

An Oral Health Education Training Intervention: A pilot study with Haitian schoolteachers

Lydia A. Rosado, LDH, MSDH, MPH; Lori Rainchuso, RDH, DHSc

Abstract

Purpose: Risk factors for oral disease are elevated among disadvantaged populations living in developing countries; rural Haitian school children have limited or no access to health care services. The purpose of this pilot study was to assess Haitian schoolteachers' attitudes and knowledge on oral health prior to and after attending an oral health educational intervention as well as their perceptions and experiences of receiving and implementing oral health education in a Haitian classroom setting.

Methods: This mixed methods study used a quantitative, quasi-experimental, one-group pre/post-test design, before and after a 3-day oral health educational training in Borel, Haiti. A validated pre-and post-test questionnaire measured changes in oral health knowledge and attitudes. A qualitative, phenomenological approach was used to analyze information gathered during focus groups, using a semi-structured interview guide, to explore schoolteachers' perceptions and experiences regarding the training intervention and the six-week implementation of the oral health curriculum.

Results: A purposeful sample of nine Haitian primary schoolteachers (n=9) consented to participate in the study. Oral health knowledge and attitude mean scores of the participants demonstrated improvement from pre-test (70%) to post-test (78%) scores. Qualitative findings revealed two major themes; confidence and empowerment, and improved oral health knowledge and hygiene behavior.

Conclusion: Quantitative results from this study confirmed that training Haitian schoolteachers to integrate oral health education in the classroom can be an effective method for improving schoolteachers' personal oral health knowledge and attitudes. Findings also revealed a positive outlook on the training intervention and the application of an oral health education curriculum in the classroom. Results from this study provide a foundational knowledge for future oral health education trainings in underdeveloped countries with limited resources.

Keywords: oral health education, oral hygiene, health promotion, vulnerable populations, public health interventions

This manuscript supports the NDHRA priority area, **Population level: Access to care** (vulnerable populations).

Submitted for publication: 7/9/18; accepted 12/5/18

Introduction

Oral diseases are a public health issue world-wide and are ranked as the most common and preventable non-communicable disease among children and adolescents.¹ The World Health Organization (WHO) estimates that dental caries affect 60% to 90% of school aged children,² and oral health issues contribute to a loss of 50 million school hours each year.³ Childhood dental diseases, such as dental caries and gingivitis can lead to physical pain and dysfunction; subsequently effecting a child's psychological and social well-being.¹

Oral health status inequities within a population are intensified by social, environmental, biological, behavioral,

cultural, economic, and political factors.⁴ Risk factors for oral diseases are increased due to consumption of foods and beverages containing high levels of sucrose, lack of fluoridated water supplies, poor oral hygiene habits, limited access to dental care, and limited oral health literacy.^{1,2,5,6} Social determinants leading to poor oral health are elevated among disadvantaged populations living in developing countries.⁵

Access to health care services on the country of Haiti is limited.⁷ Most medical and dental clinics are located in the country's capital of Port-au-Prince, creating access issues to available health care services for rural areas.⁷ According to a

2010 report from the United Nations International Children's Emergency Fund (UNICEF), an estimated 60% of individuals living in rural Haiti had no access to health care services.⁸

Haiti has the lowest dentist-to-population ratio in the Western hemisphere; with a ratio of 0.12 dentists per 10,000 residents to provide oral health care services.⁹ Economic and financial hardships present limitations for many Haitians and routine dental care is not a common occurrence.⁷ Lower rates of oral health literacy among Haitians and limited access to dental care increase the risk factors in children for developing oral diseases.⁷

The availability of current published peer-reviewed research on oral health related literature in Haiti, particularly regarding the oral health status of children and adolescents, is lacking. A national epidemiological study on dental caries in Haiti conducted in 1999, observed the oral status of 1,218 adolescent children at 12 and 15 years of age, noting the decayed, missing, filled surfaces (DMFS).⁹ Results from the study identified decayed or missing teeth in 30% of the 12 year-olds and 46% of the 15 year-olds.⁹ Decay rates were highest among rural participants as compared to those from urban areas.⁹ Additional gaps in the literature revealed no knowledge regarding implementation of school-based oral health programs and the influence of these programs.

Haitian culture places a high value on childhood education, with the vision that children are the foundation for Haiti's future.¹⁰ Children are influenced at a young age by positive health behaviors, and school can be an optimal setting for children to receive oral health information when it is integrated into the curriculum.^{1,3,11} Schools in underdeveloped countries can provide a useful platform for educating children about oral health promotion,¹¹ as an appropriate means for preventing future dental disease.^{1,3,11}

Schoolteachers in underdeveloped countries may have limited oral health knowledge and training, and thus be ill equipped to teach oral health education in the classroom, until receiving professional training on the subject.¹²⁻¹⁴ In addition, teachers often lack any oral health educational materials for this purpose.¹²⁻¹⁷ Training schoolteachers on how to implement oral health education by incorporating learning activities to the existing curriculum can be an inexpensive and feasible means for teaching children important oral health concepts.^{3,11,18} Improving teachers' oral health knowledge not only increases their ability to provide school-based oral health education, but can also lead to improved personal attitudes toward oral health and overall health behaviors.^{2,11,15-20} Effectively advancing the oral health knowledge of schoolteachers while also providing educational materials, may be achieved through teacher training sessions.^{11-14,21}

The perceptions of schoolteachers who have been trained to provide oral health education and their experiences teaching oral health education to students has not been extensively researched.^{11-14,21} Qualitative research may provide insight into the oral health problems and assist in identifying the barriers and opportunities for providing school-based oral health education programs to disadvantaged populations, such as the children of Haiti.^{22,23} The purpose of this study was to assess Haitian primary school teachers' knowledge and attitudes about oral health before and after attending a three day oral health educational training session and their perceptions and experiences of receiving and implementing oral health education in a Haitian classroom setting.

Methods

Borel, Haiti is nestled in the Artibonite Valley, approximately 36 miles north of Haiti's capital, Port-au-Prince. James Wallace School is located in Borel with over three hundred children enrolled in pre-kindergarten through sixth grade. At the time of this study, there was no oral health education being taught in classrooms at James Wallace School or the surrounding area.

This pilot study used a mixed methods design consisting of a quantitative, quasi-experimental, one-group pre/post-test following an oral health education intervention. Additionally, a qualitative, phenomenological approach was employed to assess participant experiences, after six-weeks of implementing oral health education in the classroom. A non-probability, purposive sample of schoolteachers was chosen for the study; which included primary grade teachers who speak Haitian Creole as their primary language, teach at James Wallace School, and live in Borel, Haiti, or in the surrounding areas.

This study was approved by the Massachusetts College of Pharmacy and Health Sciences (MCPHS) University's Institutional Review Board (IRB), IRB022715R. Written and verbal consent in the Haitian Creole language was provided and secured from the participating teachers prior to the start of the study.

A dental professional provided oral health education to the study participants over the course of one week, using a Haitian Creole interpreter. Participants attended a total of three, two-hour oral health educational sessions and also received oral health-related promotional and educational classroom materials appropriate for children 5-12 years of age. Following the completion of the training sessions, study participants were asked to provide oral health education in the classroom over a six-week period of time.

The topics, presented orally in two-hour training sessions over three-days, were aligned with the recommendations for

school oral health education established by the WHO^{19,21} and also included handouts in Haitian Creole. Hands-on demonstration methods were used, and schoolteachers had opportunities to practice teaching techniques using dental models including a child's storybook about dental and body hygiene, a flannel graph for younger children, a magnet board with a variety of enlarged pictures for dental health education. Participants were provided with grade-appropriate health promotional posters; one set of materials was designed for pre-kindergarten through third grade and another for fourth through sixth grade.¹⁹ All educational materials used for the demonstration segment were donated to the school for teacher use.

A questionnaire, developed and validated by Haleem, et al.²⁴ was administered for data collection prior to and following the schoolteacher participants' completion of the oral health educational training modules. The twenty-item questionnaire was translated into Haitian Creole; six additional demographic questions were completed at the time of the pre-test assessment. The pre- and post-test questionnaire included six attitude-based questions, and 14 dental health knowledge questions.

Following the oral health educational intervention, participants implemented the oral health education sessions consisting of three basic oral health lesson plans, in their classrooms over a six-week period. Qualitative data was collected, six weeks following the oral health education implementation, using a two-hour semi-structured focus group session, and consisting of six open-ended questions with a Haitian Creole interpreter present as a translator. In addition, the primary investigator (PI) took field notes and used a digital audio recording device during the focus group interviews to ensure reliability in transcription when evaluating the phenomenological data.

Responses to the 14 dental health knowledge-based pre- and post- intervention questions were enumerated in the form of descriptive statistics. Mean scores (out of 100%) were enumerated over the study population, with exact binomial 95% confidence intervals. Mean responses to the six attitude-based Likert scale questions (strongly disagree -2 to strongly agree +2:) were enumerated, mean differences in pre and post responses were enumerated with 95% Wald confidence intervals.

Field notes and audio-recorded transcription were compared for accuracy to ensure data credibility for the qualitative findings. The CREATIVE approach described by Pitney and Parker²⁵ was employed to analyze the discussions from the focus group, and to identify emergent themes. CREATIVE, is an acronym for: *consider* the research questions and purpose: *read* through the transcripts to gain a better

sense of the data: *examine* data for important information related to the research question: *assign* labels to each unit of information that capture their meaning: *thematize* the data: *interpret* themes as they relate to the study's research question and purpose statement: *verify* the findings: and *engage* in the writing process to describe the findings.²⁵

Results

Ten Haitian schoolteachers from the James Wallace School were recruited for the study and all agreed to participate in the oral health education training sessions and the six-week follow-up focus group session. One participant was excluded from the final analysis as a result of not meeting inclusion criteria (being a teacher at James Wallace School). Data were collected from the pre- and post-test outcomes, as well as the focus group responses of the study population (n=9). The mean age of the participants was 42.1years; one-third of the participants were male.

Pre-and Post-Test Questionnaire

Table I presents the 14 dental health knowledge-based questions from the pre- and post-test. The Haitian schoolteachers' overall mean test scores improved from the pre-test (70%) to the post-test (78%). Dental health attitudinal question responses to the six Likert scale items shifted in a positive direction as indicated in the pre- versus post-test results (Table II).

Focus Group Themes

The results from the study's focus group provided knowledge on the perceptions and experiences of the Haitian schoolteachers who attended the oral health education training intervention, and the implementation of the oral health education curriculum into their classrooms. Qualitative findings in the study revealed two major themes; confidence and empowerment and improved oral health knowledge and hygiene behavior. Emerging themes described how the oral health education training and curriculum advanced participants' knowledge confidence on the subject, and fundamentally motivated the students to learn about oral health as well as a desire to improve their own oral health. The following themes reflect the participants' perceptions and experiences with the oral health education training intervention and the implementation of the oral health education curriculum in the classroom.

Theme 1: Confidence and Empowerment

Participants discussed the sense of confidence and empowerment the oral health education curriculum created for their professional growth. The oral health education training

Table I. Dental health knowledge questions (n=9)

Question	Correct Responses Pre-test (%)	Correct Responses Post-test (%)
1. Do you think that tooth cleaning is a part of general body cleanliness?	8 (89%)	9 (100%)
2. Is it easy for you to clean your teeth at bedtime every day?	7 (78%)	9 (100%)
3. How many times in one day do you clean your teeth?	9 (100%)	9 (100%)
4. What do you use to clean your teeth?	9 (100%)	9 (100%)
5. Do you use anything containing tobacco?	9 (100%)	9 (100%)
6. At what age does the first permanent molar tooth erupt in a human's mouth?	0 (0%)	7 (78%)
7. What is the total number of milk teeth in a human's mouth?	1 (11%)	3 (33%)
8. What is the total number of permanent teeth in a human's mouth?	8 (89%)	8 (89%)
9. Which of the following is the most important thing to be included in a toothpaste or miswak for healthy teeth?	7 (78%)	8 (89%)
10. What is the most common cause of gum disease?	6 (66%)	2 (22%)
11. What is the first most important sign of gum disease?	6 (66%)	6 (66%)
12. What is the most important sign of tooth decay?	4 (44%)	2 (22%)
13. Which of the following pair of preventive measures can protect you from tooth decay?	9 (100%)	8 (89%)
14. Consuming tobacco-containing products cause which of the following pair of diseases?	5 (56%)	9 (100%)
	Average Score Pre-test*	Average Score Post-test*
	70% (62%, 77%)	78% (67%, 89%)

*95% confidence interval

sessions enabled teachers to develop skills and willingness for implementing the oral health education curriculum in the classroom. The majority of the schoolteachers expressed an ability to confidently teach and answer oral health questions from the students. Participant 6 exclaimed, "I [teach the way] you taught us, to the kids." Participant 9 stated, "Every question that they ask, [the teachers] know the answer to it."

Participants expressed feeling comfortable with the oral health module because they had picture visuals and hands-on models aligned with the curriculum. Participant 2 explained, "It was very helpful because I have the pictures. If I am

talking about cavities, I can show the kids the cavity and the tooth and how to take care of it." Participant 1 added, "I feel comfortable because I was teaching the kids how to brush their teeth and stuff like that and I also have the materials to show them the pictures."

Theme 2: Improved Oral Health Knowledge and Motivation

When participants were asked if the oral health training sessions met their expectations to prepare them on the topic of oral health, the schoolteachers unanimously agreed they learned new techniques on how to prevent decay. Participant 6 noted, "You taught me how to brush teeth well enough to prevent cavities."

Additionally, participants believed the students learned about oral health and disease prevention from the oral health education curriculum. Participant 2 stated, "[The students] learned how many teeth they have and to prevent cavities, not to eat a lot of sugar, coke and stuff like that." Participant 9 added, "They know when a tooth is happy and when a tooth is sad and they smile." Participants stated that several students inquired about their own concerns for their bleeding gingiva or tooth pain and the teachers were able to explain how to prevent gingival bleeding. Participant 7 stated, "In my class, I find like eight students that have problems like gums bleeding and pain in their teeth and I taught the students how to prevent these things, how to get rid of it and how to brush and not bleed."

Participants collectively noted when using picture visuals and hands-on materials, the students were motivated to learn. Participant 4 noted, "When the students saw the materials they were very happy, they like the pictures." Participants expressed that students were excited to tell the teachers that they had brushed their teeth. Participant 9 noted, "Every morning the students come up to me and say, "Oh, look, look, I brushed my teeth last night!"

Table II. Responses to Likert-scale* Dental Health Attitude Statements (n=9)

Statement	Pre-Training Mean Rating (SD**)	Post-Training Mean Rating (SD**)	Mean Difference (95%CI***)
Dental health education is the job of the dentist and has got nothing to do with the teachers/peer leaders.	-0.63 (1.06)	-0.57 (1.13)	0 (0,0)
No matter how careful a person may be, he/she is bound to lose teeth in old age.	0.71 (1.25)	-1.33 (1.32)	-1.86 (-3.58,-0.13)
In order to have a healthy body one must have healthy teeth.	0.44 (1.24)	1.67 (0.50)	1.22 (0.38, 2.06)
Tooth cleaning should be a part of daily body cleaning activities.	1.67 (0.5)	1.56 (0.53)	-0.11 (-0.57, 0.38)
Dental check-ups can be carried out in classes by teachers or trained peer leaders on a routine basis.	1.11 (0.93)	1.56 (0.53)	0.44 (-0.33, 1.22)
Teeth can remain healthy throughout one's life if proper preventive measures are taken.	0.22 (1.48)	1.78 (0.44)	(0.40, 2.72)

* -2= strongly disagree, -1= disagree, 0= neutral, 1= agree, 2=strongly agree

** Standard deviation

*** Wald confidence interval

Conclusions drawn from the focus group noted a readiness to continue implementing the oral health curriculum module in the classroom. Participant 6 stated, “Yes, I am ready to continue teaching this oral health education curriculum.” Additionally, participants expressed they want more training in oral health education. Participant 2 agreed, “Yes, we want more knowledge.” The schoolteachers discussed the need to have more oral health educational resources to support their teaching efforts. Participant 3 explained, “I would suggest each of us have our own picture materials, that way we don't have to wait for others to take a turn.”

Discussion

A number of international studies have shown that implementing teacher-led oral health education at the primary and secondary grade levels is both a feasible and effective method for improving the oral health knowledge and oral health status of school-aged children worldwide.¹⁸⁻²⁰ Training schoolteachers to integrate oral health education with dental health promotional materials in the classroom has also been shown to improve personal oral health knowledge and demonstrate positive shifts in attitudes, which in turn has a positive impact on students.^{12-14,19} The intervention in this study provided training to Haitian primary school teachers, pre-kindergarten through sixth grade, with the goal of introducing and encouraging the implementation of an oral health education curriculum in the classroom. Similar to findings in previous studies,^{12-14,19} improvements were noted in the Haitian schoolteachers' oral health knowledge and attitudes as a result of attending the training intervention.

Although this study did not measure the effects of the oral health education program on Haitian school children, the intervention provided a sufficient route for Haitian students to receive appropriate teacher-led oral health education using relevant visual aids and other hands-on educational materials. Future endeavors to measure the effects of teacher-led oral health education on Haitian school children's oral health knowledge and practices, should benefit from this initial research determining the efficacy of teacher oral health education training.

A knowledge response from the dental health questionnaire should be further evaluated. Item number ten inquired about the most common cause of gingival disease. A majority of the respondents answered this question incorrectly (88%, n=7) on the post-test. This incorrect response could be due to the overall volume and content of the oral health education during the training intervention, or due to a focus on dental caries etiology and prevention. Future education interventions should address the need for more clarity in this area.

Previous studies utilizing oral health education seminars or workshops for training school teachers on school-based oral health education have echoed consistent outcomes of improvements in teachers' oral health knowledge and attitudes.^{12-14,19} Similarly, the intervention applied in this study produced quantitative data reflecting overall improvements in teachers' oral health knowledge as well as a change in their attitudes toward oral health.

Qualitative data gathered from the focus group session in this study adds to the depth of emerging information known regarding teacher-led oral health education in underdeveloped countries, specifically Haiti. The information gained by the Haitian schoolteachers and the feeling of empowerment from the training, may have a positive impact on the oral health behaviors of current and future Haitian students receiving the teacher-led oral health education module. Ramroop, et al.¹⁶ described barriers to implementing a teacher-led oral health education curriculum resulting from limited teacher training and a lack of educational materials. Holding three separate training sessions that were two hours in length and the use of visual display materials allowed for increased learning in this education intervention. Participants in this study suggested improving training sessions by offering oral health education sessions over the summer vacation to allow for more training time. Based on this feedback, it may be advisable for future training opportunities to take place during the summer timeframe. An additional classroom implementation barrier identified by the participants was only having two sets of grade appropriate picture visuals and hands-on dental models available for teaching the curriculum. Analysis of these comments suggest the need for additional reproduction of the picture visuals and hands-on dental models for different age groups and academic levels for future oral health education training sessions.

Limitations

Generalizing the results from this study are limited by several factors, including the lack of a control group, the application of a non-probability, purposive sample, and the small sample size (n=9). This study's pre- and post- test questionnaire applied a Likert-type scale for six questions measuring oral health attitude. In Haitian culture, a Likert-type scale rating is not a common scale for answering questions. Unfamiliarity with this type of scale may have skewed some of the results. The school setting also provided a limitation, as there was no electricity for presenting video or computer based educational recordings during the intervention. Additionally, due to the nature of a focus group, participants may have not felt comfortable sharing their perceptions in front of others and therefore, bias may exist among the participants' responses. Lastly, the short follow-up time of six weeks post- intervention and one focus group does not determine the sustainability of the school's implementation of the oral health education curriculum.

Conclusion

In conclusion, the quantitative results from this study were consistent with previous studies, confirming that training schoolteachers to integrate oral health education

in the classroom can be an effective method for improving personal oral health knowledge and attitudes. Evaluating the schoolteachers' perceptions and experiences with the oral health education training intervention, and implementation into the classroom has provided foundational knowledge for improvement in future oral health education trainings. Although this study did not evaluate the overall effects of the teacher-led oral health education of the Haitian school children, it provides information regarding the success and barriers to Haitian schoolteacher training and the implementation an oral health education curriculum. Further research is needed to determine the benefits of the teacher-led oral health education on primary school aged children in Haiti.

Acknowledgements

The authors would like to acknowledge the missionaries of Project Help Haiti, Borel, Haiti for their hospitality and assistance with communication during the intervention process of this study; and extend thanks to Dianne Smallidge, RDH, EdD for assisting in the thesis manuscript preparation, Christine Dominick, CDA, RDH, MEd for serving as a reviewer on the thesis committee, and Andrew Rothman, MS, EIT for his assistance in statistical analysis of the demographic data.

Lydia A. Rosado, LDH, MSDH, MPH is an adjunct faculty member in the dental hygiene program, Indiana University, South Bend, IN; *Lori Rainchuso, RDH, DHSc* is an associate professor in the doctorate of health sciences program, Massachusetts College of Pharmacy and Health Sciences University, Boston, MA.

Corresponding author: Lori Rainchuso, RDH, DHSc;
Lori.Rainchuso@mcphs.edu

References

1. World Dental Federation. Oral health worldwide [Internet]. Geneva; FDI World Dental Federation; 2015 [cited 2015 Jan 3]. Available from: <https://www.fdiworlddental.org/resources/white-papers/oral-health-worldwide>
2. Petersen PE, Bourgeois D, Ogawa H, et al. The global burden of oral disease and risks to oral health. Bull World Health Organ. 2005 Sep;83(9):661-69.
3. Kwan SY, Petersen PE, Pine CM, Borutta A. Health-promoting schools: an opportunity for oral health promotion. Bull World Health Organ. 2005 Sep;83(9):677-85.

4. Naghibi Sistani MM, Yazdani R, Virtanen J, et al. Determinants of oral health: Does oral health literacy matter? *ISRN Dent*. 2013 Mar 13; 249591.
5. World Health Organization. Oral health: oral health information [internet]. Geneva; World Health Organization; 2018 [cited 2015 Jan 3]. Available from <https://www.who.int/news-room/fact-sheets/detail/oral-health>.
6. Bagramian RA, Garcia-Godoy F, Volpe AR. The global increase in dental caries. A pending public health crisis. *Am J Dent*. 2009 Feb;22(1):3-8.
7. Estupinan-Day S, Lafontant C, Acuna MC. Integrating oral health into Haiti's national health plan: from disaster relief to sustainable development. *Rev Panam Salud Publica*. 2011 Nov;30(5):484-9.
8. United Nations International Children's Emergency Fund. At a glance: Haiti [Internet]. New York; United Nations; 2013 [cited 2015 Jan 3]. Available from: https://www.unicef.org/infobycountry/haiti_2014.html.
9. Psoter WJ, Saint Jean HL, Morse DE, et al. Dental caries in twelve - and fifteen -year-olds: Results from the basic oral health survey in Haiti. *J Public Health Dent*. 2005 Fall;65(4):209-14.
10. Doucet F. Arrested development: how lack of will cripples educational reform in Haiti. *J Haiti Stud*. 2012 Spring;18(1):120-50.
11. Jurgensen N, Petersen PE. Promoting oral health of children through schools-results from a WHO global survey 2012. *Community Dent Health*. 2013 Dec;30(4):204-18.
12. Dedeke AA, Osuh ME, Lawal FB, et al.. Effectiveness of an oral health care training workshop for school teachers: a pilot study. *Ann Ib Postgrad Med*. 2013 Jun;11(1):18-21.
13. Fernando S, Kanthi RD, Johnson NW. Preschool teachers as agents of oral health promotion: an intervention study in Sri Lanka. *Community Dent Health*. 2013 Sep;30(3):173-7.
14. Seman K, Yaacob H, Hamid AM, et al. Evaluation of a training programme for non-public health professionals as oral health educators. *Malays J Med Sci*. 2008 Apr;15(2):33-8.
15. Hv A, D'Cruz AM, Shirahatti RV. Knowledge, attitude and practice regarding oral health among the rural government primary school teachers of Mangalore, India. *J Dent Hyg*. 2013 Dec;87(6):362-9.
16. Ramroop V, Wright D, Naidu R. Dental health knowledge and attitudes of primary school teachers toward developing dental health education. *West Indian Med J*. 2011 Oct;60(5):576-80.
17. Sekhar V, Sivsanker S, Easwaran MA, et al. Knowledge, attitude and practice of school teachers towards oral health in Pondicherry. *J Clin Diagn Res*. 2014 Aug 20;8(8):ZC12-5.
18. Chapman A, Copestake SJ, Duncan K. An oral health education programme based on the national curriculum. *Int J of Paediatr Dent*. 2006 Jan;16(1):40-4.
19. Petersen PE, Peng B, Tai B, et al. Effect of a school-based oral health education programme in Wuhan City, Peoples Republic of China. *Int Dent J*. 2004 Feb;54(1):33-41.
20. Yazdani R, Vehkalahti MM, Nouri M, Murtomaa H. School-based education to improve oral cleanliness and gingival health in adolescents in Tehran, Iran. *Int J Paediatr Dent*. 2009 Jul;19(4):274-81.
21. Kwan S, Petersen PE. Oral health promotion: an essential element of a health promoting- school [Internet]. Geneva; World Health Organization; 2003 [cited 2015 January 3]. Available from https://www.who.int/oral_health/media/en/orh_school_doc11.pdf
22. Edmunds S, Brown G. Doing qualitative research in dentistry and dental education. *Eur J Dent Educ*. 2012 May;16(2):110-17.
23. Gill P, Chestnutt IG, Channing D. Opportunities and challenges to promoting oral health in primary schools. *Community Dent Health*. 2009 Sep;26(3):188-92.
24. Haleem A, Siddiqui MI, Khan AA. School-based strategies for oral health education of adolescents-a cluster randomized controlled trial. *BMC Oral Health*. 2012 Dec;18;12:54.
25. Pitney WA, Parker PJ. Qualitative research in physical activity and the health professions. Champaign: Human Kinetics; c2009. Chapter 4, Collecting and analyzing qualitative data. p. 54-8.