

Child and adolescent perceptions of oral health over the life course

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Abstract

Purpose To elicit perceptions of oral health in children and adolescents as an initial step in the development of oral health item banks for the Patient-Reported Oral Health Outcomes Measurement Information System project.

Methods We conducted focus groups with ethnically, socioeconomically, and geographically diverse youth (8–12, 13–17 years) to identify perceptions of oral health status. We performed content analysis, including a thematic and narrative analysis, to identify important themes.

Results We identified three unique themes that the youth associated with their oral health status: (1) understanding the value of maintaining good oral health over the life course, with respect to longevity and quality of life in the adult years; (2) positive association between maintaining good oral health and interpersonal relationships at school, and dating, for older youth; and (3) knowledge of the benefits of orthodontic treatment to appearance and

positive self-image, while holding a strong view as to the discomfort associated with braces.

Conclusions The results provide valuable information about core domains for the oral health item banks to be developed and generated content for new items to be developed and evaluated with cognitive interviews and in a field test.

Keywords Oral health · Children · Focus groups · Patient-reported outcomes · Pediatric

Introduction

Oral health is an important component of daily functioning and well-being [1]. Healthy People 2020 [2] notes the importance of prevention and control of oral and cranio-facial diseases, conditions, and injuries and of enhancing

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access to preventive services and dental care. The 2000 *Surgeon General's Report on Oral Health in America* [1, 3] noted that dental caries is the most prevalent and costly health disease among young children; consequently, caries-related healthcare needs among children and adolescents [4] constitute a major issue in the USA. Patient-Reported Outcomes (PROs) provide a basis for assessing oral health and evaluating the impact of dental care over time in a manner that focuses on what is important to the patient. The Patient-Reported Outcomes Measurement Information System (PROMIS[®]) was initiated in 2004 to develop reliable and valid patient-reported items for persons with a wide range of chronic diseases and demographic characteristics to evaluate medical interventions [5]. PROMIS provides item banks that facilitate efficient, flexible, and precise measurement of self-reported health [6]. However, PROMIS item banks are not targeted at oral health and, in particular, not at children's oral health. This study uses mixed methods, both qualitative and quantitative, to develop oral health item banks to effectively measure oral health outcomes among children and adolescents.

Oral health and the life course

Child and adolescent characteristics, such as biology, lifestyle, and environment, are important determinants of health, including oral health [7, 8]. In addition, health is influenced by multilevel influences, such as culture and the social environment. It is also important to consider the seminal research carried out in the field of life-course development [9–12], which indicate that the genetic/biological, behavioral, social, and economic factors that change as a person develops through childhood, adolescence, young adulthood, and later adult life. The maturing person and the social environment change significantly in any particular life period, and there are developmental tasks that challenge the individual at each stage. Changes occurring within the family and school environments influence the developing person and impose “developmental expectations” [13]. These influences shape children's life chances, namely “a child's future ability as an adult to participate fully in the social, economic, and political life of society” [14]. Children and adolescents convey their own ideas about their life situations, and their coping strategies, through narratives embedded within an “ecology of human development,” or the developmental environment; that is, the natural settings where they are interacting with familiar adults over time [15].

Middle childhood (ages 8–12 years) is a life stage characterized by learning cognitive skills, gaining competence in interpersonal and social relationships, and acquiring habits of mind essential for more focused learning and work tasks. It is also a time when children, while still

influenced by their family, experience a strong peer orientation and spend considerable energy cultivating and maintaining friendships. Hence, the main developmental task of middle childhood is one of the integration of inner life within a complex social world in order to build a foundation to meet upcoming adolescent challenges. Adolescents, by contrast, are faced with two main developmental tasks: to integrate and adapt to the physiological changes within themselves and to prepare themselves for the tangible adult tasks ahead of them. In the current study, we explore the beliefs and attitudes of children and adolescents toward oral health.

Focus groups with children and adolescents

The focus group is as an approach for identifying underlying attitudes, feelings, beliefs, and behaviors within a group of similar individuals. Focus groups typically consist of individuals with a common interest in the topic of focus, in this case child and adolescent participants discussing oral health and the life course. Children 8 years and older have been shown to accurately self-report their health issues [16] and respond appropriately to questions regarding their functioning and well-being [17]. Moreover, the 8- to 12-year-old cohort is more appropriate for PRO development when using written items in the final survey [18]. Focus groups have been used to obtain more in-depth data to improve the health of children and adolescents [19–22]. A key concern in researching children's lives is the unequal power relationships between adults as researchers and children as participants [23, 24]. However, focus groups can be optimal vehicles for children to view themselves as lay “experts” by conveying their thoughts, opinions, and concerns regarding their lives, especially when told that their ideas will inform a subsequent research study. As children often require visual stimuli to make issues, concrete, pen and paper art materials [25], together with Photovoice approaches [26], are often introduced before or at the start of a group. These expressive methods also serve to increase involvement and reduce reluctance to fully participate in the group discussions. Focus groups have probed adolescent oral health beliefs and attitudes [27, 28]. Although semi-structured qualitative interviews with school children on oral health issues have not yet been conducted [29], focus group-based research in this area has not yet been published.

The first phase of this study involved convening four dual-gender focus groups: two with school-aged children, 8–12 years of age, and two with adolescents, 13–17 years of age, to understand: (1) perceptions and attitudes about the oral health, including self-image, social relations, and oral pain; and (2) what school-aged children and adolescents view as their role in their own oral health, including

self-care, and assuring good oral health outcomes across the lifespan. The basic age breakdown of the focus group sample was related to dentition. Whereas in the 8–12 age group, there was mixed dentition, including permanent and primary teeth, in the 13–17 group, all had permanent teeth. Adolescents were also more likely to have full orthodontic treatment.

Methods

Participants

In order to select focus group participants, we requested patient lists from *five dental practices* in Los Angeles County, three in the East San Fernando Valley (low-income communities) and two in the West San Fernando Valley (affluent communities). These practices encompass community general clinics, safety-net clinics, group practices, solo general practices, and pediatric practices, which treat children of all socioeconomic groups. The recruitment sites cover different geographic areas and communities, with diverse ethnic compositions, ranging from low-income underserved, immigrant neighborhoods to high-income professional communities. Project staff typically contacted families referred by the dental practices, via phone and e-mail, to explain the study to parents and seek their family's participation. However, some practices preferred to contact the parents prior to contact by the project staff. Institutional review board approval for this study was obtained from the UCLA Office of the Human Research Protection Program.

Design

We designed focus group questions based upon the Pediatric PROMIS domain framework and definitions [30], which, in turn, resulted from an extensive literature review and archival data analyses. We conducted a comprehensive and systematic literature search on existing oral health items, surveys, and instruments previously used to measure oral health of children and adolescents, ages 2–17, as well as their parent, through exhaustive search engines, such as PubMed and The Cochrane Library database. We then convened content experts to reach agreement on the domain, subdomains, and elements for oral health-related physical health, mental health, and social health, within the PROMIS domain hierarchy, similar to method used to design the PROMIS framework [6] (Table 1).

The intent of the focus groups was to refine our preliminary Pediatric Patient-Reported Outcomes Oral Health conceptual framework. Questions covered six main themes: (1) the meaning of good and poor oral health; (2)

importance of oral hygiene; (3) influences on oral health; (4) importance of teeth to general health and well-being; (5) oral pain and orthodontic treatment; and (6) future oral health orientation. The questions guiding the focus group discussions are shown in Table 2.

Procedures

The focus groups took place at two sites in Los Angeles County: a community clinic in the City of San Fernando in the East San Fernando Valley and a pediatric dental practice in City of Agoura Hills in the West San Fernando Valley. Written informed consent was obtained from both parents and children prior to data collection. Prior to the focus group, children and adolescents were provided with snacks and also art materials with oral health images, which served as a way to focus their attention on issues to be discussed in the group. No siblings were included in our focus group sample. At the same time, the parents participated in their own focus group in another room away from the children's group; therefore, no parents were present during the children and youth groups. A medical anthropologist moderated, and a dentist observed each focus group. The 45-min sessions were audiotaped. After the introductions, open-ended questions were posed to promote the surfacing of emergent issues and on concerns. We wished to find out, in their own words, how children and adolescents view their oral health within a social developmental perspective. At the end of the session, the dentist observer was permitted to ask additional questions and/or provide brief comments.

Analysis

The data collection involved audio recordings; focus group transcripts; and facilitator comments. To assure the confidentiality and protection of participants, audiotaping and audio recordings were treated as confidential research

Table 1 Pediatric PROMIS oral health domains

PROMIS oral health domains	PROMIS oral health subdomains
Self-reported oral physical health	Physical functioning
	Orofacial appearance
	Pain interference
	Pain quality
Self-reported oral mental health	Oral health-related quality of life
	Dental anxiety
	Dental phobia
Self-reported oral social health	Social influences
	Peer relationships
	Family belonging
	Family involvement

Table 2 Questions for guiding focus group discussions

Questions	Subquestions
1. What are healthy teeth?	<ul style="list-style-type: none"> a. What things make your teeth healthy? b. What are some things you can do to keep your teeth healthy? c. What can healthy teeth do?
2. What are unhealthy teeth?	<ul style="list-style-type: none"> a. What actually causes people to have unhealthy teeth? b. What do you think about people with unhealthy teeth? c. What would you notice about unhealthy teeth? d. When you walk into a new class, do you ever notice anyone who has unhealthy teeth? e. Let us pretend a new kid with unhealthy teeth came into your class. How would you feel about it? f. Would you like to play and be friends with someone who has unhealthy teeth? g. Can you think of any ways that you can help to prevent unhealthy teeth?
3. How important is it to kids your age to clean their teeth?	<ul style="list-style-type: none"> a. Why? b. How often should kids brush their teeth? c. What makes kids remember to brush their teeth? d. How do you feel about kids who do not brush their teeth?
4. How do kids your age learn to take care of their teeth?	<ul style="list-style-type: none"> a. What is the best way to take care of your teeth? b. Who helps you to take care of your teeth?
5. Are teeth important to kids your age?	<ul style="list-style-type: none"> a. Can you think of some things that are more important than teeth? b. Can you think of some things that are less important than teeth? c. Are there kids that you know who are ashamed of their teeth?
6. What do you think about braces?	<ul style="list-style-type: none"> a. Why do people get braces? b. What are braces for?
7. What concerns do you have about your future oral health?	<ul style="list-style-type: none"> a. As you grow older, what oral health problems can affect you? b. How can poor oral health affect how you feel about yourself? c. How can it affect your job? d. What oral health problems would you most like to avoid in your life?

records. All focus group narratives were entered into *NVivo Version 10*, a qualitative text analysis database [31–33]. Taped data were analyzed as follows. First, a comprehensive review of the audiotapes was performed to identify classifications, which were simply coding of key words. Second, dimension codes were inserted into word processing files of the focus groups. We reviewed the constructs *within* each focus group; then, we looked at the total data set, to include all child and adolescent, responses *across* the four focus groups and identified ten broad domains and, within those domains, numerous dimensions, as shown in Table 3.

We grouped responses according to these domains; during this second analysis, and based upon new modes of categorizing responses, we came up with a final set of twelve key themes that best describe the data, as shown in Table 4. We examined how these themes supported the data and our overarching theoretical perspective, namely the life course, and then determined the frequency of mentions, or expressed concerns, for each theme by age group.

The broad issues explored in the discussions were classified as “coding nodes” to document frequency of expressed concerns related to a particular theme or topic and to analyze relationships between these concerns based on the age of respondents. Within each coding node, specific content was coded as pertinent to more general and/or more particular issues to allow for a multilevel analysis of links both within and outside the primary coding node (i.e., within and outside the scope of the original broad issue that evoked the original responses). This method afforded both qualitative analysis of existing links among the spectrum of attitudes and concerns expressed in the focus group. The approach helped to uncover less obvious interconnections between ideas and motivations that otherwise may escape participants and facilitators and to highlight the relative significance of these various schemas based on the number of references to the attitude or concept throughout the discussion. This method also allowed analysis of variations between attitudes and concepts based on their authorship or other attributes, while still allowing for anonymity. The method therefore augments the

Table 3 Focus group domains and dimensions

Domains	Dimensions
Dental appearance and attractiveness	Color Oral hygiene Diet and nutrition Cigarette smoking How teeth look Attributions (why teeth look the way they do)
Oral health beliefs	Imputation (blame/stigma) Importance of oral hygiene Importance of permanent teeth Genetics and oral health Longevity of teeth
Good oral health	How teeth work What healthy teeth do Association with self-image Association with self-presentation and impression management
Influences on good oral hygiene	What parents tell their children about oral health Influence of older siblings Influence of extended family members Influence of older family members exhibiting poor oral health Influence of friends Influence of media imagery Influence of teachers, health professionals
Self-care and the life course	Relation to good overall health Relation to overall quality of life Relation to life Relation to higher education and career goals Relation to motivation Relation to self-efficacy
Relative importance of teeth	Aspects of life more important than teeth Aspects of life less important than teeth
Peers' perspectives on importance of teeth	Social influence Social comparison
Interpersonal relationships	Friendship Dating Reluctance to smile
Oral pain	Orthodontic treatment Feeling the need for braces Reasons for wanting/not wanting braces Toothache
Self-perception	Self-esteem Self-efficacy Self-perceived oral health Self-confidence

standardized analysis, while not limiting its expansion capabilities for repeat studies with different cohorts (e.g., new focus groups with other constituents or in other locales).

A multidisciplinary team of researchers, including two general and two pediatric dentists, a psychologist, a sociologist, an anthropologist, and an epidemiologist,

Table 4 Frequency of mentions by themes for children and adolescents and by rate per participant

Themes	Children: age 8–12 (<i>N</i> = 14)		Adolescents: age 13–17 (<i>N</i> = 15)	
	Freq. of mentions	Rate per participant	Freq. of mentions	Rate per participant
Appearance	11	0.79	13	0.87
Oral health beliefs	30	2.14	61	4.07
Good oral health	8	0.57	11	0.73
Poor oral health	15	1.07	11	0.73
Oral health behaviors	1	0.07	2	0.13
Life course	4	0.29	23	1.53
Interpersonal effects	14	1.00	23	1.53
Pain	5	0.36	14	0.93
Orthodontic treatment	1	0.07	27	1.80
Perception of DDS	0	0	16	1.07
Genetics	0	0	2	0.13
Access to care	0	0	2	0.13

conducted the analysis for completeness and accuracy. As this analysis yielded a rich data set, the various team members separately analyzed the raw data, examined the suggested dimensions from each of the focus group's data, and synthesized the suggested domains, dimensions, and themes from the separate groups. Disagreements among researchers were resolved by further discussion to reach consensus within the group. Interpretive techniques were thus used at each phase of the focus group analysis.

Results

Participants

Four focus groups were conducted: two with school-aged children ($n = 14$; 9 boys, 5 girls) and two with adolescents ($n = 15$; 10 girls, 5 boys). In Table 5, we show demographic characteristics of the child and adolescent participants and the family characteristics as indicated by data obtained by their parents.

In comparing higher- and lower-income practice sites where the focus groups were held, different demographic patterns are apparent, with respect to race/ethnicity, income, and insurance coverage. As indicated in Table 4, 64 % of the children in focus groups held in the higher-income practice were white and 7 % are Latino, while 13 % of children were white and 47 % were Latino in the lower-income practice site. Ninety-three percent of the children in the higher-income practice focus groups spoke English in the home compared to 67 % in the lower-income site. As one would expect, the number of children in the family was lower in the higher-income practice site,

with 50 % of the homes with only one child compared to 7 % in the lower-income site, where 27 % of the children came from families with four or five children. However, 21 % of the parents chose not to provide family income information; of the thirteen parents reporting annual income over \$70,000, nine or nearly 70 % were from the higher-income practice site. Of the thirteen parents who responded that they had insurance, 62 % of children at the higher-income practice site were covered by private insurance compared to 38 % in the lower-income site. Thirteen percent of children at the higher-income practice site had Medicaid coverage, while 88 % of the children in the lower-income site had public insurance. Because of the large percentage of non-respondents in income and insurance status, we prefer to indicate the percentages across the category. For example, one-third of the children in the lower-income practice site came from families with annual incomes of \$40,000 or less, while none of the children in the higher-income practices came from families at this income level. Seven percent of children in the higher-income practice site came from families with annual incomes of between \$41,000 and \$50,000, compared to 13 % for the lower-income site.

Child and adolescent responses

Overarching issues from the children and adolescents included: (1) understanding of the value of maintaining good oral health over the life course, with respect to longevity and quality of life in the adult years; (2) positive association between maintaining good oral health and interpersonal relationships at school, and dating, for older youth; (3) knowledge of the benefits of orthodontic

Table 5 Demographic and socioeconomic characteristics of focus group's children and their parents, by high- and low-income sites

Location	Site 1: higher-income private practice						Site 2: lower-income community clinic						Total	
	Age 8–12		Age 13–17		Total		Age 8–12		Age 13–17		Total			
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Children's gender														
Female	1	12	2	33	3	21	4	67	7	78	11	73	14	48
Male	7	87	4	67	11	79	2	33	2	22	4	27	15	52
Subtotal ^a	8	99	6	100	14	100	6	100	9	100	15	100	29	100
Children's ethnicity														
White	7	87	2	33	9	64	2	33	0		2	13	11	38
African-American	0		0		0		0		1	11	1	7	1	3
Latino	0		1	17	1	7	1	17	6	67	7	47	8	28
Asian	1	12	3	50	4	29	1	17	1	11	2	13	6	21
Multiracial	0		0		0		2	33	1	11	3	20	3	10
Subtotal	8	99	6	100	14	100	6	100	9	100	15	100	29	100
Children's educational level														
Elementary school	6	75	0		6	43	4	67	0		4	27	10	34
Middle school	2	25	2	33	4	29	2	33	3	33	5	33	9	31
High school	0		4	67	4	29	0		6	67	6	40	10	34
Subtotal	8	100	6	100	14	101	6	100	9	100	15	100	29	99
Language spoken at home														
English + Spanish	0		0		0		0		2	22	2	13	2	7
Spanish	0		0		0		1	17	1	11	2	13	2	7
English	8	100	5	83	13	93	4	67	6	67	10	67	23	79
Chinese	0		1	17	1	7	1	17	0		1	7	2	7
Subtotal	8	100	6	100	14	100	6	101	9	100	15	100	29	100
Parent's gender														
Female	8	100	4	67	12	86	4	67	6	67	10	67	22	76
Male	0		2	33	2	14	2	33	3	33	5	33	7	24
Subtotal	8	100	6	100	14	100	6	100	9	100	15	100	29	100
Parent's employment														
Full time	3	37	4	67	7	50	3	50	4	44	7	47	14	48
Part time	0		0		0		0		0		0		0	
Not employed	5	62	2	33	7	50	3	50	5	56	8	53	15	52
Subtotal	8	99	6	100	14	100	6	100	9	100	15	100	29	100
Parent's marital status														
Single	1	12	5	83	6	43	1	17	0		1	7	7	24
Married	7	87	1	17	8	57	5	83	7	78	12	80	20	69
Living w/significant other/life partner	0		0		0		0		2	22	2	13	2	7
Subtotal	8	99	6	100	14	100	6	100	9	100	15	100	29	100
No. of children in the home														
1	2	25	5	83	7	50	0		1	11	1	7	8	28
2	3	37	1	17	4	29	4	67	0		4	27	8	28
3	3	37	0		3	21	2	33	4	44	6	40	9	31
4	0		0		0		0		3	33	3	20	3	10
5	0		0		0		0		1	11	1	7	1	3
Subtotal	8	99	6	100	14	100	6	100	9	99	15	101	29	100
Parent's education														
Elementary school	0		1	17	1	7	0		1	11	1	7	2	7
Did not finish high school	0		0		0		0		0		0		0	

Table 5 continued

Location	Site 1: higher-income private practice						Site 2: lower-income community clinic						Total	
	Age 8–12		Age 13–17		Total		Age 8–12		Age 13–17		Total			
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
High school	0		0		0		0		2	22	2	13	2	7
Some college	0		1	17	1	7	2	33	1	11	3	20	4	14
Graduated college	5	62	3	50	8	57	3	50	5	56	8	53	16	55
NA	3	37	1	17	4	29	1	17	0		1	7	5	17
Subtotal	8	99	6	101	14	100	6	100	9	100	15	100	29	100
Annual family income level														
\$20–30,000	0		0		0		0		2	22	2	13	2	7
\$31–40,000	0		0		0		1	17	2	22	3	20	3	10
\$41–50,000	0		1	17	1	7	2	33	0		2	13	3	10
\$51–60,000	0		0		0		0		0		0		0	
\$61–70,000	0		0		0		0		2	22	2	13	2	7
\$71–80,000	1	12	1	17	2	14	0		0		0		2	7
Over \$80,000	4	50	3	50	7	50	2	33	2	22	4	27	11	38
NA	3	37	1	17	4	29	1	17	1	11	2	13	6	21
Subtotal	8	99	6	101	14	100	6	100	9	99	15	99	29	100
Type of insurance														
Private insurance	5	62	3	50	8	57	2	33	3	33	5	33	13	45
Medi-Cal or other public ins.	0		1	17	1	7	2	33	5	56	7	47	8	28
KCDC	0		0		0		1	17	0		1	7	1	3
None pay cash for dental	0		0		0		0		1	11	1	7	1	3
Could not say	3	37	2	33	5	36	1	17	0		1	7	6	21
Subtotal	8	99	6	100	14	100	6	100	9	100	15	101	29	100
Dental insurance														
Yes	5	62	4	67	9	64	4	67	6	67	10	67	19	66
No	0		1	17	1	7	1	17	3	33	4	27	5	17
NA	3	37	1	17	4	29	1	17	0		1	7	5	17
Subtotal	8	101	6	101	14	100	6	101	9	100	15	101	29	100

^a Not all subtotals equal 100 % due to rounding error

treatment to appearance and positive self-image, while holding a strong view as to the discomfort associated with braces.

Table 4 presents the frequency of mentions, by age group, of the twelve key themes that we identified in our analysis. It was interesting that appearance had similar rates of mention (0.79 vs. 0.87) for children and adolescents. Oral health beliefs, however, were almost twice most likely to be mentioned by the adolescents than by the children (2.14 vs. 4.07). Similarly, the rate of mention for interpersonal effects was fifty percent higher for adolescents than children (1.53 vs. 1.00). The only thematic area where the children had a higher frequency of mention was poor oral health (1.07 vs. 0.73); this may indicate the critical view that these children take of their peers with regard to oral health.

In the following sections, we report on the key themes that were most meaningful to our research on children's perceptions of oral health and were important areas of item development that impact future patient-reported studies of oral health. We provide quotes to illustrate how concerns are expressed in the children's own words. All quotations cited in the text are those of focus group participants (Table 6).

Appearance

In their conversations, school-aged children approached issues of the appearance of a person's teeth, more immediately, and perhaps even more viscerally, indicating both a strong aversion to a peer's poor oral health and a sense that a young person with unhealthy teeth will also have poor

overall hygiene. While adolescents often shared similar attitudes, they also viewed dental appearance and oral self-care, with an eye to the implications for self-presentation and personal character, notably as indicators of self-responsibility, self-sufficiency, and self-confidence.

Importance of oral health

School-aged children typically viewed the importance of oral health in terms of practicing good oral hygiene habits. Their habit-based perspectives contrasted with those held by adolescents, who viewed oral health in terms of social interaction and social comparison with peers, in the friendship and dating arenas.

Influences on oral health

With respect to family and peer influences on oral health, the children typically credited their dentist or their parents; however, a somewhat surprising response from a child participant was that of the influence of an older sibling in cultivating oral hygiene practices. Adolescent participants credited their parents for reinforcing oral self-care habits, but also acknowledged their peers and role models in the media.

Self-care and the life course

Child respondents viewed oral self-care, in terms of maintaining good oral health throughout life, and in one case, living a longer life as a result. Adolescents viewed oral self-care and health maintenance as a pathway to personal and career satisfaction; they assessed their current oral health in terms of longer-term consequences for making good impressions as a foundation for success in social and work life, as well as for personal attractiveness later in life.

Importance of teeth to oral health

School-aged children viewed their teeth as important to concrete tasks, such as talking, eating, smiling, and, in a few instances, for impression management. Not surprisingly, the adolescents viewed teeth in terms of personal appearance, peer and dating relationships, and questioned why many teenagers paid scant attention to their oral health, relative to the time spent engaging in recreational and leisure activities.

Interpersonal effects

In conversation, the children tended to address interpersonal effects of poor oral health, fairly concretely, namely

in terms of physical appearance, or in making friends and playing together. True to form, adolescents regarded unhealthy teeth as representing a careless attitude toward oneself, and, explicitly, to the wider world of social relationships, including dating and other activities requiring physical closeness.

Orthodontic treatment

Adolescent respondents viewed braces as expected, as a painful necessity, and as a form of treatment that restricts certain pleasurable activities. Weighing the pros and cons of braces, teenagers discussed both their cost and their intrinsic value, aesthetically for “perfect teeth” in the future, and for self-esteem, as “confidence boosters,” with expectations that “straight teeth” will “pay off,” in terms of social benefits, later on.

Discussion

These focus groups provided insights into the oral health world of middle school children and adolescents. These young people had a usual source of care, which provided them with a structure and information that enabled them to build a foundation to articulate their feelings about oral health. They placed much emphasis on oral hygiene as a means of assuring their oral health and social acceptability. The middle school children realized that, when they were younger, oral health was not as socially important as it is for them at this stage. The adolescents came to realize that oral health is an important aspect to their ability to relate to the world on social levels, such as dating, being popular, and self-esteem. On a more pragmatic basis, the adolescents acknowledged that good oral health is important for their chances of getting a good job and succeeding in life. The younger age group had less of this external perception; however, some of the children expressed a view held by their parents that poor oral health reduces the life span. They also were aware of their parents’ or grandparents’ poor oral health and its consequences.

In these children, the main reference to pain was with regard to orthodontic treatment. Several of the adolescents were in various stages of orthodontic treatment. They all found the treatment painful and restrictive; but even though they complained, all were happy that they were able to have treatment, and one who completed his treatment said that it had changed his life. In that session, there was a teenager who had crooked front teeth. She was not from an affluent family and was almost tearful when she said, “It’s weird. I want straight teeth before I’m like in my 20 s, so I want braces now actually.” Another comment indicated the cost issue: “But, unfortunately sometimes they are expensive;

Table 6 Key themes with child and adolescent responses

Themes	Responses
Appearance	<u>Child responses</u>
	<i>(M. How can you tell if someone has unhealthy teeth?)</i>
	P. It shines a bad light on them because it's actually like judging a book by its cover... When you just walk by, you're just like "Wow, that guy doesn't take care of his teeth, he must not take care of anything else"
	<i>(M. He must not take care of anything else. How about P?)</i>
	P. If you see that... that pretty much means they have poor hygiene and probably don't take care (of) the rest of their body
	<u>Adolescent responses</u>
Importance of oral health	<i>(M. How can you tell if someone has unhealthy teeth?)</i>
	P. Well, teeth are kind of like they're the first thing you look at when you're like talking to a person. So, it kind of like reflects on you if you take good care of your teeth. They're like, "Oh, that person is responsible" something like that
	P. I think that having good teeth sort of impacts what people think of you as a self-sufficient person because taking care of your teeth is something you do yourself, so it sort of shows to other people that you're going to take care of yourself, that you can take care of yourself, and yeah, I guess
	<u>Child responses</u>
	<i>(M. To clean the teeth: how important is it for kids your age?)</i>
	P. Very important especially at a young age because you produce good habits of cleaning your teeth that will hopefully carry out through your life, so you won't have bad teeth and you won't be judged about it and you will have many friends with good teeth
Influences on oral health	<u>Adolescent responses</u>
	<i>(M. How important do you think it is for people your age to clean their teeth?)</i>
	P. I think it's really important because now, we're getting into dating and stuff and, yeah, and if you don't want to have bad breath or stuff like that. So, people when they don't brush their teeth, it's kind of gross. I wouldn't want to be near them that much because it would really always smell. Well, I mean for the people that care about what other people think about them, then they think it's really important. So, they should get to, you know, the habit of cleaning their teeth and not only just because they care about what other people's opinions are. They should also just do it for themselves because they need it
	P. I think they should brush their teeth because some people judge others by their teeth
	<u>Child responses</u>
	<i>(M. How do kids your age learn to take care of your teeth?)</i>
Self-care and the life course	P. My brother taught me how to brush my teeth when I was really little. He was about 13. So, he taught me how to brush my teeth. He had braces [and told me], "you do not want to have your teeth ending up like this." And I was like, "Yes, I don't. Please help me with my teeth." He also showed me my parents' teeth and I was like, "Yes, I don't. Please show me"
	<u>Adolescent responses</u>
	<i>(M. How do people learn to look after their teeth; people your age?)</i>
	P. I think it's something that you learn when you're little because your parents are always telling you to brush your teeth. So, then it becomes second nature to brush your teeth. But then also, there're advertisements and magazines and movie stars and one that has perfectly straight white teeth. I suppose that's another reason
	P. I would say our influences come from other people. It seems like if you are going out, you have to keep appearances. I have to make sure that I look my best. I got to make sure that I got a great smile; that I smell nice. I also think that your dentist influences you because when you go and get a check-up, you want to make sure that they do not say like: "Clearly, you have not been brushing in this area, so you need to work on that." So, I see that they influence you as well
	<u>Child responses</u>
<i>(M. What concerns do you have about your future oral health?)</i>	
P. My dad and my mom told me that you live 10 years longer if you have your teeth. If you have dentures, you live 10 years shorter than you were supposed to	
<u>Adolescent responses</u>	
<i>(M. Concerns about oral health later on in life?)</i>	

Table 6 continued

Themes	Responses
	<p>P. ... I guess I really need to clean my teeth more than I regularly do. Okay, so for me personally, I would want to like right now, I want to have my teeth be amazing so that if I'm trying to find a job and I don't want to be in the back like stock – getting the stuff from the trucks. I want to be out in front of the customers, now that [inaudible] my job would work out and then I also, in the future, I want teeth but it's kind of funny sometimes because my great grandparents, they have dentures and they take them out and they start talking. (Everyone laughed.) So, I feel like I would be like a cool grandpa. (Everyone laughed.)</p>
Interpersonal effects	<p><u>Child responses</u> <i>(M. The new kid comes into the class with unhealthy teeth, and how are you feeling?)</i> P. First impressions are the impressions that are going to stay. <i>(M. Got it.)</i> P. Exactly, it's going to stay and if I ever see him, I'm like, okay, it's good. Doesn't really have good hygiene, probably stay away from him maybe. If I ever get to know him, I'll just be straight up and say "Brush your teeth, it looks horrible"</p> <p><u>Adolescent responses</u> <i>(M. How do you feel when you see people with unhealthy teeth?)</i> P. In terms of dating, I would not want to date someone with super bad teeth, but [that person] does not have to have the perfect teeth either. As long as they take care of themselves. Some of my friends have really nice teeth; some of them do not but I do not really mind P. With my friends, I do not really mind because I have a lot of friends that have braces and crooked teeth. But, relationship-wise, it is kind of gross; if their breath smells or stinks, then, yes P. I think is important to take care of your teeth when you are young. Especially in high school you have all those school dances and you go out a lot so you want to look at all the pictures and you want to feel comfortable with yourself looking back and be happy with the way you looked</p>
Orthodontic treatment	<p><u>Adolescent responses</u> <i>(M. What do you think about braces?)</i> P. You get cuts a lot in your gums and stuff and then just not fun. Yeah, I can't really eat. I haven't eaten candy in like two years and it's not really fun. I mean I'm like a kid, I should be eating candy P. I think getting braces if you need them is also important because the alignment of your teeth, you know, needed. That's what I heard. Because if they're not straight, then it might affect you later on P. Well, it's like a really good confidence booster P. I wanted them so bad because I had really bad teeth, so I didn't really want ugly teeth P. I guess braces are a good thing and a bad thing. The bad thing is that you get restrained from [eating the foods you want] or you are kind of nervous about people and what they think about the first impression how they think you look different with braces; the feeling it hurts. But, the good thing is that (P paused) I would want to get braces because I am in eighth grade, so when I [become] a senior-like in the senior picture, prom-[I will] have better teeth. [They] also have a good effect and I think people should go for it. But I also think that they are expensive. They are sort of expensive. Otherwise, [they] are a big help</p>

you are not going to be able [to get them]." The growing awareness and acceptance of orthodontic treatment by these teens were evident; however, access to this treatment from a cost or accessibility standpoint may be prohibitive for many families as this participant intimated. It seems that the standard for what constitutes an acceptable dentition is that of television actors in novellas that are a part of the visual culture among Latinos in the USA; however, these images are also found in mainstream Anglo-American soap operas and sitcoms. These actors have the most beautiful white, straight teeth imaginable.

An important element for both age groups was the various colors of teeth characterized by the participants. Tooth color is associated with oral hygiene and is a

reflection on a person's ability to engage in self-care and an indication of a general lack of self-responsibility. Having yellow teeth is somewhat off-putting, but having green, brown, or black teeth is tantamount to being an outcaste. It is not only the color of teeth that is important, as one middle school child said, "one kid that I saw at fourth grade had this like big black spot all over his gums and it really bugged me. It grossed me out." Unfortunately, what this child might have been referring to is the natural melanin color variation found in African-Americans. Be it on teeth or gingiva, color triggers visceral responses in children and may foster feelings, such as stigma and stereotyping and their effects, on both the viewer and the viewed.

Implications for PRO measurement

Understanding and assessing children and adolescents are complex as they are not a stable target, rather in the stage of emerging-developmental skills and functions. Younger children are already capable of expressing a range of emotions (e.g., anxiety and happiness). Research has shown that children 8 years and older are mature enough to be able to accurately self-report health issues, and children ages 8–17 can talk about and respond to items asking them about their functioning and well-being, and they can also offer unique insight into the understandability of the items. However, due to limited level of maturity and responsibilities, they will not be able to answer all questions related to their oral health such as insurance co-pay or other financial questions, for which parents or guardians are the appropriate respondents. Therefore, it is possible to assess patient-reported oral health outcomes for children and adolescents with youth surveys supplemented by parent interviews. Given the young age of children, oral health outcomes have profound long-term impacts on their future functioning and well-being; therefore, a life-course lens is needed to capture the full process. The focus groups elicited children's experiences from a developmental perspective.

For this project, after a comprehensive and systematic literature search on existing oral health items, surveys, and instruments relative to children and adolescents (ages 8–17) and their parents, we came up with core physical, mental, and social health domains for the oral health item banks. These domains were revised in light of data derived from focus group analysis. Youth responses from the focus groups refined conceptual definitions, generated content for new items, and documented saturation of the construct. The focus groups also elucidated a number of issues that provided the basis for questions or items that are not usually found in surveys and that tend to broaden the view of oral health. For the most part, new items concerned: (1) life course and longevity, (2) intergenerational perceptions, (3) social relationships, including friendship and dating behaviors, and (4) the appearance and importance of the teeth and the mouth at this stage of life. Hence, our study only reinforces the importance of informing the field of the use of qualitative methods, such as focus groups, in the formative stage of oral health item development.

Implications for future research

Because our focus group sample included only children and adolescents who had a regular source of dental care, we expect that their oral health is better than that of the general population; hence, the sample may have included individuals with a more positive view of their oral health

than a general sample of children. For latter phases of the project, which includes both a comprehensive survey and a dental exam ($N = 400$), we are sampling broadly to include study participants who seek care at safety-net clinics, as well as private dental practices, so as to ensure that the item bank reflects the concerns of those children and youth in less optimal oral health.

Following the focus groups, we conducted a series of face-to-face cognitive interviews to refine, polish, and improve the items according to feedback from children and adolescents, parents, and professionals (not reported here). The cognitive interviews were conducted to solicit feedback on item clarity. Cognitive interviewing provided a means to assess participants' responses to the items and explore the meaning of the items. For each candidate item, we probed the subject regarding the item content and response options. We explored how respondents recall information, what time frame they use, and what time frame is beyond their recall. Cognitive interviews were conducted using intermittent and retrospective probes following completion of all items. Subsequently, items will be administered to youth from the general population and clinical samples. The nature and content of these items, together with the results of the cognitive interviews, will be presented in a subsequent paper.

In conclusion, the qualitative methods used in the initial phase of the project are the initial step in the development of oral health item banks and associated short-form surveys for children and adolescents. These surveys can be used by dentists, oral health researchers and professionals, and public policy makers for oral health screening, program assessment, oral health evaluation with large populations as well as oral health management and policy planning.

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