

DENTAL CARIES HEALTH PROMOTION INTERVENTION IN ABU DHABI AMONG YOUNG CHILDREN

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ABSTRACT

Background: Dental caries is a considerable public health problem in young children (age 12 years and below) in the United Arab Emirates (UAE) The aim of this work is to design a health promotion intervention aiming to reduce the prevalence of dental caries in Abu Dhabi children aged 6 years and below. If the intervention showed evidence of success this intervention can be generalized to the whole UAE.

Materials and Methods: Literature review was done to discuss the prevalence of dental caries and its determinants. Based on the findings, a health promotion intervention plan was proposed together with an implementation proposal and an evaluation plan.

Expected Result: Reduction of dental caries prevalence is expected among Abu Dhabi young children (6 years and below) and an increase in awareness about oral hygiene practice and eating habits among Abu Dhabi pregnant and new mothers are expected if this program was implemented properly.

Conclusion: There is high prevalence of dental caries and its risk factors in the UAE including Abu Dhabi. This will have an increasing economic and health impact on the UAE. Preventing dental caries and controlling its risk factors by a well-developed health promotion program will help to change the current situation to the desired outcome which is the reduction of dental caries dmft (decayed, missing and felt primary teeth) and prevalence in UAE children.

Keywords: health promotion intervention; Dental caries; children, United Arab Emirates.

1.0 Introduction

1.1 The importance of oral health

Oral health is one of the main components in defining overall health and quality of life¹. The number one chronic disease affecting young children is dental caries (cavities)². Primary teeth are crucial to young children. They are as important as the permanent teeth to children and adults. These primary teeth have many functions. They serve in chewing, speaking, child's aesthetic, self-esteem, and saving space for the future permanent teeth. Several studies have shown that healthy primary teeth are the foundation for healthy permanent teeth^{3,4}. Dental caries can cause many problems. It can cause pain, discomfort, and can affect children's ability to communicate, and learn. Moreover, a recent study showed that about 50 million school hours are lost annually because of oral health⁵. Other studies showed that children with severe caries have less weight and show evidence of failure to thrive compared to a control group⁶.

1.2 Dental caries among young children in developing and developed countries

Over the last few decades evidence showed that dental caries level have decreased in industrialised countries.⁷ For example: In Italy (Sardinia), the mean DMFT (Decayed, Missing and Felt teeth for permanent teeth) in 12 years old children declined from 4.3 - 3.1 in 1989 to 0.8 - 1.5 in 2004⁸. In Switzerland the mean DMFT of 12-year-old children decreased from 7.9 in 1964 to 0.84 in 1996⁹.

The reasons for this were searched by Petersson and Bratthall in a literature review. They found that the use of fluoride in its different forms (e.g toothpaste, mouth rinse, fluoride foam, gels ...etc) contributed most significantly to the decline in the prevalence of dental caries. Other factors like: introduction of dental health education programmes, decreased sucrose consumption, dental awareness, improved preventive approaches in dental clinics, increased availability of dental resources, also played a role in the reduction of dental caries prevalence^{10,11}.

However, the picture for dental caries varies from country to country in the developing world. For example, a recent literature review done in Saudi Arabia showed that the mean (decayed, missing and filled primary teeth) dmft was 5.0 for Saudi children¹². In Kuwait in 2006 a mean dmft of 4.6 was reported for 6-year-old children¹³. In Malaysia the 2005 Oral Health Survey of Preschool Children found that more than half (55.8%) of the 5-year-old children had three or more deciduous teeth affected by caries and more than a quarter (25.3%) of them had more than 10 dmft (dmft > 10)¹⁴. In Nepal the picture is different. The prevalence of dental caries in 5- to 6-year-olds is 52% with a mean of dmft of 1.59¹⁵.

1.3 Dental caries determinants

The determinants of dental caries have been widely studied. A lot of factors are now well known to have a direct contribution to the development of dental caries in children. The risk factors for dental caries in children have been classified by the American Academy of Pediatrics into the following categories: (1) Social/Environmental Characteristics: low socioeconomic status, having limited or no dental insurance or dental access, insufficient exposure to fluoride, family history of dental caries and high level of a bacteria called

Streptococcus mutans in parents' mouth (2) Physical Characteristics: special needs children, low birth weight, inflammation of the gingiva, some chronic oral conditions, and high amount of plaque on the hard tissue of the mouth. (3) Behavioral risk factors: poor diet and oral hygiene habits.¹⁶

In the UAE Al-Bluwi in her literature review identified some risk indicators that have an association with dental caries in UAE young children (nationals and non-nationals). Some of these factors are: being a male in primary teeth age group, being a female in permanent teeth age group, less educated mothers, high-income families, low-income families, high snack consumption level and utilising dental services only when there is pain.

1.4 Dental caries in the UAE

A recent literature review done by Al-Bluwi in 2014¹⁷ showed that dental caries is a considerable public health problem in young children (age 12 years and below) in the United Arab Emirates (UAE). In Abu Dhabi the prevalence of dental caries in children 6 years old was between 78.85% and 95% with dmft range 5.1–8.4. The picture in Ajman is almost the same. The prevalence of dental caries in Ajman was found to be between 72.9% and 76.1% with dmft range 4.4–4.5. The difference in the dmft range between Ajman and Abu Dhabi is observed because of one study done in Abu Dhabi in 1998 by Al-Hosani and Rugg-Gunn¹⁸ which estimated the dmft to be 8.4. This dmft was high because only children born in the UAE were included in the sample, which excluded many children born outside the country. The Author concluded that “the prevalence of dental caries in the UAE is high with no evidence of decline. The World Health Organization 2000 goals are still unmet for UAE children” (the WHO goal is that 50% of 5–6 year olds would be free of dental caries in 2000)¹⁹.

1.5 The UAE and the dental caries preventive efforts

Dental caries is still one of the most prevalent health problems in the UAE²⁰. The largest preventive oral health programme in the UAE was done in Sharjah in 1995-1996 and focused mainly on individual education and availability of fluoride to schools children²¹. This program was advised by WHO consultants. The programme was established because of the alarming fact that dental caries in the UAE was increasing, that most carious lesions in children were untreated and little preventive activity had been carried out. The Emirate of Sharjah had the largest and most comprehensive programme, which contained many of the elements of a successful preventive programme. In this program every school in Sharjah were asked to do daily oral health education and tooth brushing sessions. Television programmes on oral health, newspaper cartoons and booklets on dental health were also available²². This was followed by numerous programmes and projects, ranging in their scale and focus, within each emirate and by some dental schools, which mainly focused on tooth brushing and the importance of fluoride^{23 24}. This large preventive programme did not work because it only concentrated on oral hygiene practice. Dental caries is a multifactorial disease and oral hygiene is only one factor that contributes to its development. Diet practice, type of snacks, frequency of eating and unfavourable infant feeding practice are as important as tooth brushing and these are influenced mostly by cultural background and mother's education. Thus, the challenge is to address this fact in a country with a multicultural background like the UAE. Another point is that access to dental services and fluoridated toothpaste may have been masked as counteracted by greater access to high sugared food and drinks. AL-Bluwi in

her literature review suggested that in the future, preventive dental caries programmes should focus on the mother during pregnancy and after birth to promote a more positive attitude towards oral health and diet habits.

1.6 Rationale of choosing this subject

- a. The prevalence of dental caries in the UAE children is high with no evidence of decline.
- b. The World Health Organization 2000 goals are still unmet for UAE children.
- c. In Abu Dhabi the prevalence of dental caries was between 78.85% and 95% with dmft range 5.1–8.4 in 1998 and 2002 respectively.
- d. This high prevalence of dental caries and its risk factors in the UAE including Abu Dhabi will have a negative economic and health impact on the UAE.
- e. Many preventive efforts were done in the UAE to reduce the prevalence of dental caries but with no evidence of success.
- f. Oral health is one of the top 10 health priorities for the Health Authority of Abu Dhabi²⁵.

The suggested health promotion program may play a role in the reduction of dental caries among UAE children aged 6 years and below. If this program showed evidence of success it can be generalized to the rest of the UAE emirates.

2.0 Materials and Methods

To guide the process of planning of this health promotion program the THCU planning model was used²⁶. THCU planning model was developed by The Health Communication Unit (THCU), University of Toronto. This model is based on 6 key steps. Step 1: Pre-planning & Project Management. Step 2: Is to conduct a Situational Assessment. Step 3: Establishing goals, objectives and identifying the target population. Step 4: Developing strategies, activities and resources Step 5: Developing Indicators Step 6: Reviewing the Program Plan.

The situational assessment was made by conducting a literature review about the prevalence of dental caries and its determinants in the UAE in general and in Abu Dhabi in particular (normative need). Data were collected from the various published studied in in PubMed, Academic Search Complete, Google, and the list of reference in relevant articles. Four keywords were used in the search: "dental caries," "epidemiology," "prevalence," and "UAE." All studies conducted in the UAE in general or any single emirate that sheds light on the prevalence of dental caries of children under 13 years were included in the literature review. The felt need is to be achieved by doing a cross sectional study to know the level of awareness of new and pregnant mothers living in Abu Dhabi about oral hygiene and diet practices.

The planning model PRECEDE- PROCEED was applied to be able to use more than one theory and address multiple levels of the dental caries problem in Abu Dhabi young children. By using this model interpersonal, intrapersonal and community levels were involved in the health promotion program. Multiple strategies were used as well.

There were no comprehensive dental health promotion programs conducted in the UAE published except for one done in Sharjah in 1995-1996 which focused mainly on individual education and availability of fluoride to schools children²⁷.

The planned programme is the first comprehensive dental caries preventive program in the UAE. The new in this program is that:

- This will be the first oral health promotion program in AD addressing three levels(interpersonal, intrapersonal and community levels) at the same time
- Mother education and dental school visits will be addressed for the UAE residents for the first time
- An annual cross sectional study is to be conducted to assess the prevalence of dental caries in AD in a randomly selected representative sample. All the previous cross sectional studies done in AD were either non representative or had other weakness²⁸. This annual cross sectional study will try to overcome the previous studies' weaknesses.
- By law schools will not be allowed to have soft drinks, sweets, unhealthy foods and snacks vending machines in their premises.

3.0 Project plan

3.1 Needs assessment

Normative need

The prevalence of dental caries in the UAE children is high with no evidence of decline. The World Health Organization 2000 goals are still unmet for UAE children. In Abu Dhabi the prevalence of dental caries was between 78.85% and 95% with dmft range 5.1–8.4. This high prevalence of dental caries and its risk factors in the UAE including Abu Dhabi will have a negative economic and health impact on the UAE. However, many preventive efforts were done in the UAE to reduce the prevalence of dental caries but with no evidence of success. From all of the above reasons a strong program is needed that will raise the awareness among mothers and children about how to have healthy teeth to tackle this issue.

Felt needs

The awareness of new and pregnant mothers living in Abu Dhabi about oral hygiene and diet practices needs to be assessed. This will be done by a cross sectional study. Sample will be randomly selected from obstetric and pediatric clinics at private and public hospitals/clinics. Attachment 1 is a suggested survey to be used in the cross sectional study. It is divided into two sections. Section one collects data about the participants' demographic and socioeconomic status. Section 2 collects data about participants' perceptions, opinions, beliefs, and attitudes towards early childhood caries. These data will be used to establish baseline information about the knowledge on oral hygiene and eating habits among Abu Dhabi pregnant and new mothers (new mother is a female with a child less than one year old). Some demographic and oral health data about Abu Dhabi residents are important to be acquired by the health program planner before the establishment of the program activities.

Details about what type of data is needed are found in table 1. These data will help in the implementation and evaluation of the program.

Table 1: Demographic and oral health data of Abu Dhabi residents required for the Dental carries health promotion programme

	Data needed	
	Category of Data	Data found/ Data needed
1	Demographic Data How many children are eligible for the program (number of children aged 6 years and below)? Number of pregnant and new mothers (new mother are women with a child less than one year old).	
2	Community Oral Health Status Prevalence of dental caries? Annual visit to dentist/dental clinic in last year? Prevalence of patient who have undergone dental cleaning in the last year?	
3	Dental Care Number of dentists in Abu Dhabi?	
4	Insurance % of population who are uninsured for dental care	
5	Prevention Programs Are there any ongoing formal dental prevention programs?	

3.2 Goal:

Reduce the prevalence of dental caries in Abu Dhabi children aged 6 years and below.

3.3 Objectives:

- To establish baseline data about oral hygiene and eating habits among Abu Dhabi pregnant and new mother within the first 3 months of the project.
- To increase awareness about the oral hygiene practice and eating habits among Abu Dhabi pregnant and new mother by 60% from the baseline at the end of April 2020.
- Reduce the prevalence of dental caries in Abu Dhabi children aged 5-6 years from 78-95% to 50-60% by the end of December 2020.
- Reduce the mean dmft index from 5.1–8.4 to 3 in children aged 5-6 years by the end of December 2020.

3.4 Target group:

Primary target:

- Children living in Abu Dhabi aged 6 years and below
- New and pregnant mothers living in Abu Dhabi

Secondary target:

- The whole population.

3.5 Strategies:

Ottawa Charter Actions²⁹ are going to be used in this health promotion program:

- Build Healthy Public Policy
- Create Supportive Environments
- Strengthen Community Action
- Develop Personal Skills
- Reorient Health Services

3.6 Model and theory:30

For individual level the health belief model is going to be used.

The program aims to magnify awareness among pregnant and new mothers about poor oral hygiene and eating habits. Poor oral hygiene and eating habits which are highly dependent on the mother's behavior will lead to risk for their children. The mothers must realize this risk internally and that it is not random but specific to that health behavior.

This model emphasizes that dental caries in young children is determined by the mothers' perceptions regarding:

- Perceived susceptibility: mothers will follow a good oral hygiene and eating habits for their children when they accept that, though the primary teeth are replaceable, dental caries on primary teeth will have psychological, social, health, physical and economic impact on them and on their children.
- Perceived severity: mothers must understand that dental caries in primary teeth will have psychological, social, health, physical and economic impact on them and on their children.
- Perceived benefits: following good oral hygiene and eating habits will reduce the risks.
- Perceived barriers: mothers identify the barriers of following good diet for their children and using proper oral hygiene habits. They must identify, as well, why they don't take their children to the dentist for checkups and prophylaxis.
- Cues to action: Print materials, reminder letters, advices from gynecologists or pediatricians might encourage mothers to consistently follow the recommendations of proper diet and oral hygiene habits.
- Self-efficacy: mothers must have the confidence that they can have their children free of caries. This can be achieved by sharing successful stories of mothers with children with no caries experience.

For interpersonal level the social cognitive theory (SCT) is going to be used.

According to this theory three main factors affect the likelihood that a person will change a health behavior: (1) self-efficacy, (2) goals, and (3) outcome expectancies. Observation is a key factor in this model. According to this theory when individuals observe a model performing a behavior and its consequences, they learn the behavior and use the information to guide subsequent behaviors.

For community level the community organization model is going to be used.

In this model community groups help in identifying common problems, mobilize resources, develop and implement strategies to reach common goals.

3.7 Stakeholders

Stakeholders	Why
Ministry of Education	It has a big responsibility on encouraging schools and kindergartens to have oral hygiene instructions in their curriculums
HAAD (Health Promotion Committee)	They have important responsibilities in the implementation of many of the project activities.
SEHA	It supports the project to ensure health awareness in the population.
Health Insurance Companies	They support the project, benefit from the outcomes of the project
Dental schools	Dental students will play an important role in delivering dental preventive measures (oral hygiene education, oral prophylaxis, fluoride application and fissure sealant) to the children (4-6 years old in KG1 KG2 and grade 1 students). This will provide benefit to both the dental students and the children. (Dental students will practice and have experience on community dentistry and children will have the treatment.) Dental students will help in making the posters and other dental health education materials.
Abu Dhabi main TV channel	It will help in distributing the message that we need to deliver to Abu Dhabi residents.
Sponsors	They provide funding to the program
Team leader and members	The organizers of the program, advocates of health promotion

3.8 Budget

To determine the budget needed for this health promotion program, a group of human resources and expertise in business are needed. This must be done before the establishment of the program.

3.9 Timeline:

Attachment 2 shows the GANTT chart for the program. The program will start on 1st January 2015 and end on 31st December 2020. So the total length of the program will be 6 years. This will give a total of six years to measure the effect of this health promotion program on children. The dental caries (dmft and prevalence) will be measured at the end of the year 2015 for children 5-6 years old and then it will be measured again after 5 years in children 5-6 years old at the end of year 2020. This will show us the effect of mother education, changes in the environment, changes in the health policies and the involvement of the community on the oral health of children after five years of the implementation of this program.

3.10 Barriers

- Addressing objective one which is “To increase awareness about the oral hygiene practice and eating habits among Abu Dhabi pregnant and new mother by 75% from the baseline at the end of April 2020” in a country with a multicultural background like the UAE.
- The great access to high sugared food and drinks by all Abu Dhabi residents (children and adults). May mask, even reverse the effect of the program’s preventive efforts.
- Lack of support from stakeholders (because of the unawareness of the importance of oral health).

4.0 Implementation

The main strategies for implementing the plan are: influencing community action, changing the environment, developing personal skills, reorienting health services and making new health policies.

Objective 1: To establish baseline data about awareness of oral hygiene and eating habits among Abu Dhabi pregnant and new mother within the first 3 months of the project.

Strategy 1: Conduct a cross sectional study (survey)

Activity 1.1: A cross sectional study will be conducted to know the level of oral hygiene and eating habits awareness among AD pregnant and new mothers. A list of all hospitals and clinics (private and public) in AD Emirate will be obtained from HAAD and SEHA. Then by a help of a biostatistician (x) number of clinics will be chosen randomly. Those clinics will have volunteers, nurses and receptionists to distribute a questionnaire to pregnant and new mother in obstetric clinics and pediatric waiting rooms. The biostatistician will determine, as well, the number of questionnaire needed to have a proper sample size. A single questionnaire will take around 15-25 minutes to be completed (see attachment 1³¹).

Model: Community organization model

Measures: Number of pregnant and new mothers participated in the survey

Resources: Human: volunteers to distribute the surveys to different health institutes, receptionists and nurses.

Strategy 2: Collect, analyze and communicate data

Activity 2.1: Collect awareness survey data and other required data (specified in table 1) including demographic information on household income, educational level, age, ethnicity and profession. Then analyze these data. These data will go primarily on a descriptive analysis to find correlation between demographic data and measures of oral health (dental caries prevalence and dmft). In a later stage inferential statistics will be made.

Activity 2.2: Communicate the survey results and their importance with the stakeholders as providing a baseline to proceed to the next step which is awareness campaign.

Model: Community organization model

Measures: Number of stakeholders informed about the results

Resources: Human: statisticians, health promotion planning group.

Objective 2: To increase awareness about the oral hygiene practice and healthy eating habits among Abu Dhabi pregnant and new mothers by 60% from the baseline at the end of April 2020.

Objective 3: Reduce the prevalence of dental caries in Abu Dhabi children aged 5-6 years from 78-95% to 50-60% by the end of December 2020.

Objective 4: Reduce the dmft mean in Abu Dhabi children aged 5-6 years from 5.1–8.4 to 3 by the end of December 2020.

What the literature says:

- To have an effective prevention we should focus on young individuals³².
- Using fluoride in its different forms is effective in the prevention and control of dental caries³³
- Community water fluoridation is effective in the reduction of dental caries³⁴
- Fluoride gels, mouth rinse and varnishes are very effective in the reduction of dental caries in high risk patients.³⁵
- School –based dental sealant programs will reduce pit and fissure sealant decay in the posterior teeth by 60%.
- To make the school-based dental sealant programs more cost saving, they should be delivered to high risk population, for example children living in low income families.^{36 37}
- The United States saves more than \$4.6 billion of the dental costs annually because of water fluoridation.³⁸

Strategy 1: Create Supportive Environments

Activity 1.1: Advertisement for the campaign will be conducted in effective ways to reach the public. Advertisement will be distributed in different languages, places & through different media (posters in roundabouts, malls, universities, schools, Abu Dhabi main television channel and social media).

Activity 1.2: The ceremony of the campaign will be launched by famous figure to have a powerful influence on the public. Press conference release will be arranged in the launching day by press release staff (television, radio, newspaper & social media).

Activity 1.3: School lunches which are rich in milk and cheese are encouraged to be available to all students. This can be achieved by encouraging the schools' cafeterias to sell such food or by giving the parent an option at the beginning of the school year to pay 500 AED. With this amount of money the school/ kindergarten will have the responsibility to provide the child with a health meal each day at the lunch break.

Activity 1.4: Each student in KG1, KG2 and grade 1 will be given one tooth brush during the distribution of the uniforms and school books. Those teeth brushes will be kept at schools. Students are encouraged to have their teeth brushed after school lunch.

Activity 1.5: Small shops and supermarkets are encouraged to have the cariogenic snacks in high shelves were young children can't reach easily. Shops that do this will be rewarded by having a logo that can be posted in their shop which shows that this shop is a healthy oral shop.

Model: Social Cognitive Theory

Measure: Number of schools distributing toothbrushes to their students at the beginning of the school year, number of schools having healthy oral food in their cafeteria, number of parents paying extra school fees to have healthy oral food for their children and number of shops with healthy oral shop logo.

Resources: Human: Famous figure, employees to put the advertisements in different places, media experts.

Strategy2: Develop personal skills

Activity 2.1: Posters about oral hygiene and good eating habits will be present in the Obstetrics and pediatric waiting rooms. These posters will be prepared by students in dental collages (Sharjah Dental School) and reviewed by dentistry professors in the same dental collage. Students are encouraged to do those posters by making a competition: best poster will be distributed in all Abu Dhabi health sectors with the student name on it. All informative materials will be prepared one month before the campaign. Materials will be in different forms and languages (Arabic and English). They will include updated, evidence based, clear & simple messages. Materials will be pilot tested before printed by giving these materials to a small random sample of new and pregnant mothers and ask them what do they think about it (is it easy to understand, attractive and/or useful).

Activity 2.2: Pediatricians and gynecologist are encouraged to educate new and pregnant mothers about the following:

- Educate pregnant and new mothers about breast feeding and healthy complementary feeding.
- Encourage parents to educate themselves about oral hygiene practice and eating habits.
- Encourage parents to educate their children about how to make wise choices regarding foods.
- Educate parents about proper amount and way of tooth brushing for children below 2 years and below 6 years.

The media will be oral consultation and brochures.

Activity 2.3: The main Abu Dhabi TV channel will provide the key messages to the mothers and to the children. Those messages will be simple and clear. Those messages will appear at least twice daily during children time and family time. Advertisements will be also available on the most popular regional children channels e.g: MBC3, Toyor Aljana and Baragham.

Activity 2.4: Strengthen the importance of oral health, healthy food for teeth and oral hygiene in the school curriculum.

Activity 2.5: At school children should be taught how to brush teeth properly by their teachers

Model: Health belief model

Measure: Number of waiting rooms with oral health posters, number of persons who watched the media advertisement, number of schools teaching oral hygiene instructions in their curriculum and number of health counseling made by pediatricians and gynecologists.

Resources: Media experts, volunteers, dentists to teach teachers proper way of tooth brushing before teaching the students.

Strategy 3: Reorient health services

Activity 3.1: Oral health education material should be available in all pediatrics', gynecologists' clinics and waiting rooms. They also should be distributed to the healthcare facilities. (It also applies for Strategy 2)

Activity 3.2: Provide healthcare workers with regular continuing education in preventing and treating dental caries. This could be done by yearly lectures and workshop about children oral health and its updates. The lectures will be given in public hospitals, health complexes, and private hospitals. Health providers who attend the lectures and workshop will be awarded CME hours.

Activity 3.3: Each student will have a chance to have a free dental checkup each year arranged by his/her school. (The program planner will help the schools to arrange

these checkups to be done by dental students studying in the UAE). Parents of children who need treatment will have a telephone call from the school to encourage them to take their children to the dental office.

Activity 3.4: In the framework of a School-Based Clinical Preventive Program each student must have at least one chance a year to have oral prophylaxes, or fluoride application. Schools are responsible to arrange a visit to the dental school or to have dental students coming to their school.

Activity 3.5: School-based dental sealant program will be provided to the identified high risk patients. The high risk patients will be identified during the annual school dental checkups done by the dental students. See activity 3.3

Treatment program in the school will be done by using mobile vans, portable equipment or by taking the kids to the dental schools (arranged previously with the Dental Collage Oral Health Community Department).

Model: Community organization model

Measure: Number of health provider attended the oral health lectures and workshop.

Resources: volunteers to distribute the oral health education materials, public health specialists to provide lectures to healthcare workers and dental students.

Strategy 4: Strengthen community action

Activity 4.1: Invitation letters will be sent to different officials in the community about the program and its importance. They will be asked to reply if they are interested to take part in the program. Later, program planners will have a meeting with the interested officials and discuss with them how they can help in this program.

Activity 4.2: The program planners will communicate the progress, and impact reports of the project with the stakeholders. Work with the Ministry of Health and Ministry of Education in strengthening the current policy and implementation of banning soft drink and snack vending machines in schools.

Activity 4.3: Different officials in the community will work to empower the campaign in all kind of media; not only in radio, TV station and newspaper but also on Twitter & Facebook. Twitter & Facebook accounts will be created to update the public about the campaign activities and provide the public with information.

Activity 4.4: The idea of water fluoridation should be discussed with oral health experts and governmental officials in the community and a decision on promoting this idea to policymakers should be made.

Model: Community organization model

Measures: Number of social media followers and friends, number of website page views, and number of officials in the community agreed to participate in this campaign.

Resources: program planners, different officials in the community and oral health experts

Strategy 4: Build healthy public policy

Regulations will be made on the following issues:

- Families with a household income at or below 5000 AED are not charged for dental treatment services of their children (6 years and below).
- Schools are not allowed by law to have soft drink and snack vending machines.
- Sale of sweets and unhealthy foods should not be allowed inside schools.

Model: Community organization model

Measure: enhancements of these regulations

5.0 EVALUATION:

This health promotion program is going to be evaluated through its different stages to identify gaps, modify it as necessary, demonstrate accountability, and communicate the knowledge gained.

Here is the frame work of the health promotion program evaluation:

Planning and needs assessment evaluation

(Formative evaluation)

- Need assessment: survey questionnaire will be pilot tested before its distribution to ensure reliability. The sample will be 30 ladies (new and/or pregnant mothers) taken randomly from one public hospital and one private clinic.
- Printed education materials, advertisement materials and materials to be broadcasted on TV will be pilot tested by focus group. These materials will be given to a small random sample of new and pregnant mothers (12 mothers) and they will be asked what they think about it (is it easy to understand, attractive and/or useful).

Implementation evaluation

(Process evaluation)

The process evaluation will be used during the campaign initiation and implementation. All tasks and activities will be evaluated independently. This will help us to know what is

working and what is not. This will be achieved by different indicators/ measures depending on the type of activity or task (see measures determined for each strategy in Implementation).

Outcome evaluation

The objectives of the program are going to be evaluated as follows:

Objective:

To increase awareness about the oral hygiene practice and eating habits among Abu Dhabi pregnant and new mother by 60% from the baseline at the end of December 2020.

At the end of each year the questionnaire used to establish baseline data about awareness of oral hygiene and eating habits among Abu Dhabi pregnant and new mothers (attachment 1) is going to be used in a cross sectional study to monitor the increase of oral awareness.

Objective:

Reduce the prevalence of dental caries in Abu Dhabi children age 5-6 years old from 78-95% to 50-60% by the end of December 2020.

Reduce the dmft mean from 5.1–8.4 to 3 in children 5-6 years old by the end of December 2020.

At the end of each year a dental examination survey is going to be conducted to monitor the change in the dmft mean and dental caries prevalence. This will be achieved by taking a random sample from Abu Dhabi kindergartens and schools (for children aged 5-6 years) and checking their oral status.

6.0 Conclusion and recommendation

There is high prevalence of dental caries and its risk factors in the UAE including Abu Dhabi. This will have an increasing economic and health impact on the UAE. Preventing dental caries and controlling its risk factors by a well-developed health promotion program will help to change the current situation to the desired outcome which is the reduction of dental caries dmft (decayed, missing and felt primary teeth) and prevalence in UAE children.

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Declaration

None declared

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