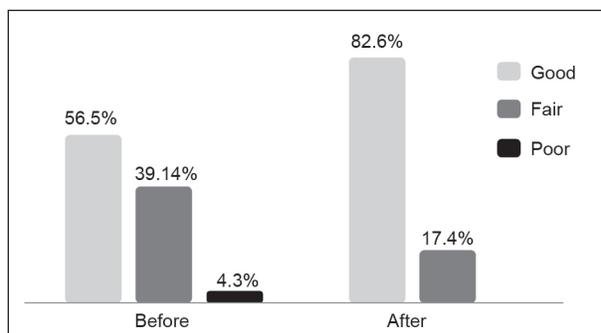
**Table 1.** Socio-demographic characteristics of study participants

Characteristic	Number	%
<b>Ethnicity</b>		
Hispanic	34	73.9
Non-Hispanic	12	26.1
<b>Level of education</b>		
Never attended school or less than high school	19	41.3
High school	23	50.0
More than high school	4	8.7
<b>Child's age (y) [mean (SD) = 3.6 ± 1.1]</b>		
0–2	12	26.1
3–4	25	54.3
5	9	19.6
<b>Total</b>	<b>46</b>	<b>100.0</b>

The questionnaire asked caregivers whether they agreed or disagreed with specific statements on oral health knowledge, and they had the option to answer that they did not

know. Before the PEI, 56.5% had “Good” knowledge on oral health, and after the PEI, 82.6% had “Good” knowledge on oral health (Figure 1).

**Figure 1.** Oral health knowledge of the participants before and after Promotora Model Intervention (n=46)



Higher levels of oral health knowledge were found among participants with at least high school education than among those with less than high school education, both at baseline and three months post-PEI (Table 2), but oral health knowledge increased for both educational groups. Shows the mean knowledge scores before and after the PEI. Knowledge increased significantly for all domains except knowledge on healthy diet (Table 3).

All parents/caregivers agreed with the statement that it is important to brush their child’s teeth daily, even before the PEI (Table 4). Agreement with the statement that drinking fluoridated water is a safe and effective way to prevent cavities doubled between pre-intervention (45.7%) and post-intervention (91.3%). Regarding knowledge about bacterial transmission, 73.9% of participants were aware before PE intervention and 93.5% afterwards. Finally, in the pre-PEI survey, 67.4% of participants agreed with the statement: “By the age of 1, children should not be drinking from a baby bottle.” Agreement increased to 76.1% after the educational intervention.

**Table 2.** Oral health knowledge of the participants before and after the Promotora Educational Intervention by level of education

Level of education	Knowledge before promotora educational intervention							
	Good		Fair		Poor		Total	
	Number	%	Number	%	Number	%	Number	%
High school or above	20	74.1	7	25.9	0	0.0	27	100.0
Less than high school or never attended school	6	31.6	11	57.9	2	10.5	19	100.0
<b>Total</b>	<b>26</b>	<b>56.5</b>	<b>18</b>	<b>39.1</b>	<b>2</b>	<b>4.3</b>	<b>46</b>	<b>100.0</b>
$\chi^2=9.318$ (p=0.009)								
Level of education	Knowledge after promotora educational intervention							
	Good		Fair		Poor		Total	
	Number	%	Number	%	Number	%	Number	%
High school or above	25	92.6	2	7.4	0	0.0	27	100.0
Less than high school or never attended school	13	68.4	6	31.6	0	0.0	19	100.0
<b>Total</b>	<b>38</b>	<b>82.6</b>	<b>8</b>	<b>17.4</b>	<b>0</b>	<b>0.0</b>	<b>46</b>	<b>100.0</b>
$\chi^2=4.535$ (p=0.042)								

**Table 3.** Mean and standard deviation of knowledge before and after Promotora Model Intervention

Knowledge	Mean	Standard deviation	p-value*
<b>Knowledge of general oral health</b>			
Before intervention	13.2	2.55	<0.0001
3 months after intervention	14.9	2.22	
<b>Knowledge of bacterial transmission</b>			
Before intervention	1.43	0.77	0.001
3 months after intervention	1.89	0.31	
<b>Knowledge about healthy diet</b>			
Before intervention	1.65	0.56	0.519
3 months after intervention	1.58	0.61	
<b>Knowledge about fluoride benefits</b>			
Before intervention	2.71	0.95	0.001
3 months after intervention	3.26	0.49	

\*Paired t-test

**Table 4.** Participants' responses to selected questions before and after PE intervention (n=46)

Question	Before		After	
	Number	%	Number	%
<b>It is important to my brush child's teeth every day:</b>				
Agree	46	100.0	46	100.0
Disagree/do not know	0	0.0	0	0.0
<b>Drinking water that contains fluoride is a safe and effective way to prevent my child from getting cavities:</b>				
Agree	21	45.7	42	91.3
Disagree/do not know	25	54.3	4	8.7
<b>When I blow on my child's food to make sure it is not too hot, or taste my child's food to make sure it is fine, it is possible for germs in my mouth to get onto my child's food:</b>				
Agree	34	73.9	43	93.5
Disagree/do not know	12	26.1	3	6.5
<b>By the age of 1, children should not be drinking from a baby bottle:</b>				
Agree	31	67.4		
Disagree/do not know	15	32.6		

## DISCUSSION

The study found that parents/caregivers had relatively low levels of knowledge on oral health when first surveyed, but knowledge increased considerably after a Promotora-led educational intervention. Findings are comparable to other studies that also found relatively low levels of oral health knowledge among mothers of low socioeconomic status (25). Consistent with that observation, the study found a negative association between parents/caregivers' education level and their oral health knowledge. These results suggest that the educational level of the parents is related to their oral health knowledge. Also, evidence indicates that a higher level of education of the parents/caregivers, as well as race, age, number of children and literacy (4), may be associated with the oral health status of the child. Using the Promotora Model may help deliver effective information to parents/caregivers of young children (8, 15-19, 21). The adaptation of this model holds great promise in increasing oral health-related knowledge and skills of underserved communities, which could lead to improve children's oral health status.

Regarding knowledge of bacterial transmission of cariogenic bacteria, this study found a statistically significant increase after the PEI. These findings are consistent with other studies in which knowledge of bacterial transmission risk factors, such as blowing on the child's food or sharing food or utensils, are considered acceptable behaviors (5,6,27,28). Educating parents on bacterial transmission may help reduce dental caries among children younger than 5 years of age.

Additionally, no change was found in knowledge of parents/caregivers regarding healthy diet before and after PEI. These results are disappointing because other studies found that parents' lack of knowledge on diet negatively affect their children's oral health (3).

The issue of parents not agreeing with professional guidelines that "children should be weaned from using baby bottles by age 1" has been reported previously (8,26,29). An increase in agreement with that statement after the PEI was found, but a relatively large proportion of parents still disagreed with this recommendation or remained unsure about it.

This study had some limitations that may have affected the results. Some baseline participants were not available

to complete the post-intervention questionnaire due to migration and seasonal moves, which reduced the sample size. The study findings may have been biased due to the number of patients lost to follow-up. Levels of familiarity completing a questionnaire and varying levels of language ability may have influenced responses, although an investigator fluent in both English and Spanish was always available during the completion of the questionnaire.

In conclusion, the results of this study show statistically significant increases in parents/caregivers' knowledge of oral health practices, bacterial transmission, and fluoride use following their participation in a Promotora-led educational intervention, across levels of educational attainment. It can be highlighted that the PM instituted in the University of Florida (UF)/Naples Children and Education Foundation (NCEF) Pediatric Dental Center, using a bilingual Promotora with experience in public health, was an appropriate educational approach that can be used at clinical/or community sites in order to increase parents/guardians' knowledge regarding their children's oral health. This study demonstrated that the Promotora model, developed for educational purposes, has given the parents that visit the UF/NCEF Pediatric Dental Center the necessary tools to understand the importance of their children's oral health. Also, the PM can be implemented in any region with a high prevalence of dental caries.

However, parents/caregivers' level of education (29-31) continued to show a significant correlation with oral health knowledge after the intervention. Further research is needed to determine behavioral and disease outcomes following the Promotora intervention ♣

**Conflict of Interest:** None.

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