

## FLUORIDATED COMMUNITY WATER KNOWLEDGE AND OPINION AMONG HISPANIC PARENTS IN SOUTHWEST FLORIDA

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### ABSTRACT

Fluoridated drinking water is a safe and effective method for preventing dental caries in children and adults. The purpose of this cross-sectional study was to determine the knowledge and opinion of Hispanic parents in Collier County, Southwest Florida regarding fluoridated community water. The study sample included 190 Hispanic parents whose children were treated at an academic pediatric dental clinic. A structured survey instrument containing 32 items was completed by the parents. The mean ( $\pm$ SD) age of the parents and children was  $33.64 \pm 7.19$  and  $6.33 \pm 2.88$  years, respectively, and the majority of participants were females ( $n=158$ ; 83%). Thirty percent (30%) of the participants attended high school. Among the children of participants, 84.2% had experienced caries in the primary dentition and 33.7% in permanent dentition. Approximately 64% of the parents did not know whether the tap water at home contained fluoride. With respect to the type of water consumed in the household, 84.2% did not drink tap water at home and 93.2% drank bottled water. The majority of the participants agreed that fluoride "should be added to the drinking water." Only 5.3% of the participants believed there were health hazards associated with fluoride in drinking water, although 67.4% reported they did not know. A majority of parents did not know the purpose of water fluoridation; this may adversely affect their children's caries experience. The results show that more dental public health education is needed within the Hispanic community in Southwest Florida regarding the fluoridation of community water and its benefits.

**Key words:** Knowledge, Hispanic, water fluoridation, dental caries.

## CONOCIMIENTO Y OPINION SOBRE AGUA FLUORURADA DE LOS PADRES HISPANOS AL SUR OESTE DE FLORIDA

### RESUMEN

El agua fluorurada para consumo humano es un método seguro y efectivo para prevenir la caries dental en niños y adultos. El propósito de este estudio transversal fue determinar el conocimiento y opinión de los padres Hispánicos en el municipio Collier, al Sur Oeste de Florida, con

relación al consumo de agua fluorurada. La muestra incluyó 190 padres Hispánicos cuyos hijos fueron atendidos en un centro de estudio de odontología pediátrica. Una encuesta estructurada con 32 ítems fue respondida por los padres. La edad promedio ( $\pm$ DE) de los padres y de los niños fue de  $33,64 \pm 7,19$  y  $6,33 \pm 2,88$  años, respectivamente, la mayoría de los participantes eran mujeres ( $n=158;83\%$ ). Treinta por ciento (30%) culminó bachillerato. Entre los niños de los participantes, 84,2% habían experimentado caries en la dentición primaria y 33,7% en la dentición permanente. Aproximadamente 64% de los padres no sabían si el agua de grifo del hogar contenía flúor. Con relación al tipo de agua que se consume en el hogar, 84,2% no tomaba agua de grifo y 93,2% tomaba agua embotellada. La mayoría de los participantes, están de acuerdo con que el flúor “debería ser agregado al agua para consumo humano.” Solo 5,3% de los participantes cree que existen peligros para la salud asociados al flúor en el agua de consumo, aunque 67,4% de ellos no sabían. La mayoría de los padres no sabía el propósito de fluorurar el agua; esto podría impactar negativamente en la experiencia de caries de sus niños. Estos resultados muestran que existe necesidad de mayor educación en la comunidad Hispánica en el Sur Oeste de Florida con relación a la fluoración del agua de consumo y sus beneficios.

**Palabras clave:** Conocimiento, hispanos, agua fluorurada, caries dental

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## Introduction

Community water fluoridation (CWF) is a safe and effective approach for preventing dental caries, reducing its incidence by approximately 25% in both children and adults (1). First introduced in 1945, CWF remains an effective public health measure even with the availability of other sources of fluoride (2), and CWF currently reaches 67.1% of U.S. residents (3,4). In the State of Florida, 78.0% of the population receives fluoridated drinking water.

The estimated 2014 population of Collier County was 348,777, of which about 5% was children less than 5 years old and 26% was Hispanic (5). Collier County, located in southwest Florida, has fluoridated community water reaching 78.5% of its population (6).

In the last 30 years, the oral health of the United States has improved, but substantial disparities remain. Approximately 46% of Hispanic children aged 2–8 years have experienced dental caries in the primary dentition and 27% in the permanent dentition, both of which are

significantly more prevalent than among non-Hispanic children of the same age (7). In addition, the Hispanic population is among the fastest growing segment in the United States, suggesting that the extent of the disparity may be increasing (8).

Recent conversations with parents of the children who visit our clinic suggest that Hispanic families do not drink fluoridated community water, which led us to question the reasons for that behavior. The purpose of the investigation was to determine the knowledge and opinions of Hispanic parents in Collier County regarding drinking community fluoridated water.

## Materials and methods

A cross-sectional study design was used to determine the knowledge and opinions of Hispanic parents regarding community water fluoridation and the dental caries status of their children. The study protocol was approved by

the University of Florida Health Science Center Institutional Review Board.

We developed a 32-item structured self-completed survey instrument to assess parents' knowledge and beliefs on a variety of oral health topics, including fluoridation of drinking water. The instrument included items that have been used in prior studies as well as newly created questions. English and Spanish versions of the survey instrument were created, both of which were pretested.

We sought to recruit parents of all children who attended a dental clinic for an initial patient visit or six-month recall between November 2014 and February 2015. The study was described to parents and they were asked to provide written informed consent for participation. Any questions participants had about the questionnaire were addressed by the investigators. Those parents who did not know how to read nor write were interviewed by one of the bilingual investigators.

The *dft index (decay and filled teeth)* in the primary dentition and *DFT index (Decay and Filled Teeth)* in the permanent dentition were determined by one of the previously calibrated investigators, using a dental chair with artificial light, explorer, and mirror.

Data analysis was conducted by using IBM SPSS version 21 statistical software package (IBM Corp, Armonk, NY). We conducted descriptive and bivariate analyses, and used the chi-square test to test the bivariate association between categorical variables.

## Results

### *Characteristics of the participants*

During the study period, 190 Hispanic parents whose children visited the dental clinic for the first time or six-month recall provided consent and completed the questionnaire (Table 1). The mean ( $\pm$  SD) age of the parents was  $33.6 \pm 7.2$  years and  $6.3 \pm 2.9$  years for the children. The majority of the parents (83.2%)

**Table 1.** Selected characteristics of the study participants (n=190).

Characteristic	Number	Percent
Parent's sex		
Female	158	83.2
Male	32	16.8
Parent's age (y)		
19–27	33	17.4
28–36	100	52.6
37–45	46	24.2
$\geq 46$	11	5.8
Age of the child		
$\leq 5$	86	45.3
6–10	87	45.8
$\geq 11$	17	8.9
Level of education of the parent		
Less than high school	98	51.6
High School	57	30.0
More than high school	35	18.4
Caries experience primary dentition		
Yes	160	84.2
No	30	15.8
	Mean dft= 5.33 $\pm$ 4.37	
Caries experience permanent dentition		
Yes	64	33.7
No	126	66.3
	Mean DFT=0.86 $\pm$ 1.49	

were female. Of the 190 participants, 51.6% had less than a high school diploma or GED. The large majority (84.2%) of their children had experienced dental caries in their primary dentition and 33.7% experienced caries in their permanent dentition.

Knowledge and opinion regarding community fluoridated water

Most of the parents (64.2%) knew that the “public water system supplies their home water” and most (63.7%) did not know if their home’s

tap water contains fluoride (Table 2). When asked about the purpose of adding fluoride to drinking water, 32.1% responded “to prevent tooth decay”, 14.2% answered “to clean the water” and 49.5% reported they did not know.

When asked whether fluoride should be added to public drinking water, 52.1% of the participants answered in the affirmative. In response to the question on whether there are health hazards associated with fluoride in the public drinking water, 5.5% answered “yes” and

**Table 2.** Parents'knowledge and beliefs regarding fluoridated community water (n= 190).

Question	Number	Percent
Home gets water supply from public water system?		
Yes	122	64.2
No	46	24.2
Do not know	22	11.6
Tap water at home contains fluoride?		
Yes	29	15.3
No	40	21.1
Do not know	121	63.7
Should fluoride be added to the public drinking water?		
Yes	99	52.1
No	12	6.3
Do not know	79	41.6
Purpose of adding fluoride to drinking water		
To build strong bones	6	3.2
To keep pipes from rusting	2	1.1
To prevent tooth decay	61	32.1
To clean the water	27	14.2
Do not know	94	49.5
Any health hazards associated with fluoride in public drinking water?		
Yes	10	5.3
No	52	27.4
Do not know	128	67.4

67.4% reported they did not know. Knowledge and opinions of community water fluoridation did not differ significantly by parents’ age, sex, or level of education ( $p > .05$ ).

Drinking water preference in the household.

The large majority of the participants (84.2%) did not drink tap water at home, and 93.2% drank exclusively bottle water (93.2%) (Table 3).

**Table 3.** Type of water consumed in the household (n=190).

Type of water	Number	Percent
<b>Tap water</b>		
Yes	30	15.8
No	160	84.2
<b>Bottled water</b>		
Yes	177	93.2
No	13	6.8

## Discussion

Drinking fluoridated community water prevents dental caries in children and adults (1). Community water fluoridation has been characterized as “the most cost-effective method of delivering fluoride to all members of the community, regardless of age, educational attainment, or income level” (5).

This study showed that bottled water was the drinking water of choice in the household of Hispanic parents visiting our clinic. Similar results have been reported from other studies (9–11), and the most frequent reason for this behavior was reported to be perceived toxicity of tap water.

Considering that a large proportion of parents reported not drinking tap water in the household, it may be reducing their exposure to fluoride and its caries prevention benefits for themselves and their children (11–13). Participants' inadequate fluoride exposure from drinking water may be partly responsible for

the high prevalence of dental caries in this Hispanic community.

In this study, almost 50% of the participants did not know the purpose of fluoride in drinking water, despite the considerable proportion of parents who knew of fluoride's beneficial effects in preventing dental caries; this percentage is higher than was found in a study conducted in a Latino community in California's Central Valley (13). We also found that Hispanic parents preferred bottle water over tap water and they generally lacked knowledge about the fluoride content of their tap water. Because community water fluoridation has been identified as the most cost-effective method of delivering fluoride to all members of the community, an educational campaign about fluoridated drinking tap water is needed in order to increase awareness of the benefits of fluoridated drinking water in the Hispanic community of Southwest Florida.

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