

**Improving Oral Hygiene to Prevent Dental Problems through Awareness Raising Among  
Children in Armavir Marz: a Community Service Grant Proposal**

Master of Public Health Integrating Experience Project

Community Service Grant Proposal Framework

by

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## **Table of Content**

Acknowledgments.....	iii
List of abbreviations .....	iv
Executive Summary .....	v
Introduction/Literature Review.....	1
Situation in Armenia.....	3
Implementation Plan Synopsis.....	3
Evaluation Plan Synopsis.....	5
Hypothesis.....	6
Ethical considerations .....	11
Timeline .....	12
Logistical Considerations and Budget .....	12
Appendix 2. Criteria for classifying debris and calculus.....	19
Criteria for classifying debris.....	19
Appendix 3. Timeframe .....	33
Appendix 4. Budget of the proposed study “Improving Oral Hygiene to Prevent Dental Problems through Awareness Raising among Children in Armavir marz” .....	34

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## **List of abbreviations**

WHO	World Health Organization
OHI	Oral Hygiene Index
OR	Odds Ratio
TOT	Training of trainers
IRB	Institutional Review Board
SES	Socio-Economic Status

## **Executive Summary**

According to the World Health Organization (WHO), oral health is an important part of the general health and it includes disorders such as oral and throat cancer, oral infection and abscesses, “periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing.” Improving the wellbeing of persons with oral health problems are of high importance worldwide. According to the WHO, oral diseases are among the most prevalent non-communicable diseases and are major components of the global burden of disease.

This paper is a Community Service Grant Proposal for improving oral hygiene to prevent dental problems through awareness raising educational sessions among kindergarten nannies, children and their parents in Armavir Marz. The target population for the program will be children of kindergarten-age. The program will be implemented in all kindergartens from Armavir Marz as an intervention; kindergartens from Ararat Marz will be in the control group for evaluating the effectiveness of the proposed intervention. The effectiveness of the project will be assessed by evaluating the OHI before and after the intervention. The program will last 18 months from August 2016 to December 2017 with the overall budget of \$19,738.

## **Introduction/Literature Review**

According to the World Health Organization (WHO) Collaborating Centre for Nutrition and Oral Health, nutrition affects the teeth during development and malnutrition may exacerbate periodontal and oral infectious diseases<sup>1,2</sup>. However, the most significant effect of nutrition on teeth is the local action of diet in the mouth on the development of dental caries and enamel erosion. Dental erosion is increasing and is associated with dietary acids, a major source of which is soft drinks<sup>1,2</sup>.

Worldwide, 60–90% of school children and nearly 100% of adults have dental caries. Dental caries can be prevented by maintaining a constant low level of fluoride in the oral cavity. Severe periodontal (gum) disease, which may result in tooth loss, is found in 15–20% of middle-aged (35–44 years) adults in the world<sup>2</sup>. Globally, about 30% of people aged 65–74 have no natural teeth<sup>2</sup>.

According to the New York state oral health surveillance, “dental caries, the most common chronic childhood disease, impacts children’s functioning including eating, growth, speaking, and learning”<sup>3</sup>. Oral disease in children and adults is higher among poor and disadvantaged population groups. Risk factors for oral diseases include an unhealthy diet, tobacco use, harmful alcohol use, poor oral hygiene, and social determinants, including low socioeconomic status and low level of education<sup>4</sup>.

Oral health has an important role in health in general and can influence the quality of life. Dental caries as well as periodontal diseases are highly irreversible and have increased in the last couple of decades as a result of lack of access to oral health care services and low awareness of primary prevention techniques among population. If proper oral hygiene habits are cultivated

among children during school age period, when children are in overall development stage, it will result in better oral health, and thus higher quality of life<sup>5</sup>.

The problems connected with oral hygiene can be met in all children, especially in children with developmental disabilities. They are important part of our society. According to the American Academy of Pediatrics, children with developmental disabilities often have unmet complex health care needs as well as significant physical and cognitive limitations<sup>6</sup>. Children with more severe conditions from low-income families are particularly at risk with high dental needs and poor access to care. In addition, children with developmental disabilities are living longer, requiring continued oral health care, which shows that the oral hygiene has an important role also for children with disabilities, to prevent the other health problems<sup>6</sup>.

According to surveys made in Inuvik Region of Canada, based on clinical examinations of children of 2-6 years of age, protective factors for severe early childhood tooth decay were higher family income (OR = 0.68; 90% CI = 0.54–0.85), community water fluoridation (OR = 0.49; 90% CI = 0.26–0.91), drinking milk (OR = 0.44; 90% CI = 0.24–0.81) and fruit juices (OR = 0.46; 90% CI = 0.24–0.90) after the child began to walk<sup>7</sup>. Based on investigations and analysis made in the field of oral health WHO has designed guidelines and assessment tools for evaluating oral health status, risk factors and finding out future needs for oral health intervention. It is highly recommended to include oral health in national health surveillance systems, and through project monitoring find outcomes and thus provide decision makers, public health planners with information on relevance and effectiveness of projects<sup>8</sup>.

Oral hygiene is vital both for primary teeth and for permanent teeth. Infection in primary teeth can lead to damage of the permanent teeth, thus preventing proper child development and may result in maxillofacial anomalies<sup>9</sup>.

### **Situation in Armenia**

In Armenia, the level of oral hygiene is very low among children. According to Tadevosyan A. (2005), among 117 urban and rural 12 years old children from Sisian, only 21% of the respondents had appropriate oral hygiene habits and 86% had dental caries<sup>10</sup>. The pilot study results by Simyan R. (2005) suggested that 84% of children 5-7years old needed dental treatment and 61% of surveyed mothers of these children did not have appropriate oral health related knowledge, attitude, and behavior<sup>11</sup>.

### **Implementation Plan Synopsis**

The goal of the proposed community projects is to improve the oral hygiene as well as to prevent dental problems among young children in Armavir Marz by raising awareness about the issue and teaching children and their parents' proper hygiene practices. To achieve this goal the proposal suggests to implement three activities:

- Training of trainers for kindergarten nannies, raising knowledge on primary prevention techniques, as well as proper oral hygiene habits among kindergarten nannies
- Teaching kindergarten children about oral hygiene and daily care of teeth
- Training of parents, through information sharing about oral hygiene.

The trainings will be carried out in Armavir Marz. All public kindergartens will participate in this program. The participants will be senior group children aged 4-5 years.

Training of trainers (TOT) involves training of nannies on dental caries, periodontal diseases primary prevention techniques, as well as proper oral hygiene habits. Training among nannies is a key factor since they play a big role in children's daily life because of spending a large amount of time in the kindergarten with children. Moreover, nannies may provide information to parents who have questions about dental health. In addition, nannies may substitute for some parents who cannot participate in the training. Prevention is the key to solving dental problems and good oral hygiene is the first step in prevention.

After the TOT, nannies will teach kindergarten children how to clean their teeth and will organize trainings for parents. The duration of the training for nannies will last for two weeks with three trainings per week. The trainings will be conducted during the hours of bedtime of children. The duration of each training session will be 30 minutes. The specialist-psychologists will be invited to participate in the training in order to provide more effective methods of transferring oral hygiene related knowledge to kids, like models based on the theory of games, using other parent-child interaction methods<sup>12,13</sup>. The first two days will be devoted to children's general health and the importance of proper nutrition for dental health. The remaining time will be concentrated on dental health issues. Information about oral hygiene will be provided including the starting age for cleaning teeth, the frequency of teeth cleaning, the correct methods and duration of teeth cleaning procedures.

Teaching kindergarten children about oral hygiene and daily care of teeth include the importance of giving them an opportunity to regularly clean their teeth in kindergartens. Nannies will teach children the duration, proper methods and the frequency of teeth cleaning. Nannies will use funny entertainments and games as means of activities throughout the year.

The main reason of teaching children this way is to create interest in the cleaning process. Hopefully, this will result in making oral hygiene a good habit for the future.

Parents' training about oral hygiene means raising their awareness on dental caries, periodontal diseases, primary prevention techniques, as well as proper oral hygiene habits. The schedule for trainings includes daytime hours and also evening classes for parents who work during daytime. Trainings will last for two weeks with three training sessions, with the average duration of 30 minutes. The first day of the training informative booklets will be disseminated among parents. The agenda will provide information about schedules for all trainings. Important points on oral-hygiene will be included in reading materials as well as providing parents with stationery for taking notes. Trainers will explain the key points of oral hygiene to the parents, since the knowledge on proper hygiene is very important not only for the children but also for all of the adults in the family. Informed parents will pay more attention to dental health of family members and their children and thus avoid many problems in the future.

### **Evaluation Plan Synopsis**

Evaluation will include the examination of oral hygiene of the children before and after the intervention, to determine if the education has improved their oral hygiene. For measuring children's oral hygiene condition, the evaluation will use the Oral Hygiene Index (OHI), which measures the current oral hygiene status based on the amount of debris and calculus occurring on six representative tooth surfaces in the mouth often used in field surveys<sup>14</sup>. The student investigator, who is a dentist, will do the examinations for OHI.

## Hypothesis

By September-November 2017, the Oral Hygiene Index of children 4-5 years old from Armavir marz public kindergartens will be 36.84% lower (1.92 vs. 1.21) compared to the OHI of children 4-5 years old in Ararat marz kindergartens in September-November 2017 as a result of the “Improving Oral Hygiene to Prevent Dental Problems Through Awareness Raising Among Children in Armavir Marz” project.

For the proposed study a quasi-experimental non-equivalent control group design (Panel Design) will be used.

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O O

The preference of the design is based on the fact that it has a control group and a baseline measurement for the intervention and control groups. In the panel design each person has his/her own control and minimizes variability of the groups at pre-test and post-test. The OHI of the target intervention group and control group will be measured before the intervention (September, 2016) and one year after the intervention. This evaluation design has some strengths and weaknesses in terms of threats to internal and external validity.

Internal validity: History can be a problem for the program evaluation, as we have a control group from another marz, so in case of other similar nationwide interventions we would be able to see the results of our project by comparing the results with the control group, but in case if there are different types of activities in each of the selected marz the history still can be a threat to internal validity. The study sample is not formulated based on outlying characteristics

of participants, so statistical regression is not considered as a problem. Since children will not be randomly assigned to intervention and control groups, selection bias is a threat to internal validity. In this case selection bias can occur when: 'cases (or controls) are included in (or excluded from) a study because of some characteristic they show which is related to exposure to the risk factor under the evaluation<sup>15</sup>. We might face attrition since we will use a panel design and the same children will be tested for baseline and follow-up. Some participants may stop going to the selected kindergartens or refuse to participate in the follow-up OHI measuring. We propose to compare the characteristics of those children who will drop out of the study with those who stay to understand the level of this threat to internal validity. Another threat to the internal validity is maturation, since the second assessment will be made in one-year period after the intervention, maturation could be a threat, but having a control group will help to minimize this threat. For avoiding the compensatory rivalry threat we will propose to blind the participants to knowing about a comparison group. Testing can be a threat to internal validity, since children who went through the baseline measurement could probably be more careful to their oral hygiene, because during the testing they will get familiar with some of the information on oral health. The risk to have in instrumentation threats will be lower if the testing of the participants will be conducted by the same person (dentist) using the same methodology of calculating the OHI.

External validity: for the proposed program evaluation the selection-treatment interaction is a big threat. While evaluation is happening in the kindergartens of two marzes the results may not be generalizable to other groups of participants. Reactive/situational effects is a possible threat, participants who are involved in the program evaluation might show better results because of their realization of being in the evaluation. This threat could affect generalizability if we

implement a similar project without evaluating it. Testing-treatment interaction could also be potential threat to external validity, since the baseline measurement could have some effect on the study population and if the intervention is conducted in a different group without a baseline measurement we might not expect similar results. It is known that when the same group of people get two or more treatments there may be a cumulative effect and such results cannot be generalized to single treatments, so multiple treatment effects is a threat in our study also, as participants in the intervention group can have access to other sources of information on the topic, such as internet, book and TV programs, which could make the findings from the proposed evaluation not generalizable to other groups who may or may not be exposed to similar other programs.

### **Setting/Sources of data**

For the intervention group children from kindergartens of Armavir marz villages will be randomly selected. Children from kindergartens of Ararat marz villages will be randomly selected to the control group. For the control group Ararat marz is selected because of close geographical localization to Armavir marz and the similar socio-economic development level. The exclusion criteria will be participants who will leave the kindergarten in one-year period after the intervention (August, 2016 - December, 2017) and the children whose parents do not allow them to participate in this program. For the calculation of the sample size the study design will be considered<sup>16-17</sup>.

$$(z_{\alpha/2} + z_{\beta})^2 * \frac{(\sigma_1^2 + \sigma_2^2)}{\delta^2}$$

Alpha is the type one error probability  $z_{\alpha/2}=1.96$ ; the type two error probability is  $z_{\beta}=0.84$ ,

the difference between the null and the alternative is  $\delta=0.71$ , standard deviations for OHI before and after the intervention are  $\sigma_1=0.85$ ,  $\sigma_2=0.82$  respectively<sup>13</sup>. The sample size will be:

$$(1.96 + 0.84)^2 * \frac{(0.85^2 + 0.82^2)}{0.71^2}$$

$$N=22$$

For both the intervention and control groups the number of the participants has to be 22.

Taking into consideration the response rate among Armenian population during the related study, which was 78%, the adjusted sample size will be 28 participants per group. Since there is a follow up test among the participants after 1 year from the intervention, there is a need to take into consideration also the attrition rate. According to a similar study the attrition rate for 1 year can be 2.43%. The final sample size will be 29 participants per group.

### **Sampling technique**

For the sampling process simple random sampling will be used. The simple random sampling is considered to be the most unbiased technique and each eligible person in the population has equal opportunity to be involved in the study. The list of all eligible children from 4-5 age group in Armavir marz will be requested from the existing 12 kindergartens.

According to the sample size the list of 29 random numbers will be generated with Microsoft Excel RANBETWEEN function with the range corresponding to the actual number of eligible participants, those 4-5 year age group children from all kindergartens of Armavir marz.

The coordinator of the study will obtain information on all children attending kindergartens of Armavir marz from the Marz Administrative Center. The same approach will be used for the control group selection in Ararat marz.

### **Evaluation variables and instruments**

Oral Hygiene Index consists of the Debris Index and Calculus index, each of them includes 12 numerical determinations showing the total of debris or calculus found on surface of each of three segments of each dental arch<sup>13</sup>.

There are 3 segments identified in each jaw, including: right, left and middle parts. From each segment the tooth with the worst condition, those with the highest score of debris and calculus is selected as a representative of the specific segment (Appendix 1). Afterward, the scores for all segments are calculated for both calculus and debris, and after these calculations the overall OHI is calculated as sum of the mentioned calculus and debris scores (Appendix2).

The main independent variable is the presence or absence of the intervention (training of parents, nannies and children) and the main dependent variable is the OHI. The main intervening variables are the daily teeth brushing frequency (once a day, twice a day, more than twice a day, seldom, never), mother's age, educational level, occupational status, mothers' oral health related knowledge, attitude and behavior, gender of the child, and the SES of the family.

<sup>11, 18-20</sup> One of the intervening variables is the daily teeth brushing frequency that will be treated as ordinal variable. At the same time, intervening variables such as mother's age is continuous variable, mother's educational level is ordinal variable, mother's occupational level is a nominal scale with a few options, gender of a children is a binary variable, the SES of the family is continuous variable that would be generated by summarizing the answers taken from the socio-

demographic questions from the questionnaire. The intervening variables mothers' oral health related knowledge, attitude and behavior are continuous variables.<sup>11</sup>

### **Data Management and Analysis**

The data will be collected using the questionnaire for parents (Appendix 3, 4 ), which the student investigator adapted from a previous study done in Yerevan, Armenia<sup>11</sup> and through measuring children's OHI. The data will be entered into Microsoft Excel software, after which it will be coded and transferred into SPSS 17.0 software (Statistical Package for Social Sciences) for the further statistical analysis. For the data cleaning double entry will be performed.

For the description of the study population descriptive statistics will be used. Means and standard deviation (SD) will be used to present continuous variables and proportions for categorical variables. The data will be compared between the intervention and comparison groups using two sided-t-test for continuous variables and chi2 test for categorical variables. Afterwards the linear regression analysis will be conducted for the dependent variable (OHI). The crude associations will be checked between all variables (including dependent, independent and intervening) by simple linear regression analysis (SLR). Later for adjustment of confounders the multivariable linear regression analyses will be conducted between the dependent variable and explanatory variables. The significance level for all variables will be determined  $p \leq 0.25$ .

### **Ethical considerations**

To participate in the evaluation of the proposed intervention, all parents of our participants will sign a written consent form. Since the study population includes children aged 4-5, there will be an assent form for them. For getting the assent from the children the

psychologist of the project with the kindergarten nannies will introduce the project evaluation to the children using appropriate materials, including games and movies to explain the project details and obtain children's agreement for their participation in the evaluation.

One of the possible risks is physical burden, in terms of time allocated for the evaluation of the intervention. However, the duration of the evaluation process – OHI measurement usually takes at most 5 minutes and it is an easy process without pain.

All the information that will be collected during the study will not be used for any other purposes. In addition, the student investigator prepared an application for the AUA Institutional Review Board (IRB) and met the IRB requirements. The student investigator will request a letter of support from the Ministry of Health and Ministry of Education and Science before starting the fieldwork.

### **Timeline**

The duration of the study is expected to be 18 months (Appendix 4). The program starts in August 2016, during this month the office and personnel will be selected. In August 2016 there will be conducted community visits to the regions for obtaining the data on the existing kindergartens of Armavir and Ararat marzes and selecting the study population. The baseline evaluation measurements will be taken in September 2016. The interventions will be conducted in September-November 2016 (4 kindergartens monthly). In year 2017 September-November, 1 year after the intervention the same children will be post-tested and data will be collected and analyzed.

## **Logistical Considerations and Budget**

The staff of the evaluation team will include evaluation expert, data collector, data entry officer and data analyst. Budget will be calculated based on salaries of personnel, data collection and other expenses. The budget of the proposed project is developed for the duration of 18 months, starting from August 2016 and ending in December 2017. The total estimated budget is 19,738\$ (Appendix 4). It consists of personnel cost, operating cost, and project material cost. In purpose to calculating the personnel cost there were conducted consultations with experienced managers in Public Health sphere in Armenia. Salaries are calculated based on the number of hours required to fulfill the duties of each position and yearly salaries are calculated based on the number of months worked per year. The active period is the period of March-May 2017 when activities are conducted, including the planned trainings as the main part of our intervention and baseline data collection on OHI, and passive period is the period starting from June 2017 to the end of February 2018, which is considered to be waiting period before the post testing for evaluation of the project results based on the knowledge of the participants. No costs are calculated for the waiting period.

The calculation of operational cost is conducted considering the market prices and taking into account all the needs for the implementation of the project activities. The total operating cost might be lower than the presented calculation in case if the office and other assets were available in a working organization.

The project materials cost was calculated considering the number of information materials needed based on the number of trainings. The number of questionnaires are calculated based on the amount of pre-testing and post testing needed for data collection in control and

intervention groups. The number of participant information booklets is calculated based on the number of participants in the intervention group. Five educator packages are for the 4 educators and a trainer. Each package will include all the materials for conducting in class activities (education materials, colored papers, pencils, pens, prizes).

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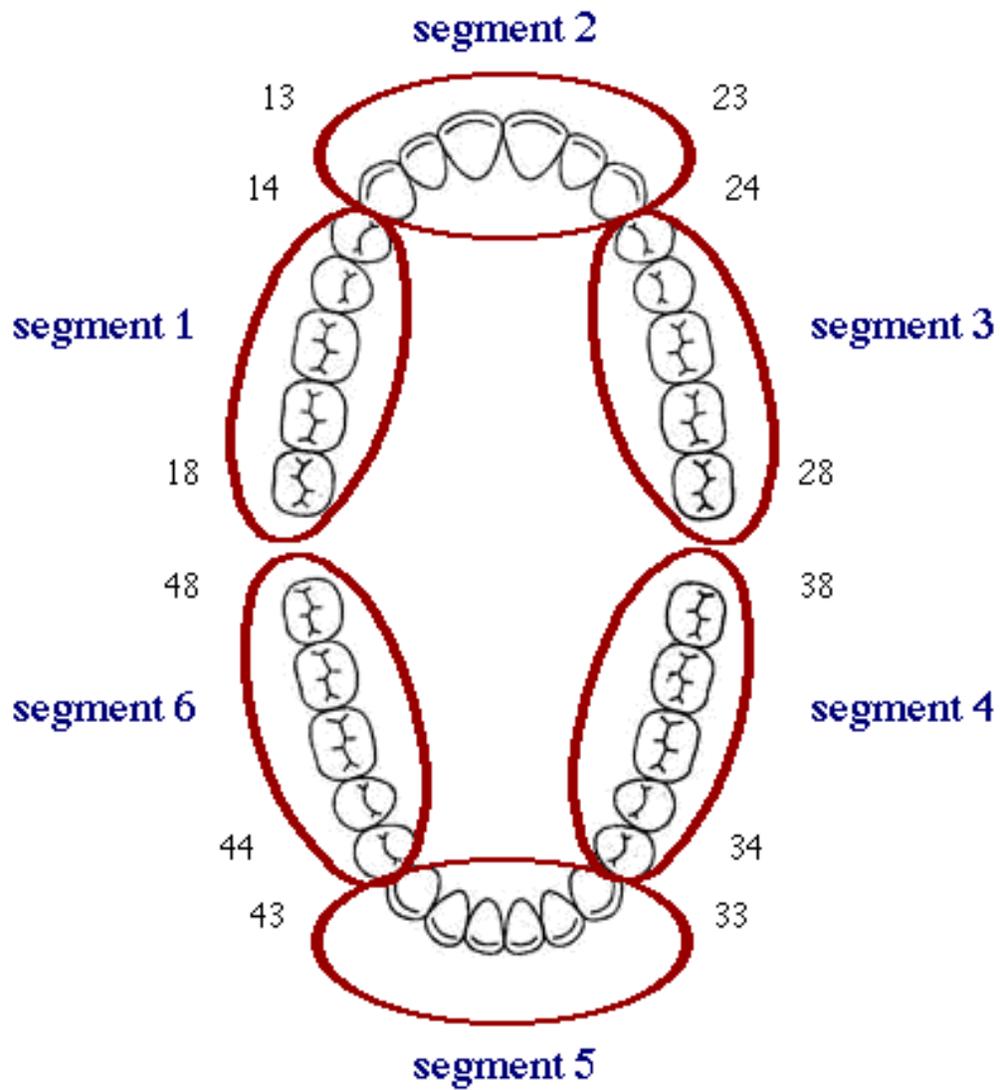
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Appendix 1. Three segments of each dental arch<sup>13</sup>



Oral Hygiene Index (Greene and Vermilion, 1960)

## Appendix 2. Criteria for classifying debris and calculus<sup>13</sup>

### Criteria for classifying debris

Scores	Criteria
<b>0</b>	No debris or stain present
<b>1</b>	Soft debris covering not more than one third of the tooth surface, or presence of extrinsic stains without other debris regardless of surface area covered
<b>2</b>	Soft debris covering more than one third, but not more than two thirds, of the exposed tooth surface
<b>3</b>	Soft debris covering more than two thirds of the exposed tooth surface.

### Criteria for classifying calculus

Scores	Criteria
<b>0</b>	No calculus present.
<b>1</b>	Supragingival calculus covering not more than third of the exposed tooth surface.
<b>2</b>	Supragingival calculus covering more than one third but not more than two thirds of the exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both.
<b>3</b>	Supragingival calculus covering more than two third of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth or both.

Source: Oral Hygiene Index (Greene and Vermilion, 1960)

**Appendix 3. Questionnaire (English version)**

<p><b>1.</b> Child's ID _ _ _ _</p>	<p><b>2.</b> Date ___/___/___ dd/mm/yy</p>
<p><b>3.</b> Child's birth date ___/___/___ dd/mm/yy</p>	
<p><b>4.</b> Child's gender    1) Male                               2) Female</p>	<p><b>5.</b> Residency of the child (family)  _____</p>
<p><b>6.</b> In your opinion, are oral diseases serious ones? 1. Yes 2. No 88. Do not know/Difficult to answer</p>	<p><b>7.</b> Toothpastes with fluoride are effective in preventing tooth decay. 1. Yes 2. No 88. Do not know/Difficult to answer</p>
<p><b>8.</b> How often do you believe a child should go to the dentist? 1. Every 6 months 2. Once a year 3. Whenever needed-no regular schedule 4. Other _____ 88. Do not know/Difficult to answer</p>	<p><b>9.</b> At what age should a child start cleaning his/her teeth? 1. As soon as the first tooth appeared 2. 1-2 years of age 3. 3-4 years of age 4. After 4 years of age 5. When attending a dentist 6. Other (specify) _____</p>
<p><b>10.</b> Has a dentist or any of the dental staff ever demonstrated to you how teeth should be cleaned? 1. Yes 2. No</p>	<p><b>11.</b> How important is oral health to overall health? 1. Very important 2. Somewhat important 3. Not very 4. Not at all important 88. Do not know/ Difficult to answer</p>
<p><b>12.</b> In your opinion, which of the following is the best method/are the best methods for preventing tooth decay? (Check all that apply) 1. Limiting sugary snacks 2. Using fluoridated water and dental products with fluoride 3. Chewing sugarless gum 4. Regular dental visits 5. Proper oral hygiene (brushing and flossing the teeth) 88. Do not know/ Difficult to answer</p>	<p><b>13.</b> How often do you put off going to the dentist until you have a toothache? 1. Always 2. Sometimes 3. Rarely 4. Never</p>
<p><b>14.</b> Do you think that you need to learn how correctly clean your teeth? 1. Yes</p>	<p><b>15.</b> If your children have signs of tooth decay what do you do? 1. Do not care if no pain</p>

<p>2. No</p>	<p>2. Use pills for pain killing 3. Visit to a dentist only in pain 4. Visit to a dentist immediately for dental filling 5. Go to a dentist for extraction of tooth 6. No decayed tooth</p>
<p><b>16.</b> How often do you pay attention to the condition of your children teeth? 1. Always 2. Sometimes 3. Rarely 4. Never</p>	<p><b>17.</b> Are you able to access dental services for oral health care when necessary? 1. Yes 2. No</p>
<p><b>18.</b> About how long has it been since your child last visited a dentist? 1. 6 months ago or less 2. Within past 12 months 3. More that one year ago 4. Never has received dental care (go to question 20) 88. Do not remember/Difficult to answer</p>	<p><b>19.</b> What was the main reason that your child last visited a dentist? (Please check one) 1. Regular checkup 2. Something was wrong, bothering or hurting 3. Went for filling tooth/teeth 4. Went for pulling out tooth/teeth 5. Other (specify) _____  88. Do not remember/Difficult to answer</p>
<p><b>20.</b> During the past 12 months, was there a time when your child needed dental care but could not get it at that time? 1. Yes 2. No (go to question 21) 88. Do not remember/Difficult to answer</p>	<p><b>21.</b> What was the main reason that he/she could not get dental care? 1. Could not afford it because of cost 2. Problem was not serious enough 3. Do not like/trust/believe in dentist 4. Child is afraid of dentist 5. Other (specify) _____</p>
<p><b>22.</b> How old was your child when he first received dental care? 1. Under 4-year-old 2. 4-year- old and older 3. Never has been at a dentist 88. Do not remember/Difficult to answer</p>	<p><b>23.</b> How often do you go to the dentist or dental hygienist? 1. At least once a year 2. Twice a year 3. Less than once a year 4. Do not go 5. Whenever needed-no regular schedule 6. Other (specify) _____</p>
<p><b>24.</b> Do you have a dentist you usually see for care? 1. Yes</p>	<p><b>25.</b> How often do you brush your teeth? 1. Never 2. Every few weeks</p>

<p>2. No</p>	<p>3. Every few days 4. Twice a day 5. Once a day</p>
<p><b>26.</b> How would you describe the condition of your child's teeth? 1. Excellent 2. Good 3. Fair 4. Poor 88. Do not know/Difficult to answer</p>	<p><b>27.</b> How often does your child brush his/her teeth? 1. Brushing once a day 1. Never 2. Every few weeks 3. Every few days 4. Twice a day 5. Once a day</p>
<p><b>28.</b> If your child brush his/her teeth, please indicate whether tooth brushing is performed by: 1. supervision of adults 2. without help of adults</p>	<p><b>29.</b> Do you think that having accurate preventive information on oral health will help maintain good oral health? 1. Yes 2. No 88. Do not know/Difficult to answer</p>
<p><b>30.</b> In your opinion, how often should people replace their toothbrushes? 1. Every 6 months 2. At least once a month 3. Every year 4. Until it gets broken 88. Do not know/Difficult to answer</p>	<p><b>31.</b> If your teeth are sensitive to heat, cold, or sweet things, you should switch to a toothpaste with: 1. Tartar control 2. Strontium chloride 3. Baking soda 4. None of the above 88. Do not know/Difficult to answer</p>
<p><b>32.</b> If you needed some additional information on prevention oral disorders, where would you like to get it? (Check one, most preferable options for you) 1. TV 2. Newspapers, journals 3. Dentists 4. Children pediatrician 5. School-based programs 6. Others (specify) _____ 88. Do not know/Difficult to answer</p>	<p><b>33.</b> Does your child have sweets in-between-meals every day (desserts or candy, sugary drinks)? 1. Yes 2. No (go to question 35)</p>
<p><b>34.</b> Please check the frequency of eating sweets by your child: 1. 1 time per a day 2. 2 times per a day 3. 3 times and more 88. Do not know/Difficult to answer</p>	

	1. Strongly agree	2. Agree	3. Neither agree nor disagree	4. Disagree	5. Strongly disagree	88. Don't know/ Difficult to answer
<b>35.</b> I think that tooth decay often occurs in poor quality teeth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>36.</b> Tooth brushing once a day is sufficient to have healthy teeth if it is done carefully	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>37.</b> My family cannot afford themselves to apply for dental services in case of need	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>38.</b> I think that eating many sugary foods/drinks causes tooth decay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>39.</b> The regular dental visits are important for having good oral health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>40.</b> Early teeth cleaning is important for children's health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>41.</b> Frequency of sugar consumption has a greater role than total amount consumed in causing caries (tooth decay)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>42.</b> I will receive high-quality dental treatment if it is expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Demographic characteristics	
<p><b>43.</b> How old are you? (completed years)</p> <p>_____</p>	<p><b>44.</b> What is your marital status?</p> <ol style="list-style-type: none"> <li>1. Married</li> <li>2. Separated/Divorced</li> <li>3. Widowed</li> <li>4. Single</li> </ol>
<p><b>45.</b> How many members live in your household? _____</p>	<p><b>46.</b> How many <i>children</i> live in your household? _____</p>
<p><b>47.</b> Educational level of mother</p> <ol style="list-style-type: none"> <li>1. High</li> <li>2. Middle</li> <li>3. Low</li> </ol>	<p><b>48.</b> Educational level of father</p> <ol style="list-style-type: none"> <li>1. High</li> <li>2. Middle</li> <li>3. Low</li> </ol>
<p><b>49.</b> Are you employed?</p> <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	<p><b>50.</b> On average, how much money does your family spend monthly?</p> <ol style="list-style-type: none"> <li>1. Less than 50'000 AMD</li> <li>2. From 51'000 to 100'000 AMD</li> <li>3. From 101'000 to 200'000 AMD</li> <li>4. From 201'000 to 300'000 AMD</li> <li>5. Above 301'000 AMD</li> <li><b>88.</b> Do not know/Difficult to answer</li> </ol>
<p><b>51.</b> How would you rate the child's family's general standard of living?</p> <ol style="list-style-type: none"> <li>1. Substantially below average</li> <li>2. Little below average</li> <li>3. Average</li> <li>4. Little above average</li> <li>5. Substantially above average</li> <li>88. Do not know/Difficult to answer</li> </ol>	

**Appendix 4. Questionnaire (Armenian version)**

<p><b>1.</b> Երեխայի տարբերակման համարը ____</p>	<p><b>2.</b> Ամսաթիվ___/___/___ օր/ամիս/տարի</p>
<p><b>3.</b> Երեխայի ծննդյան ամսաթիվը օր/ամիս/տարի</p>	<p>___/___/___</p>
<p><b>4.</b> Երեխայի սեռը 1) Արական 2) Իգական</p>	<p><b>5.</b> Երեխայի բնակության վայրը (ընտանիքի)  _____</p>
<p><b>6.</b> Ձեր կարծիքով բերանի խոռոչի հիվանդությունները կարո՞ղ են լուրջ հիվանդություններ համարվել</p> <p>1. Այո 2. Ոչ 88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>	<p><b>7.</b> Ձեր կարծիքով, արդյոք ֆտոր պարունակող ատամի մածուկները արդյունավե՞տ են բերանի խոռոչի հիվանդությունները կանխելու համար</p> <p>1. Այո 2. Ոչ 88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>
<p><b>8.</b> Ձեր կարծիքով ի՞նչ հաճախականությամբ է պետք երեխային տանել ատամնաբույժի մոտ</p> <p>1. 6 ամիսը մեկ անգամ 2. Տարին մեկ անգամ 3. Միայն անհրաժեշտության /կարիքի/ դեպքում 4. Այլ տարբերակ (նշեք)_____</p> <p>88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>	<p><b>9.</b> Ո՞ր տարիքում երեխան պետք է սկսի մաքրել ատամները</p> <p>1. Առաջին իսկ ատամը դուրս գալուց հետո 2. 1-2 տարեկանում 3. 3-4 տարեկանում 4. 4 տարեկանից սկսած 5. Միայն ատամնաբույժին այցելելու ժամանակ 6. Այլ տարբերակ (նշեք)_____</p>
<p><b>10.</b> Ատամնաբույժը Ձեզ երբևիցե բացատրել է ատամների ճիշտ մաքրելու կանոնները;</p> <p>1. Այո 2. Ոչ</p>	<p><b>11.</b> Ձեր կարծիքով, առողջ բերանի խոռոչ ունենալը անհրաժեշտ է՞ ընդհանուր առողջություն ունենալու համար</p> <p>1. Շատ անհրաժեշտ է 2. Անհրաժեշտ է 3. Ոչ այդքան անհրաժեշտ է 4. Անհրաժեշտ չէ 88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>

<p><b>12.</b> Ներքոհիշյալ ցանկից ընտրեք Ձեր կարծիքով ամենա ճիշտ տարբերակը/տարբերակները ատամի կարիեսը (ատոմնափուտը) կանխելու համար (Նշեք բոլոր հնարավոր պատասխանները)</p> <ol style="list-style-type: none"> <li>1. Շաքար պարունակող սննդամթերքի սահմանափակումը</li> <li>2. Ֆտորացված ջրի և ֆտոր պարունակող ատամնաբուժական արտադրանքի օգտագործումը</li> <li>3. Շաքար չպարունակող մաստակների օգտագործումը</li> <li>4. Կանոնավոր այցելություն ատամնաբույժին</li> <li>5. Բերանի խոռոչի համապատասխան հիգիենա (խողանակով և ատամի թելով մաքրել)</li> </ol> <p>88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>	<p><b>13.</b> Նշեք, թե փչացած ատամ ունենալու դեպքում որքա՞ն հաճախ եք հետաձգում ատամնաբույժին այցը, քանի դեռ ուժեղ ատամացավ չունեք:</p> <ol style="list-style-type: none"> <li>1. Միշտ</li> <li>2. Երբեմն</li> <li>3. Հազվադեպ</li> <li>4. Երբեք</li> </ol>
<p><b>14.</b> Ձեր կարծիքով Դուք կարիք ունեք սովորելու, թե ինպես ճիշտ մաքրեք Ձեր ատամները</p> <ol style="list-style-type: none"> <li>1. Այո</li> <li>2. Ոչ</li> </ol>	<p><b>15.</b> Ինչպե՞ս եք վարվում Ձեր երեխայի ատամի փչացման նշաններ ունենալու դեպքում</p> <ol style="list-style-type: none"> <li>1. Եթե ցավ չկա ուշադրություն չեմ դարձնում</li> <li>2. Ցավազրկող եմ տալիս</li> <li>3. Այցելում եմք ատամնաբույժին միայն ցավ ունենելու դեպքում</li> <li>4. Անմիջապես այցելում եմք ատամնաբույժին ատամը բուժելու նպատակով</li> <li>5. Դիմում եմք ատամնաբույժին ատամը հեռացնելու նպատակով</li> <li>6. Ատամնափուտի (կարիեսի) բացակայություն</li> </ol>
<p><b>16.</b> Որքա՞ն հաճախ եք ստուգում Ձեր երեխայի ատամների վիճակը</p> <ol style="list-style-type: none"> <li>1. Միշտ</li> <li>2. Երբեմն</li> <li>3. Հազվադեպ</li> <li>4. Երբեք</li> </ol>	<p><b>17.</b> Կարիքի դեպքում Դուք ունե՞ք ատամնաբույժին դիմելու հնարավորություն</p> <ol style="list-style-type: none"> <li>1. Այո</li> <li>2. Ոչ</li> </ol>

<p><b>18.</b> Մոտավորապես ե՞րբ է Ձեր երեխան այցելել ատամնաբույժի վերջին անգամ</p> <ol style="list-style-type: none"> <li>1. Վերջին 6 ամսվա ընթացքում</li> <li>2. Վերջին 12 ամսվա ընթացքում</li> <li>3. 1-2 տարի առաջ</li> <li>4. Երբևէ ատամնաբույժի չենք դիմել (անցեք 20-րդ հարցին)</li> </ol> <p>88. Չեմ հիշում/Դժվարանում եմ պատասխանել</p>	<p><b>19.</b> Ո՞րն էր վերջին անգամ Ձեր երեխայի համար ատամնաբույժի դիմելու պատճառը</p> <ol style="list-style-type: none"> <li>1. Սովորական ստուգումը</li> <li>2. Ինչ-որ բան անհանգստացնում էր</li> <li>3. Ատամները պլոմբելու համար</li> <li>4. Ատամները հեռացնելու համար</li> <li>5. Այլ նպատակով (նշեք) _____</li> </ol> <p>88. Չեմ հիշում/Դժվարանում եմ պատասխանել</p>
<p><b>20.</b> Վերջին 12 ամիսների ընթացքում եղե՞լ է այնպիսի դեպք, որ Ձեր երեխան ատամնաբույժի կարիք ունենա, բայց չկարողանա տվյալ պահին անհրաժեշտ օգնությունը ստանալ</p> <ol style="list-style-type: none"> <li>1. Այո</li> <li>2. Ոչ (անցեք 22-րդ հարցին)</li> </ol> <p>88. Չեմ հիշում/Դժվարանում եմ պատասխանել</p>	<p><b>21.</b> Ո՞րն է այդ օգնությունը չստանալու պատճառը</p> <ol style="list-style-type: none"> <li>1. Անհրաժեշտ գումարի բացակայությունը</li> <li>2. Պրոբլեմը այդքան էլ լուրջ չէր</li> <li>3. Բժիշկներին չենք վստահում</li> <li>4. Երեխան ատամնաբույժից վախենում է</li> <li>5. Այլ տարբերակ / նշեք/ _____</li> </ol>
<p><b>22.</b> Քանի՞ տարեկանում է Ձեր երեխան առաջին անգամ դիմել ատամնաբույժի</p> <ol style="list-style-type: none"> <li>1. Մինչև 4 տարեկան</li> <li>2. 4 տարեկան հասակում կամ ավելի ուշ</li> <li>3. Երբևէ չի այցելել ատամնաբույժի</li> </ol> <p>88. Չեմ հիշում /Դժվարանում եմ պատասխանել</p>	<p><b>23.</b> Ի՞նչ հաճախականությամբ եք Դուք այցելում ատամնաբույժի</p> <ol style="list-style-type: none"> <li>1. Առնվազն տարին 1 անգամ</li> <li>2. 2 տարին մեկ</li> <li>3. Ավելի քիչ քան տարին 1 անգամ</li> <li>4. Չեմ այցելում</li> <li>5. Միայն անհրաժեշտության /կարիքի/ դեպքում</li> <li>6. Այլ տարբերակ (նշեք) _____</li> </ol>
<p><b>24.</b> Դուք ունե՞ք ատամնաբույժ, որին մշտապես այցելում եք</p> <ol style="list-style-type: none"> <li>1. Այո</li> <li>2. Ոչ</li> </ol>	<p><b>25.</b> Ի՞նչ հաճախականությամբ եք մաքրում Ձեր ատամները</p> <ol style="list-style-type: none"> <li>1. Երբեք</li> <li>2. Մի քանի շաբաթը մեկ</li> <li>3. Մի քանի օրը մեկ</li> <li>4. Օրը 1 անգամ</li> <li>5. Օրը 2 անգամ</li> </ol>
<p><b>26.</b> Ինչպես կգնահատեք Ձեր երեխայի ատամների վիճակը</p> <ol style="list-style-type: none"> <li>1. Չերազանց</li> </ol>	<p><b>27.</b> Որքա՞ն հաճախ է Ձեր երեխան մաքրում իր ատամները</p> <ol style="list-style-type: none"> <li>1. Երբեք</li> </ol>

<p>2. Լավ 3. Բավարար 4. Վատ 88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>	<p>2. Մի քանի շաբաթը մեկ 3. Մի քանի օրը մեկ 4. Օրը 1 անգամ 5. Օրը 2 անգամ</p>
<p><b>28.</b> Եթե Ձեր երեխան մաքրում է իր ատամները, խնդրում ենք նշել, թե մաքրում է մեծերի օգնությամբ, թե ինքնուրույն</p> <p>1. Մեծերի օգնությամբ 2. Ինքնուրույն</p>	<p><b>29.</b> Ձեր կարծիքով, բերանի խոռոչի հիվանդությունների կանխանգելման վերաբերյալ բավարար տեղեկություններ ունենալը կնպաստի արդյո՞ք առողջ բերանի խոռոչ ունենալուն</p> <p>1. Այո 2. Ոչ 88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>
<p><b>30.</b> Որքա՞ն հաճախ ատամի խոզանակը պիտի փոխվի</p> <p>1. 6 ամիսը մեկ անգամ 2. Առնվազն ամիսը մեկ անգամ 3. Տարին մեկ անգամ 4. Երբ կոտրվի 88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>	<p><b>31.</b> Եթե Ձեր ատամները զգայուն են ջերմության, ցրտի կամ քաղցրի նկատմամբ, Դուք պետք է անցնեք հետևյալ ատամի մածուկի օգտագործմանը</p> <p>1. Ատամնաքարի առաջացումը կանխող 2. Ստրոնցիում պարունակող 3. Կերակրի սողա պարունակող 4. Վերը նշվածից ոչ մեկը 88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>
<p><b>32.</b> Որտեղից կցանկանայիք տեղեկանալ բերանի խոռոչի հիվանդությունների կանխարգելման մասին (Նշեք Ձեր համար միայն մեկ գերադասելի տարբերակ):</p> <p>1. Հեռուստացույցից 2. Անսագրերից, թերթերից 3. Ատամնաբույժից 4. Մանկական բժիշկից 5. Դպրոցներում կազմակերպված դասընթացներից 6. Այլ (նշեք)</p> <p>88. Չգիտեմ/Դժվարանում եմ պատասխանել</p>	<p><b>33.</b> Ձեր երեխան ուտում է քաղցրավենիք ամեն օր հիմնական ուտելիքների միջև</p> <p>1. Այո 2. Ոչ (անցեք 35-րդ հարցին)</p>
<p><b>34.</b> Խնդրում ենք նշել քաղցրավենիք ուտելու հաճախականությունը</p>	

1. Օրը 1 անգամ 2. Օրը 2 անգամ 3. Օրը 3 անգամ և ավելի 88. Չգիտեմ/դժվարանում եմ պատասխանել						
	1. Լիովին համաձայն եմ	2. Համաձայն եմ	3. Ոչ համաձայն եմ, ոչ էլ ոչ	4. Համաձայն չեմ	5. Լիովին համաձայն չեմ	88. Չգիտեմ/ դժվարանում եմ պատասխանել
<b>35.</b> Ես կարծում եմ, որ ատամների փչացման պատճառը նրանց անորակ լինելն է	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>36.</b> Կարծում եմ, որ ատամները օրը մեկ անգամ լավ մաքրելը բավարար է առողջ ատամներ ունենալու համար	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>37.</b> Մեր ընտանիքը չունի համապատասխան ֆինանսական հնարավորություն ատամնաբուժական ծառայությունների դիմելու համար	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<p><b>38.</b> Կարծում եմ, որ քաղցրի չափազանց շատ օգտագործումը/չարաշահումը նպաստում է ատամների փչացմանը</p>	<input type="checkbox"/>					
<p><b>39.</b> Կանոնավոր այցելությունները ատամնաբուլյժին կարևոր են Ձեր և Ձեր երեխայի առողջ բերանի խոռոչ ունենալու համար</p>	<input type="checkbox"/>					
<p><b>40.</b> Վաղ տարիքից ատամների խնամքը շատ կարևոր է երեխայի առողջության համար</p>	<input type="checkbox"/>					

<b>41.</b> Շաքար պարունակող սննդամթերքի բազմակի օգտագործումը առավել հաճախ է առաջացնում ատամնափուտ, քան այդ սննդամթերքի շատ քանակը	<input type="checkbox"/>					
<b>42.</b> Ես կստանամ լիարժեք ատամնաբուժական օգնություն թանկ գներ վճարելու դեպքում	<input type="checkbox"/>					

**Սոցիալ-ժողովրդական տվյալներ**

<b>43.</b> Քանի՞ տարեկան եք _____	<b>44.</b> Ինչպիսի՞ն է Ձեր ամուսնական կարգավիճակը:  1. Ամուսնացած 2. Բաժանված/ամուսնալուծված 3. Այրի 4. Չամուսնացած
<b>45.</b> Քանի՞ հոգի է ապրում Ձեր ընտանիքում: _____	<b>46.</b> Քանի՞ երեխա է ապրում Ձեր ընտանիքում: _____
<b>47.</b> Մայրիկի կրթության աստիճանը 1. Բարձրագույն 2. Միջնակարգ 3. Թերի միջնակարգ	<b>48.</b> Հայրիկի կրթության աստիճանը 1. Բարձրագույն 2. Միջնակարգ 3. Թերի միջնակարգ
<b>49.</b> Դուք աշխատո՞ւմ եք:  1. Այո 2. Ոչ	<b>50.</b> Միջինում, ամսական որքա՞ն գումար է ծախսում Ձեր ընտանիքը:  1. 50000 դրամից քիչ 2. 51000-ից մինչև 100000 դրամ

	<p>3. 101000-ից մինչև 200000 դրամ  4. 201000-ից մինչև 300000 դրամ  5. 301000 դրամից ավելի  88. Չգիտեմ/դժվարանում եմ պատասխանել</p>
<p><b>51. Ինչպե՞ս կբնութագրեք Ձեր ընտանիքի նյութական վիճակը:</b></p> <p>1. Միջինից բավականին ցածր  2. Միջինից մի փոքր ցածր  3. Միջին  4. Միջինից մի փոքր բարձր  5. Միջինից բավականին բարձր  88. Չգիտեմ/դժվարանում եմ պատասխանել</p>	

## Appendix 5. Timeframe

	August 2016	September 2016	October 2016	November 2016	September 2017	October 2017	November 2017	December 2017
Office and equipment rendering	X							
Hiring staff	X							
Schools and participants selection, scheduling	X							
Gathering baseline data in the control and intervention groups		X						
Intervention in all kindergartens of Armavir marz		X	X	X				
Collecting follow-up data in the control and intervention groups, data entry, and data analysis					X	X	X	
Writing a report, which will include implementation and evaluation with recommendations on future actions								X

**Appendix 6. Budget of the proposed study “Improving Oral Hygiene to Prevent Dental Problems through Awareness Raising among Children in Armavir marz”**

	\$	Duration	Subtotal
Personnel cost			
Program coordinator	\$600/month	10month	6,000\$
Program trainer	\$300/month	3month	900 \$
Psychologist	\$150/month	3month	450\$
Driver	\$200/month	9month	1,800\$
Subtotal			9,150\$
Salary taxes average 25% of the subtotal			2,288\$
<b>Subtotal</b>			<b>11,438\$</b>
Office rent for 10 months	\$100/month	10month	1,000\$
Office supplies	\$50/month	10month	500\$
Communication and electricity	\$80/month	10month	800\$
Car rental and maintenance	\$200/month	10month	2,000\$
Fuel cost	\$100 per car/per month	10month	1,000\$
<b>Subtotal</b>			<b>5,300\$</b>
Computer	\$650	2computers	1,300\$
Printer	\$400	1 printer	400\$
<b>Subtotal</b>			<b>1,700\$</b>
Information booklets in pictures for kids	\$2/booklet	150participants	300\$
Training packages for trainers	\$20/package	3 month	60\$
Subtotal			360\$
<b>Total</b>			<b>18,798\$</b>
Unexpected expenses	5 % of the total cost		940\$
<b>Total cost of the project</b>			<b>19,738\$</b>