Causes of dental caries from the perspectives of adolescents: A qualitative study

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Abstract

Objective: Various factors affect dental caries and impact the patterns of dental care. A few studies have been conducted to identify these factors from the perspectives of students. This study aimed to explore factors influencing dental caries from students’ perspectives.  
Methods: A qualitative design using content analysis approach was conducted to collect the perspectives of 18 Iranian students who were studying in 8 guidance schools. They were chosen through purposive sampling. Semi-structured private interviews and focus groups were held for data gathering. The tape-recorded interviews were transcribed verbatim and analyzed using an inductive content analysis approach. In order to support the validity and rigor of the data, different trustworthiness criteria such as acceptability, confirmability and transferability were considered.  
Results: During data analysis, four main categories were developed: “difficult conditions of care”, “disability in caring”, “uncontrollability of dental caries” and “intangible sense of the factors causing dental caries”. The participants more emphasized their own experiences about having insufficient dental-oral care, not paying attention to oral health, dental fear and the lack of both knowledge and competency regarding this issue.  
Conclusion: The findings of this study revealed factors influencing dental caries from students’ perspectives and emphasized the roles of individual, parent, dentist and community in this respect. The findings of this study can be considered to be a valuable basis to design oral health interventions. However, more studies are required to improve our understanding of dental fear and denote barriers and social beliefs pertinent to oral health in different groups of students.  
Key words: Adolescent, Dental Caries, Oral Health, Qualitative Research.  
Please cite this article as follows:  
Received: 30.01.2013 Final Revision: 11.06.2013 Accepted: 03.07.2013

Introduction:  

Oral health is more than benefiting from health teeth and an unavoidable component of public health that reflects body health (1). Dental infections, teeth decay, and teeth loss influence the person’s body and mind (2). For instance, it may result in iron deficiency and weight loss, hinder growth, increase the probability of low birth weight and acute and chronic infections, reduce voice quality, damage self-esteem, and reduce person's social performance (3). Oral and dental diseases limit individual’s activities at the school, work or home and even waste healthcare financial resources (4). Dental caries and periodontal diseases are the most prevalent diseases in the world (5). Oral health and dental carries are considered to be the indicators of
community health (6). However, more than 99% of people in the world suffer from oral diseases (7). Oral health care is the most common unmet need among children (8). It is also the reason of poor work at school and also an indicator of children’s needs for dental treatment (9, 10). On the other hand, oral hygiene and health behaviors among adolescents aren’t satisfactory (11). Iran is located in the eastern Mediterranean region, where 30 to 60 percent of adolescents brush their teeth twice in a day (12, 13). In the capital of Iran, Tehran, 20% of high school students brush their teeth once a day regularly and 63% of them don’t use floss and 31% use it irregular (14). The prevalence of dental caries is reported to be 75% and mean of the index of teeth decay, DMFT (Decay/ Missing/ Filled/ Teeth) is 2.71 that is higher than the international standards determine by the world health organization (WHO). According to the reported statistics, attention to oral and dental health is one of the strategies devised by the WHO to prevent from chronic diseases and promote health (5). Understanding the components and determinants of oral health to prevent and control oral and dental disease (15, 16), the importance of health behaviors in adolescence and their stabilization in adulthood (17), ineffectiveness of pure emphasis of personal components in oral health (18), high prevalence of dental caries among children, low prevalence of the application of cleaning teeth tools among children (19), the necessity of designing interventions based on differences and social features and its importance in preventing dental carries (20), the importance of conducting qualitative studies using focus group discussions and interviews of the reasons for lack of inter-dental cleaning behaviors in students (2) are main logics behind conducting the present study. Several qualitative studies have been conducted on oral and dental care such as teenager’s decision to undergo orthodontic treatment (21), parents’ conceptions of their children’s oral diseases (22), and the experiences of young patients with oral cancer (23) and why iranian adolescents don’t brush their teeth (2), but none of them have been explained factors related to dental carries from students’ perspectives. Therefore, this study aimed to explore factors influencing dental carries from students’ perspectives.

Methods:

Qualitative content analysis is a suitable method to develop knowledge, new ideas, and practical guides for performance (24). Therefore, to increase the depth of interpretation of different data, a content analysis approach was used in this study. After obtaining approval from the education and training organization in Tehran, 8 guidance schools from north, south, west and east of Tehran were selected using the simple random sampling method. The inclusion criteria were age 11 to 15 year olds, willingness to participate in the study, ability to speak, suffering from dental caries and the diagnosis of oral diseases such as bleeding gums, filling, missing and pulled teeth by the first researcher who was trained to diagnose and identify tooth decay and gum diseases. The first researcher, who received some skills in interview techniques, obtained the permission to conduct the study in the selected guidance schools. A purposive sampling method was utilized to select 18 students using the above mentioned inclusion criteria. The analysis of the interviews guided the researcher to choose the next participation. Sampling was discontinued after achieving saturation where no new data was collected (25). Finally 18 students participated in this study.

The protocol of this study was confirmed and supported by the research council affiliated with Tarbiat Modares University, which corroborated its ethical considerations. Permission to enter the research area was achieved from the department
of education and the selected school’s principals. All the students were informed about the aim and methods of the study, time and place of the interview, the confidentiality of their identities, and that they could withdraw from the study at any time. Those students who agreed to willingly participate in the study signed written informed consent. Also it was informed that type-recorded data and transcriptions could be given to participate in case of their request.

Data collection was performed from 2011-2012 in Tehran through semi-structured interviews, group discussions, and journalism. The main questions asked during the interviews were: may you tell me your experiences of oral disease (bleeding gums, missing and pulled teeth and orthodontics)? And how did you handle this situation?

In addition, the participants’ thoughts were followed using probing questions. They were asked to clarify their responses, explain more examples of the phenomenon and state the reason for their answers. The duration of face to face interviews and focus group discussions were 20 and 45 minutes, respectively.

All face to face interviews and focus group discussions were tape-recorded and analyzed. Data analysis and data collection were carried out simultaneously. Content analysis used in this study, is the technique to extract data from textual data and reveal subjective descriptions and stimulus that induces to person. This method determines participants’ overt and covert experience (24) the participants’ statements and words were used for the initial coding that guided the process of next interviews. The latent meanings of the text as themes were developed by coding of students’ remarks and connotations. The codes were classified and compared based on their similarities and differences and finally themes were extracted.

To increase the rigor of the data analysis process, the measures suggested by Lincoln and Guba as credibility, transferability, dependability and confirm ability were used (26). The credibility of findings was checked using providing the students with a summary of the interviews (member checking) to review and provide comments. Moreover, interactions were made with participants. Sampling with maximum variance, and selection of participants with different genders, age and financial conditions were in line with transferability of findings. With regard to confirm ability, the comments of external evaluators were incorporated into the analysis process.

**Results:**

In this study, 18 students including 11 boys and 7 girls participated. Students’ fathers and mother’s educational level was primary school to bachelor and above. Job of students’ parent was employee, housekeeper and self-employment. During data analysis, four main categories were developed: “difficult conditions of care”, “disability in caring”, "uncontrollability of dental caries” and “intangible sense of the factors causing dental caries”. also having not enough skill in cleaning teeth, insufficient awareness of oral health, interpersonal unfavorable characteristics, inhibiting individual experience in oral heath, neglect of oral health, lack of perceived threat, fear of dentist, fear of dental environment, individual and non-individual experience in developing fear, fear of treatment, social beliefs as a barrier to oral health, puberty and dental care, the role of inheritance in oral health, the age of onset dental care, lack of attention to primary teeth and the role of nutrition in dental care were 16 sub categories. (Figure 1).

According to the analysis, threat to dental health creates mental conditions that the adolescent to follow healthy behaviors. This concept not only can have individual identity, but also have psychological cognitive and social sources. This phenomenon was extracted from
the experiences of those participants who considered the health statues of their teeth acceptable and rationalized unhealthy behaviors.

Figure 1 - Factors related to dental caries of adolescents’ prospective
Difficult conditions for care

Many participating adolescents in this study stated that their oral health was neglected. They had not enough acknowledge and kills to use inter dental cleaning tools. Their unpleasant experiences of applying this tool demotivated them to use dental cleaning instruments that resulted in dental caries.

“Some children are lazy and don’t like to brush their teeth” (A girl 13 years old).
“Because I don’t know the correct method of brushing my teeth, I had toothache. My gums bleed, when I brush my teeth (A boy 11 years old).

“Some children said when we brush our teeth we can’t sleep”. (A girl 13 years old).
In addition, some students did not take care of their teeth as one part of their bodies; because their teeth in mouth were invisible to them.

“I don’t like yellow teeth; no one can see my black teeth. The front teeth are important and they are not yellow” (A girl 12 years old).
Fortunately, my teeth are inside of my mouth and no one attend to them (A boy 13 years old).

The participants declared that some interpersonal unfavorable characteristics and mental and physical diseases caused teeth decay and so it made dental caries uncontrollable.

“Person who is sick, she or he is impatient and do not attend to her or his teeth” (A boy 14 years old).

The students in this study assessed the statute of their teeth carefully and thought that they would not affected oral and dental diseases.

“I have not any problem about my health, my teeth are nice and good, I have not any disease” (A girl 12 years old).

Disability in caring

Most of the students believed that dental fear was one of the most important reasons for tooth decay and avoid the dentist and regular treatment. Dental fear has metal sources, begins in childhood, and achieved by an individual negative experiences, friends, family and relatives and mass media. According to the findings, most of the participated stated a fear of dentist and dental care environment.

“I was afraid of dental instruments and the dentist, especially when he shouts” (A boy 13 years old).

“I've already gone to the dentist, I am scared of dentist and I feel pain” (A girl 12 years old).

Individual and non-individual experience in developing fear was stated by participants.

"When she/he is going to the dentist, she or he is scared of the dentist probably she/he pulled his/her teeth or has already seen someone that pulled their tooth". (A girl 13 years old).

One of the students mentioned that media play an important role in creating fear.

“The movie showed a dentist very terrible and illusive that created fear” (A boy 13 years old).

Uncontrollable factors in dental caries

Adolescents believed that dental caries is a non-personal behavior. They attributed tooth decay to factors such as inheritance, social beliefs and puberty.

“Inheritance plays an important role in dental health. My cousins don’t brush their teeth and they are healthy, I brush my teeth carefully but they do not” (A boy 13 years old).

The students declared that this is as social belief that first feel pain then go to the dentist.
When I have pain in my teeth I will go to the dentist like all people. (A boy 13 years old).

Another social belief was using sweet and chocolate in celebrations and ceremonies.

“We have always chocolate at home, I eat it each night and know that this is a mistake. We eat it in ceremonies”. (A girl 13 years old).

One of participants stated that changes in the puberty period affect oral health and adolescents focus on other activities.

“In this age period, we take care of my appearance, and things inside of the mouth are not important”. (A boy 15 years old).
Intangible sense of the factors causing dental caries

In this study, participants did not know much about the influence of factors such as primary teeth, the age of onset dental care and nutrition on their oral health. Most adolescents did not consider their teeth a priority in their life because they were unaware of the consequences of lack of attention to primary teeth and role of them in their general health.

“I brush my front teeth very much, they are permanent teeth, but I do not brush back teeth because they are primary teeth” (A girl 12 years old).

“I pulled out my primary teeth, but I brush my permanent teeth” (A boy 11 years old).

The participated stated that if a behavior did not develop during childhood, its establishment might be hard during the adulthood. Also they had not a perception of the appropriate time to start caring teeth.

“I did not use to brush and floss my teeth during childhood and it is too difficult for me now to practice it” (A boy 13 years old).

“A child cannot brush all his/her teeth entirely, parents must teach how to do it to their children” (A boy 12 years old).

In addition to the items listed above, the participants did not know how inappropriate nutrition affected tooth decay, so they ate sweet and did not care their teeth.

"The dentist said that there was decay in my teeth. She mentioned that sweet things and food caused caries… I always eat sweet foods” (A boy 14 years old).

Discussion:

This study was conducted to provide an understanding of the factors related to tooth decay from students' perspectives. The collected data were analyzed through the content analysis approach. The theme of “threat to dental health encompassed social, political and educational aspects related to dental care. Individual, familial, social interactions and also interaction with the dentist were introduced a crucial factors in this theme (27, 28).

The students emphasized that they did not pay attention to their own oral health. They mentioned that their negative experiences, insufficient skills and knowledge, and good assessment of their teeth statues led to difficult conditions of caring their mouth and teeth. Consistent with our findings, Pakpour, et al. (2012) Reported those students’ negative experiences such as gum bleeding and boring brushing demotivated students to use dental cleaning tools (2). Trulsson, et al. (2002) stated that adolescents did not care about their oral health, while they were aware of the diseases and their interference with their social interactions (21). In addition, shame of not caring for dental health was another reason for the avoidance of going to the dentist. In another study (29), the students declared that they knew the methods of teeth cleaning and were skillful in this area. Also, the students expressed that using dental floss was difficult for them; so, they preferred not to apply it (30). The students in the present study assessed the statue of their teeth very well; therefore, brushing was not important to them (2). In this regard, Talekar, et al. (2005) stated that two-thirds of American people rated the statue of their teeth very well, while their examinations did not prove it (31). Gregory, et al. (2007) reported that some people believed that oral disease is considered to be a normal phenomenon (29). It seems that students do not acquire the knowledge and skills to maintain the health of their teeth. Therefore, motivated strategies for improving oral health must be taught to students. Indeed, motivation may facilitate oral health behaviors and facilitate changing individuals’ inappropriate behaviors.

Theme of “inability in caring” played a main role in students' oral health and affected the quality of oral care. Jamieson and Koopu (2006)
stated that one of reasons for people unwillingness to oral care is dental fear that impacts healthy beliefs and practices (32). Hilton, et al. (2007) believed that factors such as negative experiences of teeth care, toothache, and pulling out tooth impacted going to the dentist and using dental services. In addition, parents as health care providers faced with dental fear of their children (33).

The study showed that individuals have an inherent fear of dentist and seldom used dental services (34). Fear of treatment is learning from friends, relatives and mass media. Individuals who have experienced dental fear reported a low quality of life and psychosomatic disorders. To mange treatment, patients must deal with the fear before and during treatment. The Lazarus and Folkma's coping processes with the treatment can be applied. At the time of patient arrival to the clinic, and in the waiting room, techniques such as relaxation, deep breathing, financial, emotional and physical support by friends or relatives or the therapeutic team can control patients' stress and reduce their fear (25).

Puberty, inheritance and social beliefs formed the current belief that dental caries was uncontrollable. It has been showed that different social beliefs in different cultures especially among ancient civilizations have been classified under three categories: good, bad or no effect beliefs and have made life meaningful to people. Beliefs such as calculus of teeth is the result of extra iron, and gaps are forming as a result of scraping calculus of teeth, inheritance and kind of teeth help with the development of dental caries and microbes do not play any role in tooth decay, are the most important harmful beliefs influencing dental health. Kwan and Holmes reported that chinese peope believe that people are susceptible to oral diseases and bleeding of the gums and loss of all teeth are normal among older adults. Also, older people believed that traditional treatment was better and prevention from oral diseases is ineffective (35). According to the above mentioned item, one of the most important factors related to dental and oral health problems is misconceptions in the community. The participants in this study stated that inheritance and changes in the puberty period played important roles in their decision to take care of teeth as they would make oral diseases uncontrollable. Other studies have been shown that inheritance plays some role in kind, appearance and anomalies of teeth (36), but dental plaque was caused dental caries and removing this factor should be considered to be a priority (37). Jung, et al. (2010) reported that puberty period reduced the effect of family and environment on the person and increased the effect of other factors such as a school, peer and culture. Adolescents prefer to develop independent habits that these changes affect their health behaviors (38). However, other studies have shown that adolescents like to take care about their aesthetic appearance and therefore, caring for their teeth during puberty (39) that it is not consistent with these study findings. Also, extra hormones can cause swollen and sensitive mouth and gums during puberty period. Adolescents will understand more this period if are taught about this period. Health professionals must consider factors related to oral and dental health such as inheritance, puberty and social believes.

The results of our study showed that students did not have good understanding of factors related to tooth decay such as nutrition, age of onset of care and the role of primary teeth. The students mentioned that their parents did not attend to their primary teeth during childhood .Studies show that children's parents are not aware of the importance of primary teeth. They do not apply methods to prevent tooth decay, because they believe that primary teeth fall down. According to some believe that decay of primary teeth do not impact permanent teeth decay, and if primary teeth fall down, they would be replaced with other teeth. Also people referred to the
dentist, when they were sick and did not pay attention to the health of primary teeth (33). The qualitative study of Somali immigrants in America in 2001 about oral health showed that parents did not care for primary teeth, because they are not long time in mouth (33). It is clear that the attitudes of parents, especially mothers on their children's attitudes impacted primary teeth. According to above mentioned items, primary teeth as the basis for the development of permanent teeth should be given special attention in the two groups of mothers and their children. The establishment of caring behaviors of primary teeth to mothers can be started in pregnancy. Studies have shown that teeth decay control can be started with modifying food habits and avoiding eating sweet foods. Although the effect of sugar has been demonstrated in tooth decay, but repeating consumption patterns are essential in it. There is a relationship between consumption of sweet foods and inappropriate nutritional habits and the high prevalence of tooth decay that can be the index of inadequate understandings of the impact of this factor on teeth health (40). In this respect the key role of producers of food products should not be forgotten in both the public and private sectors (28). Also, informing people about oral health by mass media and responsible organization is emphasized.

Conclusion:

Based on the findings, there are serious challenges in the domain of oral health that may cause disorders in their oral health and daily life. The participants in this study confronted with uncertainty in caring for their teeth, due to the fact that oral health was a challenge for them. In addition, this study confirmed the factors related to dental caries from adolescent’s perspectives and emphasized the role of an individual, a dentist and community.

Suggestions

Future studies are required to explain barriers related to oral health and inhabiting social beliefs in different groups. Also, understanding the process related to dental fear especially investigating old interactions of the students related to fear, process of action and reaction, and emotional process require more studies. Also assessment of adaptation processes and factors related to them must be considered.

Acknowledgements

This paper is a part of PhD thesis in health education. This study was supported financially by the research council of Tarbiat Modares University. We sincerely thank all participants for their participation in the different stages of this study and stated their Valuable experiences and views for research.

Conflict of Interest: “None Declared”

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